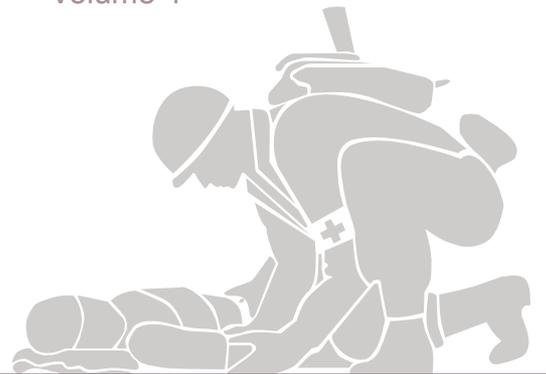


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# White Papers

US ARMY MEDCOM  
Interior Design Master Plan  
Volume 4





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2019

# MEDCOM Interior Design Master Plan

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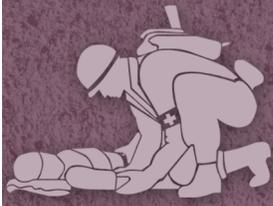
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# 1. Acoustics

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# Hospital QUIET ZONE



## Controlling noise and improving privacy

by Niklas Moeller

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**CONVERSATIONS AND THE CACOPHONY EMANATING FROM TELEPHONES, ALARMS, TELEVISIONS, CARTS, DOORS, MEDICAL, AND MECHANICAL EQUIPMENT ENSURE NOISE IS EVER-PRESENT IN U.S. HOSPITALS.** VARIOUS ECONOMIC INCENTIVES, REGULATORY MEASURES, AND DESIGN GUIDELINES HAVE BEEN DEVELOPED OVER THE PAST DECADE TO ENCOURAGE HOSPITALS TO ADDRESS THIS PROBLEM.

It is important for those involved in the planning and construction of these facilities to understand these initiatives, as well as how to help hospital administrators achieve their acoustic goals.

One of the most powerful measures is the value-based

purchasing program (VBP) enacted by the Centers for Medicare and Medicaid Services (CMS). It provides monetary incentive to improve patient outcomes by penalizing poorly performing hospitals, while rewarding those that do better. At its outset, it was funded by a one percent withholding of Medicare. In 2014, that figure began rising by 0.25 percent annually and will reach its currently planned cap of two percent by 2017.

The VBP program is rooted in a total performance score for each hospital calculated from clinical quality assessments (70 percent) and patient satisfaction scores (30 percent). The latter is based on the results of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey. Failure to submit these surveys to CMS results in a two percent withholding of Medicare.

Researchers have found the sick and the elderly are the most likely to have their sleep disturbed by noise, and people never completely habituate themselves to night-time noise.

The HCAHPS (pronounced ‘h-caps’) survey is given to a random sample of patients between 48 hours and six weeks after discharge, and is used to gain insight into perspectives on the quality of their hospital stay. It includes 18 questions, grouped under eight topics. Hospitals earn points for achieving a certain performance level relative to other hospitals, for improving their performance over previous periods, and for consistency across all eight categories.

The section pertaining to the hospital environment includes a question relating to noise that asks, “During this hospital stay, how often was the area around your room quiet at night?” The patient can respond: never, sometimes, usually, or always. Since 2007—when collecting and submitting the survey became mandatory—noise has consistently been the worst-rated factor nationwide. As such, this problem has the greatest potential to impact hospital funding by dragging down consistency scores as well as patients’ overall rating of their stay. It may also affect a hospital’s competitiveness because the public can review each facility’s results online.

### **Patient comfort and outcomes**

It is worth noting the HCAHPS survey focuses on the quietness of the patient’s room at night. Though noise is not responsible for all sleep disruptions, its contribution is significant.

Researchers have found the sick and the elderly are the most likely to have their sleep disturbed by noise, and people never completely habituate themselves to night-time noise. Noise reduces both the quantity and quality of sleep through delayed onset, shifts to lighter stages, motility (*i.e.* tossing and turning), and awakenings, which weaken the immune system and impede the body’s ability to generate new cells. It can also lead to problems during the day, such as agitation and delirium.<sup>1</sup>

However, a growing body of medical studies show noise also causes problems during the day. As illness can increase sensitivity to environmental stressors, noise can create anxiety, driving up nursing calls as well as pain medication requests. In fact, side effects such as elevated blood pressure, quickened heart rate, and increased metabolism have led some researchers to conclude noise may even slow recovery rates and length hospital stays.

Additionally, patients are not the only ones affected. Though one might think staff can become conditioned to noise over time, no one is able to fully tune out these disturbances because senses are designed to detect such changes in the environment. Both the American Hospital Association (AHA) and the Institute for Safe Medical Practices (ISMP)

recommend that medical error prevention programs take noise into consideration, given it can impact caregivers’ concentration, stress levels, and fatigue.

### **HIPAA and speech privacy**

Speech privacy is yet another acoustic concern in hospitals. Conversations occur at administrative stations, and in hallways and semi-private rooms. Often, areas used for the input and retrieval of both medical and financial information are located near waiting areas.

Patients know if they can overhear conversations occurring in adjacent areas, others can hear them as well, making them uncomfortable and less likely to discuss private matters with their caregiver. They also have a fundamental right to auditory privacy, which has been officially recognized in a set of federal regulations developed by the U.S. Department of Health and Human Services (HHS).

Introduced in 1996, the *Health Insurance Portability and Accountability Act (HIPAA)* primarily deals with the use of protected health information (PHI) and of any individually identifiable health information, as well as its storage, and sharing in electronic systems. However, a small but essential part of the *HIPAA* pertains to oral communication, because to exclude conversations would essentially allow for private information to be inappropriately shared if it was done verbally.

*HIPAA* requires healthcare entities take “reasonable safeguards”—including administrative, technical, and physical measures—to ensure speech privacy during both in-person and telephone conversations with patients and between employees. Compliance was required by healthcare-related facilities and other organizations working with PHI as of April 14, 2003. There are stated penalties for non-compliance, but HHS has elected to address speech privacy issues on a complaint basis to date, and few monetary penalties have been issued. However, a hospital must be able to demonstrate it has investigated acoustics, researched possible solutions, and implemented economically viable ones.

### **Improving acoustics using the ABCs**

If one focuses on the types of noise created by building occupants and small medical equipment rather than structure-borne or mechanical sources, there are three key ways to improve noise control and speech privacy in hospitals: absorbing, blocking, and covering. None of these

The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey includes a question regarding the quietness of the patient's room at night. Since 2007, it has been the poorest-rated factor nationwide, dragging down consistency scores.

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francisblack



Health Insurance Portability and Accountability Act (HIPAA) requires hospitals to take 'reasonable safeguards' to protect patients' privacy during in-person and telephone conversations.

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Squaredpixels

methods can achieve the desired goals on its own; rather, they must be used in combination. The further challenge in hospitals is to apply them in such a way so as not to compromise cleanliness or staff's ability to easily access patients and interact with one another.

### Using absorptive materials

Hospitals often have hard finishes, causing noises to echo, overlap, linger, and travel great distances. Adding absorptive materials still meeting the criteria for sterility and washability will reduce

the energy and, therefore, the volume of noise reflected off their surfaces back into the space.

Since the ceiling is usually the largest unbroken surface in a facility, a good absorptive tile helps lessen the distance over which noises and conversations can be heard. In fact, a Swedish study determined cardiac patients in rooms with absorptive ceiling tiles were less likely to be readmitted than those in traditional rooms.<sup>2</sup>

Ceiling absorption is often rated using noise reduction coefficient (NRC), which ranges from 0 to 1 (*i.e.* 0 to 100 percent absorption). Articulation class (AC) and ceiling attenuation class (CAC) are two additional ratings to consider. AC is the measure of the tile's ability to absorb noise reflected off the ceiling into neighboring spaces in open-plan areas in the frequencies important for speech privacy. CAC indicates the tile's value as a barrier to airborne sound transmission between adjacent closed offices, which is less relevant in hospitals where deck-to-deck construction is typically used. An appropriate tile should be specified and consistent coverage ensured throughout the building.

The ceiling's absorptive power is affected by the type of lighting system used. From an acoustic perspective, the best lighting is an indirect system because it helps to maintain the coverage of the acoustical tile across the entire ceiling. A system incorporating a minimum number of fixtures while still meeting the lighting requirements should be specified.

Hanging absorptive wall panels may be needed in some situations. They are most effective when applied to large vertical surfaces and reflective locations, such as corridors. Acoustic wall panels are available featuring photographs or artwork.

Soft flooring can be used to lessen footfall and other 'traffic' noise. The challenge for hospitals is to implement it in a manner that does not compromise sanitation or hamper the movement of patients and equipment. Some have purchased motorized beds and use modular carpet tiles so individual sections can be removed for easier cleaning.

### Implementing blocking strategies

When introduced to blocking, most people immediately think of walls, but a well-planned layout can also be used to minimize direct (*i.e.* line of sight) transmission of sound to and from neighboring spaces. For example, high-activity

areas and noisy machines such as icemakers should be located in spaces well-separated from patient rooms. Doors facing each other across hallways should be offset. It is also helpful to rethink traditional aspects of the hospital landscape. For instance, nursing stations can be decentralized in order to prevent large groups from talking near patient rooms.

However, caution needs to be taken when applying blocking strategies, because caregivers must be able to readily monitor and access patients. When one blocks out noise, the line of sight is also affected.

The most common blocking tactic is to construct deck-to-deck walls. The aim is to completely seal the room, but wall performance is sensitive to any gaps. Basically, if light can pass through, so can sound, and often well enough to substantially reduce the wall's impact.

Of course, an open door is a private room's biggest Achilles' heel and some hospitals are re-evaluating the open-door policy in an attempt to address this weakness. However, even when the door is closed, sound can transmit through HVAC components, openings under doors, and even back-to-back electrical switches and outlets. Any penetrations must be properly treated and managed during design, construction, maintenance, and renovation to ensure the wall's integrity.

### Covering noise with sound masking

When a closed room fails to provide speech privacy and control noise, some argue it is due to poor design or construction. While there is some truth to this position, it erroneously assumes the correct approach is to rely solely on physical isolation.

In fact, both blocking and absorption only address part of the acoustic equation. These strategies are needed to reduce volume peaks, the distance over which sounds travel, and the length of time they last. They also decrease a facility's overall background sound level. The lower level makes remaining noises more noticeable and disruptive to occupants. It also allows them to clearly overhear conversations, even those occurring at a distance or in another room.

Providing a higher and more consistent background sound level is accomplished by installing a sound masking system. This technology basically consists of a series of loudspeakers integrated in a grid-like pattern above the ceiling, as well as a method of controlling their zoning and output. The loudspeakers distribute a comfortable sound, similar to softly blowing air.

Adding more sound to a space may run contrary to most people's understanding of how to control noise, but the premise behind masking is simple: any noises below the new background sound level are covered up, while the impact of those above it is lessened because the degree of change between the baseline and any volume peaks is smaller.

Sound masking's ability to reduce the quantity and severity of volume changes also makes it an effective method of



Absorptive ceiling tiles reduce the volume of sounds reflected off their surfaces, the length of time they last, and distance they travel.

Photo © iStockphoto.com/sshepard

improving sleeping conditions. In fact, in a 2005 study of intensive care unit (ICU) patients, quality of sleep improved by nearly 43 percent when sound masking was used.<sup>3</sup>

Masking also entirely covers conversations or reduces intelligibility, improving privacy. However, this effect requires some distance and, therefore, masking does not prevent staff and patients from communicating with one another.

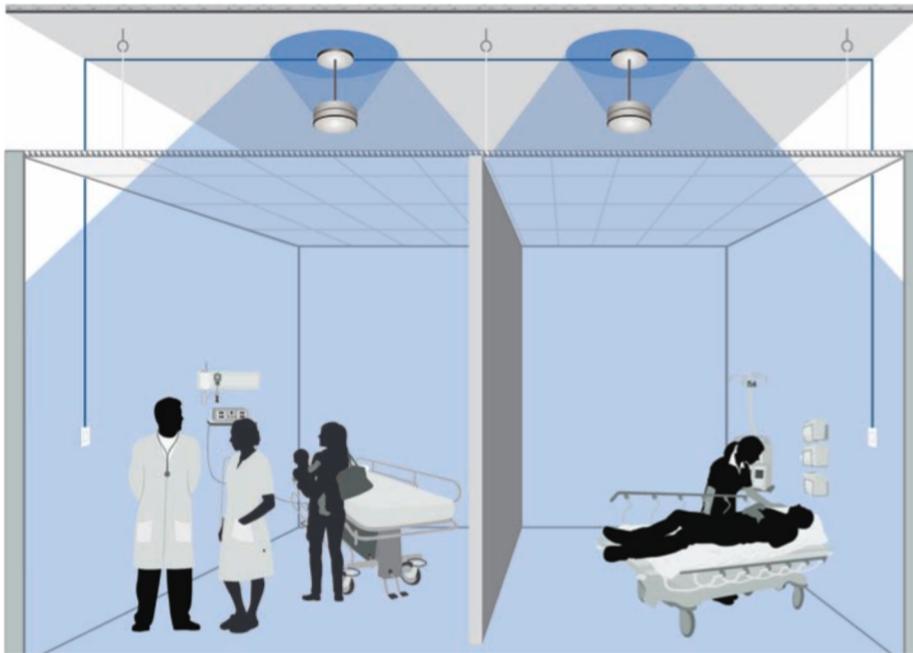
There are several design considerations worth noting when procuring this type of system for a hospital. For example, these environments are often highly fragmented, increasing emphasis on the requirement for numerous masking control zones.

Additionally, because opening the ceiling has the potential to spread contaminants into the occupied space below, the system should provide localized adjustment of all output settings and paging zones from a location below the ceiling (e.g. a control panel or computer). One does not want to have to put a containment system in place when changes need to be made to settings.

A networked-decentralized sound masking design will provide the required small zones (*i.e.* one to three loudspeakers), while allowing hospitals to make adjustments without reopening the ceiling or incurring significant disruption to their operations. It will also allow patients and staff to adjust the masking levels according to individual needs, as described in the 2014 Facility Guidelines Institute (FGI) *Guidelines for Hospitals and Outpatient Facilities*. In this way, the system will not only improve comfort, but also increase patients' sense of control over their environmental conditions, raising satisfaction levels and HCAHPS scores.

### Reducing noise through policy

While most of the acoustical burden must be borne by the



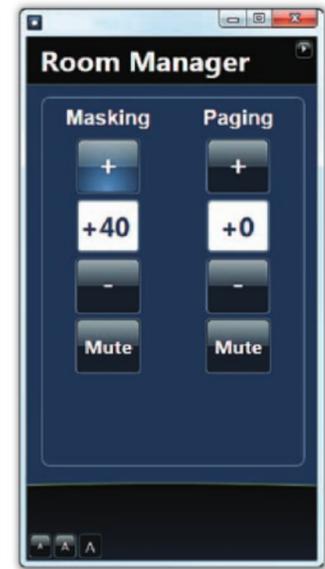
A sound masking system's loudspeakers are typically installed in a grid-like pattern above the suspended ceiling. They distribute a comfortable sound similar to softly blowing air, covering up noise and conversation.

Image courtesy K.R. Moeller Associates Ltd.

Patients and/or caregivers can be given control over the masking volume in patient rooms.

Rotary switches or programmable keypads can be installed for this purpose. Some systems also provide room control apps or integration with third-party controllers.

Images courtesy K.R. Moeller Associates Ltd.



facility's design as outlined in this article, efforts to control noise should not stop there. Once the hospital is occupied, administrators should continue to identify and subsequently reduce or eliminate unnecessary sources. For example:

- lower the telephone's ringer volume;
- dim the lights in the evening to encourage quiet;
- fix or replace faulty equipment, such as squeaky carts and creaking doors;
- provide training on how to handle loud vocalization by patients;
- purchase quieter equipment, such as hand-towel dispensers and door hardware;
- limit or eliminate overhead paging by equipping staff with personal devices; and
- use visual indicators for low-priority or advisory alarms, rather than audible signals.

Some hospitals have even formed committees tasked with raising caregivers' and visitors' awareness of noise and enforcing behavioral policies related to its reduction. Anti-noise posters are often topped with clever acronyms, such as Silent Hospitals Help Healing (SHHH) and Help Us Support Healing (HUSH) or the time-honored, 'Hospital Quiet Zone.' Policies for caregivers include:

- respond to alarms promptly;
- change IV bags before alarms sound;
- restock supplies during the evening rather than at night;
- talk only to listeners in close proximity, not from a distance;
- use hushed, rather than normal, speaking tones whenever possible;
- ask patients to employ headsets and turn off unwatched television sets; and

Providing a higher and more consistent background sound level can be accomplished by installing a sound masking system.



The majority of the acoustical burden has to be borne by the facility's physical design; however, efforts to control noise and protect speech privacy should continue through behavioral policies aimed at both staff and visitors.

Photo © iStockphoto.com/Spotmatik

- designate 'quiet time' during which no routine checks are made unless medically necessary.

In addition to the aforementioned design strategies, they may also:

- implement waiting lines at a specified distance;
- post signs reminding both staff and patients to consider their voice level; and
- locate staff telephones away from areas where conversations may be overheard.

The hospital should also designate an individual who will document

speech privacy practices (as required by *HIPAA*), provide privacy awareness training for employees, and act as the contact for complaints.

### Conclusion

People will always create noise as they go about their day in a busy, round-the-clock healthcare facility. By considering acoustics during the hospital's planning and construction, one can help administrators meet regulatory requirements, relieve some of the environmental stress from caregivers, and—above all—create more comfortable places in which patients can recuperate. **CS**

### Notes

<sup>1</sup> This comes from A. Joseph and R. Ulrich's "Sound Control for Improved Outcomes in Healthcare Settings" (The Center for Health Design, 2007) and H. Xie et al's 2009 piece, "Clinical Review: The Impact of Noise on Patients' Sleep and Noise Reduction Strategies in Intensive Care," from *Critical Care* (13:208).

<sup>2</sup> See D. Bennett's article in the May 30, 2010 *Boston Globe*, "Fixing the Noisy Hospital."

<sup>3</sup> See M.L. Stanchina et al's 2005 article, "The Influence of White Noise on Sleep in Subjects Exposed to ICU Noise," in the sixth volume of *Sleep Med*.

## ➤➤ ADDITIONAL INFORMATION

### Author

Niklas Moeller is the vice president of K.R. Moeller Associates Ltd., manufacturer of the LogiSon Acoustic Network sound masking system. He also writes about acoustics at [soundmaskingblog.com](http://soundmaskingblog.com). Moeller can be reached at [nmoeller@logison.com](mailto:nmoeller@logison.com).

### Abstract

Conversations and the cacophony emanating from telephones, televisions, alarms, carts, doors, medical equipment, and mechanical systems ensure noise is ever-present in hospitals. In the United States, economic incentives, regulatory measures and design guidelines have been developed over the past decade in order to encourage hospitals to address this problem. It is important for those involved in the planning and construction of these

facilities to understand these initiatives, as well as how they can help hospital administrators to achieve their acoustic goals with materials including sound-masking technologies.

### MasterFormat No.

27 00 00—Communications  
27 50 00—Distributed Communications and Monitoring Systems  
27 51 19—Sound Masking Systems

### UniFormat No.

D60—Communications  
D6060—Distributed Communications and Monitoring, Hospitals

### Key Words

Division 27                      *HIPAA*  
Acoustics                        Sound masking systems



## Don't miss your **TARGET**

LogiSon TARGET rapidly and accurately tunes the masking sound to the specified spectrum, ensuring it's comfortable and effective. It also gives you a detailed report proving the results. After all, you're purchasing a sound masking system to increase speech privacy and control noise, not for the pleasure of owning the equipment.

[www.logison.com/target](http://www.logison.com/target)

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# SOUND MASKING

## For Hospitals



Noise is a well-documented problem in hospitals. Sources include patients, staff and visitors talking, as well as the cacophony produced by televisions, alarms, carts, doors, medical equipment and mechanical systems.

These sounds cause more than just irritation. A growing body of research shows that noise actually harms patients by elevating heart rate and blood pressure, as well as increasing muscle tension and metabolism.

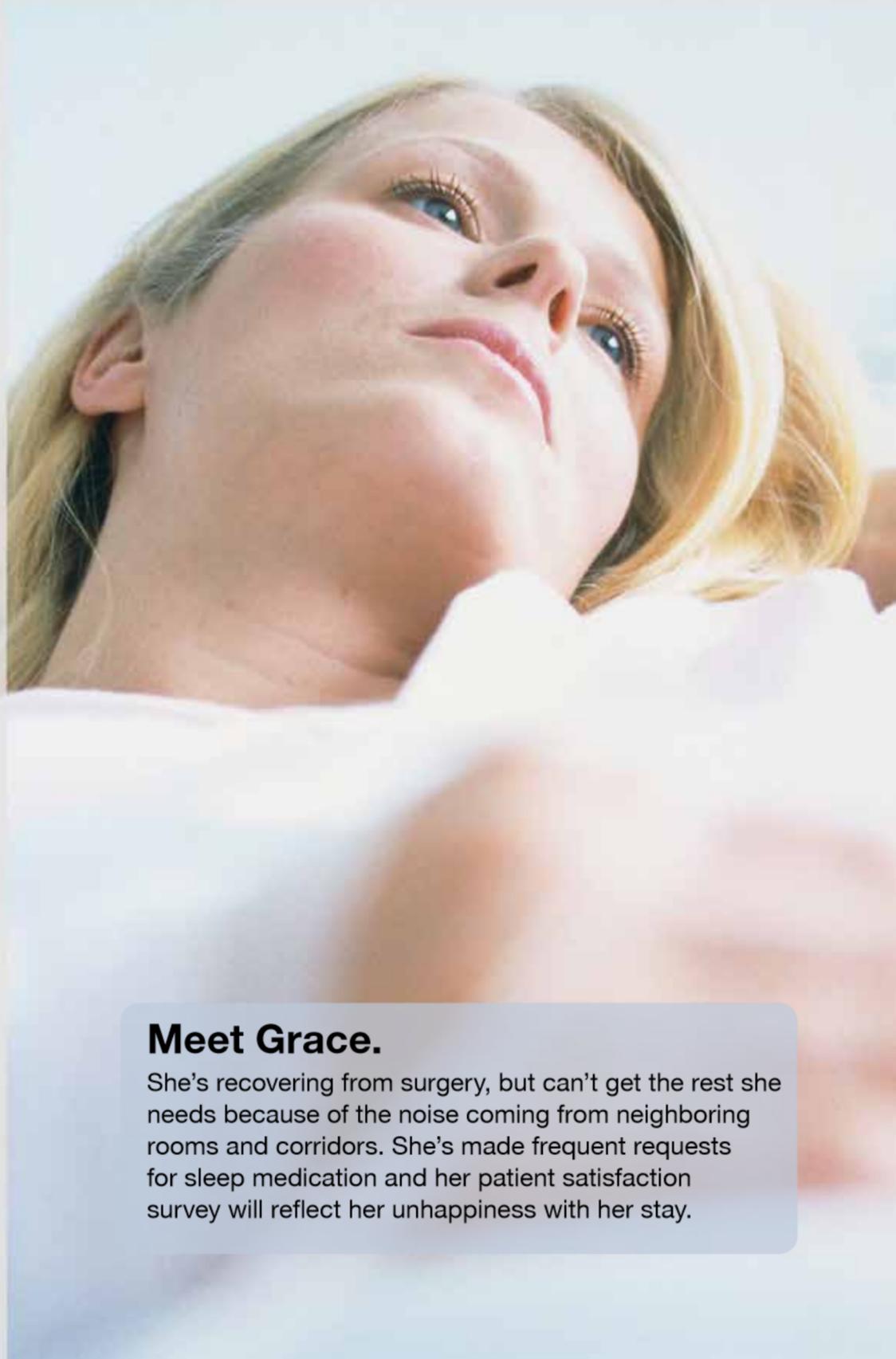
Noise also prevents patients from getting the rest they need for recovery. While it's not responsible for all disruptions, its contribution is significant. Sleep deprivation can cause agitation, delirium, decreased tolerance to pain and suppressed immune response, increasing nursing calls and lengthening hospital stays.

No wonder *Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS)* scores show that noise is the most common patient complaint. Under the new Value-Based Purchasing program, this issue will impact government funding.

But patients are not the only ones affected. Noise also tires staff out and disrupts concentration, affecting workplace satisfaction and the quality of care.

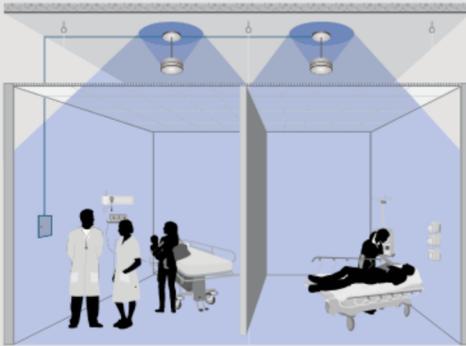
Speech privacy is yet another concern. Patients' right to privacy has been officially recognized in the *Health Insurance Portability and Accountability Act (HIPAA)*, which requires healthcare entities to take reasonable safeguards to protect verbal communication.

Addressing these acoustical issues helps to create an environment that promotes healing and supports the proficient delivery of care.



### Meet Grace.

She's recovering from surgery, but can't get the rest she needs because of the noise coming from neighboring rooms and corridors. She's made frequent requests for sleep medication and her patient satisfaction survey will reflect her unhappiness with her stay.



## The LogiSon® Solution

The LogiSon Acoustic Network generates a continuous, soothing background sound that maintains the noise floor at a comfortable volume. Though most compare the sound to softly blowing air, it's specifically engineered to cover speech and noise while remaining unobtrusive.

This technology is easily installed in new and existing spaces, including reception, waiting and common areas, sleep labs, pharmacies, staff quarters and offices, laboratories, observation and diagnostic imaging rooms, as well as the ER. It's earned over seventeen industry awards – four for healthcare applications – and its efficacy has been proven in many hundreds of millions of square feet worldwide.

Hospitals are also increasingly using the LogiSon Acoustic Network in patient rooms where it's proven to improve patient satisfaction ratings for noise. The system is uniquely designed to provide local control in individual rooms or areas, allowing occupants or staff to adjust the volume as needed to enhance privacy, reduce disturbances and improve sleeping conditions. In this way, it not only increases comfort, but patients' sense of control over their environment.

The LogiSon Acoustic Network can also provide paging and background music functions where needed. Networked control over all loudspeaker settings and zoning allows changes to be made without re-opening the ceiling.

For more information about the system's advanced features, see our brochure or contact your local LogiSon Representative.

## The Quest for Silence

For many years, the typical approach to acoustic problems in the healthcare field was to try to achieve the lowest possible volumes, particularly in and around patient rooms in hospitals. Various methods were drawn into this 'Quest for Silence,' including high spec walls, decentralized nursing stations, behavioral policies, and more. However, noise control and speech privacy remained elusive goals. In fact, HCAHPS scores show that noise remains the lowest-rated marker of patient satisfaction.

Though well-intentioned, part of the problem with this earlier approach is that it is impossible to eliminate all noises from a busy, round-the-clock healthcare environment. Furthermore, the more silent one tries to make a space, the louder the remaining noises seem to occupants.

This phenomenon can be attributed to the fact that an effective acoustic environment relies on the provision of an appropriate *noise floor* or level of continuous background sound. Once established, it covers up any noises that are lower in volume and diminishes the impact of those that are higher. Without it, occupants can clearly hear conversations and noises, even those generated at a distance or relatively low in volume.

### New FGI Guidelines

That is why resources such as the *FGI Guidelines for the Design and Construction of Health Care Facilities* now recommend the use of sound masking systems in healthcare applications. Although the system increases the background sound level, occupants perceive treated spaces as quieter for the above noted reasons. Speech privacy is also greatly improved.

### Improved Sleeping Conditions

Furthermore, sound masking has been found to be a very effective method of improving sleep. Studies show that it shortens the time it takes to fall asleep and helps reduce sleep disruption due to noise. In fact, in a study of ICU patients, quality of sleep improved by 42.7% when sound masking was used (Stachina et al., 2005). The technology's success lies in its ability to decrease the magnitude of change between baseline and peak volumes. It's this change, rather than a noise's volume, that determines whether or not disruptions occur.

## Case Study

### MEMORIAL MEDICAL CENTER • Modesto, California • USA

Memorial Medical Center is affiliated with Sutter Health, a family of not-for-profit hospitals, physician organizations and other medical services that share resources and expertise to advance healthcare quality and access.



### Problem

Memorial was experiencing noise issues and decided to conduct a trial of the LogiSon Acoustic Network in semi-private and private patient rooms, as well as in their Cancer Center. An independent acoustical consultant was hired to quantify its impact. The rooms selected for testing included one directly across from the nurses' station, one with a direct path of sound transmission from a medication dispenser, and several off a main corridor. Their acoustical design was generally poor, with gypsum walls and ceilings and large glass windows. Only the Cancer Center rooms featured a suspended ceiling.

### Solution

Measured and subjective findings showed that the LogiSon Acoustic Network reduced speech intelligibility and the amount of disruption caused by conversation. Noise from the dispensing machine and other sources was far less noticeable. Overall, the difference between the masked and unmasked floors was dramatic. The nursing staff was very pleased with the results. The trial expanded into an installation that covers four floors of patient rooms and corridors. Post installation surveys show a marked improvement in terms of patient satisfaction with noise levels.

# SOUND SOLUTIONS CASE STUDY

## ACOUSTICS & PATIENT SATISFACTION IN HOSPITALS

Addressing acoustics with a multi-prong approach for absorbing, blocking and covering sound has been a winning formula for decades. In hospitals, where gypsum ceilings and other hard surfaces often contribute to a poor acoustical environment by reflecting and reverberating sound, there has been a growing need to apply a better approach and a return to the A, B, C formula as a basis for good acoustical construction and design.

Volumes of research support the importance and impact noise levels have on patients (see study list on page 2) and hospitals are paying attention. In its monthly update to its employees and staff, The University Hospital/ SUNY Upstate Medical University cites the following impact of high noise levels on patients and encourages employees to participate in reducing these levels to improve patient satisfaction.

### THE IMPACT OF HIGH NOISE LEVELS ON PATIENTS

- Sleep Disruption/Awakening
- Decreased Rate of Wound Healing
- Higher Incidence of Rehospitalization

Hospitals like The Saint Alphonsus Regional Medical Center in Boise, Idaho have also attested to the marked improvement in the satisfaction reported for patient rooms and attributed to reducing noise, upgrading the ceiling tile and moving to single patient occupation for greater privacy. Their satisfaction surveys used a 10 point scale and patients rated their quality of sleep at 7.3 in the new upgraded private rooms versus 4.9 in the old semiprivate rooms.

The importance of sleep quality in contributing to patient recovery is well documented. Proper acoustics and using sound masking has been recognized as contributing positively to the healthcare environment to foster this.

### CHALLENGE:

At Holy Spirit Hospital in Camp Hill, PA they had traditionally used hard ceilings in their construction, but this created acoustical problems in patient rooms, as Tim De- Blae, vice president for cardiovascular services explained, "Although using hard ceilings in the patient rooms made it easier to clean than tile, we were in a quandary about why our rooms sounded like echo chambers."



### THE ABC'S OF ACOUSTICS

Combining high performance ceiling tile to absorb and block sound, and adding a quality sound masking system to cover the remaining sounds that are not absorbed or blocked is the best way to approach the acoustic design for privacy and for comfort.

### ABSORPTION

- **NRC or Noise Reduction Coefficient** measures the degree to which a surface or material absorbs sound.
- **AC or Articulation Class** measures how well a ceiling panel prevents sound from reflecting back down to adjacent workspaces in an open-plan environment.

### BLOCKING

- **STC or Sound Transmission Class** measures how well a wall or partition prevents sound from transmitting to the other side.
- **CAC or Ceiling Attenuation Class** indicates the ability of a ceiling panel to block sound transmission.

### COVERING:

- **AI or Articulation Index** represents how well speech can be understood in a given space.
- **PI or Privacy Index** represents how well the elements in, and the properties of, a space render outside conversations

Speech Privacy Can Be Objectively Measured Using Articulation Index (AI) and Privacy Index (PI)		
Speech Privacy Levels	AI	PI
Normal	≤0.15	≥85%
Confidential	≤0.05	≥95%
Secure	Special consideration required	

As per **ASTM E - 1130** Standard for Speech Privacy  
**AI** varies from 0 (absolute privacy) to 1.0 (perfect intelligibility, no privacy)  
**PI** is a related rating system and the inverse of the AI  
 An AI of 0.15 is a health care standard versus an AI of 0.20 for open office plan as a standard

# SOUND SOLUTIONS

## CASE STUDY

### ACOUSTICS & PATIENT SATISFACTION IN HOSPITALS



Holy Spirit needed to address their HIPAA requirements and wanted a solution to the acoustical problems patients were experiencing in the patient rooms. They felt this was impacting the patient's comfort.

#### **SOLUTION:**

After researching a number of alternatives and companies, Holy Spirit felt that Lencore was the right choice to take on their challenge.

Holy Spirit Hospital opted for sound masking because it was more cost effective than other solutions they were considering. "The sound masking system did everything for us," said DeBlaey. "From a HIPAA standpoint it helped mitigate some of the information sharing and it got rid of the echo effect in patient rooms." Tim added, "Before, one of the major complaints that came up through our patient survey system was noise level, particularly after hours when things are quiet in the hall with the exception of the nurse's station. Since the installation of the masking, patients have commented about how quiet the Heart Center is and how well they slept."

#### **OUTCOME:**

Investing in a quality sound masking system and upgrading ceiling tiles effectively "covered" potential breaches in oral privacy and helped Holy Spirit meet their HIPAA oral privacy objectives and avoid potential liability.

"When we opened our new Heart Center with patient rooms fit ed with sound masking, our patient satisfaction rating jumped to 98 percent," added Tim DeBlaey. "The system is also a positive for our staff. Nurses can maintain a normal tone of voice without interrupting patients."

#### **THE FINAL DIAGNOSIS:**

The supporting research and data all agree. Patients that can rest better and that are more comfortable are more likely to heal faster, have lower incidence of re-hospitalization and report greater satisfaction with their hospital stays.

Protecting privacy and providing comfort enables Lencore, as part of a multi-prong approach, to make the difference between an unhappy patient and a patient who is truly satisfied with their hospital experience.

***"Since the installation of the masking, patients have commented about how quiet the heart center is and how well they slept."***

-Tim Deblaey  
VP, Cardiovascular Services  
Holy Spirit Hospital

#### **RELATED HEALTH CARE STUDIES**

- National Center for Biotechnology Information (NCBI) – *Environmental Noise as a Cause of Sleep Disruption in an Intermediate Respiratory Care Unit* by Aaron, Charlisle, Carskadon, Meyer, Hill, and Millman.
- Annals of Emergency Medicine – *Comparison of the Auditory and Visual Privacy of Emergency Department (ED) Treatment Areas* by Barlas, Sama, Ward, and Lesser.
- The Journal of The Acoustical Society of America – *Noise Levels in Johns Hopkins Hospital* by Busch-Vishniac, West, Barhill, Hunter, Orellana, and Chivukula.
- Occupational and Environmental Medicine – *Acoustics and Psychosocial Environment in Intensive Coronary Care* by Blomkvist, Eriksen, Theorell, Ulrich, and Rasmanis.
- The American Journal of Emergency Medicine – *Noise in the ED* by Tijunelis, Fitzsullivan, and Henderson.
- Public Health Brief – *Noise and Hospital Stay* by Fife and Rappaport.

# HOW TO SPECIFY SOUND MASKING



How to prepare a  
**performance-based**  
sound masking specification for  
speech privacy and noise control.

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ACOUSTIC NETWORK

Research conducted by the Center for the Built Environment (CBE) shows that acoustics are an integral part of an effective workplace. Employees are more satisfied and organizations more profitable when their facility provides the requisite level of speech privacy and noise control.

Many organizations use a sound masking system to maintain an appropriate ambient level in their facilities, which is usually between 40 and 48 dBA in commercial interiors. This technology consists of a series of loudspeakers, which are typically installed in a grid-like pattern in or above the ceiling, and a method of controlling their output. The sound the loudspeakers distribute has been specifically engineered to increase speech privacy; however, it also covers up intermittent noises or reduces their impact by decreasing the change between baseline and peak volumes. Although the background sound level is technically higher, occupants perceive the space as quieter. Many systems also provide paging and music distribution, eliminating the need for a separate system.

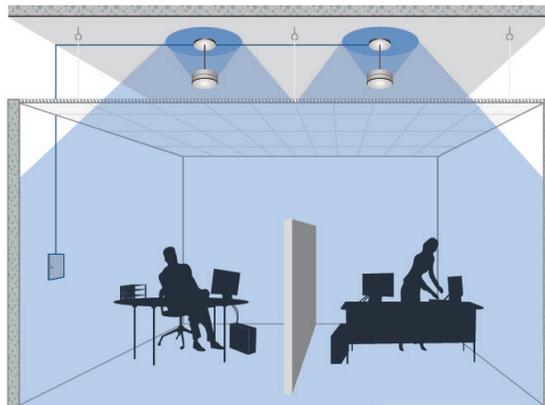
Sound masking systems have been used in various applications for decades, including offices, call centers, banks, courthouses, libraries, military facilities, hospitals and other healthcare environments. In recent years, they have gained even more popularity because of the increased use of open plan space and demountable partitions, rising densities and sustainable design practices, all of which have a significant impact on acoustics.

The field has also changed with the introduction of new types of sound masking systems. Users are no longer limited to a choice between centralized and decentralized products, but can now select a digital or networked technology. However, what often gets lost in the shuffle are the key design and performance features that can have a substantial impact on the outcome within each space.

## The Specification Gap

Sound masking is a critical design choice for which one does not want to leave a lot of room for interpretation. After all, when purchasing a system, the user is not seeking the mere pleasure of owning the equipment. Without a set of performance

standards, poor procurement decisions can be made. The desired level of speech privacy, noise control and occupant comfort may be sacrificed, as well as the user's ability to easily and cost-effectively adjust their system in the future.



*Figure 1: A sound masking system consists of a series of loudspeakers installed above the ceiling, and a method of control.*

In order to keep the focus on design and performance, the manner in which sound masking systems are specified needs to be updated. Currently, they are often specified according to the above noted types, limiting the number of vendors that can bid on a given project. Bidding opportunities are further restricted when the specification incorporates propriety elements such as the dimensions of components, types of inputs/outputs and other trivial details. At the other end of this spectrum are specifications that merely state "provide a sound masking system." The contrast to the manner in which most other building systems such as a HVAC or fire alarms are specified is striking.

The best-practice approach for sound masking is to write a performance-based specification focusing on the qualities that are critical to the system's effectiveness and occupant comfort.

## Key Performance Criteria

A sound masking system's performance is determined by the following criteria:

- Adjustment zone size
- Masking sound generation
- Volume adjustment capabilities
- Frequency adjustment capabilities
- Loudspeaker requirements
- Measured results

These six elements are vital to every project's success. Clear requirements can be set for each one and various masking technologies are available that can meet those standards. In other words, a specification focusing on these elements allows competitive bids and, providing the terms of the spec are upheld, also ensures a high level of performance from the system ultimately selected.

### Adjustment Zone Size

Acoustic conditions and user needs vary between private offices, meeting rooms, corridors and reception areas, as well as across open plans. Sound masking designs with small adjustment zones (i.e. individually controllable groups of loudspeakers) enable the user to adjust their frequency and volume to meet these diverse needs.

Conversely, designs using large adjustment zones – from eight to dozens or even hundreds of loudspeakers – require the user to make compromises that may increase the system's effectiveness in some areas while diminishing occupant comfort in others or vice versa.

The impact of these compromises is far from minimal. A few decibels of variation in masking volume can dramatically impact the system's effectiveness, even without taking into consideration the consistency of frequency levels. In many situations, users can expect a 10 percent reduction in performance for each decibel variation below the target masking volume. A poorly designed system can allow as much as 4 to 6 dB variation (i.e.  $\pm 2$  dB or  $\pm 3$  dB), meaning the system's effectiveness will be halved in some areas of the user's space.

Zone size also affects the ease with which the user can make changes to the system in the future. Churn rates and renovations require building systems that can be quickly, easily and cost-effectively readjusted. Large zones limit the user's ability to reconfigure the sound masking system without first physically changing its design, moving loudspeakers and/or re-wiring parts of the system.

In other words, the single most important factor within a sound masking specification is to place an upper limit on adjustment zone size. In this case, less truly is more: one to three loudspeakers in each zone provides a high degree of flexibility.

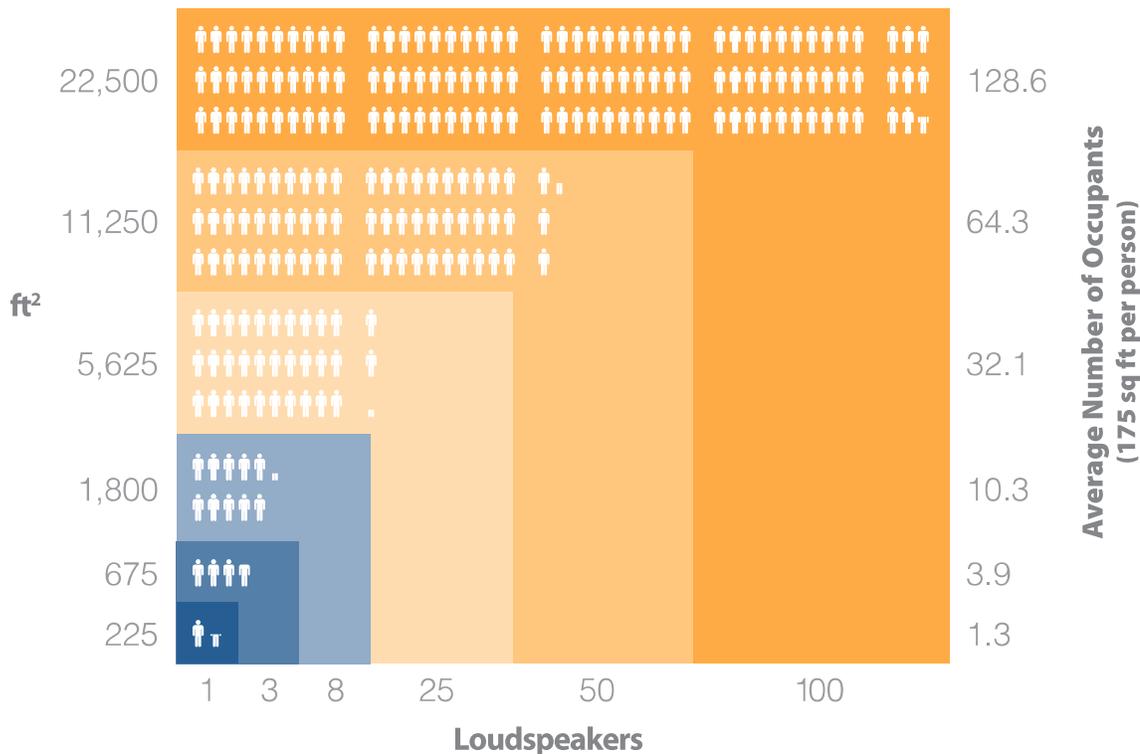


Figure 2: The greater the number of loudspeakers within each adjustment zone, the larger the area of compromise and the greater the number of people affected by it.

## Masking Sound Generation

Each small adjustment zone should feature a dedicated masking sound generator in order to avoid a phenomenon called phasing (i.e. uncontrollable variations in the masking levels), which occurs when a number of loudspeakers adjacent to each other emit the same masking signal. This problem is circumvented in this case because each loudspeaker is typically adjacent to another that is supplied by a different generator.

To maximize unobtrusiveness, each masking generator should also provide a sound that occupants perceive as being random (i.e. with no noticeable repeat cycle). Its actual generation can be pseudo-random but, in this case, the repeat cycle should be as long as possible. If there is no noticeable loop, and the masking is also finely tuned to suit the needs found throughout the space, occupants will not focus on the sound.

The sound produced by the generator should cover the entire masking spectrum of 100 to 5,000 Hz (or as high as 10,000 Hz).

## Volume Adjustment Capabilities

The masking sound is greatly affected by the overall workplace design, including the materials used, location on the floor, items above the ceiling and furnishings. These elements have an impact no matter how the loudspeakers are installed (i.e. upward-facing above a suspended ceiling or direct-facing cut through a ceiling). For this reason, the ASTM standard for measuring and evaluating masking performance in open offices (i.e. ASTM E1573-09, *Standard Test Method for Evaluating Masking Sound in Open Offices Using A-Weighted and One-Third Octave Band Sound Pressure Levels*) requires measurements to be taken in areas representative of all workspace types.

If the adjustment zones are large, numerous loudspeakers are set to the same output level, but after interacting with the variables in the space as noted above, the masking volume fluctuates. Variations of 2 dB or more call attention to the masking sound, reveal its source to occupants and diminish results.

Large-zoned designs attempt to mitigate these volume variations by including audio transformers as volume controls on each loudspeaker. However, they only provide rough adjustments of 3 dBA each. When the volume cannot be finely adjusted in small areas, the user needs to set a volume that is best 'on average,' compromising comfort or effectiveness at various, unpredictable points across their space. In other words, if they require a particular performance level in one area, other areas may have to endure louder volumes. If comfort is desired, the masking's effectiveness may be diminished in some areas.

Therefore, the specification should call for fine volume controls for each small zone. Increments of 0.5 dB enable the user to adjust the volume wherever needed in order to accommodate variable acoustic conditions.

The specification should also require the final masking volume be consistent, a range of 1 dBA ( $\pm 0.5$  dBA) of the desired volume at each test location. Again, the benefits are comfort and consistent performance across the space.

## Frequency Adjustment Capabilities

The sound masking system should also provide fine frequency control within each small adjustment zone.

The range of masking sound is generally specified to be between 100 to 5,000 Hz (or as high as 10,000 Hz). The system should provide control over these frequencies via third-octave adjustment, because it is both the industry standard and the basis for masking targets set by acousticians.

However, simply providing third-octave adjustment is not sufficient if these controls are paired to large adjustment zones. A well-designed system provides equalization for each group of one to three loudspeakers.

## Loudspeaker Requirements

As long as the masking system can meet the volume and frequency targets established by the specification, it is not essential to specify the loudspeaker's size, wattage rating or other parameters. However, it is worth noting that

very small loudspeaker drivers (less than 3 inches or 76 mm) are not likely to generate sufficient levels below several hundred hertz (i.e. down to the required 100 Hz). These low frequencies are necessary to create the full masking spectrum. While they play a relatively small role in reducing speech intelligibility, they are vital to occupant comfort and to mask a wider range of noises. Most masking loudspeakers are 4 to 8 inches (100 to 200 mm) in diameter and rated from 10 to 25 watts.

It is also useful to specify a loudspeaker that can be converted and installed in either an upward- or downward-facing orientation on site. For example, certain situations that are not always evident during the design stage may force the use of downward-facing loudspeakers in some areas.

## Measured Results

The true gauge of whether the sound masking system ultimately selected is performing as required is gained from post-adjustment measurements.



*Figure 3: Requirements vary between different facility areas, as well as across open plans. If the sound masking cannot be finely adjusted to accommodate these differences, a trade off between effectiveness and comfort will be required.*

The specification should require specific results that are measured and documented. Best practice is to require a test in each 1000 ft<sup>2</sup> (90 m<sup>2</sup>) area, and that the vendor adjust the sound masking system within that area as needs dictate. Some systems may be able to outperform this requirement, but it is a good baseline.

Measurements should include:

### ***Overall volume and variation tolerances***

Masking volumes typically range between 40 and 48 dBA, depending on the type of space and the user's performance requirements. 48 dBA is usually the maximum for comfort; therefore, that level should not be exceeded, except in special cases. As previously mentioned, the results should be consistent within a range of 1 dBA ( $\pm 0.5$  dBA).

### ***Masking frequency curve***

There is a general curve that the acoustical community considers effective and comfortable. It is defined in third-octave bands. The specification should set maximum variations for each frequency band. Plus or minus 2 dB variation is a reasonable expectation.

### ***Temporal uniformity***

This term refers to the consistency of the masking volume over time. While this attribute can be assessed, it is usually not an issue and is less frequently specified and evaluated.

Note that there are no independent standards for masking performance, only standards relating to measurement such as ASTM E1573-09, *Standard Test Method for Evaluating Masking Sound in Open Offices Using A-Weighted and One-Third Octave Band Sound Pressure Levels*. A specification stating that the sound masking system is or should be 'compliant' with – or 'meet' – any ASTM standard is misleading. Instead, it is essential that it outlines all of the above requirements for masking output.

## Additional Considerations

### ***Timer functions***

Timers automatically adjust the masking volume to vary in anticipation of noise levels throughout the day, balancing effectiveness and comfort. For example, the user may want the masking volume to lower at a certain time of day when there are fewer occupants in the facility.

Considerations for the specification include whether the timer provides variable rates of volume change, the number of independent timer zones, whether daily schedules can be independent and if unique schedules can be programmed for specific days of the year (i.e. holidays and special events).

Masking systems may also offer a ramp-up feature. It is best to specify this in retrofit situations because it is used to gradually introduce the masking sound, allowing occupants to easily acclimatize to the change in their acoustical conditions.

### Zoning methods

Beyond masking zones, most systems can be zoned for a variety of functions, including paging and timer functions, as well as local occupant control (i.e. in a meeting room). In this case, the type of zoning is relevant. For example, hardwired zones require advanced planning because a contractor has to re-cable parts of the system when changes need to be made in the future. Digital zones can usually be re-assigned without altering the system's physical design. Less planning is required from the outset because any changes can be made in minutes. Digital zoning should allow for independent zoning of all functions.

### Control methods

The method of controlling the system impacts the ease, cost, precision and amount of disruption associated with making initial and future adjustments. Some designs provide central control over a limited range of features. Others provide central control over a few features and local control over others. There are also more flexible designs offering control over all features from a central location.

Most users make significant changes to their space over time – to department location, demountable partition placement or furniture system configuration – and it is important to consider how the corresponding changes will be made to the sound masking system. The specification can include the types of features and settings that need to be controlled and from what kind of access point (i.e. hardware and/or software).



*Figure 4: If the sound masking system is installed in an open ceiling, it should blend in with other visible components, such as the lighting.*

### Security features

Depending on the user, security may be another key consideration. In this case, the specification should describe both the physical and electronic security features for the sound masking system.

Physical features can include housing below-ceiling equipment in locked enclosures and also ensuring enclosed rather than exposed cabling connections. Electronic measures can include monitoring, password-controlled access, encrypted communication and more.

If security is a concern, additional masking generators and longer generation cycles are better because short cycles can easily be filtered out of recorded conversations.

### Paging and music functions

Many sound masking systems can provide simultaneous overhead paging and background music functions. If the user requires these features, cover them in the specification.

### Aesthetics

When installed in an open ceiling, the system's appearance should be considered, including the look of the loudspeakers (i.e. an industrial aesthetic or similar to a lighting pendant), the cable and cable connections, as well as the loudspeaker suspension methods (i.e. chain or a braided steel cable).

## Certifications

Another important aspect of the specification concerns the system's certifications. Though not critical to performance per se, they are essential to meeting regulatory requirements.

Sound masking systems must meet Underwriters Laboratories (UL) or similar standards for electrical safety. In the United States, any components installed in air-handling plenum or via cut-throughs in a suspended ceiling must also be tested to meet UL 2043, *Standard for Safety Fire Test for Heat and Visible Smoke Release for Discrete Products and Their Accessories Installed in Air-Handling Spaces*. Cables must be plenum rated. If using low-voltage power supplies, these should conform to the UL1310 standard for Class 2 power sources in order to avoid conduit requirements.

Digital masking systems need to meet electromagnetic interference (EMI) standards.

If sustainability is a goal within their space, users might also voluntarily require *Restriction of Hazardous Substance* (RoHS) compliance, which limits the quantities of hazardous substances used in the system's components. Note that RoHS compliance is now mandatory in some markets (i.e. Europe).

## Drawings

Even if the sound masking technology the vendor proposes adheres to a generally worded design guide, they may intend to implement it in a different manner. Therefore, it is important to require drawings as part of the bid submission process.

Drawings can help to identify differences between sound masking proposals, because they show the components, quantities and locations, making it easier to spot design shortcuts and subsequently discuss those deviations with the vendor.

Ideally, of course, the drawings should be included as part of the specification itself, allowing the user to set the adjustment zones for each area. For example, there may be areas where the client wishes to use zones smaller than the three-loudspeaker maximum,

such as in private offices and meeting rooms. These drawing should be created by the user in conjunction with an acoustical consultant or trusted vendor.

## Compliance form

Another useful document to request in the specification is a compliance form. Vendors should be asked to submit a statement indicating their adherence to each aspect of the specification. They should also be required to note any deviations, describing how their system's design differs.

## Own Your Spec

Acoustics are an integral part of a project's long-term success and should be planned from the outset. While every sound masking system introduces a sound into the space, overall performance can vary dramatically. A well-constructed specification is essential to ensuring the technology and the system's design meets the user's current and future requirements. If not, the sound masking system may be ineffectual, underutilized, or become a source of irritation itself and possibly turned off.

However, even with a well-written specification, the user could end up with a non-conforming system unless the specifier, user or another person(s) involved in the design and procurement process is appointed as a guardian whose responsibility it is to ensure bids meet the criteria outlined. Many times the value of a well-designed specification is nullified because no one is asked to ensure all proposals – and, indeed, the system ultimately selected – conform to the desired performance levels.

It is also wise to learn what services are offered in conjunction with each proposal under consideration. The sound masking system should be supported by professionals who can properly design and implement it and provide the user with ongoing support.

For a sample of a performance-based spec visit: [www.soundmaskingspecs.com](http://www.soundmaskingspecs.com)



[www.logison.com](http://www.logison.com)

# Sound Masking vs. Noise Cancellation

**Sound masking** (or “white noise”) is often confused with **sound cancellation**. They are not the same thing, though this is a common mistake. When we speak to customers, they often think of sound masking as if it were something like the “Cone of Silence” in the old Get Smart TV series. In the TV series, whenever someone was speaking in “the cone of silence,” the theory was that no one outside the cone could hear it very well. Unfortunately, it never really worked – with comical results!

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**Sound cancellation** – or “active noise control” – electronically alters an incoming sound wave to minimize or eliminate it altogether. With sound cancellation the sound wave is picked up by a microphone, analyzed by a microprocessor, and then a speaker placed in the path of the sound wave broadcasts a mirror image (exact opposite) frequency, thus flattening out the wave and canceling out much or all of the sound. This has proven quite effective in small, controlled environments where there are few frequencies to “mirror” (such as wearing noise-canceling headphones on an airplane), but it’s not practical for open office areas in part because the processors necessary to analyze and mask



so many frequencies would be prohibitively expensive.

**Sound masking**, on the other hand, works on the principle that when background noise is added to an environment, speech is less intelligible. In technical terms, the “Articulation Index” – a measurement of how intelligible speech is – has been lowered by this change in the signal-to-noise ratio. The “signal” would be, for example, the person speaking, and the “noise” would be the sound masking. A high signal-to-noise ratio means that speech is very intelligible – an amphitheater would have a very high Articulation Index, for example. Based on this principle, scientists and engineers realized that you don’t have to actually stop the sound waves from a speaker’s voice in order to obtain speech privacy, you just have to make the speaker’s words unintelligible.

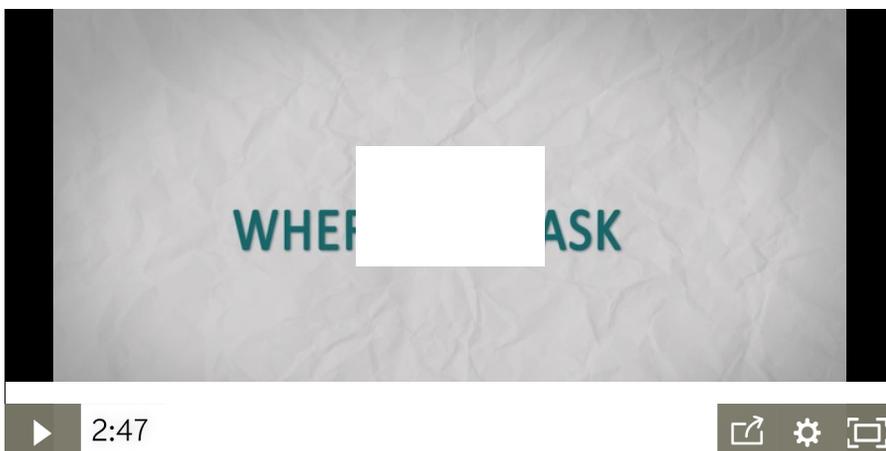
*If I can see and hear you but I can’t understand the words that you’re saying, we have effectively established speech privacy.*

This is what a “white noise” system does to mask sound – it basically “fills in” the sound spectrum around you with barely perceptible “unstructured” noise (“structured” noise would be sounds such as speech or music that have recognizable patterns and convey information). Your brain will tune out unstructured noise as it searches for the structured variety. You’ve experienced this kind of thing before. When you turn on your computer, you hear the cooling fan begin to spin. However, your mind quickly filters out this unstructured sound and it becomes effectively “invisible.” The goal of any speech privacy system is to add enough sound to an area to cover up speech, yet still be quiet enough to be almost imperceptible. Good, well-tuned, quality sound masking systems will produce sound that your mind naturally tunes out. The more uniformly the sound masking system accomplishes this throughout the treated area, the more “invisible” the sound becomes.

### **What is Sound Masking?**



Because sound masking covers the sound rather than canceling or stopping it, sound masking systems treat the destination rather than the source of the sound. For example, if you were concerned that sound was traveling out of an HR conference room to an adjacent office area, you would treat that office area – the destination – rather than the conference room. You would treat the place where the sound is heard, rather than the place where it originates.



## Read More: How to Achieve Speech Privacy (/how-sound-masking-works/)

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### Proven ROI

[The Cognitive Cost of Distractions \(/reducing-distractions/the-cognitive-cost-of-distractions/\)](#)

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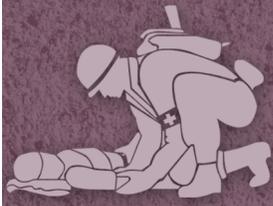
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## 2. Color

2019

# **A summary of Color in Healthcare Environments: A Critical Review of the Research Literature**

As a San Diego-based professional interior designer for the past 30-plus years, I understand only too well that color is a fundamental element of the design environment. We have created millions of square feet of healthcare environments for our acute-care and senior-living clients all over the United States and overseas. Our clients have asked us, too many times to count, what would be the appropriate color scheme for their projects. What would make their patients and staff feel better and work better?

According to *Color in Healthcare Environments: A Critical Review of the Research Literature*, color choice “is linked to psychological, visual, aesthetic, and technical aspects of human-made environments.” Therefore, we tend to choose colors based on geography, culture, and user characteristics. Similarly, the lighting, size, and shape of the space will also affect the color palette we choose. This color study was funded by the Coalition for Health Environments Research (CHER, now known as The Center for Health Design [CHD] CHER) in 2002-2003, and written by Ruth Brent Tofle, PhD; Benyamin Schwarz, PhD; So-Yeon Yoon, MA; and Andrea Max-Royale, MEdes.

The necessity for a color study of this nature became clear to CHER committee members after much discussion about the possible links between color and patient health. It was decided that a research study would help determine if in fact there was evidence to prove that various colors do make a difference in patient health, staff effectiveness, and healthcare facility efficiency. We felt that this topic affected everyone and would have a broad range of influence for the entire healthcare field—designers, planners, and end users alike.

The authors' goal was not only to provide a literature review on color in healthcare, but also “to separate among common myths and realities in the research and application of color in healthcare design.” It is important for us as design professionals to realize the relevance of the evidence that is presented in this study. It is clear that color use is not based on empirical data, but rather on “pseudo-scientific assertions.” As a result, many trends in color choices are based on inappropriate information.

After reviewing all available research on the topic, the following conclusions were

reached:

1. There are no direct linkages between particular colors and health outcomes. There was not enough evidence to promote a causal relationship between environments painted in particular colors and patients' healthcare outcomes.
2. Specifying particular colors for healthcare environments to influence emotional states or mental and behavioral activities is simply unsubstantiated. While studies have shown that color-mood association exists, there is no evidence to suggest a one-to-one relationship between a given color and a given emotion. In spite of contradictory evidence, most people continue to associate red tones, for example, with stimulating activities and blue tones with passivity and tranquility. Clearly, colors do not contain inherent emotional triggers. Emotional responses to colors are caused by culturally learned associations and by a person's physiological and psychological makeup.
3. There are demonstrable perceptual impressions of color applications that can affect people's experience and performance. For example, there are indications in the research literature that certain colors may evoke a sense of spaciousness or confinement. However, the perception of spaciousness is attributed to the brightness or darkness of color and is highly influenced by contrast effects, particularly brightness distinctions between objects and their background.
4. The popular press and the design community have promoted the oversimplification of the psychological responses to color. Many authors of guidelines tend to make sweeping statements that support myths or personal beliefs. Likewise, most color guidelines for healthcare design are nothing more than affective value judgments whose direct applicability to the Architecture and interior design of healthcare settings seems oddly inconclusive and nonspecific. The authors of the color study would advise against the creation of universal guidelines for appropriated colors in healthcare settings. The complexity of user groups and the multiple uses of the environment make efforts to prescribe universal guidelines a waste of energy.
5. The study of color in healthcare settings is challenging because it occurs in the context of meaningful settings and situations. Our judgement of a color in certain settings is a result of multiple layers of experience. Consequently, we should be cognizant of these layers when selecting a color palette. Our reaction to color will be based on perception, cognition, and physiology. Analysis of color in any environment means respecting other kinds of processing forces such as culture, time, and location.

The literature review outlined by this study shows us common mistakes to avoid when we are selecting colors for healthcare environments. The authors insist that

“while users of healthcare settings should be allowed to contribute to the color selection whenever possible, the process should not be focused solely on satisfying people's preferences.” Instead, it is suggested that the primary consideration in color selection be on the purpose and intended use of color within the space. It is from this point that designers will be able to “create color combinations for the sake of the users that draw both on art as well as science.”

I had the opportunity to share the study with one of our clients, San Diego State University, when it was building its new Student Medical Center in San Diego. The physicians wanted to know what color selections to make for their new medical center. I was able to show them what the evidence did and did not prove about “healing colors.” This helped establish creditability with the client. I see it as our role as design professionals to constantly educate our clients and expose them to all evidence that helps to add credence to our solutions. The study is an invaluable tool for this.

In conclusion, the color study answers two basic questions about color. The first is, “What is empirically known about human response to color and how, if at all, color influences human perception or behavior in a specific setting?” The simple answer is, very little.

Secondly, “Which color-design guidelines for healthcare environments, if any, have been supported by scientific research findings?” It is clear that universal color-design guidelines are not supported by any strong evidence.

These are not the answers we wanted to hear. We all would like very much to have a guideline for this aspect of the design world. As in other fields, explanatory theories may help to predict outcomes of environmental interventions. Therefore, it is possible that we will someday be able to predict influences of color on people based on theory.

The color study states that “clearly, the research of color in healthcare environments is an important endeavor. Yet, the subject matter is complex and multifaceted. Furthermore, mastering this knowledge for the application of research findings in healthcare settings requires caution and sensitive creativity is paramount.” The obvious implication, therefore, is that careful consideration of culture, geography, use of space, etc., is essential to the color choices we provide our healthcare clients. As designers, we should not base our color selections on market trends or personal beliefs.

The color study is an excellent, practical body of information and useful in your understanding of evidence-based information about color. This is only a cursory

overview of some salient points presented in the color study; therefore, we at The Center for Health Design (CHD) CHER encourage all in the healthcare design field to peruse the complete document for additional insights. This study is available through The Center for Health Design's Web site (<http://www.healthdesign.org>). **HD**

Jean M. Young, ASID, CID, AAHID, President and Chief Designer/Planner at Young &plus; Co., Inc., has been a certified designer for more than 30 years. Her leadership in promoting high-performance and sustainable design and involvement in professional organizations such as Coalition for Health Environments Research (CHER) ensures that clients receive state-of-the-art design.

# Behavioral health design | HFM

Jocelyn M. Stroupe AAHID, IIDA, ASID, EDAC

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## About this article

This feature is one of a series of quarterly articles published by Health Facilities Management in partnership with the [American Academy of Healthcare Interior](#)

[Designers.](#) **AAHID**

Each year, five to seven percent of U.S. adults have serious mental illnesses, which commonly include social phobia, major depression, post-traumatic stress disorder (PTSD), general anxiety, bipolar disorder, Alzheimer's disease, schizophrenia and obsessive-compulsive disorder.



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BTUs or FTEs?**

There's a better way to  
support patient care...



*Greater efficiency  
supports patient care.*

Additionally, mental health is a central feature of the Affordable Care Act, which includes the expansion of mental health services. Seen as a way to address the historic access issues, this expansion is expected to impact 62 million Americans with benefits

that include mental health and substance abuse services starting this year.

Behavioral health settings, which may include psychiatric hospitals, psychiatric units in the general hospital environment, alcohol and addiction treatment facilities, behavioral health clinics and emergency departments (EDs) with psychiatric specialties, must adjust quickly to these realities.

## **Clinical shifts**

The overall number of inpatient beds in all psychiatric hospital settings has declined over the past decades, due to public policies promoting deinstitutionalization and a movement toward treatment in the outpatient setting. As a result, there are psychiatric bed shortages, increased use of EDs for acute episodes and gaps in community-based services.

Outpatient settings can provide lower-cost treatment for this demanding population and a smooth transition of care, which has accounted for an increase in such facilities under construction. In many of these settings, spaces that serve multiple functions such as community-based activities can change public perception about mental health.

Telepsychiatry increasingly is filling in the gaps for more rural and underserved locations as well as extending the ability of physicians to reach more patients and divert behavioral health patients from the ED. In areas that are more densely populated, psychiatric EDs have emerged to specifically address the behavioral health population and reduce the demands on the ED.

The emergence of 23-hour observation units in psychiatric EDs addresses wide swings in levels of traffic and allows clinicians to determine whether a patient should be admitted for inpatient care. Crisis stabilization units are emerging as a solution to acute psychiatric needs, diverting psychiatric or crisis cases away from EDs, diverting adults from jails and juveniles from detention centers.

## **New treatment protocols**

One of the more significant trends impacting design has been a focus on creating a “normalized” environment that reflects the types of situations patients will encounter when they leave the facility. The result has been to incorporate more complex interior spaces into the overall design.

Flexibility in treatment spaces allows for multiple functions and effective space

utilization. Community spaces also are designed to be flexible as well as open and social. These spaces serve as locations for meeting with family, having casual interactions and structured therapies, and help to reduce stress associated with inpatient care. They are designed to promote patients' participation in therapeutic activities and reduce the amount of time spent alone in their rooms.

Access to outdoor spaces also has become an important aspect of therapy. In situations where this is not practical, a view to the outdoors and access to natural light are important in the healing process.

Inpatient environments, in particular, should emphasize efficiency and effectiveness in treatment, because a patient's length of stay is limited and the goal is to support the individual's transition to normal life as quickly as possible. As much as possible, the design should give patients a sense of control over their environment through such elements as lighting flexibility, furniture options and space layouts.

## **Safety and security**

The approach to safety has shifted from traditional locked-down units and enclosed nurse stations where patients spend the majority of their time alone in their rooms. The focus is now on providing comfortable environments, with reduction of barriers and with a more residential character. However, the safety of patients and staff is the most critical aspect of design.

Generally, zones of risk, in which patients may cause harm to themselves or others, identify an approach to addressing security needs based upon areas of greatest concern. Zones of high risk are those in which patients are alone and unsupervised, such as the patient room, toilet room or shower, or a seclusion room. Medium-risk zones include those in which patients may have some supervision, are in small groups and are rarely alone, such as in group rooms, day rooms, laundry or the dining room.

Low-risk zones are those in which patients are observed and accompanied, such as in corridors, or where patients are not allowed, such as staff spaces, clean and soiled rooms and housekeeping rooms.

Suicides are the greatest concern and studies recommend that staff have visual access to patients at all times to reduce such incidents. For the design of patient spaces, the objects in the room and design features, such as door knobs, shower curtains, window treatments, ceiling and fixtures, need to be specified to prevent self-harm.

The New York State Office of Mental Health Patient Safety Standards, Materials and

Systems Guidelines ([www.omh.ny.gov/omhweb/patient\\_safety\\_standards](http://www.omh.ny.gov/omhweb/patient_safety_standards)) and the National Association of Psychiatric Health Systems Design Guide for the Built Environment of Behavioral Health Facilities ([www.naphs.org/quality/design-guide-for-the-built-environment](http://www.naphs.org/quality/design-guide-for-the-built-environment)) are two resources that provide useful product and material selection details. The focus of the guides is safety, commonly addressing prevention of ligature hazards and solutions that are ligature-resistant as well as tamper-resistant.

For areas with the highest level of concern, specifications for lighting fixtures, ceiling systems, mirrors and hardware must be considered carefully. For furnishings, solid, securely mounted or built-in furniture may be appropriate where the furniture is meant to be stationary. In other cases, where furniture should be moved to allow for flexibility in the space, consideration of the weight of the piece is important. Most guidelines recommend determining whether furniture or other components in a room cannot be turned into a weapon or be used to hide contraband.

In a recently published report by the Center for Health Design on “Design Research and Behavioral Health Facilities” ([www.healthdesign.org/chd/knowledge-repository/design\\_research\\_and\\_behavioral\\_health\\_facilities](http://www.healthdesign.org/chd/knowledge-repository/design_research_and_behavioral_health_facilities)), 115 articles were identified to have sufficient research methodology to be considered when designing for behavioral health facilities. In most cases, the existing guidelines were found to lack sufficient research-based data to support the recommendations. The researchers found that the complexity of behavioral health settings and diagnoses is a possible contributor to the limited research in this area.

Of the studies identified, there is some knowledge that can be useful to design teams. One category, the physical environment and its relationship to social behavior, provides some guidance on patient rooms. Single patient rooms have been found to eliminate roommate issues. Patient privacy is greatly enhanced and there are fewer disruptions and incidents that typically can occur in shared rooms. Private rooms also promote a quieter environment, leading to better sleep for most and lowered levels of agitation for some patients. However, findings differ for children’s environments and some disagreement exists about the safety of private vs. shared rooms. For counseling spaces, on the other hand, social aspects are found to be particularly important because comfort, relationships and communication are essential to improving outcomes.

While much of the available information identifies how to mitigate harm to the patient or staff, studies have emerged that focus on the modification of behaviors through careful and thoughtful approaches to the design.

In an article in the *New York Times*, evidence-based design researcher Roger S. Ulrich identified violence in psychiatric facilities as a significant area of concern that can be impacted through the design of the facility ([www.nytimes.com/2013/01/13/opinion/sunday/building-a-space-for-calm.html](http://www.nytimes.com/2013/01/13/opinion/sunday/building-a-space-for-calm.html)). He believes that the goal of facility design should be to reduce stress and, thereby, reduce aggression. Typical inpatient units are not designed for calm, nor do they serve to support a patient's ability to cope.

A Swedish study cited by Ulrich identified architectural features to reduce stress and aggression that were incorporated into a hospital's design. A significant reduction in the use of patient restraints was found and the number of patient sedations was considerably lower. Ulrich believes this is an indicator that the environment can positively influence behavior.

## **Daylight, art, color**

The positive impact of daylight has been shown in one study to reduce the length of stay for bipolar patients ([www.ncbi.nlm.nih.gov/pubmed/8882914](http://www.ncbi.nlm.nih.gov/pubmed/8882914)). In this study, 174 patients with clinical depression were assigned to either sunlit or dimly lit rooms. Patients in the sunny rooms stayed an average of 16.9 days compared with 19.5 days for those in the dimly lit rooms.

In a report published by the Coalition for Health Environments Research called "Color in Healthcare Environments" ([www.healthdesign.org/chd/research/color-healthcare-environments](http://www.healthdesign.org/chd/research/color-healthcare-environments)), the effect of color on health care environments was found to be limited. Despite numerous studies on color, there is no evidence to support a one-to-one relationship between a given color and a given emotional response. Although studies show a mood-color association, there is no evidence of colors being emotional triggers. Individual responses to color vary and are influenced by their culture and physiological and psychological makeup. The trend in behavioral health design is toward the use of brighter, more optimistic color palettes and away from those that are more neutral.

There have been studies that indicate that the use of realistic art can be beneficial in behavioral health settings to reduce patient anxiety and agitation. Results showed that medication dispensed for anxiety and agitation was significantly lower on days when a realistic image of a landscape was displayed. In addition to better outcomes for patients, the cost of medication was compared for the different conditions, establishing a potential financial case for the annual cost savings of \$4,000 to \$27,000.

Utilizing nature as a healing distraction benefits all ages of patients. By allowing the lines between interior and exterior to blur, the benefits of the outdoors can be brought inside. Similarly, accessible outdoor spaces that carefully address safety concerns can be calming, positive and therapeutic distractions.

## **Special considerations**

Given the range of specialties and ages in behavioral health, it is critical to understand the unique requirements for each to provide a supportive environment. While adult populations may require a higher degree of security, different requirements should be taken into account when designing for other populations.

A growing older population points to increasing numbers of seniors with dementia and mental illness. Older adults often are brought to the ED for care, compounding overcrowding. Because of their ages, these patients have longer lengths of stay, tying up valuable ED space. Additionally, most EDs are not equipped to address the specific needs of the elderly. Geriatric patients, because of their medical and physical limitations, require corridors with handrails to promote ambulation. Lighting and flooring materials should be designed to address limitations of sight and to reduce falls. The transition between materials and contrast levels of flooring color also should be considered.

Facilities for children and adolescents should be designed to address the unique aspects of this age range. Their physical needs and cognitive abilities change over time, giving them different perspectives on their environment. What appeals to a young child may not be engaging for an adolescent, yet the environment needs to respond to all.

Research has shown that positive distractions can enable a child to be more receptive to treatment and to be treated with fewer medications. As much as possible, the environment should strive to provide a sense of normalcy. The patient room becomes a place where a child can have more control over the environment and can personalize his or her space. Play spaces are important tools to reduce tension and anxiety. They can allow for learning and exploration by enabling children to engage with their environment.

Caring for the mental health of military personnel and veterans can be wide-ranging. The issues they face include PTSD, as well as traumatic brain disorders, drug addiction, pain management, sleep disorders and suicide. Though PTSD and traumatic brain injuries represent major mental health care needs, psychological

issues more generally go beyond these specific problems.

Many veterans perceive constant threats to themselves and their families, thereby responding differently to environmental conditions. For example, open atrium spaces may be considered threatening to a veteran with combat experience. The Department of Veterans Affairs has embraced a Planetree model of care that focuses on creating more welcoming and family-friendly environments.

## **A holistic approach**

Behavioral health conditions have shifted to a holistic treatment approach in which patients take charge of their healing process through individual and team-based care in a supportive and nurturing environment.

Treatment facilities should be designed to be safe and comfortable, emphasizing personal empowerment and individual dignity, thus becoming a catalyst for improving health care practices and enabling patients to take control of their own healing process.

**Jocelyn M. Stroupe**, AAHID, EDAC, IIDA, ASID, is principal at Cannon Design, Chicago. She can be reached at [jstroupe@cannondesign.com](mailto:jstroupe@cannondesign.com).

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## **Mental health center provides healing village**

The new 180-bed, 151,000-square-foot Essex County Hospital Center's Institute for Mental Health Policy, Research and Treatment in Cedar Grove, N.J., seeks to enable all patients to receive appropriate care in a least-restrictive environment.

The design team, led by Cannon Design, began with the goal of creating a facility that challenged conventional perceptions regarding behavioral health care. The center is bright, open and inviting, with forms and materials that speak of movement — a metaphor for transitioning through the healing process and, therefore, to the outside world with speed and purpose.

Organized around the concept of a healing village, it features a series of interconnected multistory buildings, each with specific functions for patient care. At the heart of this village is a central outdoor courtyard, serving as the community green. Enclosing the green is the primary circulation zone that also serves as an indoor social rehabilitation mall and features a cafeteria, chapel, computer lab, library and hair salon.

The main entry is a two-story glass-cube lobby, situated at the junction of the

administrative building and the social rehabilitation mall, allowing patients, families, visitors and staff to have a direct view through the lobby into the community green, thus providing cues about how the center is organized.

Facing out to the thick forested portion of the site are “residential neighborhoods,” comprising two three-story buildings each housing six patient care units. For operational efficiency, each unit is standardized with patient rooms that can swing from either private or semiprivate as patient census requires. Units are divided into night zones with bedrooms and hygienic facilities, and day zones with dining, on-unit treatment, recreational and lounge spaces. Each unit has direct access to protected exterior space in the form of either a covered patio or a covered porch.

Selected for their ability to suggest a warm and inviting environment, building materials contribute significantly to the success of the overall palette in suggesting a natural environment.

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## **Behavioral care facility offers range of services**

Comprising two interrelated buildings that operate symbiotically to respond to the broadest range of patient needs, the University of Arizona Medical Center’s Behavioral Health Pavilion and Crisis Response Center in Tucson, integrates physically and operationally with an existing acute care hospital and emergency department (ED).

Devised by Cannon Design in association with CDG architects, it features parallel “bars” of patient and support spaces and circulation systems oriented along an east-west axis for optimal sun control. On the site, the buildings are organized around a shared-service court that provides a secure circulation zone for medical staff, law enforcement, courtroom personnel, and patient and material transfers. Internally, each building is organized around a variety of accessible exterior spaces that connect patients and staff directly to nature.

A full continuum of care is provided with acute and subacute inpatient services, outpatient services, crisis assessment and stabilization, and specialized facilities for law enforcement, paramedics and other first responders. Additionally, a courtroom serves patients entering hospitalization through the legal system.

The crisis response center provides a single response point to assess, stabilize and treat patients who do not require emergency or acute psychiatric care, freeing up EDs and inpatient units as well as jails and juvenile detention facilities.

All patients have private rooms with access to views and daylight along with independent access points allowing for segregated movement of patients and staff onto units, greatly enhancing safety. Access to shaded outdoor gardens is provided on all levels for patients, visitors and staff, promoting healing and well-being. The environmentally sensitive architecture enhances comfort for occupants through daylighting and passive climate control. Wayfinding is simplified by the clear organizing strategy and visual connectivity with the outdoors.

Safety and security for patients, visitors and staff have been balanced carefully with openness and connectivity, creating a normalized, yet clinically effective, environment. The design addresses patient dignity, staff retention and visitor comfort through a regionally inspired design that transforms a health facility to a public amenity.



# The Application of Color in Healthcare Settings

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## By

Sheila J. Bosch, PhD, LEED AP, EDAC  
*Director of Research*  
*Gresham, Smith and Partners*

Eve Edelstein, MArch, PhD, EDAC, AssocAIA, F-AAA  
*President*  
*Innovative Design Science*

Rosalyn Cama, FASID, EDAC  
*President and Principal*  
*CAMA Inc.*

Jain Malkin, CID, AAHID, EDAC  
*President*  
*JAIN MALKIN INC.*

October 2012

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# About the Authors

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**Sheila J. Bosch**, PhD, LEED AP, EDAC - [sheila\\_bosch@gspnet.com](mailto:sheila_bosch@gspnet.com)

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Sheila J. Bosch serves as the director of research and innovation for Gresham, Smith and Partners. An invited member of The Center for Health Design's Research Coalition and an active participant in national-level research activities, Bosch is a recognized expert in her field. Her more than 20 years of professional experience have led to numerous opportunities to publish articles on a variety of issues and speak to healthcare industry professionals on topics such as the role of researchers in healthcare architectural practice, improving healthcare through building design, process improvement initiatives in the emergency department, and evidence-based design for women and infants facilities. Whether conducting research or providing consulting services, Bosch is committed to improving the built environment, the natural environment, and the well-being of building occupants.

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**Rosalyn Cama**, FASID, EDAC - [rcama@camainc.com](mailto:rcama@camainc.com)

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Rosalyn Cama is the president and principal interior designer of the evidence-based planning and design firm CAMA, Inc., in New Haven, CT. She has served as the 24th president of the American Society of Interior Designers (ASID) and currently serves as chair of the board for The Center for Health Design. Cama has authored *Evidence-Based Healthcare Design*, a John Wiley & Sons publication, and frequently writes and lectures on the topic. Recognized as an industry leader, *Healthcare Design* magazine named Cama as one of the 25 “Most Influential People” in healthcare design in 2009-10, and ASID named her Designer of Distinction in 2012. Cama is currently engaged in the development of the Global Institute of Biophilic Design. [www.camainc.com](http://www.camainc.com)

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**Eve Edelstein**, MArch, PhD, EDAC, AssocAIA, F-AAA - [neuroarchitecture@gmail.com](mailto:neuroarchitecture@gmail.com)

---

Eve Edelstein is founder and president of Innovative Design Science, a research-based design consultancy that integrates information from the biomedical sciences and 4D immersive virtual mockups to inform design projects. As a research specialist at Calit2, University California, San Diego, her work in neuro-architecture has developed wearable wireless human biosensors and real-time 3D modeling software to test design in immersive virtual reality mockups and real-world projects. Edelstein's contributions include research-based design guidelines for the Canadian Ministry of Health (1 million square foot mental and general health facility); in China (2.4 million square foot hospital campus); and for emergency, operating suites, ICUs, PACUs, and educational facilities in the United States.

Edelstein is a research fellow with the Academy of Neuroscience for Architecture and teaches courses and workshops in research-based design, immersive 4D virtual modeling, and developed the first series of courses in neuro-architecture. Edelstein's work can be viewed in the BBC TV *The Secret life of Buildings* and the PBS special *the Science of Healing* and at [www.InnovativeDesignScience.com](http://www.InnovativeDesignScience.com).

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**Jain Malkin**, CID, AAHID, EDAC - [jmalkin@jainmalkin.com](mailto:jmalkin@jainmalkin.com)

---

Jain Malkin is president of Jain Malkin Inc., a San Diego, CA, interior architecture firm specializing in evidence-based design. She is the author of several well-known books on healthcare design, most recently, *A Visual Reference for Evidence-Based Design*, published by The Center for Health Design, and she lectures globally on these topics. Malkin was named one of the "Most Influential People" in healthcare design by *Healthcare Design* magazine, and she was awarded the 1997 Hyde chair of excellence at the University of Nebraska College of Architecture. She is a board member of The Center for Health Design and on the editorial advisory board of the *Health Environments Research & Design (HERD) Journal*.

# About the Funders

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## Jain Malkin Inc.

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Jain Malkin Inc. is an interior architecture firm recognized internationally in the field of healthcare design and senior living. The firm has been an advocate for research-based design since Jain Malkin's book *Hospital Interior Architecture* was published in 1992. That book had a chapter on the use of color in healthcare facilities to help guide practitioners in this important component of interior design. "The Application of Color in Healthcare Settings" continues this valuable discussion. [www.jainmalkin.com](http://www.jainmalkin.com).

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## KI

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KI manufactures innovative furniture and moveable wall system solutions for education, healthcare, government, and corporate markets. The employee-owned company is headquartered in Green Bay, WI, and operates sales offices and manufacturing facilities in the United States, Canada, Latin America, Europe, and Asia. KI tailors products and service solutions to the specific needs of each customer through its unique design and manufacturing philosophy. For more information, visit [www.ki.com](http://www.ki.com).

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## Pallas Textiles

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The Center for Health Design

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The Center for Health Design (CHD) is a nonprofit organization that engages and supports professionals and organizations in the healthcare, construction, and design industry to improve the quality of healthcare facilities and create new environments for healthy aging. CHD’s mission is to transform healthcare environments for a healthier, safer world through design research, education, and advocacy.



### Material Palette

This colorful material palette brightens a children's hospital.

EL PASO CHILDREN'S HOSPITAL  
INTERIOR DESIGN: CAMA Inc.  
ARCHITECT: KMD Architects  
PHOTOGRAPHER: CAMA Inc.

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# Executive Summary

In the last half of this century, a vast number of books have been written on the topic of color—the psychology of color, color theory, color and the environment, color and light, and color and culture . . . to name a few. Interestingly, each is filled with individual studies—not necessarily in healthcare—and many suggest definitive conclusions about the best colors for a range of users and settings, or color preferences for boys and girls, different cultures, and so forth.

In today's context of research, however, the methodological rigor of these studies falls short of what we have come to expect with the introduction of evidence-based design. An extensive review of color literature carried out in 2004 by Tofle, Schwarz, Yoon, and Max-Royale concluded that there is insufficient evidence to assert that specific colors can evoke a certain mood, nor is there a link that can be made between specific colors and health outcomes.

Despite this, many studies describe how colors can influence performance and the experience of a space. Color can create the illusion of a higher ceiling or a wider room or facilitate cueing in wayfinding orientation. In the healthcare setting, there are many functional uses of color. As an example, a color separation between the floor and the wall in circulation spaces helps those with aging eyes to distinguish between different planes and reduce mobility issues. Since hospitals are likely to serve an increasing number of aging baby-boomers in coming years, the many functional uses of color related to aging and health are very relevant.

Although rigorous rules for the application of color in healthcare settings will not be found in this paper, there are suggestions for the application of color as well as issues for practitioners to consider such as the type of activity that will occur in a space and whether it requires concentration or social interaction, the age of the occupants, their mobility, the nature and severity of the illness, and the amount of brightness and contrast required to perform tasks safely.

Much of what we think we know about color is anecdotal. The results of many color studies that are often quoted have been done in laboratory settings or using small color chips representing basic primary colors. This is very different than the experience of color on walls in an interior environment. It is difficult to do controlled studies on color in real-world settings and even more challenging in clinical environments.

This paper's value is as a reference for architects and designers as it presents what is currently understood about color, separating research from experience and anecdote, and it is likely to give many design professionals confidence about the application of color to their projects.

The Appendix discusses the cultural implications of color.



## Research Highlights

This paper looks at studies of color in a number of different healthcare settings—from pediatric to geriatric nursing units—and considers a variety of uses—from signage to wayfinding. Here are some of the key findings from the literature review of rigorous peer-reviewed studies on color in healthcare settings during the past decade.

**Dittmar (2001)** found in a large-scale study using color names alone (blue, green, red, yellow) highly significant differences in color preference with advancing age; increased age was correlated with decreased preference for blue. There was no significant gender difference for preferred colors, but a gender difference in least preferred colors.

**Park (2009)** examined color preferences among pediatric outpatients, inpatients, and healthy children and found no statistically significant difference in color preference among the three groups of children, and, therefore, did not support the hypothesis that pediatric patients would have different color preferences than healthy children. However, all preference comparisons revealed that white was the least preferred color.

**Gibson, MacLean, Borrie, and Geiger (2004)** examined the behavior of 19 residents in a long-term care dementia unit and found that 13 used color to help them find their rooms, with structure (e.g., room number, name plate) as the second most often reported visual cue.



**Blumberg and Devlin (2006)** used a demographic questionnaire, a photographic comparison test, and a design questionnaire with 100 junior high school students. Responses to the photographic comparison test showing healthcare settings indicated that adolescents prefer the “bright colors and inventive design” of a child-focused hallway. For a set of lobby images, the majority of the adolescents preferred the adult-oriented photo, possibly because of the tricycle, pastel colors, and toys in the child-oriented lobby that were age-specific and not geared toward adolescents.

Color was one component of the changes made in a corridor of a psychiatric hospital intended to reduce the “institutional” feeling of the space and provide a “sense of nature” in a paper by **Edgerton, Ritchie, and McKechnie (2010)**. The renovation did not affect the number of patients using the corridor, but there was an increase in the number of positive behaviors, although the difference was not statistically significant, except for an increase in “talking” behavior.

**Rousek and Hallbeck (2011)** report that color contrasts can improve signage comprehension and conclude, from a limited set of colors and graphics tested, that a combination of red and white backgrounds with black font was preferred. It should be noted that the font, size, scale, and color contrast are very important, along with the intelligibility of the design graphic itself.





## Beyond Vanilla

White walls are often associated with a clinical appearance and institutional settings. Adding color and an interesting ceiling design, as in this procedure room, can make the environment seem less intimidating.

SCRIPPS CENTER FOR INTEGRATIVE MEDICINE  
INTERIOR DESIGN: Jain Malkin Inc.  
ARCHITECT: Schmidt Scanlon Gordon  
PHOTOGRAPHER: Michael Campos



# Introduction

There are few design topics more interesting than the use of color in our daily lives. We are surrounded by an ever-changing palette of color in nature that inspires the principles used in the creation and selection of materials for interior design. These same principles also apply in the culinary presentation of food and the creation of fine art. Since color is an inseparable part of our lives, it is all the more puzzling to explain the lack of it in many of our new hospitals.

Thus, the origin of this paper is based on this very observation: A number of new hospitals built in the last five years have been lacking in color. We wondered what forces are at work here? Clearly it is more difficult, and more risky, to successfully apply color to an interior environment than to use a neutral palette, but there are likely a number of factors in play here.

The importance of this issue, however, goes beyond aesthetics. Is it possible to enhance the patient's experience and potentially impact clinical outcomes by understanding how to apply color in healthcare settings? The environment may be even more important in the acute-care setting. Recent neuroscientific research and studies of circadian rhythms demonstrate that the color spectrum of light directly influences human biological systems and health outcomes (Edelstein, 2008). Topics such as lighting, biophilic design, color theory and application, color and the aging eye, the cultural dimension of color, and physiological and psychological responses to color all demand attention when thoughtfully designing and shaping the interior environment.

This paper will concentrate on the application of color in healthcare settings.



### Color and Brand

Color may be tied to an institution's logo or corporate brand.

YALE-NEW HAVEN HOSPITAL  
INTERIOR DESIGN: CAMA Inc.  
ARCHITECT: Salvatore Associates  
PHOTOGRAPHER: Rick Scanlan

# Role of Color in Healthcare Environments

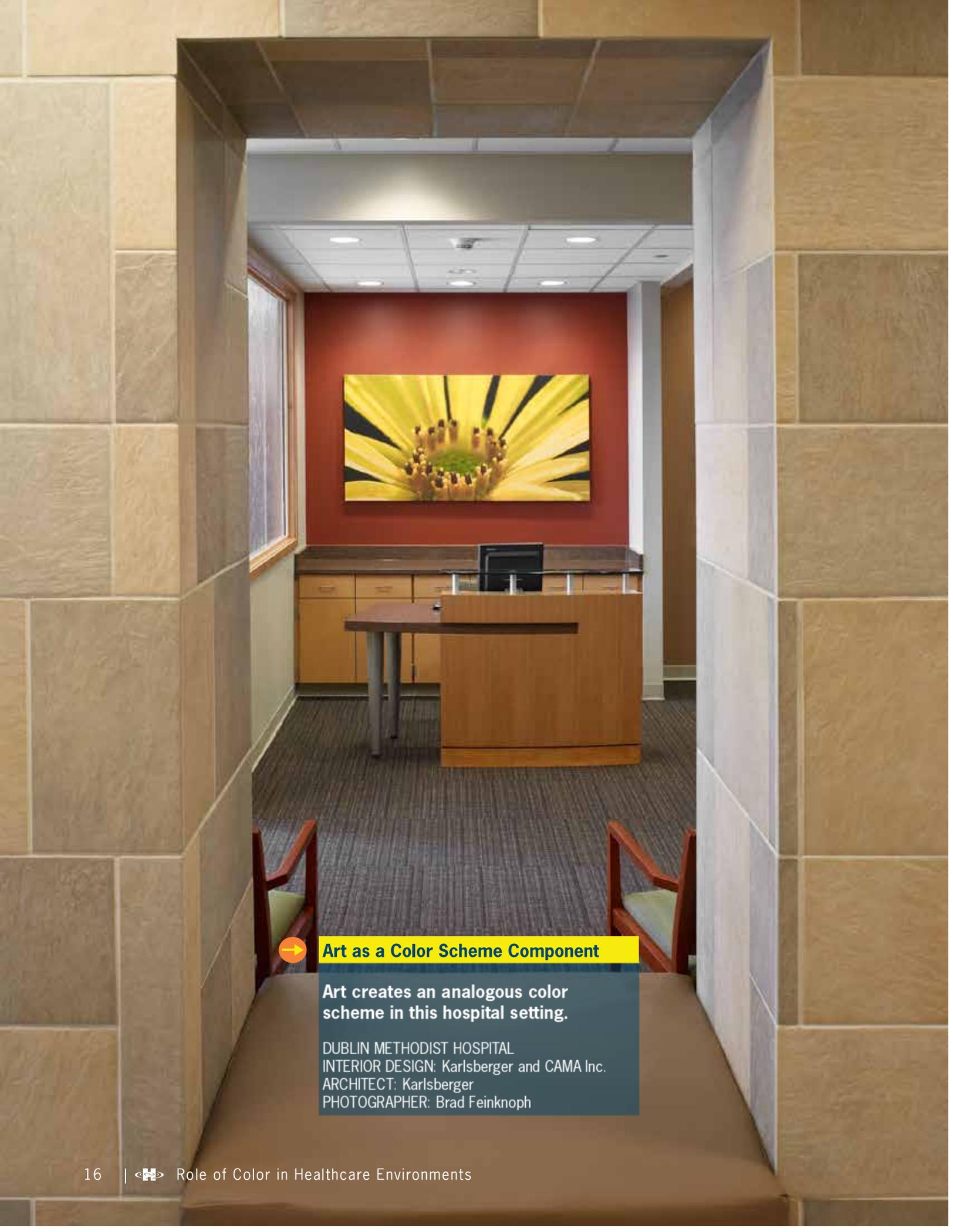
## Current State of Research on Color

Many color guidelines have been proposed for healthcare settings, but these only offer hypotheses suggesting that certain colors may be associated with the well-being of the users of those spaces. Toffle, Schwarz, Yoon, and Max-Royale (2004) conducted an extensive literature review and analysis of several color guidelines and noted that there are considerable contradictions among guidelines and in the literature on color.

Toffle et al. (2004) state that the art of specifying certain colors to evoke a particular mood or influence behavior is unsubstantiated by research evidence. Although some studies have demonstrated that color-mood associations do exist, they could not conclude that there is a one-to-one relationship between a certain color and a specific emotion. We note for example, that while some designers use white to evoke a sense of clarity and denote cleanliness, others state that white walls are clinical and even eerie.

Edelstein and colleagues also conducted an extensive search of peer-reviewed literature on the influence of light and color on behavior, emotion, function, cognition, circadian rhythms, and health (Edelstein, 2006; Edelstein, 2008; Edelstein, et al., 2008). They found the greatest consistency in color studies focused on the brightness and color contrast, consistent with knowledge from the visual sciences and clinical research. Such research can be applied to manipulate perceptual impressions, such as a sense of spaciousness. Together these literature reviews conclude there was insufficient evidence to directly link specific colors with specific behavioral or health outcomes.

The authors conducted a broad search of color literature published, using search terms focused on color in healthcare settings. The search included journals spanning design, architectural, sociological, psychological, physiological, and nursing and medical disciplines. Studies cited in the National Library of Medicine's PubMed Medline and the Web of Knowledge databases provided a rich source of information, yielding thousands of articles that investigated the human response to light and color.



### Art as a Color Scheme Component

Art creates an analogous color scheme in this hospital setting.

DUBLIN METHODIST HOSPITAL  
INTERIOR DESIGN: Karlsberger and CAMA Inc.  
ARCHITECT: Karlsberger  
PHOTOGRAPHER: Brad Feinknoph

The publications meeting our criteria for peer-reviewed empirical studies of color in healthcare settings are reported below.

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## Color and Healing

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It has been suggested that color has a therapeutic effect, although few empirical observations exist. Edelstein et al. (2008) reviewed citations from biomedical literature and found that while influence of the colored light on health was supported by several decades of rigorous research into circadian rhythms, there was a paucity of consistent data on the influence of applied color on health.

Toffe et al. (2004) note that “oversimplification of the psychological responses to color pervades the popular press, and direct applicability to architecture and interior design of healthcare settings seems, “oddly inconclusive and nonspecific” (p. 5). They assert, “The attempt to formulate universal guidelines for appropriate colors in healthcare settings is ill advised (p. 5).”

Schuschke and Christiansen (1994) also found that “no compelling scientific reasons can be given for coloration in the hospital.” For example, their study of 68 patients found heterogeneity in their choice of sick-room color in clinics and could not support specific or absolute color solutions. Nonetheless, in all 68 subjects, a preference for light colors for all objects such as ceiling, wall, floor, curtain, furniture, and linen were reported.

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## Color Preference Associated With Aging

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The effect of aging on color perception and preference should be considered in addition to the influence of visual dysfunctions and disorders often associated with advancing years. The natural aging and yellowing of the lens alters not only the optics but also the perception of color and response to glare and darkness through which the environment is perceived. Using four color cards, Mather, Stare, and Brenin (1971) found the color preference order in geriatric patients was blue, red/green, then yellow—consistent with other widely reported results of “blue preference.” Wijk, Berg, Sivik, and Steen (1999), using a color naming test of seven colors with 80-year-olds, found preference order was consistent with earlier studies and remained stable with age.



## Relationships of Color

To visualize the relationship of colors, imagine a sphere with the familiar “flat” color wheel at the equator and the color white as the North Pole and black as the South Pole. At the equator, the colors are highly saturated and vibrant. As white is added incrementally, moving toward the top of the sphere, colors become pastel tints. As you move toward the bottom of the sphere, or South Pole, black is added in even increments and colors become dark and are sometimes referred to as shades. The core of the sphere moves through a gray scale from black to white. The sphere can be sliced at any point above or below the equator revealing a color wheel in which each of the colors (hues) is the same value of lightness or darkness. (Adapted from Philipp Otto Runge, the originator of the color sphere, 1810.)



## Newton's Color Wheel

Imagine a time when colors had no names. Sir Isaac Newton, in the 17th century, using a glass prism, divided sunlight into the colors of the daylight spectrum. He then arrayed the colors around a circular ring with white in the center and blue opposite orange. Newton's color wheel of six colors, however, is very different from today's version. This work was the starting point for investigation of complementary colors in the latter part of the 18th century (Gage, 1999).





### Color and the Aging Eye

**Rousing, bright colors are more appropriate in environments for the aged than pastels, which are barely visible to those with failing eyesight.**

SEACREST VILLAGE RETIREMENT COMMUNITY -  
SAN DIEGO HEBREW HOMES  
INTERIOR DESIGN: Jain Malkin Inc.  
PHOTOGRAPHER: Steve McClelland



## Art Corridor

**Whimsical corridor uses bright colors effectively against a neutral palette for major surfaces.**

RANDALL CHILDREN'S HOSPITAL AT LEGACY EMANUEL  
INTERIOR DESIGN: ZGF Architects LLP  
ARCHITECT: ZGF Architects LLP  
PHOTOGRAPHER: Craig Collins ©Hendrich Blessing





➔ Gift Shop

Emphasis on the ceiling with playful graphics and lighting carry the eye through the shop to the rear wall. This is likely to draw visitors into the depth of the space, which means more potential purchases.

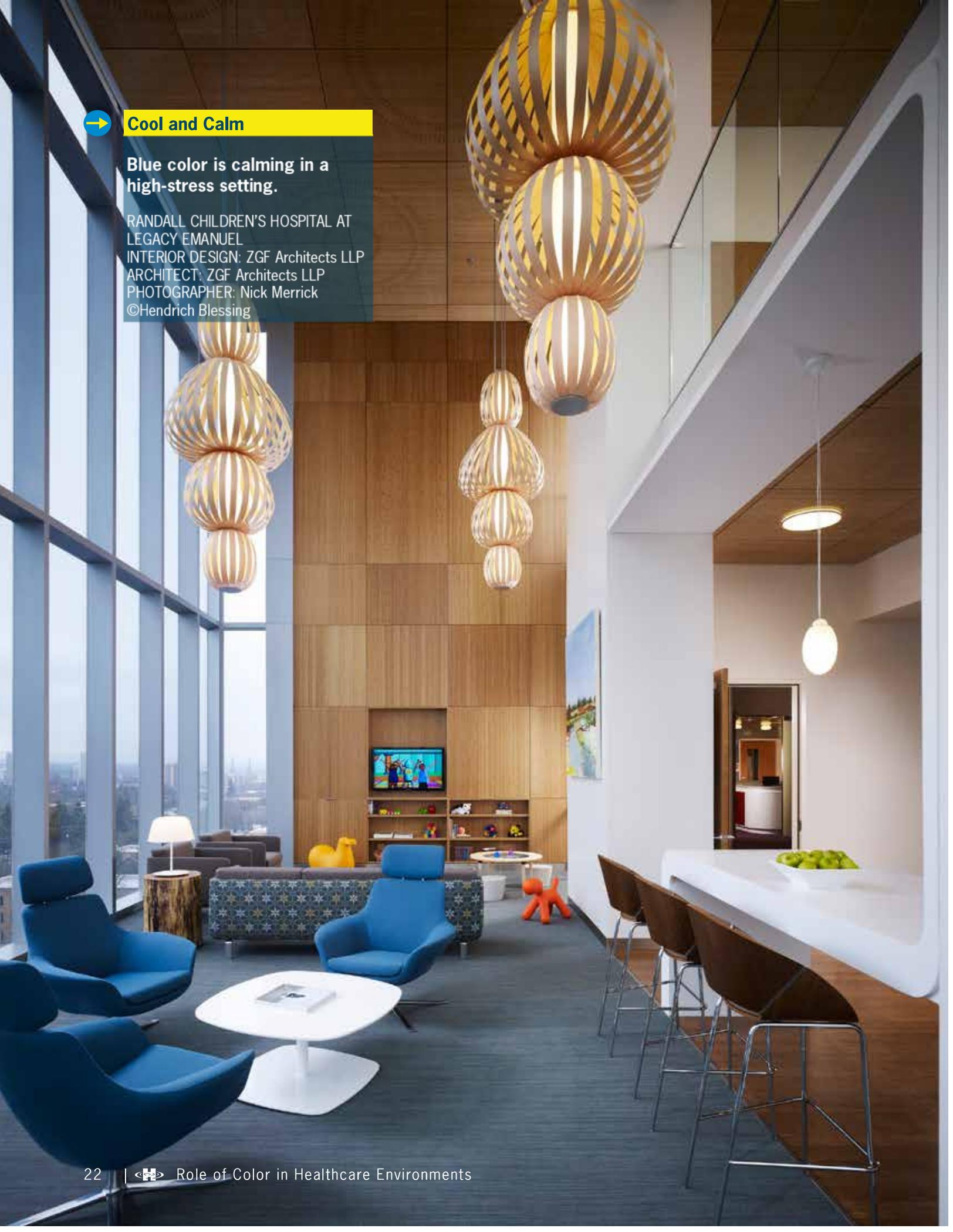
RANDALL CHILDREN'S HOSPITAL AT LEGACY EMANUEL  
INTERIOR DESIGN: ZGF Architects LLP  
ARCHITECT: ZGF Architects LLP  
PHOTOGRAPHER: Nick Merrick ©Hendrich Blessing



## Cool and Calm

**Blue color is calming in a high-stress setting.**

RANDALL CHILDREN'S HOSPITAL AT  
LEGACY EMANUEL  
INTERIOR DESIGN: ZGF Architects LLP  
ARCHITECT: ZGF Architects LLP  
PHOTOGRAPHER: Nick Merrick  
©Hendrich Blessing

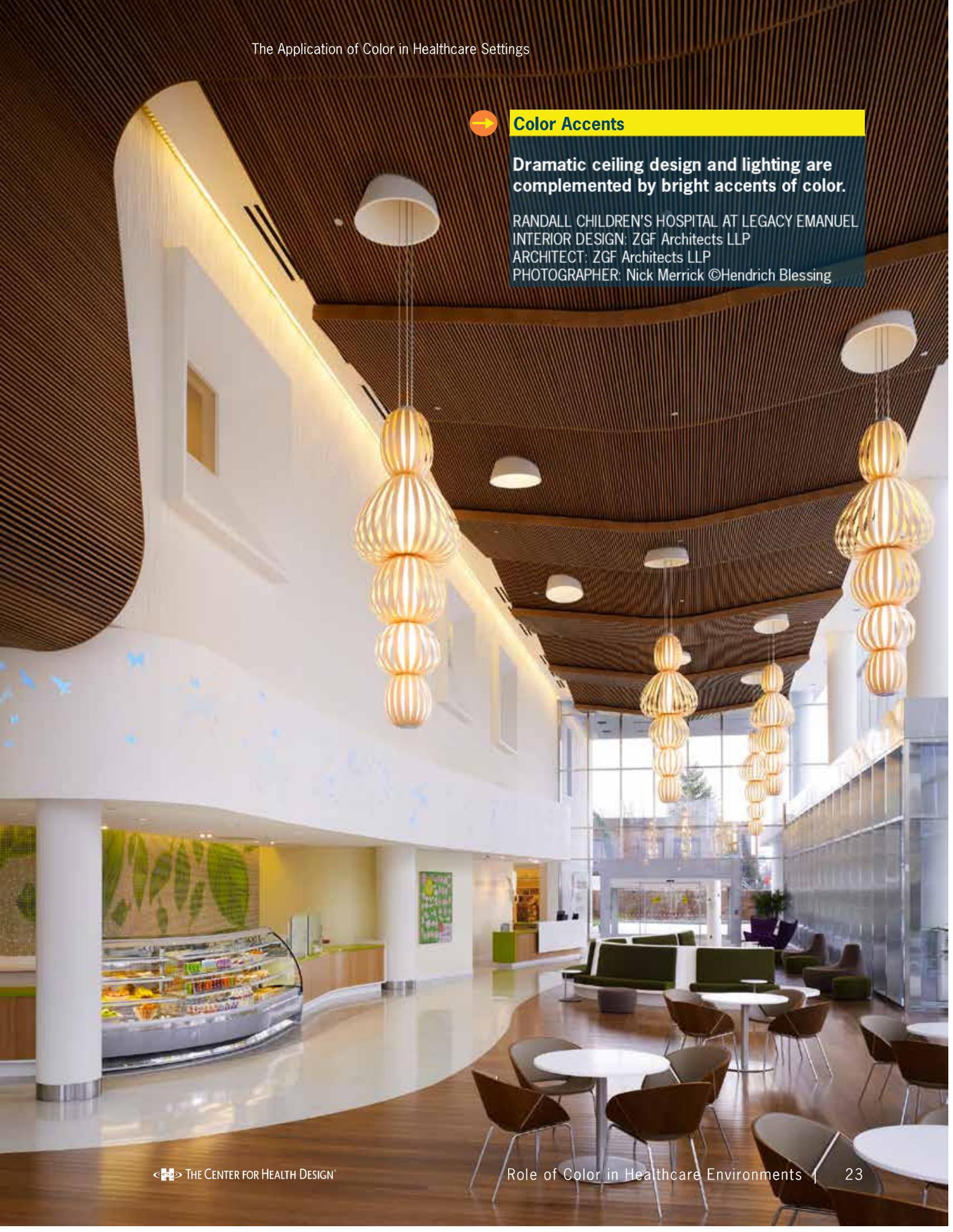




## Color Accents

**Dramatic ceiling design and lighting are complemented by bright accents of color.**

RANDALL CHILDREN'S HOSPITAL AT LEGACY EMANUEL  
INTERIOR DESIGN: ZGF Architects LLP  
ARCHITECT: ZGF Architects LLP  
PHOTOGRAPHER: Nick Merrick ©Hendrich Blessing

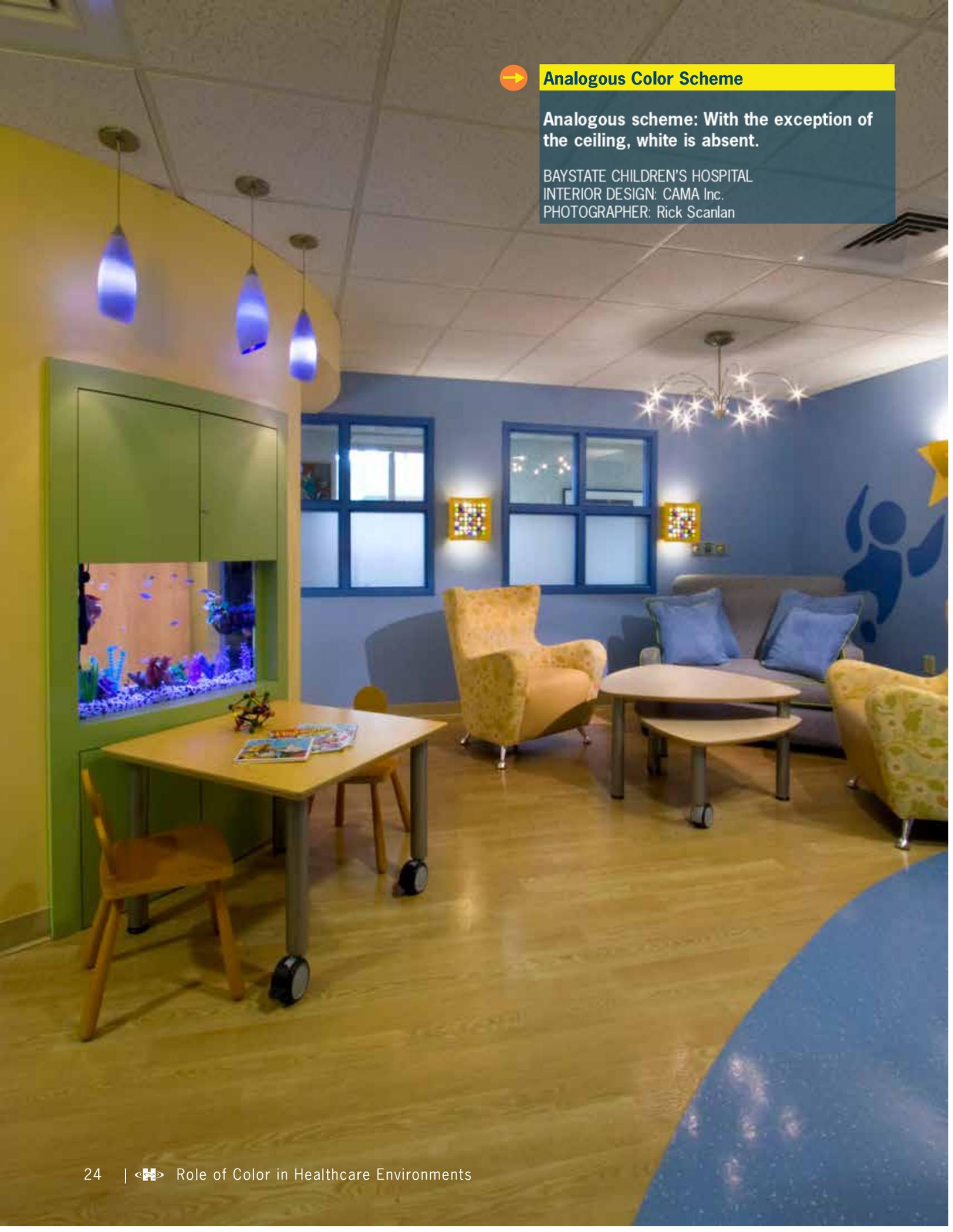




## Analogous Color Scheme

**Analogous scheme:** With the exception of the ceiling, white is absent.

BAYSTATE CHILDREN'S HOSPITAL  
INTERIOR DESIGN: CAMA Inc.  
PHOTOGRAPHER: Rick Scanlan



However, this conclusion is inconsistent with a more recent large-scale study by Dittmar (2001) ( $n = 842$ ), who found highly significant differences in color preference with advancing age. While the “blue preference” noted previously was observed, age was correlated with decreasing preference for blue and increasing choice of red/green. In both younger and older adults, there was no significant gender differences for preferred colors, but there was a gender difference for least preferred colors. These changes are opposite to the trend often reported in earlier studies of adults and children.

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### Children’s Preference in Healthcare Environments

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Three studies addressed children’s preference of color in healthcare environments. Park (2009) examined color preferences among pediatric outpatients, pediatric inpatients, and healthy children ( $n = 153$ , aged 7-11) using the Munsell color system for five hues—red (5R 7/8), yellow (5Y 9/8), green (5G 7/8), blue (5B 6/8), and purple (5P 7/8). These colors were selected in their pilot study ( $n = 63$ ) in which nine brightness/saturation combinations for each hue (45 in all) were tested to identify children’s most favorite and least favorite colors. White was also included because its prevalence in healthcare environments.

Ten models (1:12 scale) were built in which everything was the same, with the exception of one interchangeable sidewall where the different colors were displayed. Illuminance levels inside the models was 520 lux for overall illuminance (both incandescent and fluorescent) and 240 lux with the fluorescent light only. For the main study, children saw one model, but with different colored walls sequentially. Color preferences were measured using a modified version of the Pediatric Quality of Life Inventory (PedsQL) by Varni, Seid, and Rode (1999).

There was not a statistically significant difference in color preference among the three groups of children, and, therefore, the study did not support the hypothesis that pediatric patients would have different color preferences than healthy children. It should be noted that all graphs included in Park’s paper showed white to be the least preferred color. The authors noted lower preference scores for yellow in patients compared with healthy counterparts (no statistical significance reported). Gender differences for color preference were observed, with males reporting significantly



## Complementary Color Harmony

Playful soffit and design combines both warm and cool colors with dynamic shapes. Teal and red are complementary colors that lie opposite one another on the color wheel, accenting a warm neutral wall.

ADELANTE HEALTHCARE  
INTERIOR DESIGN: Jain Malkin Inc.  
ARCHITECT: Cawley  
PHOTOGRAPHER: Dustin Revella

lower preferences ( $p < .05$ ) for red and purple when compared to females. Park notes that for a color study to be successful, many confounding variables must be controlled (age, gender, emotion, hue, brightness, saturation, light sources, adjacent colors, contexts, and cultural factors).

Coad and Coad (2008) studied children's preferences for thematic design and color in one acute-care hospital in the U.K. In Phase I ( $n = 40$ ), the study interviewed 30 children and young people who were or had been inpatients, and 10 with additional learning needs and physical disabilities who had accessed services. In Phase II ( $n = 140$ ), a questionnaire was used based upon the Phase I pilot study findings. Analysis was grouped by children aged 11 and younger (range 3 to 11 years) and children aged 12 and older (range 12–18 years). The authors did not analyze statistical probabilities.

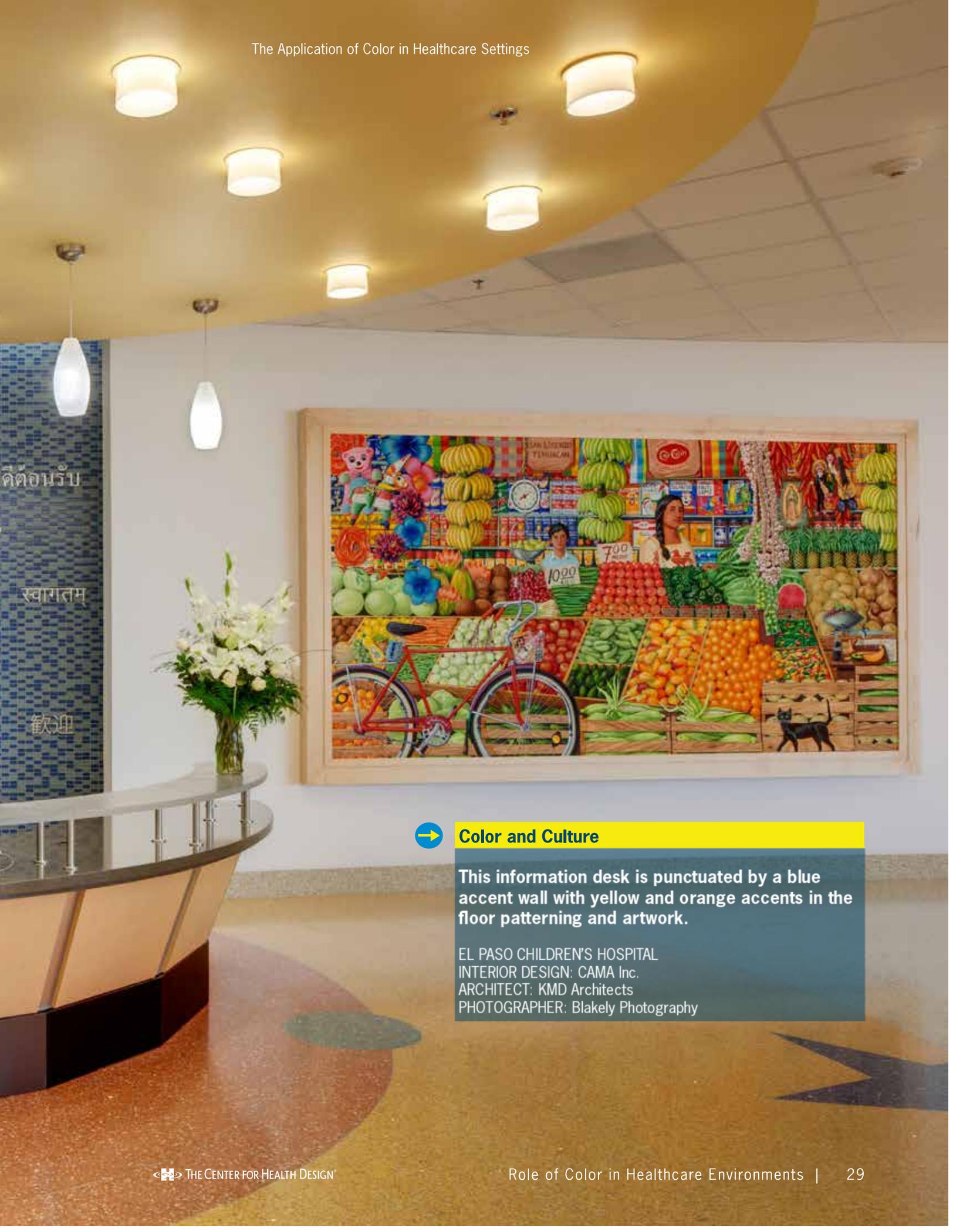
Using descriptive analysis they observed the following trends. In Phase I, participants were asked to select their color preferences for different areas of the hospital from a thematic design chart and leaflet that included over 100 colors. Each of the colors had been preassigned to a color group (reds, greens, yellow, etc.) and scored using a scale of 1 to 9, with 1 representing the most pale and a 9 representing the most dark. Contrary to suggestions, children did not prefer bright colors, but rather pale to midcolor ranges. The most preferred colors were mid blue-green colors. Overall, all of the colors chosen were not bright, as previously suggested (Redshaw & Smithell, 2000).

When asked about their preference for colors in the corridors, most children felt that they should be painted in “warm, inviting colors” and that the corridors should be a single color. The most preferred colors for corridors were “warm blue, pastel green, pale or mid-yellow (not lemon) or mid-oranges.” For the nursing areas, responses were almost evenly split between a preference for a single color versus multiple colors.

Single color preferences included “blue accent and pastel yellow and pastel orange.” Color combinations most often selected were “shades of blue, orange, pink, neutral and yellows.” For playrooms or “chill-out rooms,” respondents selected similar colors to those selected for the nursing unit.

Limitations to this study include the use of small color chips that are less





### Color and Culture

This information desk is punctuated by a blue accent wall with yellow and orange accents in the floor patterning and artwork.

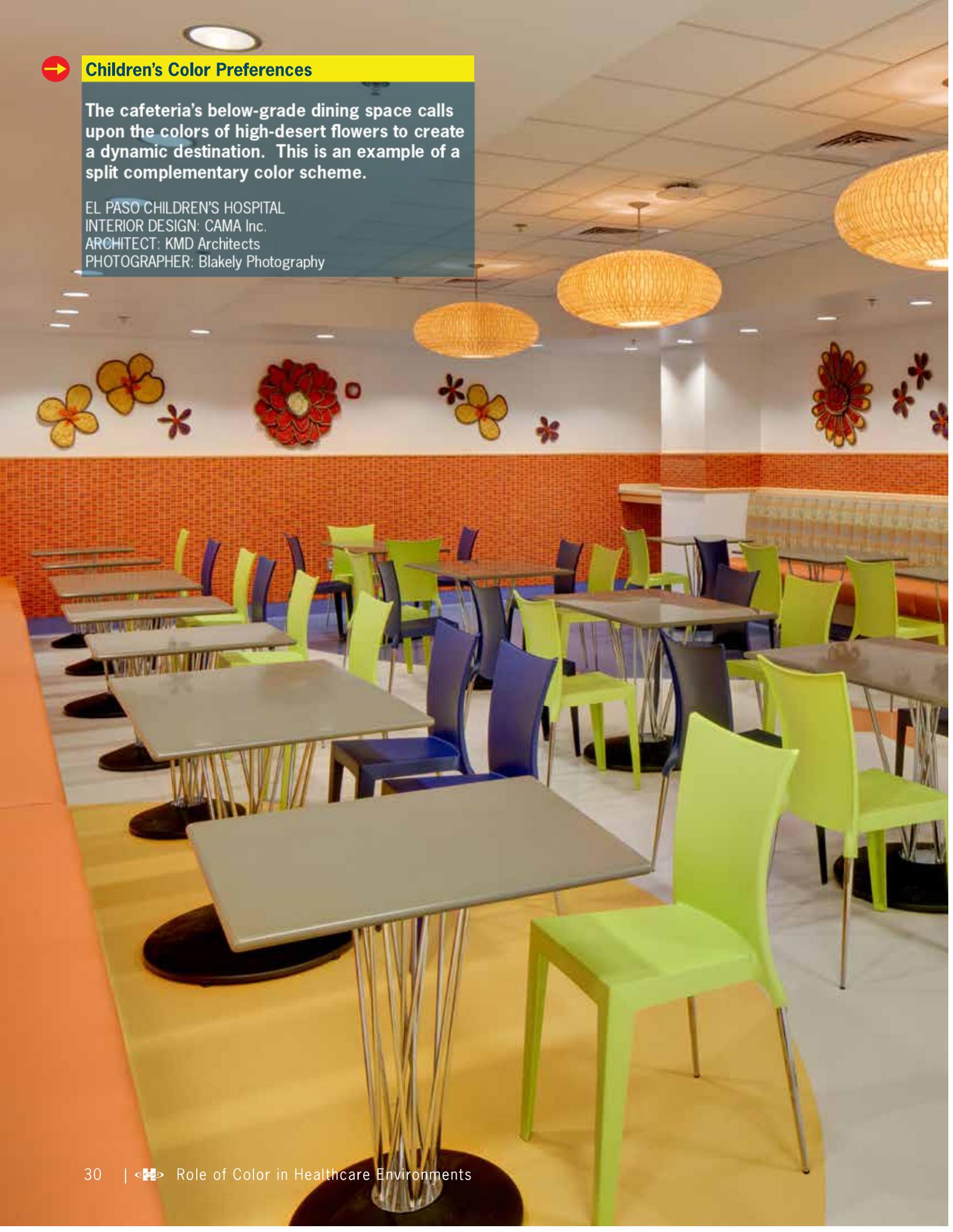
EL PASO CHILDREN'S HOSPITAL  
INTERIOR DESIGN: CAMA Inc.  
ARCHITECT: KMD Architects  
PHOTOGRAPHER: Blakely Photography



## Children's Color Preferences

The cafeteria's below-grade dining space calls upon the colors of high-desert flowers to create a dynamic destination. This is an example of a split complementary color scheme.

EL PASO CHILDREN'S HOSPITAL  
INTERIOR DESIGN: CAMA Inc.  
ARCHITECT: KMD Architects  
PHOTOGRAPHER: Blakely Photography





## Color Harmony

The French chemist Michel Eugène Chevreul, director of the dyeworks for the well-known Gobelin tapestry company in France, wrote one of the most significant books on color harmony (1855). In fact he was the first to define color harmony in a way that would be familiar today: harmonies of complementary colors, split-complements, triad, analogous colors, and tetrad.

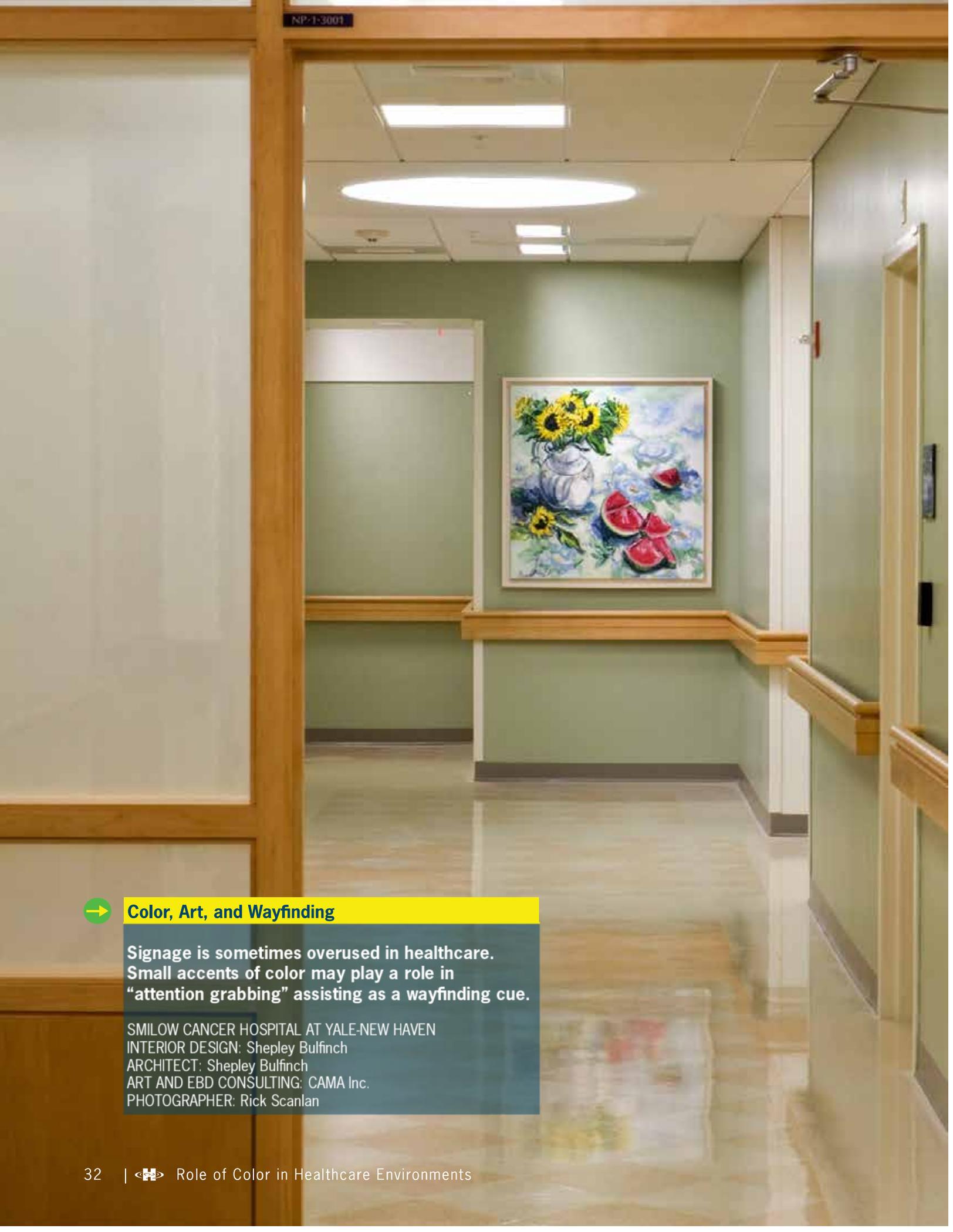
## Visual Illusion

The artist Josef Albers is a significant figure in contemporary times. His book *Interaction of Color* (2006) examines the changing nature of color based upon the relativity of one color juxtaposed with another. The book has many color plates that demonstrate how easily the eye can be deceived in thinking that a color is lighter or darker, or somehow different, depending on other colors adjacent to it. And he provides numerous examples of vibrating and vanishing boundaries through the use of shape and the selection of hue.

## The Purkinje Effect

The Purkinje effect was named after its discoverer, a Czechoslovakian physician, who observed that at twilight, color impressions were shifted to favor the short-wavelength area of the spectrum. Thus, reds, oranges, and yellows become colorless and darker, greens, and blues become clearer (Malkin, 2002). Recommended source: *Theory and Practice of Color* by Frans Gerritsen (1975).





**Color, Art, and Wayfinding**

**Signage is sometimes overused in healthcare. Small accents of color may play a role in “attention grabbing” assisting as a wayfinding cue.**

SMILOW CANCER HOSPITAL AT YALE-NEW HAVEN  
INTERIOR DESIGN: Shepley Bulfinch  
ARCHITECT: Shepley Bulfinch  
ART AND EBD CONSULTING: CAMA Inc.  
PHOTOGRAPHER: Rick Scanlan

“ecologically relevant” than studies in full-scale painted rooms. The authors noted, “It could be that the design choices are reflections of their environments at home and/or exposure to media such as television programs (the plethora of do-it-yourself and home improvement programs). Several participants referred to wanting the ability to control their environment, such as changing the color of walls and lighting” (Coad & Coad, 2008, p. 44).

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### Adolescent's Preference in Healthcare Environments

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Blumberg and Devlin (2006) administered a demographic questionnaire, a photographic comparison test, and a design questionnaire to 100 junior high school students who had been hospitalized one night or less (aged 12 to 14, 97% European American, majority middle- to upper-middle class) to better understand their preferences regarding the physical design of hospitals. The authors did not report statistically significant probabilities. Although there “were very few significant differences between the responses of those who had been hospitalized overnight and those without such hospitalization experience, findings from this study are still based largely on preferences for imagined circumstances. Unless an individual has actually experienced hospitalization, predictions of behavior may be inaccurate” (Blumberg & Devlin, 2006, p. 314). In addition, the authors suggest extending such studies to include adolescents up to 18-years-old and an improved study design with fewer overlapping confounding factors.

In their photographic comparison task, students were shown four different color prints from hospitals, two of hallways and two of lobbies, with one of each representing a more adult-oriented design and the other a child-oriented design. Students were asked to write down three things they liked and three things they disliked about each of the photos and were allowed to add other comments as well. The design questionnaire included questions pertaining to seven different topics, including several questions regarding a hypothetical stay at a hospital.

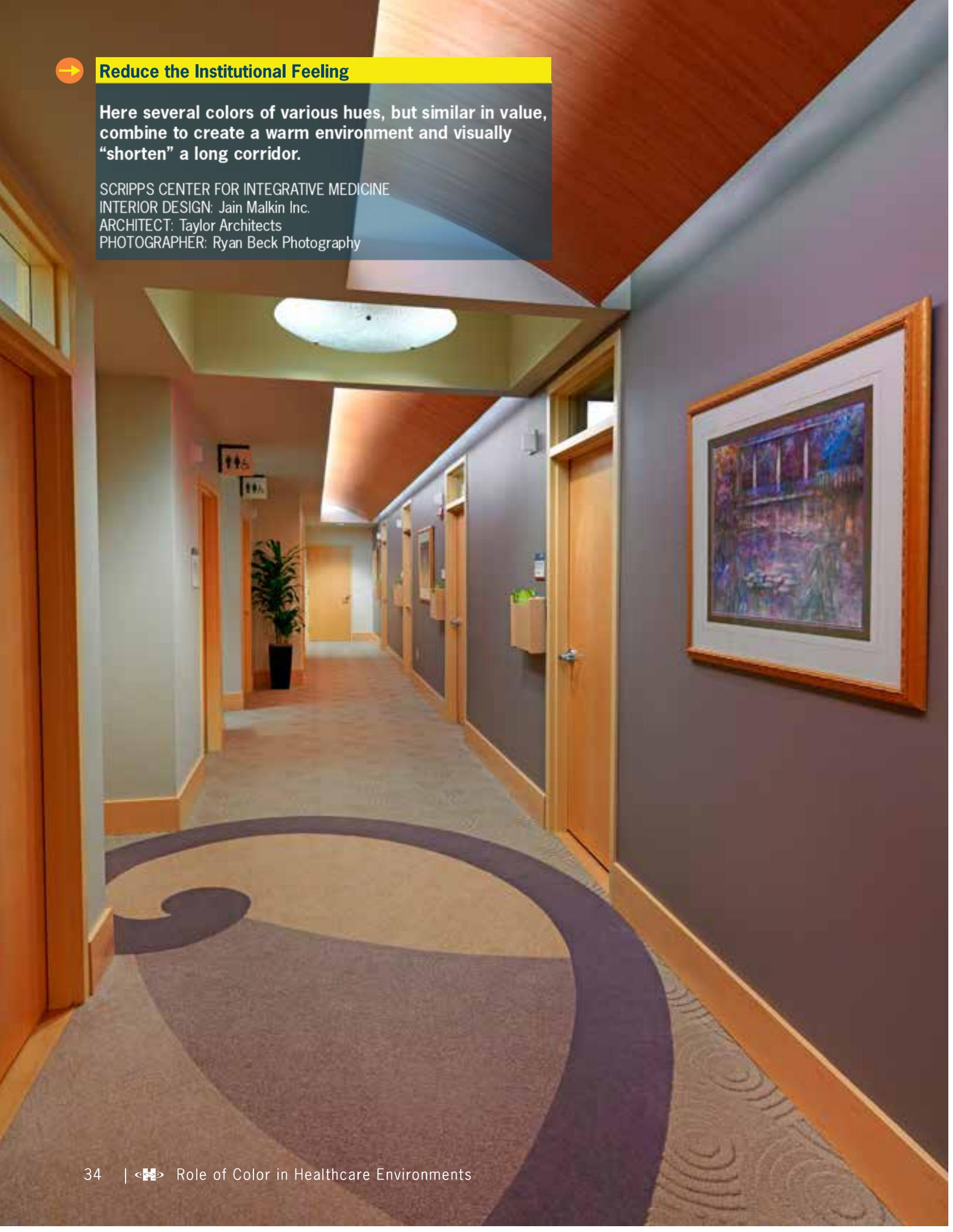
Responses to the picture comparison task frequently mentioned color and design, with 50% of respondents mentioning the color palette in the adult-oriented hallway and 73% commenting about colors in the child-oriented hallway. The adult-oriented hallway included “subtle colors” and the childlike hallway used a “brighter array of colors.” Of the students who indicated a preference for one of the hallway images,



## Reduce the Institutional Feeling

Here several colors of various hues, but similar in value, combine to create a warm environment and visually “shorten” a long corridor.

SCRIPPS CENTER FOR INTEGRATIVE MEDICINE  
INTERIOR DESIGN: Jain Malkin Inc.  
ARCHITECT: Taylor Architects  
PHOTOGRAPHER: Ryan Beck Photography



26% preferred the adult hallway and 54% preferred the child-oriented hallway, indicating that adolescents prefer the “bright colors and inventive design” of the child-focused hallway. For the set of lobby images, the majority of the adolescents preferred the adult-oriented photo, possibly because of the tricycle, pastel colors, and toys in the child-oriented lobby that were age-specific and not geared toward adolescents.

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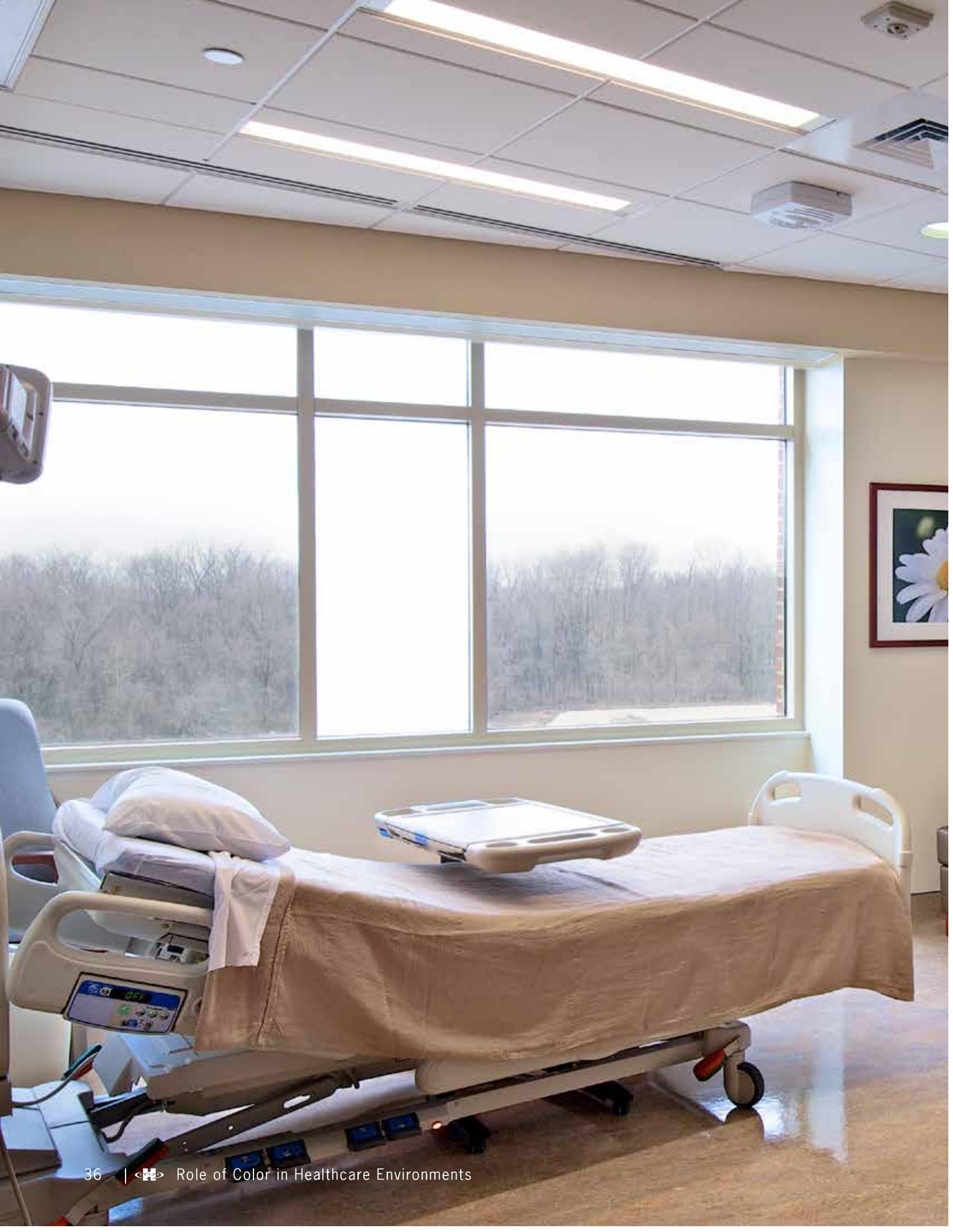
## Color in Psychiatric Settings

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Color was one component of the changes made in a corridor of a psychiatric hospital intended to reduce the “institutional” feeling of the space and provide a “sense of nature” in a paper by Edgerton, Ritchie, and McKechnie (2010). Descriptive statistics were presented, Chi-square analysis was conducted to compare patient behavior in the corridor pre/post redesign, and independent *t* tests were conducted to compare patient and staff perceptions of the corridor before and after design changes.

The floor, ceiling, and walls were changed to colors that commonly occur in nature—primarily blues and greens. Other changes included replacing transparent glass with opaque glass to obstruct unattractive views while letting in daylight, removing “institutional-style” panels from the walls, and installing two paintings and other modifications to improve the appearance of the corridor. Using behavior mapping, researchers recorded whether or not behaviors of people in the corridors involved social interaction and whether the behaviors were “positive” (e.g., getting coffee, talking) or “negative” (e.g., staring into space or talking to oneself).

The renovation did not affect the number of patients using the corridor, but there was an increase in the number of positive behaviors, although the difference was not statistically significant, except for an increase in “talking” behavior. Significant differences (*p* value not specified) were claimed suggesting that patients found the renovated corridor to be “cleaner, quieter, and more likely to make them feel good.” However, the staff was significantly more likely to rate the redesigned corridor as less bright and airy compared with the corridor before it was redesigned (*p* value not specified).





### Color, Daylight, and Eyestrain

The wall opposite a window should generally be kept light, or it will absorb much of the daylight. A window wall and frame should be light so as not to contrast too much with daylight sky. High contrast can result in headaches and eyestrain.

MIAMI VALLEY HOSPITAL SOUTH  
INTERIOR DESIGN: Gresham, Smith and Partners  
ARCHITECT: Gresham, Smith and Partners  
PHOTOGRAPHER: Cliff Ritchey



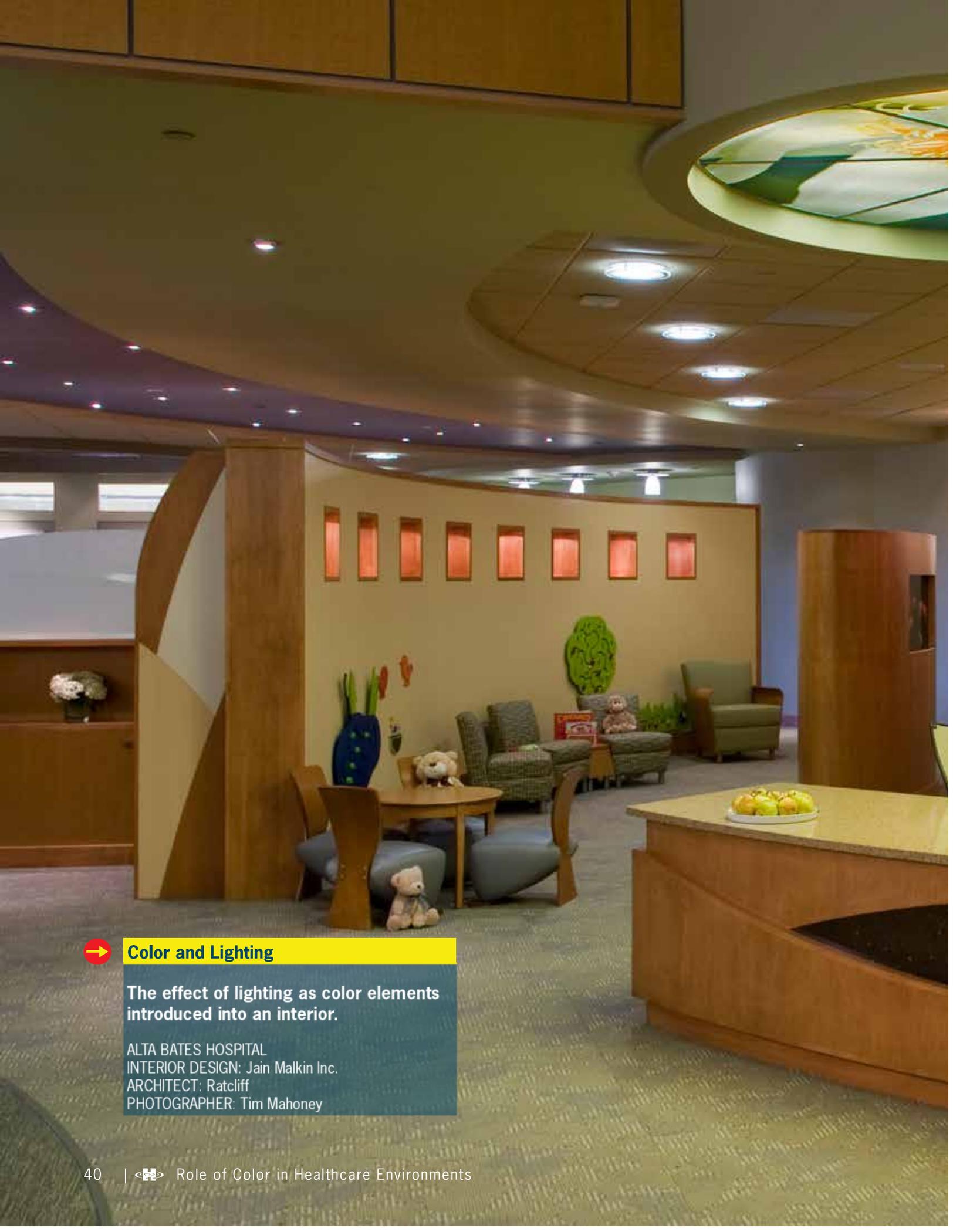
## Colors That Calm

Patient rooms feature colors intended to calm patients and their family members.

MIDDLE TENNESSEE MEDICAL CENTER  
INTERIOR DESIGN: Gresham, Smith and Partners  
ARCHITECT: Gresham, Smith and Partners  
PHOTOGRAPHER: Aerial Innovations





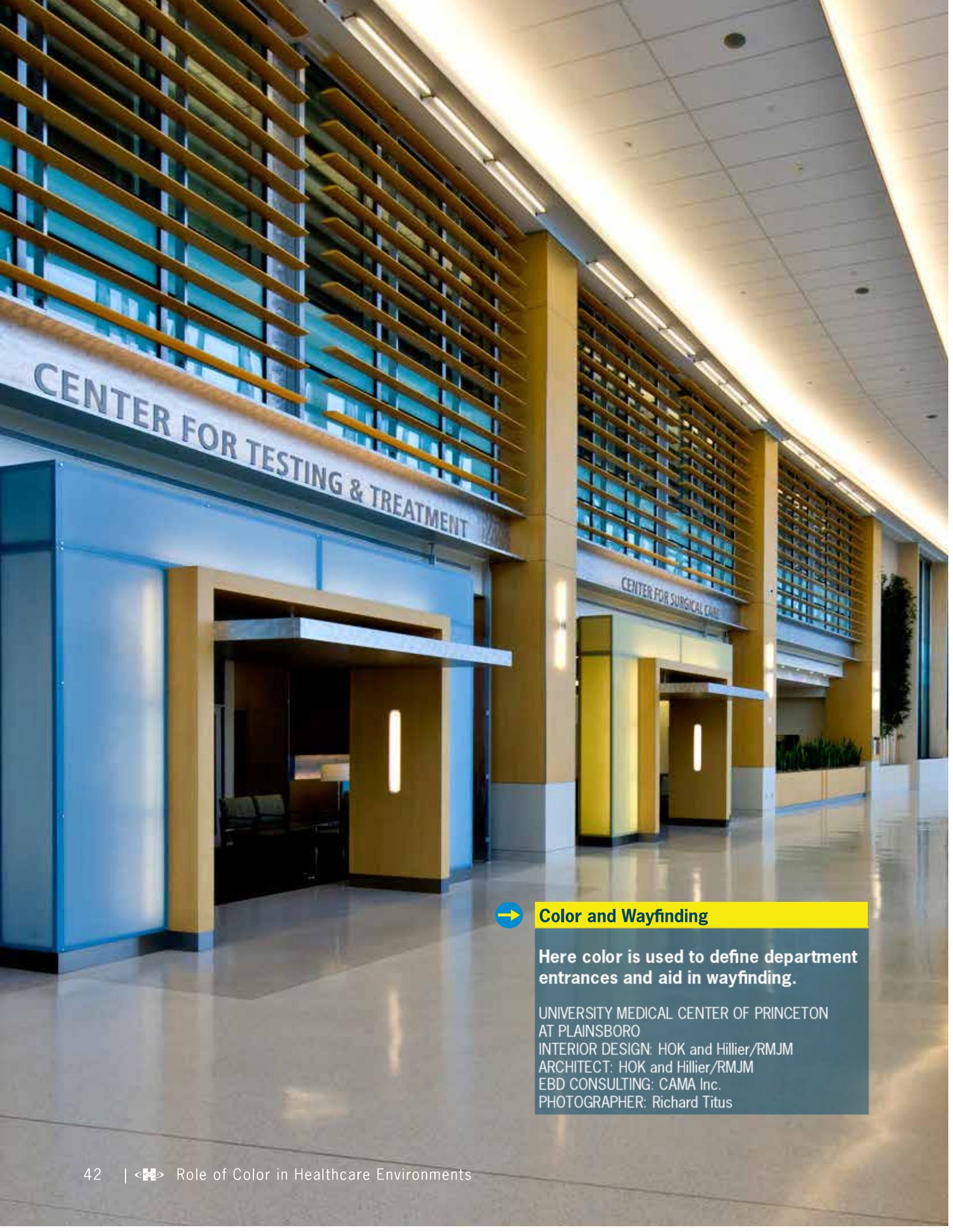


## Color and Lighting

The effect of lighting as color elements introduced into an interior.

ALTA BATES HOSPITAL  
INTERIOR DESIGN: Jain Malkin Inc.  
ARCHITECT: Ratcliff  
PHOTOGRAPHER: Tim Mahoney





CENTER FOR TESTING & TREATMENT

CENTER FOR SURGICAL CARE



### Color and Wayfinding

Here color is used to define department entrances and aid in wayfinding.

UNIVERSITY MEDICAL CENTER OF PRINCETON  
AT PLAINSBORO  
INTERIOR DESIGN: HOK and Hillier/RMJM  
ARCHITECT: HOK and Hillier/RMJM  
EBD CONSULTING: CAMA Inc.  
PHOTOGRAPHER: Richard Titus

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## Color for Signage in Healthcare Settings

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For many years, color has been used to inform wayfinding. Gibson, MacLean, Borrie, and Geiger (2004) examined the behavior of 19 (all male; mean age of 84.3 ( $SD = 4.1$ )) residents in a long-term care dementia unit following the renovation of the unit. The renovation was intended to make the unit feel less “institutional” and create an entrance to each room that was more visibly distinct, using “color, texture and cosmetic architectural structure.” Patients who were able to find their way to their rooms were interviewed using five free-response questions that allowed residents to share information regarding environmental cues that assisted them in this task. Residents who could not successfully find their room were not interviewed.

Thirteen of the 19 participants reported that color was used to help them find their rooms. Structure (e.g., room number, name plate) was the second most often reported cue (12 of 19 participants). Generalization of results from this study are limited by its small sample size, narrow age range, and the medical condition of participants.

The use of color and graphic images may be vital factors in healthcare design. As hospitals have a wide range of visitors and patients with different levels of visual impairments and disabilities, making comprehensible signage is essential. In the United States, color coding has been developed to reduce confusion and aid in decision making by specifying color stereotypes: warning information in red, caution information in yellow or amber, and advisory information in another color clearly discriminable from red or yellow/amber.

ANSI and the ISO have introduced similar universal color-coding standards (ISO 3864-1) and include green for safety. These ISO standards for safety colors, signs, and graphics are specifically designed to reduce accidents and injuries in public facilities, such as hospitals, worldwide. However, color in signage must be used with caution. For example, red-green color blindness and red-blue combinations can be difficult to resolve and have been shown to cause eyestrain thought to be due to the different focusing levels required as these colors are on the opposite end of the visible spectrum of the human eye.

The Americans With Disabilities Act reviews signage guidelines, recommending that the finish and contrast of the characters and background of signs be eggshell, matte, or other nonglare finish, and that characters and symbols contrast with their background by 70%.



### **Color and Wayfinding**

**Color and imagery reinforce the identity of exam suites; a patient advisory group participated in this design decision in order to empower visitors to navigate the facility more independently.**

MEDICAL COLLEGE OF GEORGIA  
INTERIOR DESIGN: CAMA Inc  
ARCHITECT: HEERY  
PHOTOGRAPHER: Dave Dawson

Rousek and Hallbeck (2011) report that with normal vision, 38% of participants had trouble recognizing signage during a wayfinding task; most commonly small lettering (18%), insufficient illumination (18%), insufficient contrast between the background and letters (10%), and mounting signage too high (8%). Studies simulating visual impairment by having subjects wear goggles showed many participants (70%) in their wayfinding study had trouble recognizing signage. The most commonly reported issues were improper illumination (38%), unexpected positioning (36%), and failing to notice the signage (14%). Sixty of the participants felt the signs were too small.

They studied the use of signage color in the healthcare setting. Participants ( $n = 50$ ) with healthy eyes were asked to respond to various pictograms (some with color and some black and white only) using three questionnaires, both with and without goggles designed to simulate 5 types of visual impairments (diabetic retinopathy, glaucoma, cataracts, macular degeneration, or hemianopsia).

The researchers found that color contrast improved signage comprehension and concluded from the limited set of colors and graphics tested (black, blue, white, red, green), that a combination of red and white backgrounds with black font was preferred. It should be noted that the font, size, scale, and color contrast are very important, along with the intelligibility of the design graphic itself.

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## Discussion

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While there are few color studies that have been conducted specifically for healthcare settings, it is appropriate to consider findings from studies in all built settings used by people. Indeed, hospitals include all architectural types such as bedrooms and residential spaces; places to heal, to sleep, to work; and to support the business of healthcare. Thus, a broader literature review that includes all architectural spaces, though outside the scope of this review, is warranted.

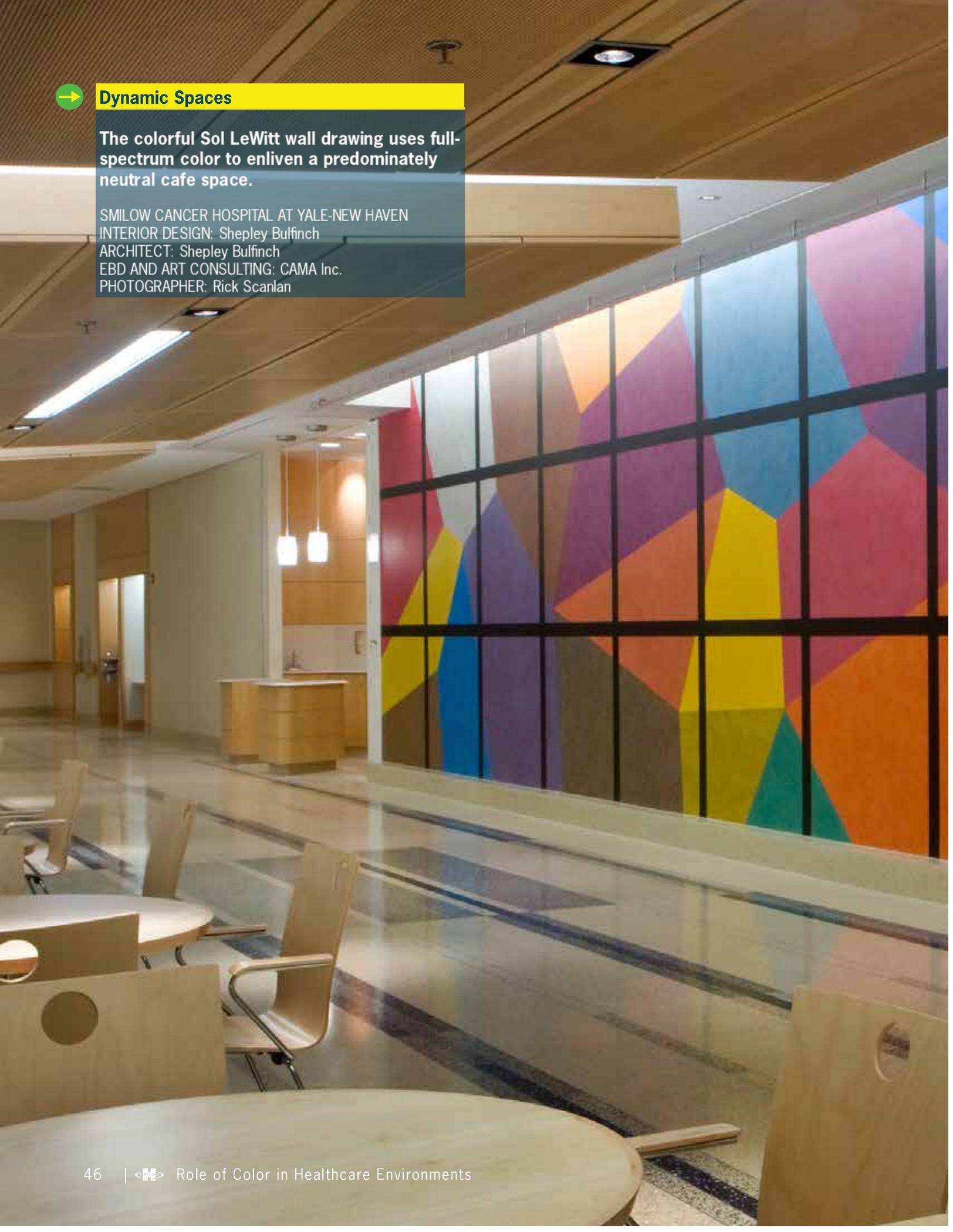
A great wealth of information is available from biological, psychological, sociological, and anthropological literature about color that far exceeds this review. However, a critical eye must be cast on earlier studies, some of which are still quoted despite being laden with societal biases and preconceptions (Edelstein et al., 2008). Meta-analyses of this literature should discriminate rigorous empirical studies from those

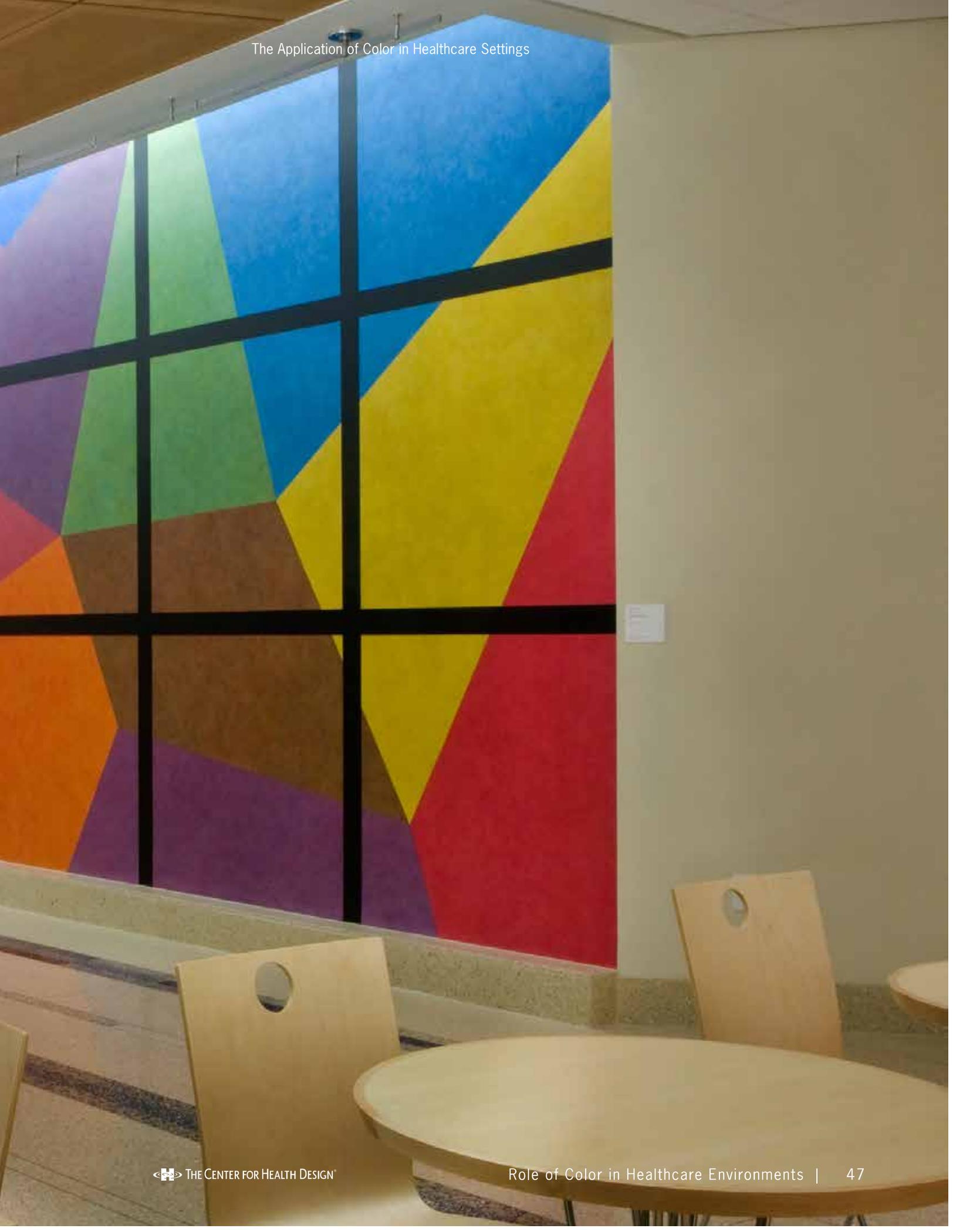


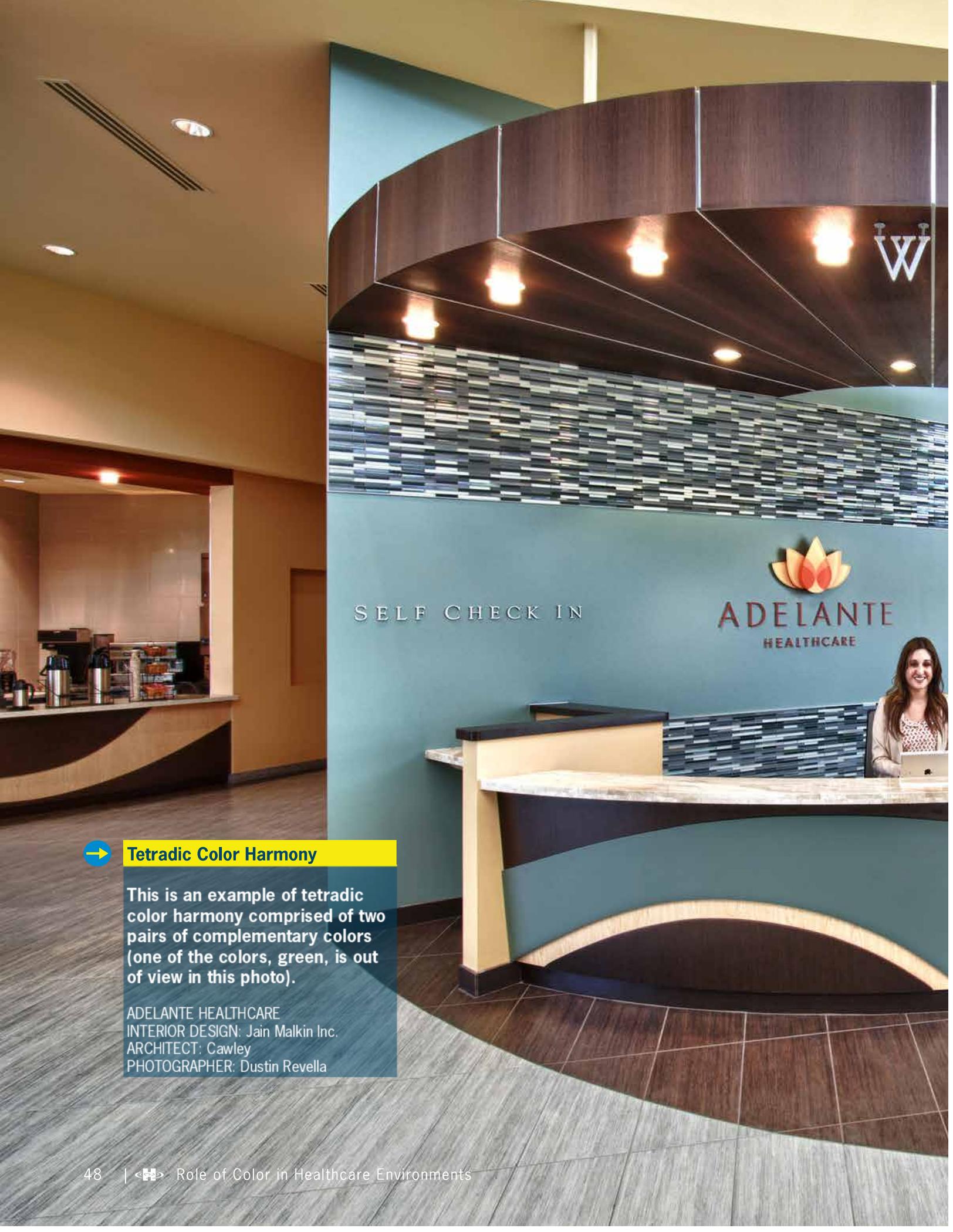
## Dynamic Spaces

The colorful Sol LeWitt wall drawing uses full-spectrum color to enliven a predominately neutral cafe space.

SMILOW CANCER HOSPITAL AT YALE-NEW HAVEN  
INTERIOR DESIGN: Shepley Bulfinch  
ARCHITECT: Shepley Bulfinch  
EBD AND ART CONSULTING: CAMA Inc.  
PHOTOGRAPHER: Rick Scanlan





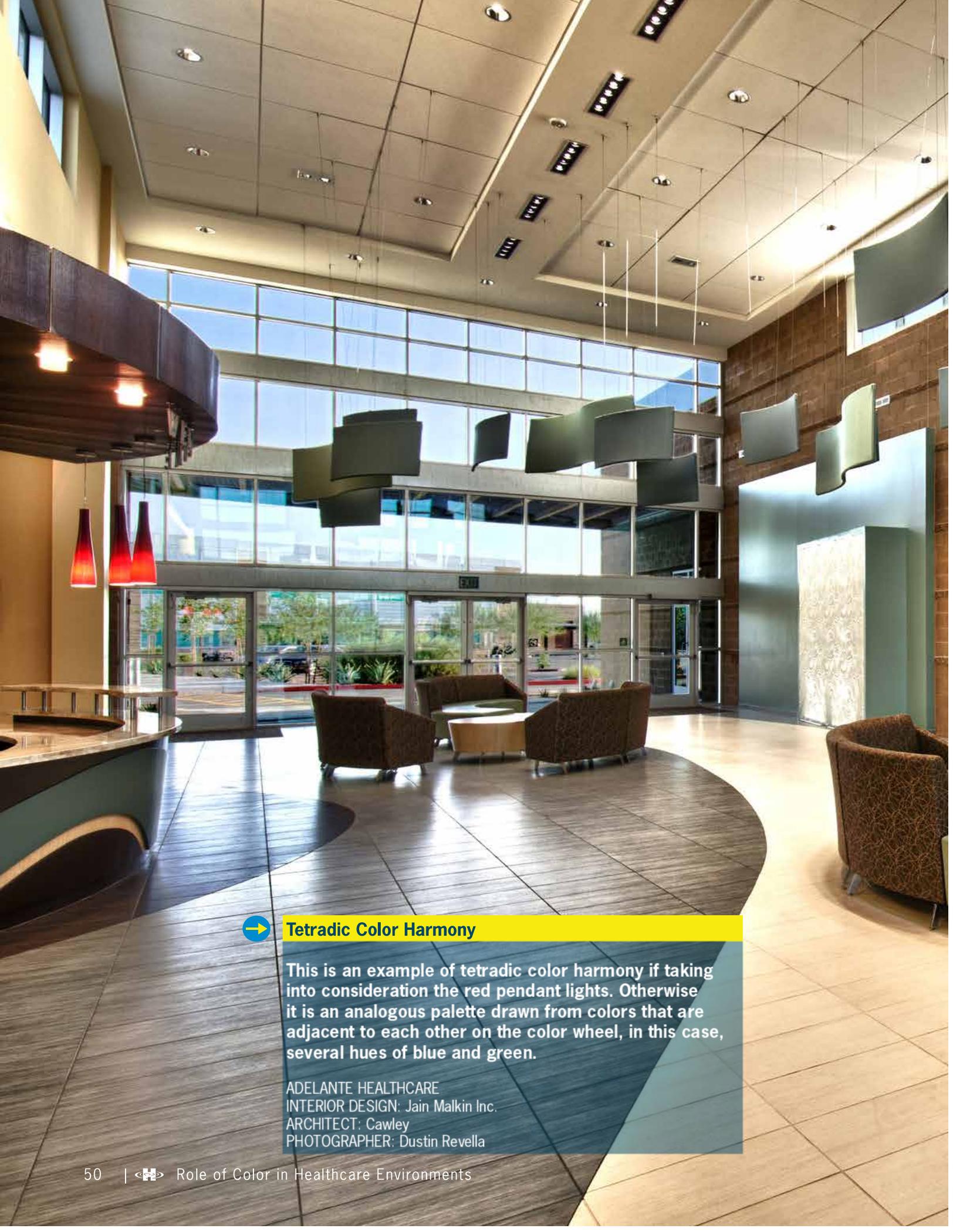


### Tetradic Color Harmony

This is an example of tetradic color harmony comprised of two pairs of complementary colors (one of the colors, green, is out of view in this photo).

ADELANTE HEALTHCARE  
INTERIOR DESIGN: Jain Malkin Inc.  
ARCHITECT: Cawley  
PHOTOGRAPHER: Dustin Revella

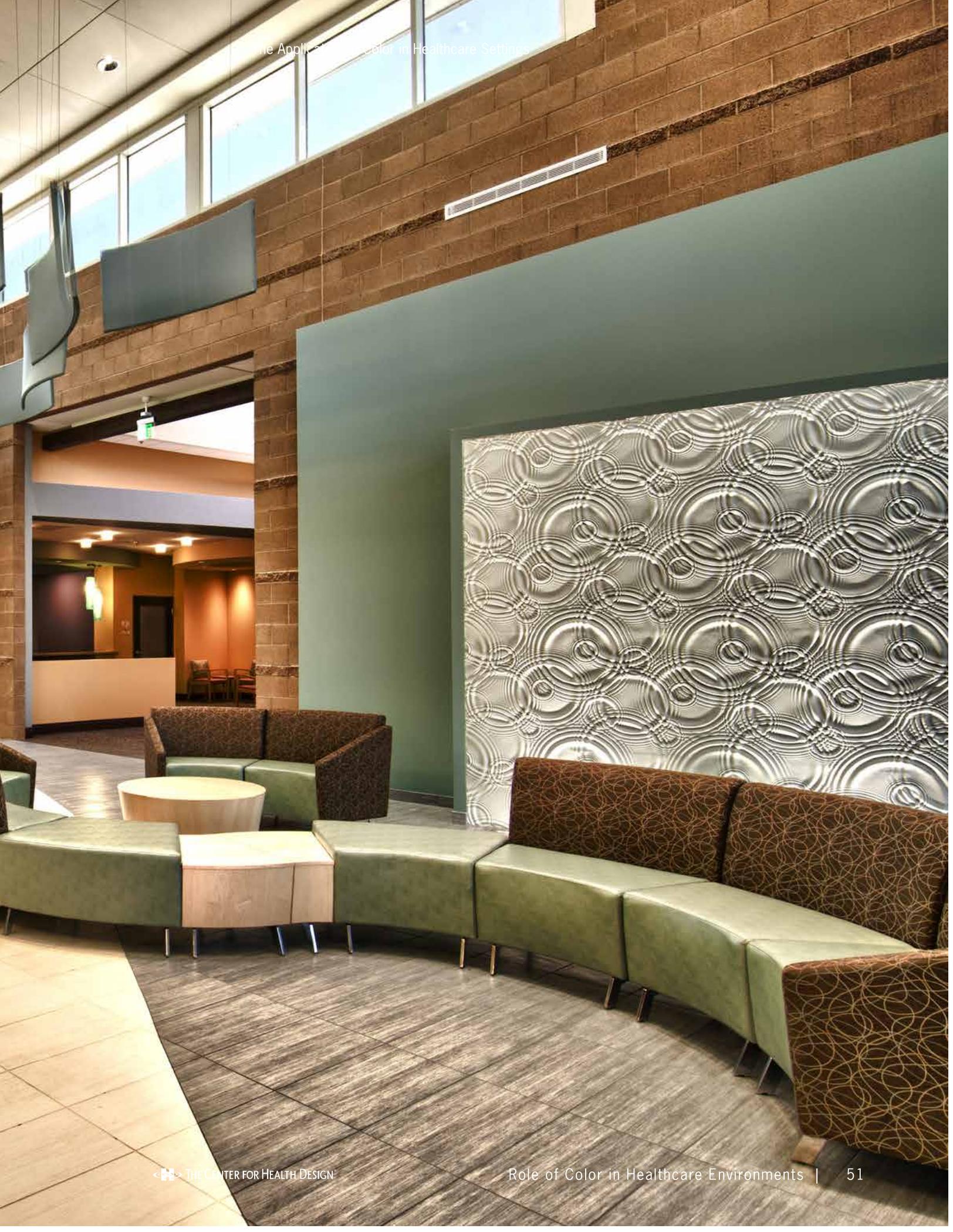




### Tetradic Color Harmony

This is an example of tetradic color harmony if taking into consideration the red pendant lights. Otherwise it is an analogous palette drawn from colors that are adjacent to each other on the color wheel, in this case, several hues of blue and green.

ADELANTE HEALTHCARE  
INTERIOR DESIGN: Jain Malkin Inc.  
ARCHITECT: Cawley  
PHOTOGRAPHER: Dustin Revella





## Dynamic Spaces

**Bright, strong colors stimulate and encourage activity.**

ELEMENTARY INSTITUTE OF SCIENCE  
INTERIOR DESIGN: Jain Malkin Inc.  
PHOTOGRAPHER: Steve McClelland

based on opinion and anecdote. Inconsistent findings in the color literature reflect the different methods used, poor study design, conditions, sample sizes, or test protocols. For example, some studies report preferences using only three colors or three shapes, while others report preference using a dozen different colors with two or three different hues of each psychological primary color.

Too few publications report on test-retest reliability, perform statistical analyses, or include the lighting conditions for every color study, as this directly impacts the perceived color. For example, Sosnova, Loseva, and Bukhareva (1999) note the loss of red green perception of luminous objects with 500-1,000 lux. The brightness of the space in which color is tested and the proximity of contrasting colors change the color perceived. Such information is widely documented and should be used when searching for common principles in the literature. Further, many studies use small cards to test color responses, but this is not likely to adequately test architectural color. Scale, dimension, and immersion in color differentially impact study results and should be taken into account. The medium used to display color also creates different perception. Illuminated color on desktop screens and virtual caves are likely to yield different responses and are accompanied by different sensations when compared to applied or painted colors. In conclusion, many studies that are commonly cited as “proof” of the impact of color have little ecological relevance to color selection in healthcare architecture. As long ago as 1933, Poulson and Neilson astutely noted that we must not fail to recognize that a true statement of color preference cannot be generalized from a singular or simple color test.

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## Interpretation and Translation

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Despite the paucity of directly relevant research, critical analysis of findings that span a breadth of evidence from multiple disciplines provide the foundation for suggesting a set of working guidelines relevant to color healthcare environments. In the spirit of evidence-based design, data from rigorous, peer-reviewed scientific and medical studies may be weighted and considered together with empirical, anecdotal, and practical experience to guide color use.

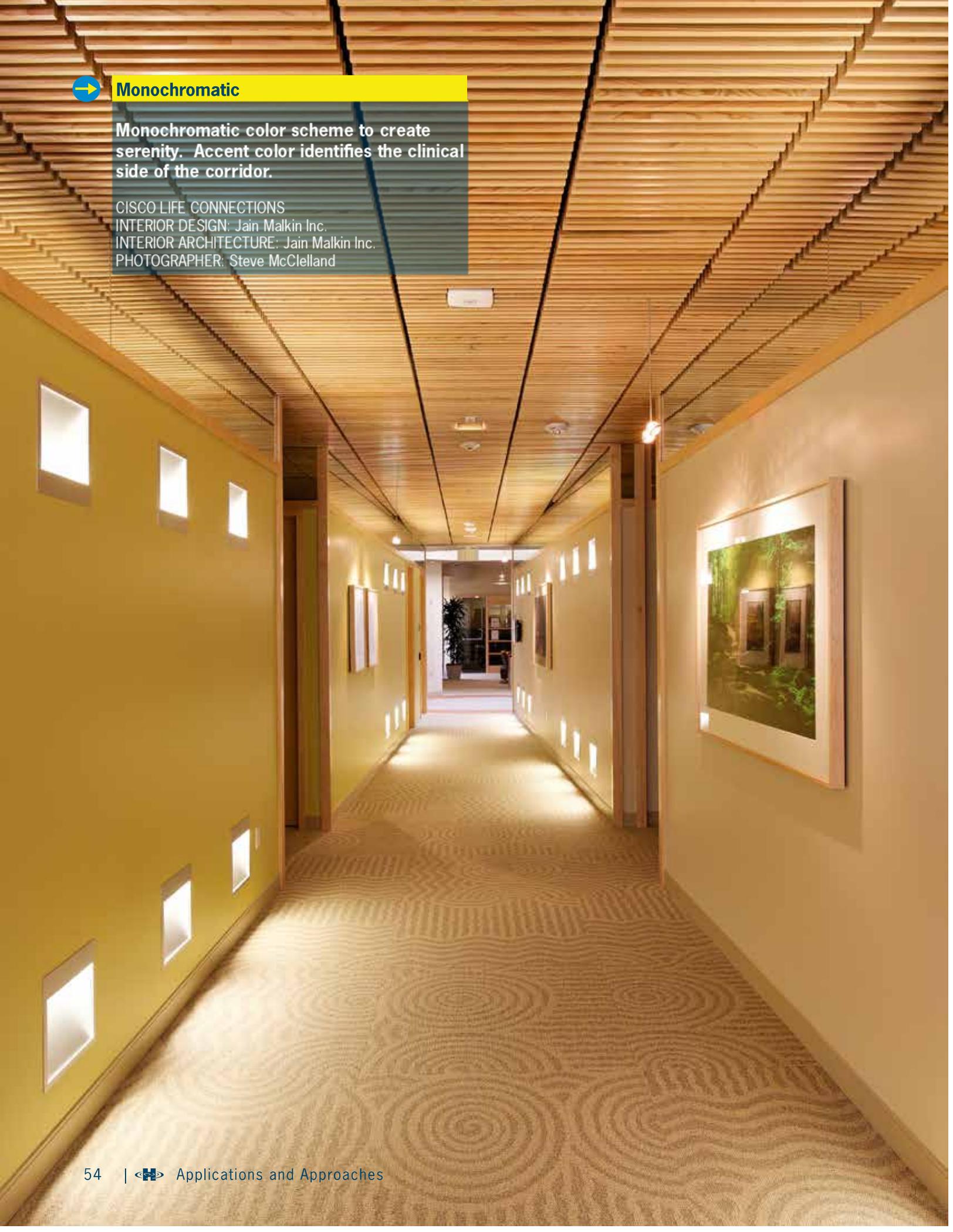
The section that follows reflects the combination of practitioners’ experience in order to describe applications and approaches to the use of color in healthcare settings. Professional experience and user responses offer valuable insights to color applications that are well-received.



## Monochromatic

Monochromatic color scheme to create serenity. Accent color identifies the clinical side of the corridor.

CISCO LIFE CONNECTIONS  
INTERIOR DESIGN: Jain Malkin Inc.  
INTERIOR ARCHITECTURE: Jain Malkin Inc.  
PHOTOGRAPHER: Steve McClelland



## Applications and Approaches



All Children's Hospital; Interior Design: Karlsberger and CAMA Inc.; Architect: Karlsberger



El Paso Children's Hospital; Interior Design: CAMA Inc.; Architect: KMD Architects; Photographer: Blakely Photography

Despite the lack of consensus in the literature of color in healthcare settings, hospitals and other facilities can still be designed thoughtfully.

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### Design Considerations

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1. Consider the needs of each specific patient population in the selection of color. In elderly populations, understand how vision changes as the eye ages. Greater contrast and more saturated colors are easier to see than pastel tones.
2. Skin color is a vital clinical cue. The patient zone should have access to natural daylight so that clinicians can assess skin tone. Colored walls and surfaces should be arranged so that light does not reflect color from the surface onto the patient. For example, neonates and those with liver disease present with yellowing of the skin from jaundice; yellow or blue surfaces would make observing these conditions more difficult. Patients at risk of low oxygen levels or cyanosis present blue or purple skin coloration; reflection from yellow surfaces could minimize observation of blue skin tone; reflection from blue surfaces could unnaturally enhance a cyanotic tone.
3. Understand the physiological effects of color and psychological perception of color: simultaneous contrast, successive contrast and afterimage, metameric color pairs, reflectance, Purkinje effect, color constancy, advancing and receding colors, figure-ground reversal.



4  
Soin Hospital; Interior Design: Jain Malkin Inc.; Architect: HOK; Photographer: James Steinkamp



6  
Sycamore Hospital; Interior Design: Jain Malkin Inc.; Architect: LWC Inc.; Photographer: Saari & Forrai Photography



9  
Cisco LifeConnections Clinic; Interior Design: Jain Malkin Inc.; Architect: Jain Malkin Inc.; Photographer: Steve McClelland

4. Consider religious or symbolic associations with color, including cultural taboos, bias, and nationality, that may be relevant to that particular community. (For more information about culture and color, see the Appendix).

5. Consider functional factors:

- Effect of lighting and materials on color.
- Ages of people who will use the space.
- Is the space for patients, staff, or visitors, and what is the typical length of time these people will be exposed to these colors?
- The nature and severity of the illness.
- The impact of illness or medical condition on color blindness or perception.
- Suitability of color palette for women, men, and children.
- Types of tasks: amount of contrast desired for the level of visual acuity and amount of contrast required.
- Is the goal to emphasize or to camouflage?
- Is the goal to organize spaces using color as the cue?
- How much contrast is desirable?
- Interaction of texture can cause the same color to look different.
- Use as cueing device in wayfinding.
- Use to denote hazards or warn of danger.
- Geographic and cultural bias: In northern climates with long, harsh winters, warm colors might be more appropriate than cool; in the West, the quality of light is a warmer and more intense color than in the East; in tropical areas, strong saturated colors (hot pink, orange, peacock, purple, lime) are often favored. (For a more information about culture and color, see the Appendix)



Miami Valley Hospital South; *Interior Design, Architect:* Gresham, Smith and Partners; *Photographer:* Cliff Ritchey



Clinical Laboratory Yale-New Haven Hospital; *Interior Design:* CAMA Inc.; *Architect:* Karlsberger; *Photographer:* Rick Scanlan



Scripps Center for Integrative Medicine; *Interior Design:* Jain Malkin Inc.; *Architect:* Schmidt Scanlon Gordon; *Photographer:* Michael Campos

6. Understand how color affects the perception of space.
7. Think about practical applications of color psychology.
8. Consider aesthetics: Although studies may indicate that a blue accent wall is desirable for a coronary care patient, for example, the specific hue and its saturation or value coupled with the way the color is used, are entirely dependent on the designer's skill and talent. Therefore, even though the initial development of color palettes may not have been based on intuition or personal taste, the final product still bears the stamp of the individual designer's unique talent.
9. Address a facility's motivation: Many interior design projects are about improving the image of an institution, recruiting and retaining staff, attracting a competitor's customer base, and/or making a statement about the experience or quality of care delivery patients can expect. Color may be tied to an institution's logo or corporate brand, the culture of its constituency, or the perception of the quality of the materials selected.
10. Consider maintenance: Maintenance is extremely important in healthcare. Color plays a role in the perception of clean. Dark colors can show white lint prevalent in healthcare or the cloudy stain of an alcohol-based hand sanitizer. Choices in wood color can also create maintenance nightmares such as the use of darker wood stains that when scratched show a lighter color wood underneath.
11. Take into account attic stock: Healthcare environments are very public spaces and get used 24/7. Materials must withstand a higher level of wear than most environments. The upkeep of such spaces requires that in-house maintenance



13  
Argyros Ambulatory Center at Eisenhower Medical Center;  
Interior Design: Jain Malkin Inc.; Architect: Boulder  
Associates; Photographer: Ed LaCasse



17  
Soin Hospital; Interior Design: Jain Malkin Inc.;  
Architect: HOK; Photographer: James Steinkamp



20 33  
Soin Hospital; Interior Design: Jain Malkin Inc.;  
Architect: HOK; Photographer: James Steinkamp

staff keep attic stock of those finishes that need constant refurbishment. Wall and floor finishes are the most common. It is sometimes the mandate of an institution to limit the number of materials or color choices so that attic stock can be maintained. Without evidence to state otherwise, this argument supports a rather neutral healthcare environment given the size of most institutions.

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### Color and its Effect on the Perception of Space

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Interior designers and architects might consider the following regarding the laws of perception and application of color theory (Malkin, 1992).

12. To emphasize the color of a specific room, the entry may be painted a complementary color.
13. Color modifies architectural form. It can expand, shorten, widen, lengthen, and give the illusion of lowering or raising a ceiling. Color can change the appearance of the environment so markedly that it can influence an individual's subjective impression of a space.
14. Bright colors appear to be lighter in weight. Ordered from "heavy" to "light" they are: red, blue, purple, orange, green, yellow.
15. Bright objects are overestimated in size. Yellow appears the largest, followed by white, red, green, blue, black, in descending order.
16. A light object appears larger against a dark background. A dark object appears smaller against a light background.
17. The wall opposite a window should generally be kept light, or it will absorb much of the daylight. (However, in a patient room, this approach might create glare if appropriate window treatment is not provided.)



Phoebe Sumter Medical Center; *Interior Design, Architect:* Gresham, Smith and Partners; *Photographer:* Brian Robbins



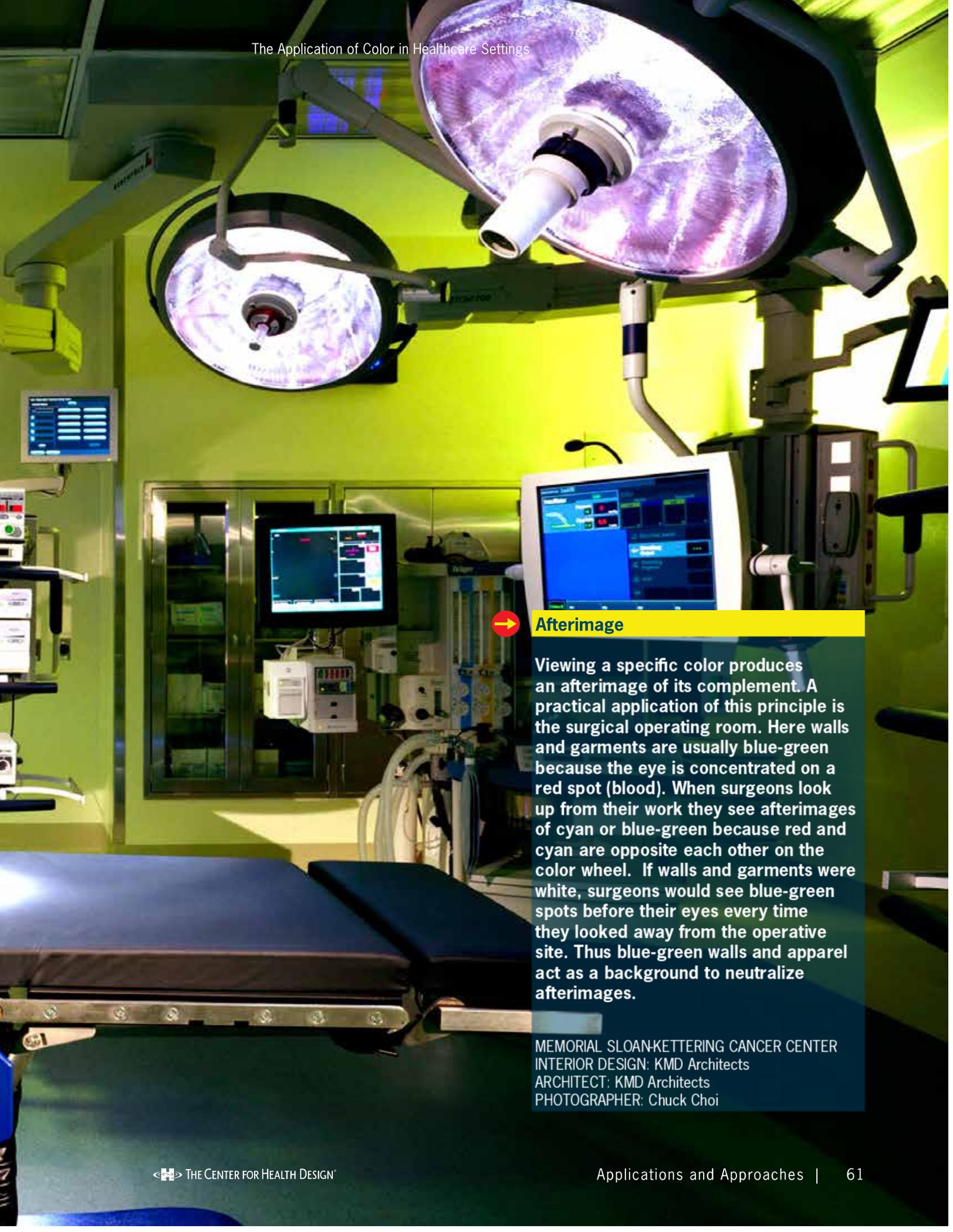
Curci Cancer Center at Eisenhower Medical Center; *Interior Design:* Jain Malkin Inc.; *Architect:* Moon Mayoras Architects, Inc; *Photographer:* Steve McClelland



Smilow Cancer Hospital; *Interior Design, Architect:* Shepley Bulfinch; *Art and EBD Consulting:* CAMA Inc.; *Photographer:* Rick Scanlan

18. A window wall and frame should be light so as not to contrast too much with daylight sky. High contrast can result in headaches and eyestrain.
19. If a red wall is placed next to a yellow wall, the yellow wall will appear greener than it actually is due to the afterimage of the red: cyan. The blue afterimage of the yellow will cause the red to appear more purple.
20. Warm colors advance; cool colors recede. (Warm colors are long wavelength colors, cool colors are short wavelength.)
21. Light colors and small patterns visually enlarge a space. Dark colors and large patterns make it appear smaller.
22. The absence of variety in the visual environment may cause sensory deprivation (Mahnke & Mahnke, 1987). Those confined to nursing homes, hospitals, and institutions need variety in lighting, wall color, and artwork for their well-being. A variety of colors is essential because an individual quickly adapts to the effects of any one color, no matter how predominant, and it becomes monotonous.
23. According to Kruithof's principle, in low levels of light (under 30 footcandles), the color of objects and surfaces will appear normal when the light source is slightly tinted with pink, orange, or yellow; at higher levels of lighting, objects and surfaces will appear normal when the light source is cooler. Therefore, a "warm" light source is best with low levels of illumination, and a "cooler" light source is best with high levels of illumination (Birren, 1969).
24. The absence of color in a patient corridor (white walls, white floor, and possibly even white baseboards) can create a visual hazard for older





### Afterimage

Viewing a specific color produces an afterimage of its complement. A practical application of this principle is the surgical operating room. Here walls and garments are usually blue-green because the eye is concentrated on a red spot (blood). When surgeons look up from their work they see afterimages of cyan or blue-green because red and cyan are opposite each other on the color wheel. If walls and garments were white, surgeons would see blue-green spots before their eyes every time they looked away from the operative site. Thus blue-green walls and apparel act as a background to neutralize afterimages.

MEMORIAL SLOAN-KETTERING CANCER CENTER  
INTERIOR DESIGN: KMD Architects  
ARCHITECT: KMD Architects  
PHOTOGRAPHER: Chuck Choi





### Color and Anxiety

Warm colors reflective of nature help alleviate anxiety in an emergency department waiting room setting.

EISENHOWER MEDICAL CENTER  
INTERIOR DESIGN: Jain Malkin Inc.  
ARCHITECT: Moon Mayoras Architects, Inc.  
PHOTOGRAPHER: Steve McClelland



25 Smilow Cancer Hospital; *Interior Design, Architect:* Shepley Bulfinch; *Art and EBD Consulting:* CAMA Inc.; *Photographer:* Rick Scanlan



26 El Paso Children's Hospital; *Interior Design:* CAMA; *Architect:* KMD Architects; *Photographer:* Blakely Photography



27 Clinical Laboratory Yale-New Haven Hospital; *Interior Design:* CAMA Inc.; *Architect:* Karlsberger; *Photographer:* Rick Scanlan

persons with reduced visual acuity and even other patients with compromised equilibrium, which could lead to falls. Color can define spatial relationships such as the junctions between walls and floors giving visual cues.

25. Wayfinding: Signage is sometimes overused in healthcare; When used, it should stand on its own and be noticed in a quick glance. Its coordination with the interior's palette should be organized early in the process. Line of sight to the next destination where further information can be imparted is more than enough for a stressed and confused traveler to handle. For instance, rather than signage to point to an obvious direction in a complex building type such as a healthcare facility, would a palette of "color brightness influenced by contrast effects, particularly between objects and background" be much more effective? Small accents of color may play a role in "attention grabbing" assisting as a wayfinding cue.

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### Sensitivity to Light and Color

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26. Since the cones of the eye are concentrated in the center of the retina, color sensitivity decreases toward the periphery of the retina until it reaches the edge where only light and dark can be discriminated. Translating this into a more practical application, the greatest values (brightnesses) and the warm, active colors (yellows, reds, and oranges) should be placed in the center of attention. Lower brightnesses and cool, unsaturated colors (dark green, dark blue, dark brown) should appear on the periphery



28 33  
Sutter Family Resource Center; Interior Design: Jain Malkin Inc.; Architect: Ratcliff; Photographer: Doug Salin



28  
USF Health Byrd Alzheimer's Institute; Interior Design, Architect: Gresham, Smith; Photographer: Randy Van Duinen



29  
Scripps Center for Integrative Medicine; Interior Design: Jain Malkin Inc.; Architect: Schmidt Scanlon Gordon; Photographer: Michael Campos

of the visual field. This knowledge is particularly important for the design of graphic signage, posters, large paintings, exhibitions, displays, and interior design. People can be led from one room to another by the skillful arrangement of successive values and colors.

27. Research around diurnal cycles suggests that nurses needing a quick break would prefer spaces that are brightly lit and also have a stronger color palette, while those who need to replenish would prefer to retreat to a room with softer lighting and a darker color palette so they can put their feet up and close their eyes for 20 minutes. This may be particularly true for nightshift workers and should be field-tested.

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### Practical Applications of Color Psychology

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Although the systematic investigation of the effects of color upon human behavior has been long in coming, those studies that do exist are often contradictory and sometimes viewed with skepticism. Despite this, the following observations will be helpful to practitioners (Malkin, 1992).

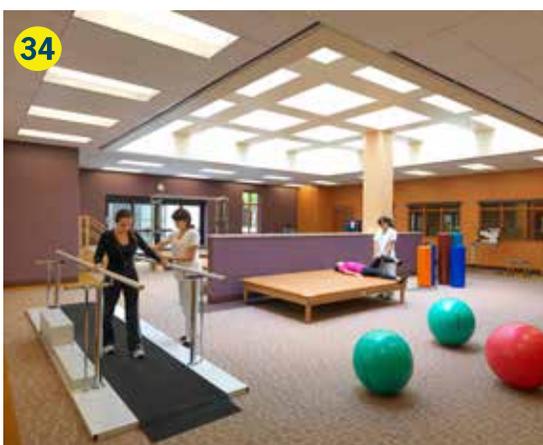
28. Red and yellows, for example, may be used in settings where creative activity is desired and socialization encouraged; greens and blues in areas that require quiet and extended concentration and high visual acuity (Sharpe, 1974).
29. Cool colors may be appropriate in environments for agitated, hypertensive, or anxious individuals; red may be appropriate in the depressed person's environment. Highly saturated colors should be avoided with autistic schizophrenics, red should be avoided for those afflicted with epilepsy and other neurological diseases (Sharpe, 1974).



Seacrest Village Retirement Community - San Diego Hebrew Homes; Interior Design: Jain Malkin Inc.; Photographer: Steve McClelland



Yale-New Haven Hospital; Interior Design: CAMA Inc.; Architect: Salvatore Associates; Photographer: Rick Scanlan



Loma Linda Rehab Hospital; Interior Design: Jain Malkin Inc.; Architect: HMC Architects; Photographer: Through HMC Architects

30. The use of busy patterns or highly stimulating colors should be avoided in settings accommodating those with neurological disorders as they may trigger seizures.
31. Rousing, bright colors are more appropriate in environments for the aged than pastels, which are barely visible to those with failing eyesight.
32. Strongly contrasting figure-ground patterns and extremely bright colors should be avoided in rooms of psychotic patients because these patterns—when not worn by the patients but impinging upon them from their environment—are thought to have an overwhelming, even intimidating, threatening effect.
33. Under warm colors, time is overestimated (one feels one has been there longer than time actually spent), weights seem heavier, objects seem larger, and rooms appear smaller. Under cool colors, time is underestimated (one feels one has been there less time than actually spent), weights seem lighter, objects seem smaller, and rooms appear larger (Birren, 1978). Thus, cool colors may be used when monotonous tasks are performed to make the time seem to pass more quickly. Red and orange are commonly used in fast food restaurants, where quick turnover of tables is desired.
34. Warm colors with high illumination encourage increased alertness and outward orientation; they are good where muscular effort or action is required, such as a physical therapy gym. Cool colors and low illumination encourage less distraction and more opportunity to concentrate on difficult tasks (Sharpe, 1974). Cool colors neutralize the negative effects of noise distraction.



Elementary Institute of Science; *Interior Design:* Jain Malkin Inc.; *Photographer:* Steve McClelland



Memorial Sloan-Kettering Cancer Center; *Interior Design, Architect:* KMD Architects; *Photographer:* Chuck Choi

35. Viewing a specific color produces an afterimage of its complement. A practical application of this principle is the surgical operating room. Here walls and garments are usually blue-green because the eye is concentrated on a red spot (blood). When surgeons look up from their work they see afterimages of cyan or blue-green because red and cyan are opposite each other on the color wheel. If walls and garments were white, surgeons would see blue-green spots before their eyes every time they looked away from the operative site. Thus blue-green walls and apparel act as a background to neutralize afterimages.
36. Another example of afterimage can be experienced by walking through a corridor that has yellow walls, a warm-toned floor, and incandescent (warm) light source—essentially a yellow-hued environment. Leaving the corridor to enter a lobby produces afterimages of blue, the complement of yellow. This concept is very important for interior design. An understanding of it can prevent a designer from creating undesirable color relationships.
37. In patient rooms, choice of headwall color has both aesthetic and clinical implications. The headwall color can reflect onto the patient's skin and thus skew a physician's diagnostic assessment. In patient bathrooms, select a color that is flattering to skin tones and check it in a light box with the source of lighting to be used around the mirror. Self-appraisal is important to a patient's morale: If lighting is poor and colors are unflattering to skin tones, patients may be shocked at their appearance.

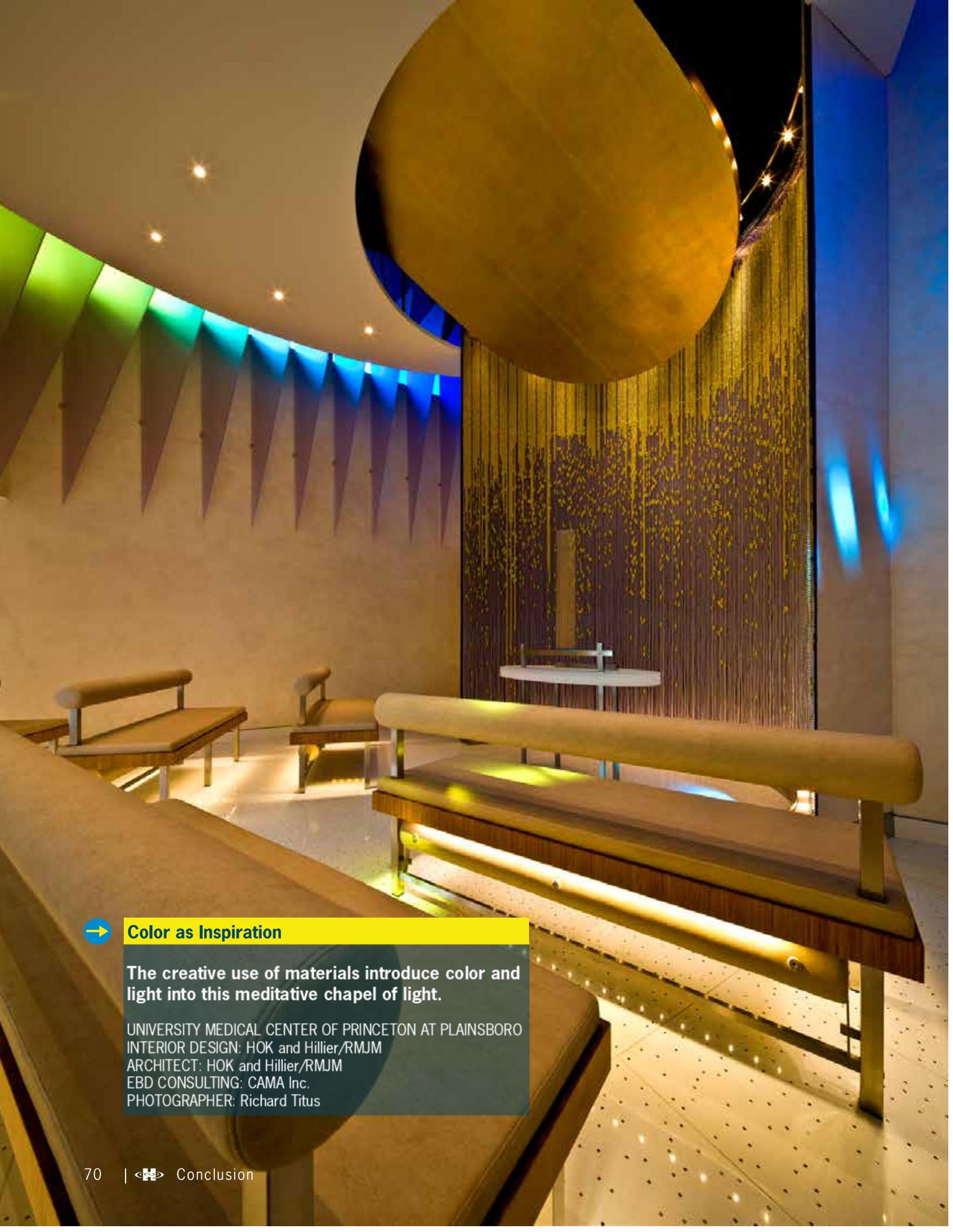


### Colored Light

Signage and LED lighting combine to create an elegant design for a beneficial federally funded program. A single accent color is highlighted by teal pendant lights to add sparkle.

ADELANTE HEALTHCARE  
INTERIOR ARCHITECTURE: Jain Malkin Inc.  
ARCHITECT: Cawley  
PHOTOGRAPHER: Dustin Revella





### Color as Inspiration

The creative use of materials introduce color and light into this meditative chapel of light.

UNIVERSITY MEDICAL CENTER OF PRINCETON AT PLAINSBORO  
INTERIOR DESIGN: HOK and Hillier/RMJM  
ARCHITECT: HOK and Hillier/RMJM  
EBD CONSULTING: CAMA Inc.  
PHOTOGRAPHER: Richard Titus

## Conclusion

The use of color has long been one of the most subjective aspects of interior design and especially so in healthcare settings. This may account for the fact that many of the newer hospitals are devoid of color. For those who seek validation through evidence-based research, it is very difficult to design color studies for the actual setting of a healthcare facility, therefore, there is little that is definitive in the way that practitioners might wish to find clear principles that can be applied to the healthcare environment.

Nevertheless, there is much value in the assembly of studies noted in this paper to enable the confident practitioner, armed with basic color theory, to understand the sensitivities of each type of patient and each setting and to be able to successfully enhance patients' experiences. Design practitioners educated and trained in the application of color theory and the principles noted above may be timid because the risk of criticism is high. Risk seems to be reduced by the specification of a neutral color palette but can also be reduced with proper evidence to support a broader palette.

This paper encourages a thorough understanding about where, when, and how color can impact the healthcare experience. It presents the best summary to date of studies done on color and encourages further research.

The lack of color (white walls) is unfamiliar to some, considered modern by others, and, for many years, has been one of the hallmarks of what has been referred to as an "institutional" environment. Consider this publication a baseline that perhaps will stimulate much more research about the influence of color. But for now, go forth and use color. The more you do it the more confident you will become.

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# Appendix

## Cultural Implications of Color

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Colors may affect people from different cultures in different ways, as specific colors have certain connotations in some countries or regions and very different connotations in others. For example, in the United States, the color white is associated with purity, cleanliness, and weddings; whereas in China, white is associated with death and mourning.

In the literature, there are mixed findings regarding the extent to which culture affects human responses to color. Although it is commonly assumed that culture plays a large role in directing human responses to color, much of the literature demonstrates that many color-emotion relationships are “culture-independent.” Gao and Xin (2006) studied the emotional responses of 70 subjects to 218 colors using three scales, including warm-cool, weak-strong, and dynamic-passive. When comparing their work to previous research, the authors conclude, “This cross-culture consistency suggests that the relationship between emotion and perception of colors may depend on some innate causation, which may not be influenced by culture and personal experience (p. 417).”

Gao and colleagues (2007) studied the emotional response of 440 subjects from seven regions to 214 different colors, using surveys developed in the subjects’ native languages. The regions included Hong Kong, Thailand, Japan, Taiwan, Italy, Spain, and Sweden. Emotional responses were comprised of 12 pairs of words such as light-dark, warm-cool, soft-hard. Subjects from different regions had similar emotional responses to color for the majority of variables (e.g., deep, pale, subdued, striking, etc.) and “despite the different cultural backgrounds, human’s responses on these variables are quite similar (p. 228).”

However, there is also literature to support the idea that culture does affect an individual’s response to color. Korean pediatric patients’ strong preferences for white were found by Jin Gyu “Phillip” Park’s recent environmental color study (personal communication, September 6, 2012). Park investigated cultural impacts on pediatric

patients' preferences for patient room wall colors using 50 Korean and 42 American pediatric patients. Six different wall colors (red, yellow, green, blue, purple, and white) were displayed using physical model simulations. Both groups showed similar preferences except for white: Korean pediatric patients reported significantly higher preference scores for white than American pediatric patients.

For adults, Choungourian (1968) reported cultural differences in color preference among 160 American, Lebanese, Iranian, and Kuwaiti university students in Beirut, Lebanon. While red and blue were preferred by Americans, those colors ranked lowest for Kuwaitis. Blue-green was least preferred by Americans, but was most preferred by both Iranians and Kuwaitis.

This is but a taste of the existing evidence, but there is still much to learn about whether or how culture influences human responses to color. Over the years, people have recommended colors for use (or colors to avoid) in various cultures, and while these are oftentimes not scientifically based, they are interesting nonetheless. The table compiles several sources of information regarding the purported cultural connotations of specific colors in selected countries. Decisions regarding the selection of specific colors for products, logos, office design, or healthcare facilities, for example, are sometimes based more on intuition than science. There is a need for more credible research regarding the relationships between color and culture, although this type of research is difficult to conduct.

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## Color Connotations By Country

This is a partial list of color connotations by culture. It is not meant to be exhaustive, but as a starting point for reference. It was developed as part of a separate project funded by SYKES, a global leader in providing customer contact management solutions and services in the business process outsourcing arena.

	<b>Argentina</b>	Red is associated with craftsmanship. <sup>4</sup> Silver connotes Gauchos, craftsmanship. <sup>4</sup> Yellow is associated with wealth, religion, ceremony, and visibility. <sup>4</sup>
	<b>Australia</b>	Red is associated with the sun (Australia and the Philippines). <sup>4</sup> Green and gold are national colors. <sup>1</sup> Yellow is associated with resurrection and rebirth (Australia and the Philippines). <sup>4</sup> Green is associated with craftsmanship. <sup>4</sup> Tan is associated with the earth (Australia and the Philippines). <sup>4</sup> Brown is also associated with the earth (Australia and the Philippines). <sup>4</sup>
	<b>Brazil</b>	Red symbolizes visibility and vibrancy. <sup>4</sup> Green is associated with rain forests. <sup>1</sup> Brown is associated with products that are important to the economy (e.g., wood and nuts), yet there are some superstitions that brown is bad luck. <sup>1</sup>
	<b>Canada</b>	In the U.S. and Canada, red is associated with excitement, warning, passion, hot, and spicy. <sup>4</sup> Also in the U.S. and Canada, yellow is associated with visibility, happy, sunny, but also caution and cowardice. <sup>4</sup> Gold is associated with money, wealth, and luminosity (U.S. and Canada). <sup>4</sup> Green (U.S. and Canada) connotes environmental, freshness, masculinity, healthy, envy, jealousy, inexperience. <sup>4</sup> Brown (U.S. and Canada) is associated with dullness, boring, fertile, strength, unprocessed, and poverty. <sup>4</sup> See also comments for the United States.
	<b>China</b>	Red is the most popular color <sup>1</sup> and is associated with celebration, communism/government, fire, summer, good luck, joy, and fertility. <sup>4</sup> Red is the color that brides wear, traditionally, <sup>3</sup> and is associated with love and happiness. <sup>5</sup> Green connotes exuberance, birth, and youth; is one of the most popular colors (along with red); <sup>1</sup> and is associated with trustworthiness and dependability, <sup>2</sup> desirability, <sup>4</sup> reliability, <sup>5</sup> and purity. <sup>5</sup> However, green is not well-received in packaging. <sup>1</sup> Gold is associated with wealth, prestige <sup>1</sup> , and preciousness, status, and decoration. <sup>4</sup> Yellow is associated with purity, good taste, royalty, and authority. <sup>5</sup> In parts of Asia, gray is sometimes associated with cheap products. <sup>1</sup>
	<b>Costa Rica</b>	Green associated with nature, but also with envy. <sup>1</sup>
	<b>Egypt</b>	Green is the national color and is associated with fertility and strength, <sup>1</sup> as well as vegetation. <sup>4</sup> Yellow is associated with the soul, the sun, happiness, and prosperity. <sup>4</sup> Gold connotes wealth. <sup>4</sup>
	<b>Finland</b>	See comments for Sweden.
	<b>Germany</b>	Red is a color of menacing character in German folk culture <sup>1</sup> and considered unlucky. <sup>2</sup> Red is also associated with fear, anger, and jealousy. <sup>5</sup> Brown is associated with the earth. <sup>4</sup> Yellow is associated with sunshine, but also cowardice and persecution, <sup>4</sup> envy, and jealousy. <sup>5</sup> Gold is associated with wealth. <sup>4</sup> Gray and silver connote sophistication. <sup>1, 4</sup> Green also represents the earth. <sup>4</sup>
	<b>India</b>	Maroon is an increasingly popular color in advertising. <sup>1</sup> Red is associated with purity <sup>1</sup> and birth. <sup>4</sup> Yellow is associated with the sun and commerce. <sup>4</sup> Green is well-liked and connotes peace and hope <sup>1</sup> and represents nature. <sup>4</sup> Brown is a mourning color. <sup>1</sup>
	<b>Ireland</b>	Green is one of the most popular colors and was once the national color. <sup>1</sup> Green also is associated with the environment, Catholicism, and quality (UK, Ireland, and Scotland). <sup>4</sup> Brown connotes earthy, honesty, and manual labor (U.K., Ireland, Scotland). <sup>4</sup> Yellow is associated with visibility and rubber (U.K., Ireland, Scotland). Gold connotes royalty (U.K., Ireland, Scotland). <sup>4</sup> Gray is associated with sophistication, elegance, traditional, tasteful, and strength (U.K., Ireland, Scotland). <sup>4</sup>

	<b>Italy</b>	Red connotes fidelity. <sup>4</sup> Brown is associated with the earth, penitence, and humility. <sup>4</sup> Green is associated with spring, fertility, and youth. <sup>1</sup> Gold is associated with divinity, <sup>1</sup> wealth, and luxury, but also greed. <sup>4</sup> Silver is related to wealth, luxury, and craftsmanship. <sup>4</sup>
	<b>Mexico</b>	Red is associated with sunny, vibrancy, intensity, religion, and death. <sup>4</sup> Yellow symbolizes the sun, and gold is associated with wealth and church adornments. <sup>4</sup> Green represent vegetation. <sup>4</sup>
	<b>Netherlands</b>	Red is associated with nature, royalty, and the government. <sup>4</sup> Brown is associated with architecture. <sup>4</sup> Yellow relates to food (e.g., cheese, butter). <sup>4</sup> Green symbolizes ecology. <sup>4</sup>
	<b>Norway</b>	See comments for Sweden.
	<b>Philippines</b>	See comments for Australia.
	<b>Romania</b>	See comments for Slovakia.
	<b>Scotland</b>	See comments for Ireland.
	<b>Slovakia</b>	Red is associated with medicine in Slovakia and Romania. <sup>4</sup> Green symbolizes nature (Slovakia and Romania). <sup>4</sup> Gold is associated with fairy tales. <sup>4</sup>
	<b>South Africa</b>	Red is a color of mourning <sup>1</sup> and is associated with death and bloodshed. <sup>4</sup> Brown connotes the earth. <sup>4</sup> Yellow signifies high rank. <sup>4</sup> Gold is associated with continuous life. <sup>4</sup> Green connotes fertility. <sup>4</sup>
	<b>Spain</b>	Red is associated with blood and aggression, also commonly used in flamenco costumes. <sup>1</sup> Yellow connotes treason. <sup>4</sup> Green jokes are considered to be racy, <sup>1</sup> green is also associated with cheap, as well as agriculture. <sup>4</sup> Gray connotes strength. <sup>4</sup>
	<b>Sweden</b>	Red symbolizes strength (Norway, Sweden, and Finland) <sup>4</sup> and has positive connotations in Nordic countries. <sup>5</sup> Yellow is associated with the heart and warmth (Norway, Sweden, and Finland). <sup>4</sup> Green symbolizes sterility (Norway, Sweden, and Finland). <sup>4</sup>
	<b>United Kingdom</b>	Red is associated with the crown, power, <sup>1</sup> and masculinity. <sup>5</sup> Green is symbolic of gardening and high-quality products. <sup>1</sup> Gold is linked with royalty, yet sometimes associated with being "low class." See also notes for Ireland.
	<b>United States</b>	Red is associated with energy and courage, but also violence and communism. <sup>1</sup> Green connotes nature, money, and good luck, but also is associated with inexperience and envy. <sup>1</sup> Gold is associated with wealth, extravagance. <sup>1</sup> Yellow connotes happy and warm, but also cowardly. <sup>4</sup> Brown symbolizes things that are natural, solid, reliable, yet dull and unsophisticated. <sup>1</sup> Gray may symbolize expensive, high tech, or futuristic, and it is the most popular color for cars. However, gray is also associated with gloom and ranks poorly in terms of consumer preference. <sup>1</sup> Gray is also associated (in the U.S. and Canada) with humility, strength, wisdom, and grief. <sup>4</sup> Silver is considered sleek, classy, and modern. <sup>4</sup> See also comments for Canada.

**Color Connotation Key**       = Positive       = Neutral       = Negative

<sup>1</sup> Morton, J. (2004). *Global color clues and taboos*.

<sup>2</sup> Sable, P., & Akcay, O. (2010). *Color: Cross cultural marketing perspectives as to what governs our response to it*. Paper presented at the American Society of Business and Behavioral Sciences Annual Conference, Las Vegas, NV.

<sup>3</sup> Morton, J. (2011). *Color matters*.

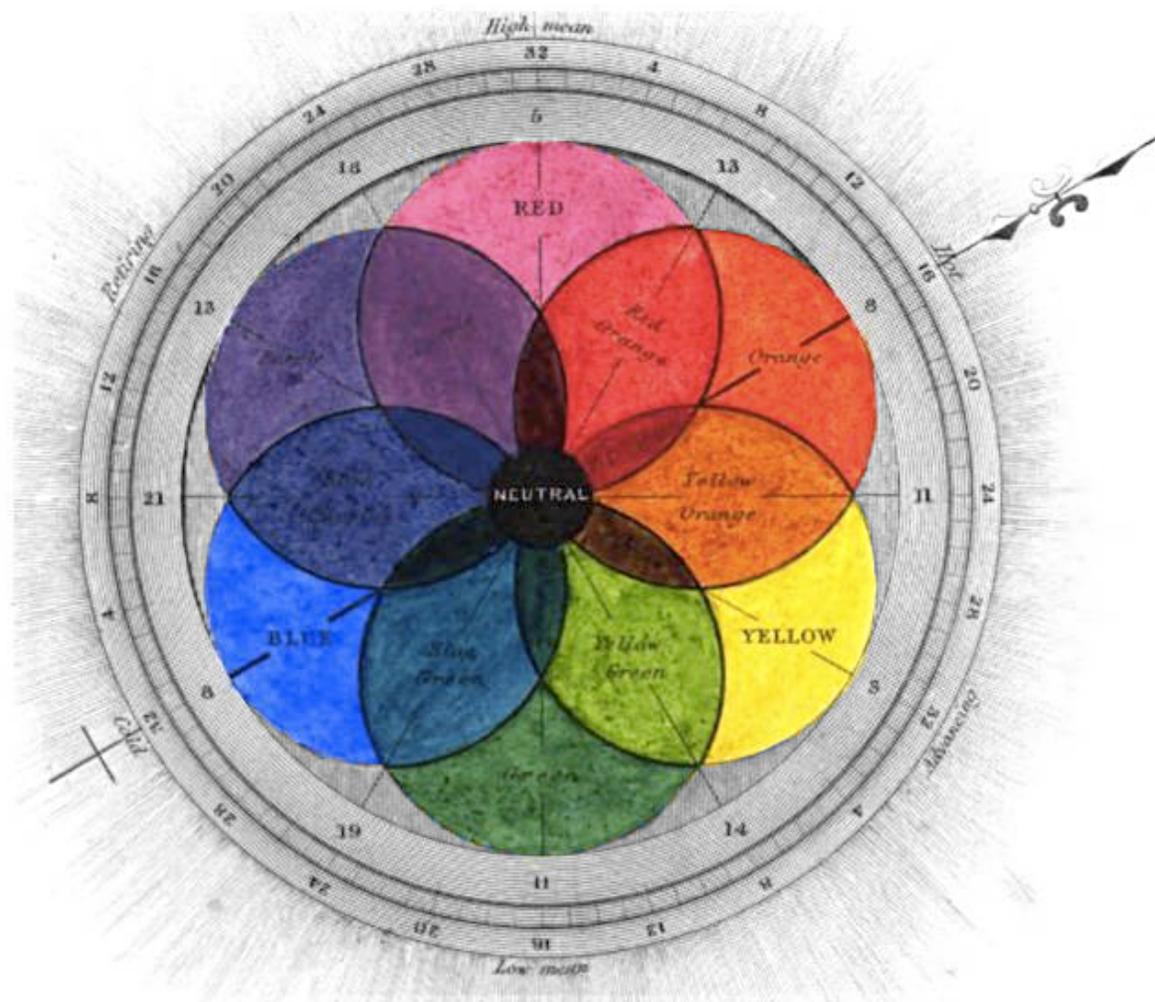
<sup>4</sup> De Botoli, M., & Maroto, J. (2001). *Colors across cultures: Translating colors in interactive marketing communications*. First published with the title "Translating colours in web site localisation" in 2001 in the *Proceedings of the European Languages and the Implementation of Communication and Information Technologies (Elicit) Conference*, University of Paisley.

<sup>5</sup> Aslam, M. M. (2006). Are you selling the right colour? A cross-cultural review of colour as a marketing cue. *Journal of Marketing Communications*, 12(1),15–30.

The Center for Health Design Inc.  
1850 Gateway Boulevard, Suite 1083  
Concord, CA 94520  
(925) 521-9404  
[www.healthdesign.org](http://www.healthdesign.org)

# Color Meanings | Color Symbolism

*Kristina says*



This is part two of a three-part series on color. Part one was [Color Therapy & Healing](#). You can read part three: [The Psychological Effects of Color](#), where we will delve into the psychology of some specific colors and how they might affect your everyday life.

Here are the topics covered in this article:

1. [The Meaning of Colors You Choose](#)
2. [How Do We See Color?](#)
3. [The Traditional Color Wheel](#)
4. [What is Color Symbolism?](#)
5. [Examples of Cultural & Religious Symbolism of Color](#)

6. [Color Meanings & Symbolism of Primary and Secondary Colors](#)
7. [Color Meanings/Symbolism Charts](#)
8. [Books About Color Symbolism & Meaning](#)

## **The Meaning of Colors You Choose**

Carl Jung, a renowned psychiatrist and proponent of art therapy, encouraged his patients to use color because he felt this would help them express some of the deeper parts of their psyche. It is believed that the color choices you make reflect a deeper meaning about your personality traits. For example, introverts and extroverts are likely to choose different colors – blue and red respectively.

The colors you choose to wear might also say something about how you are feeling that day. Some days you may feel like wearing something lighter, something red, or something blue. These choices are often a reflection of how you are feeling at the moment. Additionally, wearing certain colors may cause you to react differently to certain situations.

## **How Do We See Color?**

There are 2 main sources of light that create the colors we see: the sun and lightbulbs. As you know, the light from the sun allows us to see things during the day as well as during the night when the sun's light reflects off the moon. There is a visible spectrum of colors that we can see in addition to the combination of all colors (white) and the absence of color (black).

Surfaces reflect and absorb light differently, which results in the colors we see through our eyes. For example, a tomato absorbs all light on the spectrum except the red rays of light. The red rays of light are reflected off the surface of the tomato which then reach our eyes for processing.

The colored light enters the eye through the pupil, goes through the lens, then reaches the back of the eye called the retina. On the retina there are a bunch of light sensors called rods and cones. These rods and cones send a signal to the brain about what the eye is seeing. The cones are capable of seeing three colors: red, green, and blue. These are known as primary colors (RGB Model) – more about this below.

## **The Traditional Color Wheel – primary, secondary, and tertiary colors**

Here you can see a basic color wheel. It is based on 3 different types of colors: primary, secondary, and tertiary.



### **Primary Colors (Traditional RYB Model)**

Primary colors consist of red, yellow, and blue. These 3 hues can not be mixed or formed by any combination of other colors. Additionally, all other colors are created by mixing these three colors.

### **Secondary Colors**

Secondary colors consist of green, orange and purple (violet). Secondary colors are formed by mixing 2 primary colors.

### **Tertiary Colors**

Tertiary colors consist of red-orange, yellow-orange, yellow-green, blue-green, blue-violet, and red-violet. Tertiary colors are formed by mixing primary and secondary colors, resulting in the two-word names.

If you'd like to know more about RGB and RYB models, CMYK, reflective and transmitted light, then there are lots of additional sources out there that cover more in-depth color theory. These are just some basic concepts for our series on color therapy, meanings, symbolism, et cetera.

Now that we've covered the basics of traditional color theory, let's review color symbolism.

## **What is Color Symbolism?**

Color symbolism is the use of color as a representation or meaning of something that is usually specific to a particular culture or society. Context, culture and time are certainly important factors to consider when thinking about color symbolism.



## **Cultural Color Symbolism & Meanings of Red**

China & India: good luck, used in dresses, chair, parasol, cup lace, firecrackers in a wedding

Russia & China: revolution, communism

Mayas: south

England: buses, phone booths

Spain: bull fighting, flamenco dresses

## **Typical Meanings & Symbolisms of the Color Red:**

- alertness
- ambition
- aggression
- battle
- beauty
- brilliance
- charity
- charm
- circulation
- communism
- compassion
- courage
- danger
- desire
- determination
- devotion
- domination
- eccentricity
- emotion
- energy
- eroticism
- excitement
- lust
- madness
- martyrdom
- motion
- movement
- murder
- pain
- passion
- patriotism
- power
- prohibition
- prostitution
- rage
- rebellion
- rescue
- revolution
- romanticism
- sacrifice
- sensuality
- sexuality
- sin
- speed



- assurance
- celebration
- change
- charisma
- communication
- competence
- coziness
- creativity
- determination
- disorder
- domination
- dryness
- earth
- emotion
- encouragement
- endurance
- energy
- enthusiasm
- exaggeration
- excitement
- expansion
- explosion
- extravagance
- extroversion
- exuberance
- fascination
- friendship
- fun
- generosity
- happiness
- health
- heat
- humanism
- humor
- independence
- invitation
- joy
- laughter
- motivation
- practicality
- radiation
- security
- service
- society
- smile
- success
- sunset
- temptation
- tropic
- visibility
- warmth
- warning
- wisdom

## **Meaning of the Color Yellow**

From: [Color Symbolism Chart – YELLOW](#)

## **Cultural Color Symbolism & Meanings of Yellow**

Egypt: happiness, prosperity

China: Imperial color to worship, the sky

Futbol: yellow card, warning

Other: truth

### **Typical Meanings & Symbolisms of the Color Yellow:**

- activity
- aspiration
- alertness
- brightness
- caution
- communication
- confidence
- energy
- expansion
- expression
- extroversion
- fear
- forgiveness
- friendship
- gaiety
- happiness
- idealism
- ideas
- imagination
- intelligence
- innovation
- inspiration
- intuition
- joy
- knowledge
- laughter
- logic
- light
- optimism
- order
- philosophy
- playfulness
- power
- satisfaction
- signal
- spontaneity
- stimulation
- summer
- sunshine
- thought
- uncertainty
- warmth
- warning
- wisdom
- youth

### **Meaning of the Color Green**

[meaning of the color green](#)

From: [Color Symbolism Chart – GREEN](#)

## Cultural Color Symbolism & Meanings of Green

Islam: Allah in nature

Northern Europe: The Green Man

### Typical Meanings & Symbolism of the Color Green:

- adventure
- aspiration
- calmness
- cleanliness
- comfort
- efficiency
- environment
- equilibrium
- faith
- fertility
- foliage
- frankness
- freedom
- freshness
- friendship
- generosity
- good luck
- grass
- growth
- harmony
- health
- hope
- laziness
- life
- open air
- outdoors
- moist
- mucous
- nature
- neutrality
- progress
- prosperity
- quietness
- relaxation
- renewal
- reproduction
- safety
- security
- sincerity
- spring
- sympathy
- vegetation
- vigor
- wisdom
- youth

### Meaning of the Color Blue

From: [Color Symbolism Chart – BLUE](#)

## **Cultural Color Symbolism & Meanings of Blue**

Catholicism: Virgin Mary, God Father

Islam: Mosque decorations

UN Flag: peace, cooperation

India: mercy

Jewish: Holiness

## **Typical Meanings & Symbolism of the Color Blue:**

- acceptance
- authority
- balance
- calmness
- care
- caution
- cleanliness
- coolness
- cooperation
- compassion
- confidence
- contemplation
- culture
- depression
- despair
- depth
- dignity
- faith
- flexibility
- frankness
- freedom
- logic
- loyalty
- maturity
- obedience
- order
- peace
- piety
- power
- protection
- quality
- quietness
- reflection
- reliability
- responsibility
- sadness
- security
- self control
- serenity
- sincerity
- solitude
- stability

- freshness
- goodness
- harmony
- honesty
- hope
- ice
- infinity
- intelligence
- introspection
- isolation
- law
- stiffness
- technology
- tenderness
- tradition
- tranquility
- transparency
- trust
- truth
- unity
- value
- virtue
- water

## **Meaning of the Color Purple (Violet)**

From: [Color Symbolism Chart – PURPLE](#)

### **Cultural Color Symbolism & Meanings of Purple or Violet**

Ancient Cultures: wealth

Catholicism: contrition, penitence, color of Lent

### **Typical Meanings & Symbolism of the Color Purple or Violet:**

- ambition
- aristocracy
- art
- anxiety
- beauty
- balance
- compassion
- conflict
- contrition
- mystery
- mysticism
- nobility
- nostalgia
- passiveness
- penitence
- preciousness
- pride
- quietness

- coolness
- creativity
- drama
- dream
- dignity
- enchantment
- enigma
- extravagance
- fantasy
- fashion
- femininity
- grief
- homosexuality
- independence
- individualism
- inspiration
- intelligence
- introspection
- intuition
- justice
- knowledge
- leadership
- luxury
- magic
- majesty
- meditation
- mood
- reflection
- religious devotion
- responsibility
- richness
- royalty
- sadness
- secrecy
- sensuality
- seriousness
- shadows
- sobriety
- solemnity
- solitude
- sophistication
- sorrow
- spirituality
- splendor
- style
- sublimation
- suffering
- superstition
- truth
- value
- wealth
- wisdom
- wit
- vanity

So, do these ring a bell with what you think the colors mean? Give this fun exercise a try – here’s a fun little [personality test](#) based on the [Luscher Color Test](#).

## **Books About Color Symbolism and Meaning**

No related articles.



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## **Does your color scheme really matter?**

**By Patricia Call, CMG, and Kathleen Jantzen, PhD**

In this brief piece, we would like to explore a question: Can the colors utilized in designing treatment facilities assist mental health professionals in affecting desired treatment outcomes for their patients?

To provide a largely empirical evaluation, we looked at studies that take an objective, physical approach as well as those measuring the effects of color on the human body and mind. Research finds that it can be difficult to measure a client's physical response to color without taking into account the cultural, and anthropological preferences that are involved.

We'll discuss in detail the major hues in the color spectrum, using the most recent forecast as reference. Color forecasts show the course that colors are likely to take, used as a tool for a wide range of industries and products. Technical color notations will use the natural color system (NCS), the scientific color system with the best color clarity.

Whenever a space is designed with color in mind it is important to design with carefully considered color combinations. Rarely does a color stand alone.

### **A case of the blues**

Blue is not only the most universally acknowledged preferred color, but also blue light has been shown to have an anti-depressant effect on behavior, measured by rat immobility/mobility.<sup>1</sup>

Depression affects approximately 19 million Americans, or 9.5 percent of the population in any given year. It causes distress and impairment in social, occupational, or other areas of functioning. The DSM-IV categorizes depression as a mood disorder, which can include major depressive disorder (MDD), dysthymia, and bipolar disorder.

To overcome depression, it is essential to enhance feelings of self-worth and self-esteem, increase energy, and improve the ability to concentrate through a combined treatment of psychotherapy and medication.

Historically, blue is linked to positivity, harmony, spirituality, peace, calm, and tranquility. The most frequent blue associations occur in nature: Picture the placid surface of a blue lake undisturbed by the wind, or the rippling, impressionistic blue surface of the ocean. Of course, these visual impressions are also associated with acoustic elements. Evening waves, for example, can provide a deep soothing sound conducive to sleep.

Blue abounds in nature: peacocks gracefully fan their feathers, blue jays sweep through the skies, hydrangeas are soft and luxuriant, and tropical fish are resplendent examples of clear iridescent blues.

The color most beneficial in making people feel calm and relaxed is blue. In designing spaces for those with anxiety, a variety of blues ranging from the clarity of sky blue to the greened blue of turquoise can be utilized. Studies have shown that brighter colors: whites, light grays, and lighter colors, are found to be more pleasant, less arousing, and less dominance-inducing than less bright colors: dark grays, blacks, and darker colors.<sup>2</sup>

Creating color combinations within the context of traditional color associations is really the best approach. The forecast blue is deep and rich, a true blackened navy without a hint of gray. It combines well with the newly forecast pale, luminescent, slightly greened yellow, clear celery green, or a grayed, richly forested green.

## Green with envy

Green is one of various colors that can be beneficial to reduce anxiety and bring about a calmer state of mind. Anxiety is one of the most prevalent psychiatric disorders in the general population. Anxiety becomes problematic when it is excessive, uncontrollable, and manifested by a range of physical and affective symptoms, and changes in behavior and cognition that become a hindrance to daily, social, and/or occupational functioning.

A subjective experience of distress with accompanying disturbances of sleep, concentration, worrisome thoughts, and social or occupational functioning are common in many of the anxiety disorders. In particular, one wants to alleviate feelings of tension, agitation, apprehension, worry, and fear. Therefore, it is necessary to reduce stress levels, improve concentration, and promote feelings of calmness and relaxation.

It has been said that green is the only color that is electromagnetically neutral. Historically emblematic greens are: the playful green on Sevres porcelain, Green Bay Packers' jerseys, the abundance of jade greens, the olives of Italy and Greece with their sensual aromas and oils, mountain streams, and lily pads.

Green is natural to forests both primeval and modern. Fresh grass is green, as are lively grasshoppers, frogs, and parrots. Many currencies use green as an identifying color. Of course, green is also the color of mold, slime, and aging copper. The context within which the color is used is essential to its implications. Exposure to the natural environment and natural light improves the well-being of patients.<sup>3</sup>

Interior landscapes, atria, and undisturbed garden views give patients a center of focus beyond themselves, and place them within the context of the natural, vegetal world.<sup>4</sup>

Greens are emblematic of new bud growth, new beginnings, and the strength of malachite and green granite. Views of nature also help patients focus on a world beyond their own problems and nemeses. A peaceful view of snow-capped mountain ranges sprinkled with fir trees can be beneficial to patients and caregivers alike.

## Gray, brown, black and white

Created with the explicit purpose of contemplation, Zen gardens are often created within the narrow color range of true neutral grays and whites with only seasonal spots of color emerging. The water elements in these gardens reflect the sky and bring with them the peaceful qualities of blue.

Gray concrete imparts a sense of minimalism, offering a neutral and technological touch. Physically concrete is cold to the touch, but when it is combined with natural foliage, it imparts a space with brutal simplicity. Currently, gray is the most commonly used color. Infuse it with other hues and it takes on an entirely new life.

Brown, on the other hand, is perceived to be a very earthy, grounded color, with both physical and emotional implications. Examples are the lustrous browns of saddlery, rich moist soil, and dark chocolates of Ecuador and Ghana. Then, there are the myriad of brown woods from the Mahoganies, Walnuts, and Oaks to the Pecans, Birches and Ashes.

## What is color forecasting?

According to Call, color forecasting is the determination of new colors to be applied in the marketplace. Every product has a color, even if it is black or white.

Color adds to the financial success of the product and draws a customer to make a purchase. The same can be said for architecture and interiors.

When the colors are suitable and engaging, meeting the client's vision, the collaborative efforts that have gone into creating the project are rewarded, and customers' expectations are exceeded.

To forecast colors three to five years in advance, a multi-tiered process is employed. The colors are not currently seen in the marketplace, either on products or in the design community at large.

There are four key steps to color forecasting:

**Step 1:** Research social, economic, psychological, political, demographic, technological, cultural and entertainment, sporting, and artistic issues in many segments of society.

**Step 2:** Research and interview the particular segment of society that applies to the client, considering the particular desired outcomes.

**Step 3:** Gather images to

The forecast brown for healthcare is rich and deep with more of a yellow than a red cast to it. At this time brown can be used to augment the geographical environment. In the desert or the Rockies, brown can be used in combination with rich hues to impart a sense of comfort. It is mellow, full bodied, giving a cave-like sense of being nurtured.

support the forecast.

**Step 4:** Create a palette of colors reflecting the research.

Black is a color signifying power, sophistication, strength, fear, aggression, dominance, and a host of similar adjectives. White, on the other hand, entertains many different cultural implications.

## Red, pink and purple

Homer described the color red as “eos rhododactylos,” or rosy-fingered dawn. In this context it brings a sense of purpose, renewal, and optimism to each new day with its endless possibilities. A vibrant coral represents red with pink and yellow overtones. It is gregarious without being aggressive. A rich, burgandied Fuschia can open the mind to action and playfulness, with a “side dish of fun.”

Pink is theoretically found in the red family, but retains primary implications of its own. Combined sensitively and appropriately it is very useful in healthcare to decrease aggression. The pale dusty pink of ballet slippers is soft and non-aggressive. It is a forecast color that meets the softness and energy we seek in our positive personal relationships.

One study found that an anxiety producing story on pink paper was less anxiety producing than when read on blue or white paper. Able to be used as a natural floral accent to augment a completed interior, pink’s color range can run the gamut from fuchsia and orange-toned pinks to the whispered powdery pinks of makeup and chiffon.

Purple is often a color associated with royalty, because Indigo was initially very expensive to procure. In classic literature (namely Sir Arthur Conan Doyle’s Arthur Legend), Merlin’s robe emphasized purple, associating the color with the mystical properties of wizardry. It also has been long associated with creativity, while bright and greyed shades have been in the visual consciousness for many years.

The current forecast purple is deep, dark, and rich. This purple reminds us of the earthiness of aubergine, with a touch more blue added to the pot. Purple is not soft, but rather a warm embracing elegant color signifying a place or event that is out of the ordinary. Shadows of the urban night are bathed in purple.

## Orange and yellow

Orange is a color traditionally both bold and humorous. Orange invokes visibility, and often signifies a warning. As such, it is used on tools that must be used with care. Since its introduction into fashion and design this decade, it has been adopted with more frequency in athletics, interiors, and eco-friendly situations. The forecast orange is very red-based.

Yellow is associated with enhancing intelligence, and increasing intellectual performance. The positive, cheerful qualities of sunshine and reflected radiance are incorporated in yellow. Yellow can be a bold color choice when it is bright, or soft and charming when it is pale.

Using yellow is like offering an illumined beacon, or a single flame from a candle. In nature yellow reminds us not only of the luminosity of the sun, but also of brisk tasty lemons, chrysanthemums, and butterflies. The forecast yellow is soft with an “inner glow.”

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Patricia Call, CMG, is the strategic trend and color analyst, and interior design principal at Call Designs, Inc., an international commercial, healthcare, and residential interior design firm and the Color Marketing Group’s vice president emeritus. Kathleen Jantzen, PhD, is a clinical assistant professor of psychiatry at New York University Medical Center, a neuropsychologist, and a clinical psychologist specializing in evaluations, psychotherapy, and cognitive remediation.

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# Blue is the colour if you have mental illness

## Mental health patients are feeling blue

**Marc Abrahams**

Mon 23 Jun 2008 19.12 EDT

The year 1931 stands out in the history of research about mentally ill people's favourite colours. That summer, Siegfried E Katz of the New York state psychiatric institute and hospital published a study in the *Journal of Applied Psychology* called *Colour Preference in the Insane*.

Assisted by a Dr Cheney, Katz tested 134 hospitalised patients with mental health problems. For simplicity's sake, he limited the testing to six colours: red, orange, yellow, green, blue and violet. No black. No white. No shades of grey.

"These colours," he wrote, "rectangular in shape, one and one-half inches square, cut from Bradley coloured papers were pasted in two rows on a grey cardboard. They were three inches apart. The colours were numbered haphazardly and the number of each colour placed above it. The cardboard was presented to the patient and he was asked to place his finger on the number of the colour he liked best. After he had made the choice he was asked in a similar manner for the next best colour, and so on."

Some of the patients "cooperated well", and made six choices. Others, Katz reported, "quickly lost interest and made only one, two or three".

Blue was the most popular colour. Men, in the aggregate, then favoured green, but women patients were divided on green, red or violet as a second choice.

Patients who had resided in the hospital for three or more years were slightly less emphatic about blue. Katz says these long-term guests were "those with most marked mental deterioration". Their preference, as a group, shifted towards green and yellow.

Those of longest tenure, though few in number, had a slightly elevated liking for orange.

The report is packed with titbits that beg, even now, for further analysis:

- 38% of schizophrenics and manic depressives, each, gave first preference to blue, and 42% of all other patients
- Green received the first choice from 16% of schizophrenics, 9% of manic depressives, and 13% of other diseases
- For red as first choice, the percentage of votes were: manic depressives, 16; other diseases, 15; schizophrenics, 12. As second choice, they were: manic depressives, 22; schizophrenics, 18; other diseases, 13

• Orange and yellow were also best liked by manic depressives; green by schizophrenics; and violet by all others.

Katz foresaw practical applications for his research. He suggested that "in the furnishings of living quarters the selection of colours pleasing to special groups of patients might be worth consideration".

Consciously or not, hospital staff seem to have followed Katz's insights in fashioning their personal at-work appearance. The evocatively named Bragard Medical Uniforms, a New York firm founded in 1933, now publishes a list of the most popular uniform colours. The list currently is topped by, in order: royal blue; dark grey (which, alas, Katz excluded from his 1931 survey); dark green; and red.

• Marc Abrahams is editor of the bimonthly Annals of Improbable Research and organiser of the Ig Nobel prize

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# The Psychological Effects of Colors

*deborah says*

This is the last installment of our color therapy series: Psychological Effects of Color. You can read the previous installments: [Color Therapy & Healing](#), [Color Meanings & Symbolism](#), and download our [free Color Meaning & Symbolism Charts](#). For this last installment, we will be exploring the following topics:

1. [What is Color Psychology?](#)
2. [Applying Color Psychology to Everyday Life](#)
3. [Psychological Effects of Cool Colors](#)
4. [Psychological Effects of Warm Colors](#)
5. [Psychology of Color for Marketing & Advertising](#)
6. [Common Psychological Effects of Colors](#)

## What is Color Psychology?

The psychology of color is based on the mental and emotional effects colors have on sighted people in all facets of life. There are some very subjective pieces to color psychology as well as some more accepted and proven elements. Keep in mind, that there will also be variations in interpretation, meaning, and perception between different cultures.

## Applying Color Psychology to Everyday Life

Did you know your surroundings may be influencing your emotions and state of mind? Do you ever notice that certain places especially irritate you? Or that certain places are especially relaxing and calming? Well, there's a good chance that the colors in those spaces are playing a part.

In art therapy, color is often associated with a person's emotions. Color may also influence a person's mental or physical state. For example, studies have shown that some people looking at the color red resulted in an increased heart rate, which then led to additional adrenaline being pumped into the blood stream. You can learn more about how [color therapy](#) works and [how light and color might affect](#) us.

There are also commonly noted psychological effects of color as it relates to two main categories: warm and cool. Warm colors – such as red, yellow and orange – can spark

a variety of emotions ranging from comfort and warmth to hostility and anger. Cool colors – such as green, blue and purple – often spark feelings of calmness as well as sadness.

The concepts of color psychology can also be applied in everyday life. For example, maybe you're planning on re-painting your walls or redecorating a house or room with a new color scheme. Well, you might want to consider some of these suggestions about colors and how they might affect your emotions and mood:

## **Psychological Effects of Cool Colors**

Need to be creative? Want help getting those brain synapses firing? Try utilizing the color purple. Purple utilizes both red and blue to provide a nice balance between stimulation and serenity that is supposed to encourage creativity. Light purple is said to result in a peaceful surrounding, thus relieving tension. These could be great colors for a home or business office.

Are you looking for a peaceful and calming environment? You might consider using green and/or blue. These cool colors are typically considered restful. There is actually a bit of scientific logic applied to this – because the eye focuses the color green directly on the retina, it is said to be less strainful on your eye muscles.

The color blue is suggested for high-traffic rooms or rooms that you or other people will spend significant amounts of time. Another cool color, blue is typically a calming and serene color, said to decrease respiration and lower blood pressure. The bedroom is a great place to use these colors as they should help you relax.

## **Psychological Effects of Warm Colors**

Want to create an environment of stimulation or whet people's appetite? You might consider utilizing the colors yellow or orange. These colors are often associated with food and can cause your tummy to growl a little. Have you ever wondered why so many restaurants use these colors? Now you know why even after people watched the movie SuperSize Me, they said they were hungry.

You do want to be careful about using bright colors like orange and especially yellow. They reflect more light and excessively stimulate a person's eyes which can lead to irritation. You also probably don't want to paint your dining room or kitchen these colors if you're a calorie-counter.

## **Psychology of Color for Marketing & Advertising**

Marketing and advertising are well-known for utilizing color psychology. The fact that some companies have heavily invested in this type of research and many others have followed through in its use shows they have at enough belief in the concepts of color psychology to implement them in their advertising.

Color is consistently used in an attempt to make people hungry, associate a positive or negative tone, encourage trust, feelings of calmness or energy, and countless other ways.

Most marketing and advertising executives will likely agree that there are benefits to understanding and utilizing the psychological effects of colors. Now let's take a look at some of the more common traits of color psychology, by some common colors.

## **Common Psychological Effects of Colors**

The following are some common psychological effects of colors in the Western Hemisphere. You can also review the following pages for a more [comprehensive list of color meanings and symbolism](#), including some [charts](#) we've created that you can download or embed on your site.

Keep in mind that certain shades or tones may result in very different meanings. Also, the context around the color, and even surrounding colors, can have an effect. Think of this as more of a beginning guide to color psychology.

### **Color Psychology: The Color White**

- purity
- innocence
- cleanliness
- sense of space
- neutrality
- mourning (in some cultures/societies)

### **Color Psychology: The Color Black**

- authority
- power
- strength
- evil

- intelligence
- thinning / slimming
- death or mourning

### **Color Psychology: The Color Gray**

- neutral
- timeless
- practical

### **Color Psychology: The Color Red**

- love
- romance
- gentle
- warmth
- comfort
- energy
- excitement
- intensity
- life
- blood

### **Color Psychology: The Color Orange**

- happy
- energetic
- excitement
- enthusiasm
- warmth
- wealth prosperity
- sophistication
- change

- stimulation

### **Color Psychology: The Color Yellow**

- happiness
- laughter
- cheery
- warmth
- optimism
- hunger
- intensity
- frustration
- anger
- attention-getting

### **Color Psychology: The Color Green**

- natural
- cool
- growth
- money
- health
- envy
- tranquility
- harmony
- calmness
- fertility

### **Color Psychology: The Color Blue**

- calmness
- serenity
- cold

- uncaring
- wisdom
- loyalty
- truth
- focused
- un-appetizing

### **Color Psychology: The Color Purple**

- royalty
- wealth
- sophistication
- wisdom
- exotic
- spiritual
- prosperity
- respect
- mystery

### **Color Psychology: The Color Brown**

- reliability
- stability
- friendship
- sadness
- warmth
- comfort
- security
- natural
- organic
- mourning (in some cultures/societies)

## **Color Psychology: The Color Pink**

- romance
- love
- gentle
- calming
- agitation



### 3. Flooring

**What?** Hospital flooring must satisfy numerous requirements including: comfort, low-maintenance, infection control, low cost, safety, and aesthetics. Sustainable flooring alternatives are available to meet these demands and reduce environmental impacts during manufacturing and installation.

**Why? Enhanced Community Reputation:**

- Visible and attractive
- Demonstrates environmental stewardship

**Environmental/Staff/Patient Benefit:**

- Less impact on the environment and building occupants
- Can improve employee satisfaction by reducing staff fatigue, and slip, trip, and fall incidents
- Can reduce maintenance

**Cost Competitive:**

- Reduces environmental impact during installation
- Less chemical use and reduced accidents can lower maintenance costs



- How?**
- Assemble diverse product review team including relevant staff
  - Identify most recent products available
  - Quantify benefits: lower maintenance chemicals and labor; improved air quality, safety improvements

- Case Studies**
- Emory University
  - University of Florida

**Green Guide for Health Care (GGHC) Criteria:** *Construction: Materials & Resources and Operations: Environmental Services and Environmentally Preferable Purchasing* [www.gghc.org](http://www.gghc.org)

This is one of 5 **Building Healthy Hospitals** case studies developed by EPA's Pacific Southwest Regional Office, with Resource Conservation Challenge and Pollution Prevention funds.

[www.epa.gov/region09/waste/p2/projects/hospart.html](http://www.epa.gov/region09/waste/p2/projects/hospart.html)

**Indoor Air • Sustainable Flooring • Process Water Efficiency • Lighting Efficiency • Energy Efficiency**



# Sustainable Flooring

## HEALTHCARE - TOP 5 GREEN BUILDING STRATEGIES

The number and variety of sustainable flooring materials is in a state of flux with new daily offerings from manufacturers and an equally wide range of applications and user experiences to consider and digest. The following table summarizes the commonly available sustainable flooring materials and provides brief descriptions, cost ranges, and applicability in healthcare facilities.

SUMMARY OF SUSTAINABLE FLOORING MATERIALS			
Flooring Material	Description	Cost (per ft <sup>2</sup> )	Healthcare Application and Maintenance Considerations
<b>Bamboo</b> is aesthetically pleasing, durable, and made from a rapidly renewable, abundant resource.	Installed similar to hardwood, bamboo is available in a variety of lengths and finishes	\$3.75 - \$6.50	Very durable products and appearance is similar to other natural wood products familiar to the public. Available product can vary significantly in quality; source certification is less easy from some suppliers though most well-known manufactures offer it. Some products are susceptible to very-high moisture applications.
<b>Cork</b> is harvested from the bark of the cork oak tree every 9-11 years, leaving the tree to remain living an average of 100-120 years.	Cork is available as floating floors (earth series and classic series), parquet tiles, EcoCork, wall tiles, and underlayment.	\$5.00 - \$8.00	Cork is comfortable, reduces noise, and is easy to maintain. However, porous surface can be difficult to clean to strict infection control standards at healthcare facilities.
<b>Linoleum</b> is a natural product made from linseed oil, wood flour, rosin, jute and limestone.	Installed similar to other sheet flooring.	\$3.75 - \$7.50	Use of this material in areas where frequently exposed to sitting water (or high risk of temporary flooding) is not recommended; increasingly common in healthcare.
<b>Rubber</b> is a hard-flooring alternative made from natural material.	Durable, no-wax maintenance, and more slip-retardant than other types of hard surface flooring.	\$3.00 - \$5.00	Some facilities do not approve of its aesthetic in common areas. Some concerns for individuals with multiple chemical sensitivities (MCS).
<b>Forest Stewardship Council (FSC) Certified wood flooring</b> comes from recycled, sustainably harvested, and/or local family forestry operations.	Conventional hardwood flooring; available in solid and laminated veneers	\$4.50 - \$12.00	Available as engineered or solid and prefinished or unfinished product; not commonly found in healthcare settings outside of decorative use in lobbies and waiting rooms.
Note: Costs vary constantly for flooring choices and the number and variety of sustainable choices is ever-increasing; check with your designer and contractor for current offerings.			





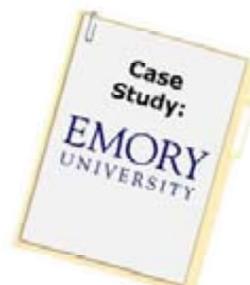
**CASE STUDY 6: MARMOLEUM—A NATURAL LINOLEUM FLOORING**

- Applicability: New construction, major renovation, or remodeling projects.
- Environmental Impact: Reduce chemical and hazardous material use in flooring manufacturing process; reduced chemical use associated with maintenance.
- Other Benefits: Varies by flooring materials (long term maintenance requirements, improved safety through reduced slip, trip, and fall incidents, etc.)

**Background**

Both the University of Florida and Emory evaluated potential flooring materials for installation at their respective buildings against the following informal performance criteria:

- aesthetically pleasing;
- durable enough to withstand heavy pedestrian traffic and frequent equipment rolling loads;
- easy to clean and maintain; and
- provides a safe walking surface for staff, patients, and visitors.



Of those listed above, Emory found the most difficulty in finding sustainable flooring materials that are both durable and easy to clean to strict infection control standards of healthcare facilities. Furthermore, when materials do meet these criteria—such as bamboo or FSC certified hardwood—the preferred choices are not more expensive to purchase compared to conventional flooring materials.

After separate analyses and despite Emory’s challenges, both facilities installed Marmoleum, a natural linoleum flooring material.

**MARMOLEUM PRODUCT SAMPLES**



Vibrant colors with texture



Lightly marbled texture



Solid color, no texture

*Courtesy of Forbo® Flooring.*



### Performance

Emory installed Forbo® Marmoleum in the clinical areas of Winship Cancer Institute and the University of Florida installed the Forbo® Marmoleum in its physical therapy rooms and various other locations. Like other hard flooring products, Marmoleum comes in a variety of colors and patterns to ensure the products fit with the aesthetic design of the building. In 2 years of use at Emory, the material has endured the high-traffic and frequent equipment rolling loads in the clinical areas. And despite problems with the underlayment preparation (unrelated to the Marmoleum) at the University of Florida's Sports and Orthopedic Surgery and Sports Medicine Institute, the Forbo® Marmoleum has performed well. Lastly, both facilities have received feedback from staff and patients surveyed that they are "as comfortable" or "more comfortable" on the floor compared to similar areas with conventional flooring with the walking surface in terms of slipping and stability.

At Emory, the success of using Marmoleum at the Winship Cancer Institute was a combination of pre-installation design considerations, wear-prevention, and proper cleaning and maintenance. Emory generally found no additional maintenance effort with the Marmoleum when following strategies recommended by Forbo's® General Floor Care Guidelines:

- **Color Selection.** The selected color of a floor covering can play a significant role in the apparent cleanliness of the floor. Emory chose to install patterns and colors to minimize the visible appearance of dirt being tracked into the Winship Cancer Institute.
- **Entrance Mats.** Forbo® estimates that as much as 80 percent of dirt entering a building comes in on occupants' footwear; therefore, use of entrance mats can considerably reduce floor soiling. Emory employs entrance mats at all building entrances and cleans them regularly as part of routine maintenance tasks.
- **Staining from Mobile Equipment.** Equipment with dark rubber tires or casters are commonly used (and frequently moved around) in healthcare facilities. Although the discoloration is generally less marked with linoleum flooring than with vinyl flooring, precautions should always be taken to minimize the risk of staining. Emory did not change the wheels of any rolling equipment and did not report floor marks or additional effort related to mark removal.
- **Physical Damage.** All resilient flooring materials are susceptible to certain types of physical damage. Stationary objects such as furniture should have adequate floor protectors. If the pressure exerted by an object on the floor covering exceeds the floor covering's rated capacity, permanent indentations can occur. Emory takes the



same precaution with its Marmoleum flooring as with other flooring instructing its staff:

- Do not slide heavy objects across the floor.
- When moving heavy objects, protecting the floor covering with thin sheets of masonite or plywood.
- **Proper Use of Floor Care Chemicals.** The chemicals used to clean flooring directly impact the appearance, wear, and longevity of the product. Quaternary ammonium compounds are commonly used in hospital disinfection programs. When mixed and used properly, quaternary ammonium compounds will have little or no effect on the physical properties of most flooring materials. Phenolic disinfectants are very caustic and may damage floor coverings or other surfaces that they come into contact with. Forbo's warranty does not cover damage caused by phenolic disinfectants. Linoleum flooring should never be cleaned or stripped with high pH chemicals because permanent damage may occur. Abrasive powders or cleansers should not be used on Forbo floor coverings. Emory finds that proper cleaning techniques is the most important factor to maximizing the life of the Marmoleum and premature wear of the flooring is most likely a result of inappropriate cleaning and maintenance techniques.

### Cost

Neither Emory nor University of Florida provided specific cost information on this product.

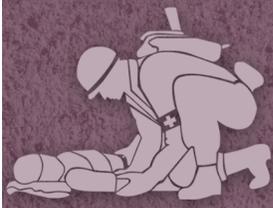


### Case Study Vitals

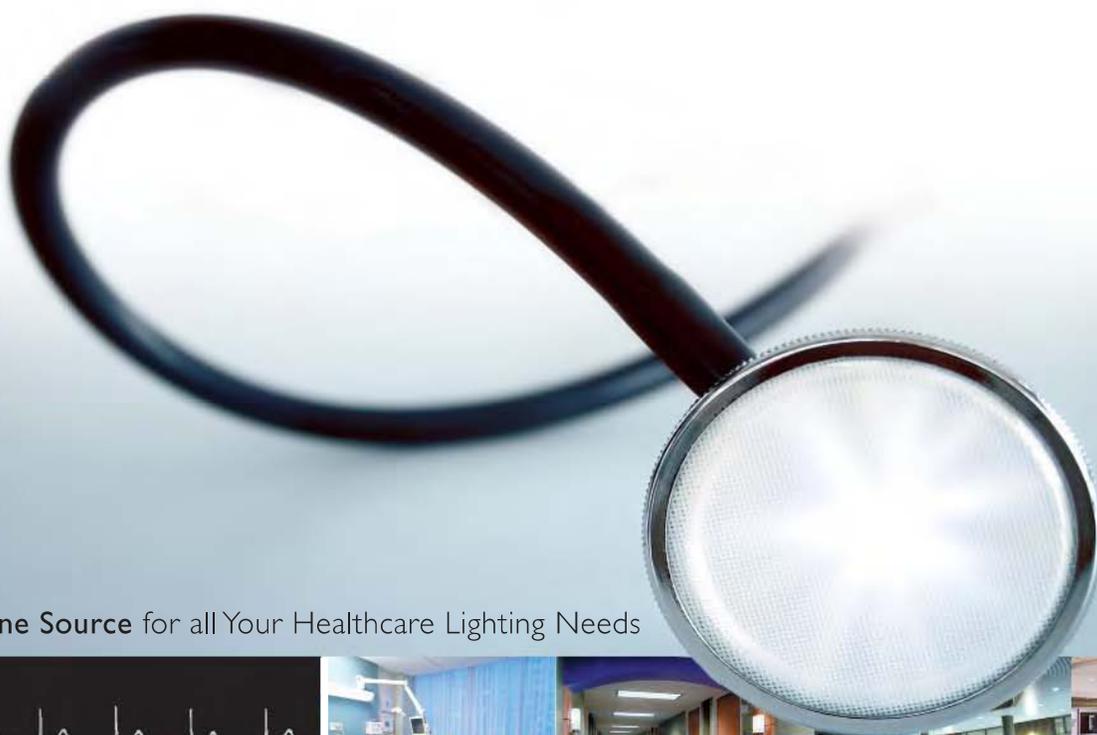
The following summarize success criteria for implementing this project at other healthcare facilities:

- Evaluate sustainable flooring materials to the specific performance needs of each use area, such as administrative, patient care, and common areas. Determine which sustainable flooring product(s) can be installed in each area.
- The success of installing sustainable flooring materials is contingent on a combination of pre-installation design considerations, wear-prevention, and proper cleaning and maintenance.





## 4. Lighting



The **One Source** for all Your Healthcare Lighting Needs



# Healthcare Solutions

## Cooper Lighting Solutions Approach

Designed with comfort, flexibility and energy-efficiency in mind, Cooper Lighting is your one source for healthcare lighting solutions. Our Company is sensitive to the challenges healthcare facilities are facing today and we have designed products that maximize energy efficiency, occupy less space, and are adaptable to different environments.

Cooper Lighting offers the most comprehensive healthcare product line in the marketplace today. From lobbies to exterior applications, and everything in between, Cooper has lighting solutions to meet the specific requirements of hospitals, surgery centers, MRI facilities, and other healthcare environments.



This brochure is an overview and guide for healthcare lighting applications and illustrates the extensive product offering available from Cooper Lighting. For additional information, please visit our web site at: [www.cooperhealthcaresolutions.com](http://www.cooperhealthcaresolutions.com)

## A Merger of Art and Science

Enhanced aesthetics incorporated into fixture design, as well as the ability for the luminaire to light architecture details, are certainly important. But patient-perceived quality of light and the effects on a healing environment are a critical factor, too. Lighting can and does contribute to improved patient outcomes as well as improved facility safety.

At Cooper Lighting, we understand that effective lighting is a merger between art and science. We are justifiably proud of our in-depth knowledge of lighting trends, energy management requirements and current legislation impacting building codes. In fact, ASHRAE/IESNA 90.1 and the Model Lighting Ordinance legislation are utilized daily in Cooper's Lighting Applications Department.

Cooper Lighting has staff accreditation and certification in numerous lighting disciplines. Commercial Lighting Certifications proudly include:

**LEED Accredited Professional** – US Green Building Council (USGBC)

**NCQLP** – National Council on Qualifications for the Lighting Professions, LC Lighting Certified

**CLMC** – Certified Lighting Management Consultant – (NALMCO)

**CLEP** – Certified Lighting Efficiency Professional (AEE)



Cooper Lighting's Healthcare Solutions approach...



Lobbies



Reception Areas/Waiting Rooms



Examination Rooms



Wayfinding

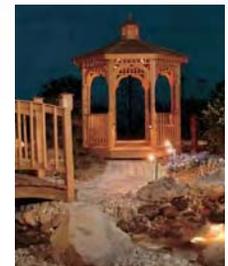


Corridors



**COOPER** Lighting

Your One Source for Healthcare Lighting



ICU

Laboratories/Pharmacies

Life Safety

Dining/Kitchens

Healing Gardens/Courtyards

pg. 10

pg. 11

pg. 12

pg. 13

pg. 14

pg. 14

Patient Rooms

Nurse Stations

MRI and Radiographic Rooms

Surgical Suites

Pediatrics

Nursery/NICU



[www.cooperhealthcaresolutions.com](http://www.cooperhealthcaresolutions.com)



Offices/Conference Rooms

Exterior Site & Area

Parking Garage

Exterior/Entrances

pg. 19

pg. 20

pg. 20

pg. 21

# first impressions

## Lobbies

The lobby creates first impressions and helps set expectations for the entire healthcare facility. Here, lighting becomes an integral element for supporting design themes and fostering a strong brand message. Architectural lighting, accent lighting and general lighting all need to be considered when designing these important spaces.

Let our design team help you select the right healthcare lighting for your next project. If daylight harvesting and system integration are important elements of the overall project, we can provide specialized ballasting, controls and sensors along with the proper lighting fixtures.



Photography: Robert Lemmermeier



Recessed Downlights Cove Lighting Wall Luminaires

Dulce Health Care Center - Dulce, NM  
Photography: Kirk Gittings Photography



Recessed Downlights  
Cove Lighting

Photography: Paul Dyer Photography



Pendant Luminaires Wall Luminaires



Cove Lighting

Floyd County Memorial Hospital - New Albany IN  
Photography: Wilbur Montgomery Photography

### Products Lobbies

	Surface and Pendant Luminaires . . . 83-90, 74-75, 144-145, 165
	Wall Luminaires . . . . . 93-100, 125-126, 143, 146
	Recessed Troffers/Parabolics . . . . . 53-54
	Recessed Downlights . . . . . 57-64, 67-72
	Architectural Recessed . . . . . 121, 124, 129-130
	Perimeter Lighting . . . . . 122
	Cove Lighting . . . . . 107, 123, 132
	Visual Therapy Luminaires . . . . . 49-51

# greeting

## Reception Areas/Waiting Rooms

These small but critical areas in a healthcare setting can set the tone for the entire patient or visitor experience. The wayfinding journey usually begins and ends from here. Greeting, reception and direction as well as visitor accountability are all orchestrated here.

Taking cues from the designs found in today's upscale hotels, these areas often feature grand desks and counters.

Photography: Paul Dyer Photography



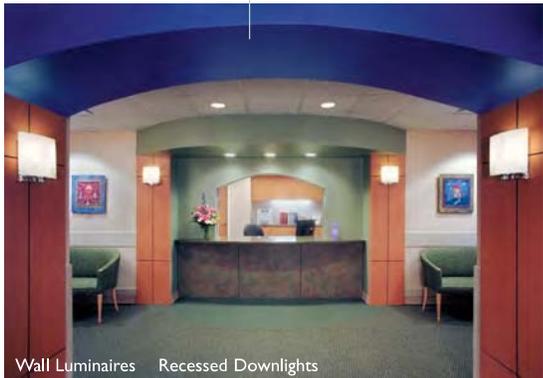
Pendant and Suspended Luminaires



Recessed Downlights Wall Luminaires Cove Lighting

Floyd County Memorial Hospital, Wilbur Montgomery Photography

St. Luke's Episcopal Hospital, Photography: Jodi Haggard



Wall Luminaires Recessed Downlights

Century City Doctors Hospital - Los Angeles, CA



Cove Lighting

### Design Considerations

- Layering of light can create a pleasant and relaxing environment.
- Task lighting and decorative lighting can help provide a welcome entry.
- Using a combination of overhead, recessed and indirect lighting can enliven these areas.<sup>(1)</sup>
- Energy efficient sources and glare-free appearance are important factors to consider.
- Recommended illuminance for these areas is 0 - 30 FC (horizontal) and 3 - 5 FC (vertical).

### Products Reception/Waiting Rooms

	Surface and Pendant Luminaires . . . . .	83-90, 144-145
	Wall Luminaires . . . . .	93-100, 143, 146
	Surface Luminaires . . . . .	101-102
	Recessed Troffers . . . . .	53-54
	Architectural Recessed . . . . .	55, 121, 124
	Recessed Downlights . . . . .	57-63
	Track Lighting . . . . .	76-78
	Perimeter Lighting . . . . .	122
	Cove Lighting . . . . .	107, 123, 132
	Suspended Luminaires . . . . .	110, 113
	Visual Therapy Luminaires . . . . .	49-51

Sources <sup>(1)</sup> Hospital and Healthcare Facility Design second Edition, Richard L. Miller FAIA & Ear S. Swenson FAIA 2002

# adaptive

## Examination Rooms

Patient evaluation and medical procedures begin in the examination room. Visibility, visual comfort and visual appeal must all be addressed in the lighting design process.

In recent years, architectural design plans for examination rooms have evolved from stark and institutional to comfortable and aesthetically reassuring. Cooper Lighting offers a variety of luminaire options for exam and treatment rooms



Recessed Patient Luminaires

Photography: Feinknopf Photography



Recessed Patient and Exam Luminaires Recessed Downlights

Photography: Feinknopf Photography

### Design Considerations

- Indirect lighting and the ability to switch the level of lighting intensity is critical.
- Consider a combination of recessed indirect/direct luminaires and specific task lighting.
- Proper placement of luminaires is critical to avoid veiling reflections in windows and computer monitors.
- Additional lighting should be installed directly above work surfaces, along with undercabinet lights for counters and downlights over sinks.
- Skin and tissue tones are best rendered under light sources with a high color rendering index (CRI) of 80 or above.

### Lighting Criteria

IESNA Standards  
 Local Exam Table 100 horizontal, 30 vertical FC  
 At Sink & Desk 50 horizontal, 30 vertical FC

#### Design Very Important Considerations:

- Color Appearance
- Glare
- Flicker
- Modeling of Faces & Objects
- Surface Characteristics
- Horizontal & Vertical Levels

#### Additional Importance:

- Light Distribution on Surfaces
- Light Distribution on Task Plane (Uniformity)
- Luminance of Room Surfaces
- Reflected Glare
- Shadows
- System Control & Flexibility

Flexibility in system design should allow for ranges in illuminance between 20-200 FC. Specialized examination task lighting may be required for certain procedures.



Recessed Patient and Exam Luminaires

Century City Doctors Hospital - Los Angeles, CA

### Products Examination Rooms

	Recessed Downlights . . . . .	57-63
	Recessed Patient/Exam Luminaires . . . . .	27-30
	Undercabinet Lighting . . . . .	43-44
	Visual Therapy Luminaires . . . . .	49-52

# direction

## Wayfinding

Visiting a modern healthcare facility can be challenging. Long corridors and hallways with identical features can create a maze that is impossible to navigate without directions or clues.

Wayfinding is essentially a succession of visual, audible, and tactile clues that help visitors experience the environment in a positive way while facilitating movement from one place to another.<sup>(1,2,3)</sup>

The components of any visual wayfinding system go way beyond simple signage to encompass architecture, lighting, landscape and landmarks including a wide spectrum of architectural and design elements.

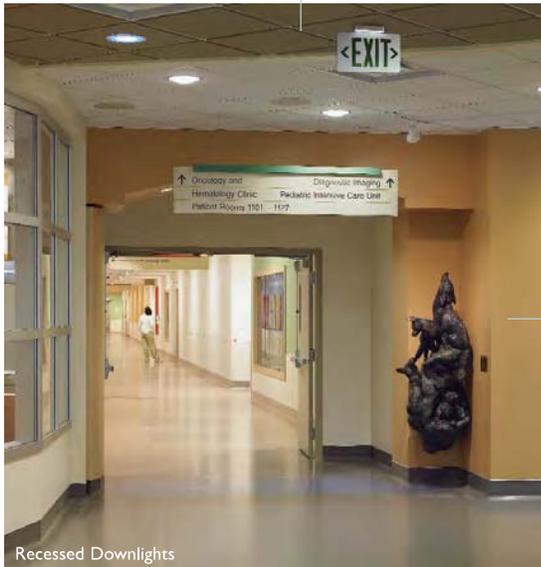
Cooper Lighting offers products that can be customized to create imagery, identification and signage that aid in the wayfinding process. With our depth of expertise, we offer designers, architects and facility directors the flexibility to modify standard wall mount luminaires or create custom solutions to project-specific needs.



St. Luke's Episcopal Hospital, Photography: Jud Haggard

Wall Luminaires

Photography: Robert Lemsemeyer



Recessed Downlights

### Design Considerations

- Environmental graphics and lighting are key elements that make wayfinding come to life.
- Clear, concise directional cues can contribute to a smooth healthcare experience.
- Successful wayfinding provides consistent clues that reassure visitors of the correct path.<sup>(4)</sup>



Sources <sup>(1)</sup> Patrick Gallagher, Principal of Gallagher and Associates (Washington D.C.) and President of the Society for Environmental Graphics Design (SEGD)  
<sup>(2)</sup> Aust, S. (2003). An Overview of Three Wayfinding Systems. ArtGr479 Wayfinding Design Iowa State University, Spring.  
<sup>(3)</sup> Foltz, M.A. (1998). Design Principles for Wayfinding. In Designing Navigable Information Spaces, MSc Thesis, MIT.  
<sup>(4)</sup> Carter & Burgess, Inc Information Center, Web. Topical Articles Issue One 2004

### Products Wayfinding

	Wall Luminaires . . . . . 48, 92, 96, 99-100, 133-135
	Recessed Downlights . . . . . 57-63
	Visual Therapy Luminaires . . . . . 49-51

# movement

## Corridors

Corridors are extremely critical lighting applications. Proper lighting design and luminaire selection enable the complex traffic flows of healthcare wayfinding to move more efficiently. Providing cues and fostering concise direction for the patient and healthcare professional, the lighting system becomes an integral part of a clear directional map. Proper uniform lighting also helps combat patient and caregiver fatigue as the eye works less to adjust to changing light levels upon entering and exiting poorly lit corridors or associated areas.

Cooper Lighting specializes in manufacturing quality luminaires that minimize glare and obscure lamp images. These products have proven successful in some of the most demanding healthcare environments.



Photography: Robert Lemmeyer

Recessed Downlights

### Design Considerations

- Color selection of finish material used in corridor ceilings, walls and floors in relation to incident reflectance is critical in these areas.
- Minimize extremes of brightness within these spaces. Excessive brightness contrast can disorient residents.<sup>(1)</sup>
- Elimination of glare is one of the most important design criteria for corridors. Recessed indirect or cove lighting are recommended. Properly shielded downlights can also work effectively in these areas.



Architectural Recessed

### Lighting Criteria

IESNA Standards  
Horizontal footcandle 10  
Vertical footcandle 3

#### Design Very Important Considerations:

- Color Appearance
- Flicker
- Horizontal Footcandles (most important)

Illuminance levels change for day and evening use, along with adjacencies to certain treatment areas; the range for corridor areas could be between 5-50 FC. Corridors in the operating room suites areas may require illuminance levels as high as 100 FC.

### Products Corridors

	Step Lights. . . . . 31, 171-172
	Recessed Troffers/Parabolics . . . . . 53-54
	Wall Luminaires . . . . . 41, 92, 95-97, 99, 126
	Surface and Pendant Luminaires. . . . . 38, 89
	Architectural Recessed . . . . . 55, 119-120, 128-130
	Recessed Downlights . . . . . 57-63, 71-72
	Cove Lighting . . . . . 107, 123
	Suspended Luminaires. . . . . 109-110, 112-115
	Visual Therapy Luminaires . . . . . 49-52

Photography: Charles Plant



Sources <sup>(1)</sup> Guidelines for Design and Construction of Hospital Facilities. 2001 Edition AIA

# flexibility

## Patient Rooms

The patient room is possibly one of the most widely debated and researched spaces in today's healthcare facility. The trend toward making these rooms more comfortable, home-like and hospitable while still providing safe and functional workspaces can be challenging.

In a hospital, it is tremendously important to provide a healing environment. Efficiency and accuracy in the patient room can lead to improved patient outcomes and contribute positively to the overall well-being of everyone involved in providing care.

Designing around task importance in the patient room includes general/ambient lighting as well as lighting for direct or cursory observation, critical examination, reading, restroom/ shower illumination, day and night-lighting and lighting control.



Bed Lights

Century City Doctors Hospital - Los Angeles, CA

### Design Considerations

- System flexibility must allow for the patient to have individual control with additional switching locations for the healthcare professional.
- Glare or excessive brightness must be eliminated in these spaces.
- Light trespass during sleep hours must be controlled to minimize exposure that can alter circadian rhythms.
- Nighttime monitoring and observation should be conducted with minimal disruptions (subdued red-amber light sources appear to positively affect melatonin).
- For good rendition of skin and tissue, a CRI of 80 or higher is recommended.

Century City Doctors Hospital - Los Angeles, CA



Recessed Downlights Bed Lights

### Lighting Criteria

IESNA Standards	Exam	Reading	Ambient
Horizontal footcandle	50	30	5
Vertical footcandle	10	5	3

#### Design Very Important Considerations:

- Color Appearance
- System Control & Flexibility
- Modeling of Faces & Objects
- Surface Characteristics
- Horizontal & Vertical Illuminance Levels
- Reflected Glare
- Light Distribution on Surfaces
- Light Distribution on Task Plane (Uniformity)
- Luminance of Room Surfaces

#### Additional Importance:

- Appearance of Space & Luminance
- Direct Glare
- Shadows
- Source/Task/Eye Geometry

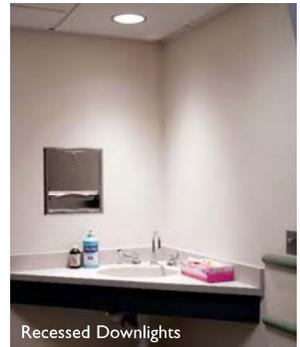
Flexibility in system design should allow for ranges in illuminance between 3-200 FC. Specialized examination task lighting may be required for certain procedures.

Photography: Feinknopf Photography



Recessed Patient and Exam Luminaires

Photography: Charles Plant



Recessed Downlights

### Products Patient Rooms

	Recessed Patient/Exam Luminaires . . . . .	27-30, 35
	Nightlighting . . . . .	31
	Patient Bed Lights. . . . .	32-34
	Wall Luminaires . . . . .	91-92, 94-97
	Recessed Downlights. . . . .	57-63
	Architectural Recessed . . . . .	55, 121
	Visual Therapy Luminaires . . . . .	49-52

# functional

## Nurse Stations

Lighting systems that support the nurse station and adjacent areas should be designed to maximize productivity, reduce errors and lower stress.

Flexibility should be designed into the lighting system for this area of the hospital that operates around the clock. Achieving a balance between circadian rhythm disruptions and high alertness for nighttime staff helps support a productive and positive healing environment. Layering of light is a good way to handle the on and off switching of particular luminaires that may be more disruptive when not required. Also recommended is the use of dimming ballasts with multiple locations of control for facility personnel.

From undercabinet task lighting to architectural luminaires that enhance and enliven spaces with low glare lighting, we offer products for these visually challenging environments.



Century City Doctors Hospital - Los Angeles, CA

Cove Lighting Recessed Downlights

Photography: Charles Plant



Suspended

### Design Considerations

- High levels of general illumination combined with additional task lighting should be utilized for the dispensing of medicine.
- Undercabinet task lighting can provide increased lighting levels for counters.
- High intensity recessed luminaires with adjustable optics can improve focus and visual accuracy.



Dulce Health Care Center - Dulce, NM  
Photography: Kirk Gittings Photography

Recessed Troffers



Direct/Indirect Recessed

### Products Nurse Stations

	Undercabinet Lighting . . . . .	43-44
	Wall Luminaires . . . . .	95-96, 112, 125
	Recessed Troffers/Parabolics . . . . .	53-54
	Recessed Downlights . . . . .	57-63
	Cove Lighting . . . . .	123
	Perimeter Lighting . . . . .	122
	Architectural Recessed . . . . .	119-120, 128-130
	Suspended Luminaires . . . . .	109-110, 112-113

Sources **Designing the 21st Century Hospital Project**, The Robert Wood Johnson Foundation, Roger Ulrich, Xiaobo Quan, Center for Health Systems and Design, College of Architecture, Texas A&M University, Craig Zimring, Anjali Joseph, Ruchi Choudhary, College of Architecture, Georgia Institute of Technology

# pleasing

## MRI & Radiographic Rooms

Magnetic Resonance Imaging (MRI), open MRI and Computer Assisted Tomography (CAT) scanning presents unique lighting demands. MRI suites, due to the intense magnetic polarity created by the diagnostic equipment, demand that luminaires be constructed of non-ferrous materials such as aluminum, brass, certain types of stainless steel and polymers preventing possible injury to the patient and healthcare technician.

Inherent in these diagnostic procedures is a degree of stress for the patient, making patient comfort in the MRI suite a critical element of the design process.

Modern X-ray rooms can be an even more complex area to light than an MRI suite. The variety of tasks combined with the mobility and articulating nature of the medical equipment dictates multi-dimensional architectural design elements.



Photography: Charles Plant

Recessed Troffers and Downlights



MRI Lighting

### Design Considerations

- Luminaire performance should be weighed against visual comfort and low brightness (glare control is more tangible to patients than the amount of light).
- Fixtures that incorporate non-ferrous materials must be considered when designing MRI areas.
- Ambient light levels in these spaces can be relatively low during patient treatments, 30 to 35 FC.
- The lighting design should provide dimming and switching for adjusting light levels as needed.
- The ability to switch fixtures on and off is necessary to control general light level for activities such as patient transfer onto radiology tables.
- X-ray viewing and documentation requires dimming general room lighting during viewing but also requires increased light levels for certain tasks.

Century City Doctors Hospital - Los Angeles, CA



Recessed Troffers

### Products MRI & Radiographic Rooms

	Dark Room Safelights . . . . .	45-47
	MRI Lighting . . . . .	65, 79-83, 137-142
	Architectural Recessed . . . . .	55
	Recessed Troffers . . . . .	56
	Visual Therapy Luminaires . . . . .	49-50

# accuracy

## Surgical Suites

Operating rooms command an unequalled level of multi-tasking and precision. The lighting design must allow for system flexibility that adjusts illuminance levels appropriately for a wide range of surgical procedures. Proper lighting design and luminaire selection can assist in limiting eyestrain, vision and fatigue.



Century City Doctors Hospital - Los Angeles, CA

Surgical Troffers

Photography: Charles Plant



Surgical Troffers

### Design Considerations

- Switching and dimming controls should be considered for these areas.
- Luminaires recessed into the ceiling must be gasketed and UL listed for damp locations.
- Luminaires should meet the requirements for Electromagnetic Interference/Compatibility (EMI), Radio Frequency Interface (RFI) and also MIL-STD 463 E.
- Reflective glare can be compounded if inappropriate finishes are selected for these areas.
- High intensity recessed fluorescent luminaires can control ceiling surface glare and also provide the recommended illuminance levels on various task planes and surfaces.
- High color rendering lamps are recommended in the most critical care areas; 85 - 95 CRI should be specified for general lighting.

### Lighting Criteria

IESNA Standards  
 Horizontal footcandle 100 average  
 Vertical footcandle 50 min.

#### Design Very Important Considerations:

- Color Appearance
- Direct Glare
- Flicker & Strobe
- Surface Characteristics
- System Control & Flexibility
- Horizontal & Vertical Levels

#### Additional Importance:

- Appearance of Space & Luminaires
- Light Distribution on Surfaces
- Light Distribution on Task Plane (Uniformity)
- Luminances of Room Surfaces
- Modeling of Faces or Objects
- Reflected Glare
- System Control & Flexibility

### Products Surgical Suites

	Surgical Troffers . . . . .	36, 39-40
	Cleanroom Troffers . . . . .	37
	Exit Lights . . . . .	147, 149-150
	Emergency Lighting . . . . .	152-154
	Power Inverters . . . . .	155

# comforting

## Pediatrics

Pediatrics and adolescent wards have the same level and amount of visual tasking and complexity as any other ward in the facility. What makes them truly unique though is that they are providing care for patients who, in many cases, do not have the ability to control their emotions. Inappropriate lighting will only contribute to additional stress, strain and fatigue.



Photography: Charles Plant

Recessed Downlights

Photography: Robert Lemmermeyer



Recessed Downlights

### Design Considerations

- Switching and dimming controls should be provided.
- Recessed indirect/direct luminaires with additional lighting for reading also works well in these spaces.
- General lighting in shared activity areas for children should be designed with illuminance intensity levels adjusted for the floor and lower wall surface, as children tend to play or sit on the floor.
- Lighting in play areas and adjacent corridors should provide adequate illumination to extend field of views.
- Choose luminaires that feature color options as well as unique design elements to enhance the overall visual interest in these spaces.

## Nursery/NICU

Nursery and NICU lighting should allow for easy observation of newborn infants. Indirect ambient lighting is recommended as it provides soft, unobtrusive light that will not harm the infant patient's eyes. Dimming and switching capabilities also need to be considered to better control illuminance levels for the various tasks performed in this environment.

### Design Considerations

- Nursery lighting design should include dimming and switching capabilities for maximum flexibility.
- High color rendering lamps should be specified, 85 CRI, for recognizing color changes in the skin.
- General lighting should include luminaires that deliver the appropriate glare-free light distribution patterns for surfaces and task planes.
- Lighting examination areas from multiple angles helps in avoiding shadows.
- Lighting requirements for these areas can range from 3-5 FC to 75- 00 FC depending on the task.



### Products Pediatric & Nursery

	Wall Luminaires . . . . . 99-100, 135
	Architectural Recessed . . . . . 35, 55, 121
	Recessed Downlights . . . . . 57-63
	Perimeter Lighting . . . . . 122
	Suspended Luminaires . . . . . 111-112

## ICU

In the Intensive Care Unit (ICU), lives literally hang in the balance between the success of the medical treatments being performed and the body's ability to heal. Design issues for these areas center around flexibility due to the various tasks performed.

Dulce Health Care Center - Dulce, NM  
Photography: Kirk Gittings Photography



Recessed Troffers



Cleanroom Lighting

Photography: Charles Plant

### Design Considerations

- Lighting should address the varied tasks of the healthcare professional, incorporating the flexibility for dimming and switching control.
- Glare-free lighting should be used to create a comfortable environment.
- Lighting equipment while at the same time providing illumination for patient care, requires luminaires that can deliver the appropriate lighting distribution for both vertical and horizontal surfaces.
- Lighting levels can fluctuate greatly depending on the task requirement ranging from 20 - 200 FC for the horizontal work plane to 5-50 FC for the vertical.
- Recessed indirect/direct luminaires with the addition of unobtrusive wall sconces are a good choice for adding visual appeal and stimulation.

## Laboratories/Pharmacies

Laboratories and pharmacies are dynamic and demanding areas. Multiple tasks are taking place simultaneously and multiple workplaces are being utilized. Amid this visual chaos, concern for the technicians' visual comfort and acuity is important.

Design issues for these areas revolve around storage, dispensing, detailed measuring, distribution and documentation. Reading very small print and differentiating between various contrast levels requires different levels of illumination based on the tasking area.

### Design Considerations

- Areas of storage and precise material handling should be free of shadows, and effort must be taken to offset the effects of highly reflective labels.
- Beyond general room lighting and supplemental lighting focused on specific workplaces, additional undercabinet or specialty task lighting may be required.
- Layering of light to create transitions in light levels between areas can reduce eyestrain.
- Research laboratories may require cleanroom lighting to control against dangerous airborne infections.
- High color rendering lamps with a CRI of 85 or greater should be employed in both laboratories and pharmacies.



Suspended and Pendant Luminaires

Photography: Paul Dyer

### Products ICU & Lab/Pharmacies

	Recessed Patient/Exam Luminaires . . . . . 28, 30, 35
	Cleanroom & Specialty Lighting . . . . . 37-40, 42
	Undercabinet Lighting . . . . . 43-44
	Recessed Troffers/Parabolics . . . . . 53-54, 56
	Suspended Luminaires . . . . 109, 111, 113-114, 117-118

# planning

## Life Safety

### Life-Saving Light That Supports The Architecture

The good news is that emergency and exit lighting strategies do not have to be an afterthought, with eyeball type luminaires mounted in the least attractive way. Exit signs can be attractive, energy efficient and complement any space. Well placed, these life-saving devices can add integrity, safety and security to the master space plan.

Incorporating emergency lighting into the general lighting specification, helps deliver superior light levels during emergency operation while, at the same time, supports the architectural theme of the space.



Emergency Lighting



Wall Luminaires

Photography: Robert Lemmeyer



Cooper Lighting is a global leader in the areas of emergency and exit lighting strategies, with countless patents and decades of case work helping to make all types of buildings and structures safe. From stairwells to patient rooms, our line of life safety products offer the appropriate emergency and exit lighting solutions for years of maintenance-free operation providing peace of mind for facility managers.

### Design Considerations

- Emergency lighting must be provided throughout the entire building and property. Minimal light levels for safe exiting are published on a national basis.
- Many communities now require an illuminated path of egress that directs occupants a safe distance away from the facility. HID, halogen and fluorescent light sources can be specified with power back-up integration to address these new codes and standards.

### Products Life Safety

	Wall Luminaires . . . . . 48, 157-159
	Emergency Lighting . . . . . 151-153
	Exit Lights . . . . . 147-150
	Stairwell Lighting . . . . . 156
	Power Inverters . . . . . 155

# sophistication

## Dining/Kitchens

Selecting the appropriate combination of luminaires in conjunction with the architectural vision for the dining area can transcend what has been traditionally thought of as an institutional environment. In short, these spaces should be looked at as more than just a place to grab a quick meal or take a short break.

Cooper Lighting manufactures a wide variety of architectural pendants, recessed, direct/indirect and wall mounted luminaires that add aesthetic integrity to the healthcare dining area while providing exceptional performance and value.

In addition, we offer a line of cleanroom and specialty lighting for kitchen and cafeteria areas where completely sealed and/or wet location luminaires may be needed.



Pendant Luminaires



Recessed Downlights Pendant Luminaires



Pendant Luminaires

### Design Considerations

- The lighting design should help in stress reduction by utilizing the appropriate amount of light to accent design elements and visually stimulate visitors.
- The ability to adjust light levels to help set a tone or mood certainly has design merit. Intense or drastic contrast contributing to glare and unwanted brightness should be avoided.
- Consideration should also be given to the diverse needs of the variety of visitors to these spaces, such as the elderly and those with physical challenges.



Dome Pendants

Photography: Charles Plant

### Products Dining/Kitchens

	Cleanroom and Specialty Lighting . . . . .	37, 39-40
	Pendant Luminaires . . . . .	74, 86-88, 165
	Recessed Downlights . . . . .	57-72
	Track Lighting . . . . .	76-78

# well-being

## Healing Gardens/Courtyards

Many of today's modern healthcare and hospital designs incorporate these spaces as a far-reaching method of improving patient outcomes. Relaxation and rejuvenation are the goal of a healing garden. In the garden, healing occurs as a result of a direct connection between the patient and the physical and natural environment. From social interaction to exercise, these gardens enhance coping and can lead to improved patient outcomes.<sup>1)</sup>

Taking cues from the hospitality industry, modern healthcare architecture stresses natural outdoor views and quiet havens.

Healing gardens and courtyards offer refreshing spaces in which to take a break from the rigors of the healthcare environment.

Cooper Lighting offers a vast array of outdoor luminaires designed for both form and function. These products not only make architecture come to life but also offer excellent performance.

Photography: Gary Knight

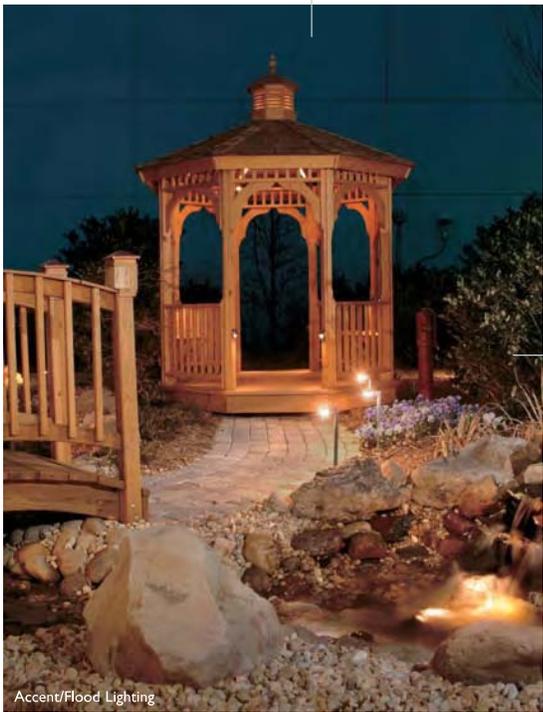


Underwater Lighting



Exterior Bollards

Photography: Gary Knight



Accent/Flood Lighting

### Design Considerations

- Properly illuminated courtyards allow these areas to be enjoyed safely after dark.
- Adding an appropriate lighting scheme to the courtyard can make these spaces even more dramatic and allow for larger group activities, which can foster healing social interaction.
- Wayfinding for patients to the outdoor therapeutic spaces should be well planned for maximum use and benefit.

### Products Garden Areas

	Wall Luminaires . . . . . 102-104, 133-134, 157-159
	Exterior Bollards . . . . . 105-106, 174-175, 179
	Architectural Steplights . . . . . 171-173
	Accent/Flood Lighting . . . . . 131, 176-178
	Underwater Lighting . . . . . 181
	Handrail Luminaire . . . . . 136

Sources <sup>1)</sup> *Healing Gardens: Therapeutic Benefits and Design Recommendations* the Wiley Series in Healthcare and Senior Living Design, 1999 edited by Clare Cooper Marcus & Marne Barnes

# compelling

## Offices/Conference Rooms

Healthcare professionals and administrators face numerous critical tasks that can contribute to high stress levels, making quality lighting design a key issue for office and administration areas. Visibility, visual appeal and visual comfort all need to be considered when selecting luminaires for this environment.

Over the past 15 years, office lighting levels and energy legislation have become incredibly systematic and scientific. Cooper Lighting's Healthcare Solutions program can help address the various recommendations and mandates of ASHRAE/IESNA 90.1 and the Model Lighting Ordinance. If standardization is important to your healthcare facility design, we have the products to fuse great lighting design with the reality of a real-world maintenance repair and operating budget.



Architectural Recessed



Architectural Recessed



Recessed Downlights



Recessed Troffers/Parabolics

Wilbur Montgomery Photography



Suspended Luminaires

### Design Considerations

- Conference room environments with media capabilities should incorporate dimming control capabilities.
- If daylight is a major contributor to the lighting scheme, it is important to add controls and sensors to adjust for fluctuations and changes to the natural light.
- Energy efficient pendant mount indirect lighting or a combination of recessed direct/indirect luminaires enhances visual appeal and comfort.
- Spreading light across the ceiling and bouncing it off walls will make an area appear larger. These types of lighting solutions can help with luminous uniformity and elimination of the "cave effect."
- Lighting reflections associated with computer monitors must not be overlooked when establishing quality office lighting design.

### Products Offices/Administration

	Pendant Luminaires . . . . . 84, 87
	Wall Luminaires . . . . . 98, 108
	Recessed Troffers/Parabolics . . . . . 53-54
	Architectural Recessed . . . . . 55, 128
	Recessed Downlights . . . . . 57-58, 61-62, 69-70
	Suspended Luminaires . . . . . 109-111, 113-118, 127

# welcoming

## Exterior – Site & Area

Lighting for security, safety, general illumination, facade, and path of egress in an exterior area application should all be considered when detailing these projects. While definitive research does not actually substantiate that exterior lighting decreases crime, we do know that a well lit area will invite visitors and dissuade trespassers.

It is generally accepted that a well lit outdoor space has a positive effect on one's perception, reducing fear and establishing confidence in entry. That is to say, "Keeping people and property secure, good lighting must enable people to take action at a distance."<sup>(1)</sup>



### Design Considerations

- Once the lighting design process moves past the basic benefits of appropriate site and area lighting, the architectural and aesthetic benefits can be quite dramatic.
- Ordinances involving light trespass and the night sky currently exist in most of the United States and in 8 countries. Complying with these regulations can be an exercise in compromise. But if done correctly, the outcomes usually exceed even the most difficult design criterion.

## Parking Garage

With space and land at a premium especially in urban areas the parking garage is widely accepted as the smart building option for the ever expanding healthcare community. These structures are being erected on an ongoing basis and, in many cases, are necessary to meet the needs of the surrounding communities.



Photography: Charles Plant

The parking garage is not a parking lot, at least when it comes to lighting. A parking garage is a long, narrow interior space with walls, beams and ceiling and, therefore, is a more complex visual environment. It's one of the few spaces where vehicles and pedestrians intermix in close quarters, and a multitude of visual tasks exist simultaneously.

Sources <sup>(1)</sup> **The Outdoor Lighting Pattern Book** by Russell P. Leslie and Paula A. Rodgers from the Lighting Research Center Rensselaer Polytechnic Institute, 1996

### Design Considerations

- Visitor safety, security and wayfinding are at the top of the design benefits list.
- The lighting levels should be uniform or relatively even throughout the space.
- Proper illumination can provide a non-threatening, secure and directionally cued environment.
- Good neighbor status is also very important to community-based healthcare facilities. Being cognizant of the effects of light trespass and glare should be built into the facility design.

### Products Exterior

	Exterior Bollards . . . . .	105-106, 160, 174-175, 179
	Wall Luminaires. . . . .	103-104, 157-159, 167, 180
	Exit Lighting. . . . .	147
	Emergency Lighting . . . . .	152-153
	Area Luminaires. . . . .	162-164, 166, 169
	Accent/Flood Lighting. . . . .	131, 168, 176-178
	Architectural Step Lights. . . . .	171-173
	Parking Garage Luminaires . . . . .	170

## Exterior/Entrances

The entrance marks the beginning of the journey for many individuals – a journey that can be filled with varied emotions about the healthcare experience. As such, these areas need to be welcoming spaces.

Cooper Lighting has a broad range of luminaires for exterior entrances. These luminaires not only deliver high performance lighting, but can also assist in defining location, direction and navigation for the wayfinding journey.



Exterior Bollards

Wilbur Montgomery Photography



Exterior Bollards

### Design Considerations

- During daylight hours, the lighting should meld into the building's architectural theme. Nighttime illumination must provide appropriate light levels to allow for safe navigation.
- Contrast ratios, glare and uniformity in relation to adjacent areas must be considered when designing these lighting applications.
- Dramatic differences in light levels should be avoided. Light levels should be gradually increased as one enters the grounds, allowing for safe entry.
- Dark sky legislation and responsible energy management must be addressed in the early stages of the lighting design process.
- During times of high illumination from the sun, providing transition areas with appropriate interior light levels becomes important. Sensors and control devices can be incorporated into the lighting scheme and automation can raise and lower light levels based on daylight contribution.<sup>(1)</sup>

Photography: Charles Plant



Wall Luminaires

### Products Exterior/Entrances

	Wall Luminaires . . . 48, 102-104, 133-134, 143, 146, 157, 180
	Surface Luminaires . . . . . 105-106, 160, 174-175, 179
	Exterior Bollards . . . . . 105-106, 160, 174-175, 179
	Architectural Step Lights . . . . . 171-173
	Accent/Flood Lighting . . . . . 131, 161, 168, 176-178
	Underwater Lighting . . . . . 181
	Inground Illuminators . . . . . 182

Sources <sup>(1)</sup> **Guidelines For Design And Construction of Hospitals and Health Care Facilities**, 2001 Edition The American Institute of Architect Academy of Architecture for Health with Assistance from the U.S. Department of Health and Human Services.

## Lighting Technology Guide

### T8 & T5 Lamps and the Electronic Ballast

The T8 lamp has now become an industry standard for a vast array of fluorescent lighting applications. With the advent of T5 technology, fluorescent lighting is gaining ground where large lumen system performance is required. Both T5 and T8 lamps offer long lamp life, less lumen depreciation, and a higher color rendering index [CRI] than other lamp configurations.

The following table [Fig. 6] shows a comparison of T8, T5, and T5HO electronic system performance. All three-lamp system combinations utilize electronic ballasts, which have a higher ballast factor increasing light output in comparison to magnetic ballasted systems. Fluorescent lamp technology has come a long way and when properly mated to application installation, the energy savings can be substantial.



- Energy Savings [up to 50% less energy]
- Better Color Rendering
- Cooler and Quieter Operation
- Lightweight Design
- No Flicker during Start-up or Operation
- Dimming ballasts modulate light from 100% to 0%.

(FIG 6) T5 VS. T8 SYSTEM PERFORMANCE

	T5 ELECTRONIC	T5HO ELECTRONIC	T8 ELECTRONIC
LAMP DESIGNATION	F28T5 / 835	F54T5 / HO / 835	F32T8 / 735
SYSTEM EFFICIENCY	93LM / W	85LM / W	85 LM / W
INITIAL LAMP LUMENS [1-LAMP]	2,900 LM *	5,000 LM	2,800 LM
LAMP WATTS	28W	54W	32W
BALLAST FACTOR	1.0	1.0	0.88
BALLAST INPUT WATTS [2-LAMP]	62W	117W	58W
COLOR RENDERING INDEX	82	82	73-78
LAMP LUMEN DEPRECIATION	0.95	0.95	0.90
LAMP LIFE	25,000 HRS	25,000 HRS	25,000 HRS *
TOTAL SYSTEM LUMEN OUTPUT [2-LAMP]	5,810 LM	9,500 LM	4,435 LM

Note: Performance data based on F28T5/835 and F54T5HO lamp and industry standard electronic 2-lamp ballast  
\*at 35°C Based on 12 hour burning cycles

### LED Technology

LEDs are quickly being adopted as an illumination solution for both indoor and outdoor products. High efficiency LED lighting systems capitalize on the longevity and convenience principals of solid state lighting and are now being offered as an alternative to traditional lamps.

#### What is an LED?

LEDs (Light Emitting Diodes) are composed of various semiconductor materials. When an electrical current passes through the diode the recombination of the positive and negative charges, within the different compositions, result in the emission of photons or light. LEDs are small non-carbon based materials such as indium, aluminum, and gallium.

#### LED Types

White LEDs are either an RGB system, which combine light from red, green, and blue LEDs or a Phosphor Converted system, where the light of a blue, violet or near-ultraviolet LED is radiated through a yellow phosphor coating emitting white light.

#### Energy Efficiency

LED luminaires that are engineered properly provide superior efficiency over most traditional lighting sources. Phosphor Converted LEDs can achieve up to 100 lumens per watt. The total Luminaire Efficacy should be considered when comparing energy savings and products. Total Luminaire efficacy should account for thermal, driver and optical losses (approximately 25% - 30%).

#### Reliability

Due to LEDs solid state principals (no filament to break), the light source is not susceptible to vibration reducing the risk of premature failure. A properly designed LED system which is driven at the proper current and voltage enables the average rated life to be 50,000 hours at 70% lumen output. The sustainability of the fixture dramatically reduces maintenance and service costs over traditional sources. An LED system should last five times longer than a traditional metal halide source potentially saving hundreds in service expense.

#### Quality of Light

LEDs allow for improved visibility over many traditional sources due to a cooler color temperature (a whiter light) and a higher color rendering index (CRI). CRI is a quantity describing how well a light source renders color realistically. CRI of 100 is the best possible score. Daylight and incandescent lamps are considered to have a score of 100. LEDs can achieve a CRI greater than 90. Color temperature and CRI of an LED can be adjusted by the manufacturer for different products and applications. A cooler LED may be chosen for an outdoor application and a warmer color temperature might be selected for an indoor application to resemble a traditional incandescent lamp.



## Cooper Lighting's Energy Solutions Approach

### Business Environment

In today's competitive environment, one clear economic theme has emerged—the need to lower costs and increase productivity. This has created a need to implement cost reduction and improved productivity strategies. Companies must use every tool at their disposal to meet this requirement, grow earnings, and increase return on investments. However, lighting, one of the most powerful tools, is often overlooked. Energy efficient lighting offers a large source of cost savings through energy reductions.



*“Implementing innovative lighting solutions amid phenomenal growth within the healthcare environment”*

### Lighting, A New Competitive Weapon

Lighting is a necessity. Energy efficient lighting is a competitive tool! Implemented properly, the lighting or re-lighting of a facility can be used to outpace competition with lower costs from reduced energy consumption, lower scrap rates and higher productivity rates. Lighting is also key to total quality management by providing more accurate visibility that translates into fewer errors and defects. Most importantly, energy efficient lighting protects the most valuable asset in every business, its human resources. Energy efficient lighting promotes a pleasant and positive environment therefore reducing absenteeism and turnover.

### Other Advantages

**Increased Productivity** Research proves that productivity is in direct proportion to environment and rises dramatically in well-lit surroundings.

**Increased Quality** Productivity increases and the quality of the finished product increases. Less time is lost through error and defects in material and workmanship are reduced.

**Increased Safety** Reducing accidents is a primary goal. By improving light levels potential hazards can be avoided.

**Increased Employee Satisfaction** Lighting directly impacts how people feel and interact. The impact can be dramatic and aesthetically pleasing.

**Important Environmental Benefits** Energy efficient lighting provides important environmental benefits. According to EPA conversion guidelines, emissions pollution reductions associated with replacing inefficient lighting in the commercial and industrial markets over ten years are estimated to be equivalent to: planting 320 million trees, removing 247 million cars, and saving 158 billion gallons of gasoline.



*“Saving Energy is Good Business”*

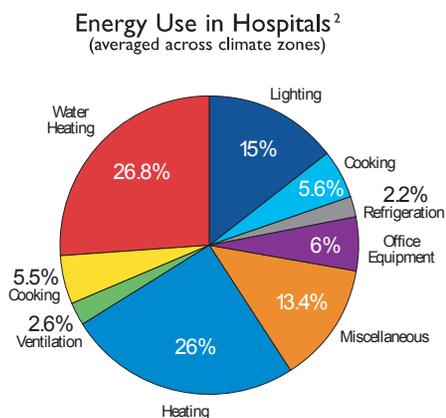
## Energy Use and Savings Potential<sup>1</sup>

Hospitals have unique and intensive energy use requirements. In addition to the need for lighting and heating 24 hours a day, hospitals demand extensive energy for ventilation, equipment, sterilization, laundry and food preparation.

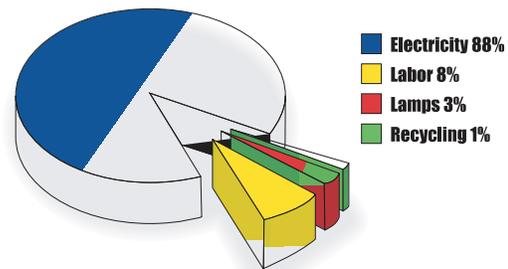
Every year, U.S. hospitals spend an average of \$1.67 per square foot in electricity costs, and another 48 cents per square foot on natural gas.

Lighting (15 percent) and HVAC (45 percent) are the largest parts of a typical hospital's energy bill. Both areas present opportunities for significant savings. For example, regular evaluations and tune-ups to the HVAC system (costing 4-20 cents per square foot) have been proven to cut those costs by 10-15 percent. This translates into roughly \$34,000/year in savings for a 100,000 square-foot facility.

Energy savings have the potential to dramatically impact a hospital's bottom line. The ENERGY STAR® Financial Value Calculator estimates that if hospitals reduce energy use by 5 percent, it is the equivalent of increasing the Earnings Per Share (EPS) by 1 cent. Similarly, each dollar of energy savings is equivalent to \$20 of increase in revenue.



## Lighting Systems Operating Costs



*“Energy savings impact:  
profits, productivity, quality,  
customer and employee satisfaction  
and environment.”*



## Market Trends Potentially Affecting Energy Use

- Hospitals are increasingly part of multi-hospital networks (an increase from 30.8 percent in 1978 to 53.6 percent in 2001). Administrative decisions on energy use may have a wider impact.
- Tight hospital budgets often change intensity or duration of patient services (e.g., less in-patient surgery, increased use of the ER), which can lead to shifts in energy demands.
- In order to compete, hospitals are offering new or specialized services and equipment. Equipment availability impacts energy use.
- Studies indicate that newer hospitals use more energy than older hospitals.

Sources <sup>1</sup>Information provided by CEE.

<sup>2</sup>Managing Energy Costs in Hospitals: Energy Consumption Data. Platts, 2004

*“Experience the Benefits of Quality, Energy Efficient Lighting”*

## Cooper Lighting Resources

Being the easiest to do business with, consistently, time-after-time, also means assisting our customers with the application of Cooper Lighting products. Either directly or through our network of Cooper Lighting manufacturers' representatives, we provide you with the answers and solutions you need to get your project done on-time and on-budget. Healthcare Solutions brings together the team approach and resources needed to help you achieve the best in lighting design on your next Healthcare Lighting project.

### e-Tools...

- Web based applications allow for quick and easy development of design ideas.
- Photometric ToolBox® allows for the easy viewing and graphical interpretation of photometric information.
- Luxicon, and design application software package for the non-AutoCAD® user; performs calculations for both day lighting and electric lighting software.
- Downloadable bundles of IESNA format photometric files for use in any Lighting design software.
- AGI32® Instabase for Cooper Lighting products is also available for download.



### Applications Department

Let the application experts at Cooper Lighting design your next lighting layout. Aided by the latest computer simulation software and a comprehensive lighting background, our Application Engineers can design, analyze, and provide statistical layouts for any lighting application. Whether the design criteria calls for Illuminance, Luminance, or Small Target Visibility (STV) compliance, Cooper Lighting can provide the fixture layout and supporting documentation necessary for your next project.



### The Source

The Cooper Lighting SOURCE facility sets the benchmark for lighting industry learning. The SOURCE continues to provide the highest standard of professional lighting education in the industry, serving lighting professionals for over 14 years.

The SOURCE learning experience to date has hosted over 30,000 participants from these professional fields:

- Architects
- Builders
- Distributors
- Electrical Contractors
- End-Users
- Energy Conservation Companies
- Engineers
- Facility Managers
- Landscape Architects
- Lighting & Interior Designers
- Retail Planners
- University Students
- Utilities

The SOURCE provides classes and workshops on specific lighting needs for various applications including healthcare. Please visit [www.cooperlighting.com](http://www.cooperlighting.com) for the latest class schedule.



### Awareness + Energy Issues (Current, Pending & Proposed)

An area of the Cooper Lighting Web Site is offered to foster an awareness of energy issues affecting the lighting industry. The information is presented as executive summaries and intended as a reference tool for further investigation. The following issues are featured:

- ASHRAE / IESNA 90.1
- LEED
- IECC
- 2002 ECCC of New York
- Ballast Legislation
- National Power Grid
- Dark-Sky
- Energy Star
- Energy Policy Act
- California Energy Commission Title 24
- NEMA
- ISO 14000
- Energy Independence & Security Act of 2007



Products Healthcare Lighting

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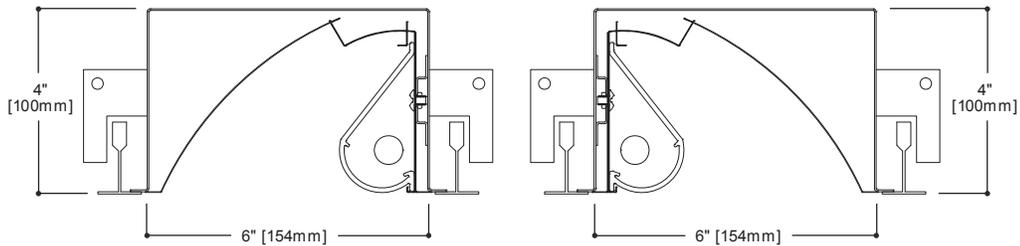


### I-Lume Exam Luminaire

- Unique, optical design provides focused, glare-free illumination
- Two 4' fixtures direct light asymmetrically minimizing shadows and positioning light exactly where needed
- Sealed, acrylic lens allows for easy cleaning
- Optional door available for completely sealed fixture needs
- Reflector uses high grade specular material for optical control
- Energy efficient design uses T5HO fluorescent lamps
- UL listed, CSA certified

### I-Lume Exam Luminaire

The I-Lume exam light provides high performance illumination in a compact, energy-efficient package. Designed around precision optics and T5HO lamp technology, the I-Lume offers powerful, focused light for examinations and procedures. Installed in pairs, its unique optical design directs light asymmetrically minimizing shadows and positioning light exactly where it is needed. The I-Lume is designed for use in healthcare facilities. Ideal for patient rooms, exam rooms and recovery areas.



### Ordering Information

SAMPLE NUMBER: MNE-48-T5HO-120V-G-EB51

<p><b>Product Family</b>                  MNE=Medical Narrow Exam (two fixtures)                  MNE-S=Medical Narrow Exam Single Fixture</p>	<p><b>Mounting</b>                  G=Grid 1" or 1-1/2" T-Grid                  F=Flange</p>	<p><b>Lamp Type</b>                  T5 Fluorescents                  254=(2) 54W Lamps                  154=(1) 54W Lamp (MNE-S only)</p>	<p><b>Voltage</b>                  120=120V                  277=277V                  347=347V                  UNV=120V through 277V</p>	<p><b>Ballast</b>                  EB51=T5HO                  EB52=T5HO                  D=Dimming Ballast</p>	<p><b>Options</b>                  EBP=Emergency Battery Pack<sup>2</sup>                  GLR=Fuse and Holder                  RIF=Radio Interference Filter<sup>3</sup>                  AM=Antimicrobial Finish</p>	<p><b>Accessories</b>                  MNE-GGD-4C=Grid Mount Door with Cable<sup>4</sup>                  MNE-GGD-4H=Grid Mount Door with Hinge<sup>4</sup>                  MNE-GGD-F-4C=Flange Mount Door with Cable<sup>4</sup>                  MNE-GGD-F-4H=Flange Mount Door with Hinge<sup>4</sup>                  (GGD's sold in pairs unless specified -S)</p>
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Notes: For additional options, consult your Cooper Lighting Representative. Specifications and dimensions subject to change without notice.

<sup>1</sup> Fixture and doors sold in pairs unless specified. <sup>2</sup> When choosing emergency battery pack, dedicated voltage must be specified. Battery pack installed in one of two fixtures. <sup>3</sup> RIF option adds 3/4" to height of fixture. <sup>4</sup> When ordering GGDs specify Grid Mount fixture.

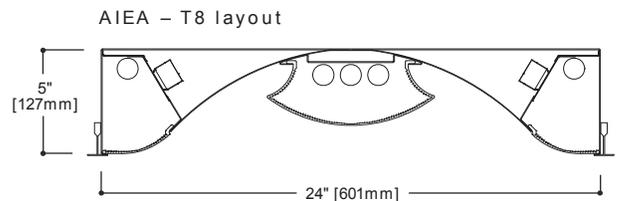
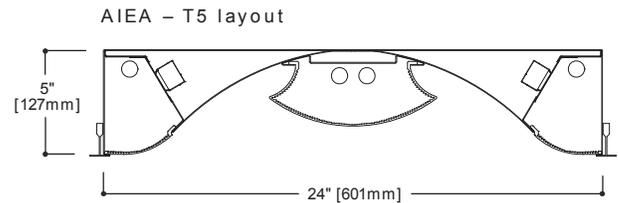
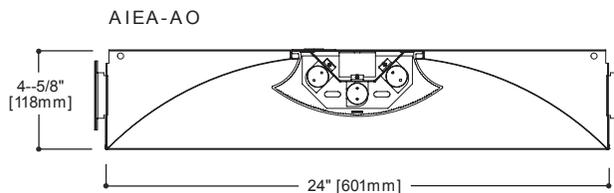


### AIEA Ambient/Exam Luminaire

- ☑ Unique optical design provides focused, glare-free illumination
- ☑ Energy-efficient design uses (4)T5HO or (5)T8 fluorescent lamps; Ambient only up to (3) lamps
- ☑ Sealed acrylic lenses for easy cleaning and maintenance
- ☑ Independent controls for exam and ambient functions
- ☑ 20 gauge steel housing offered in both 2' x 2' and 2' x 4' configurations
- ☑ Optional door available for completely sealed fixture needs
- ☑ UL listed, CSA certified

### AIEA Ambient/Exam Luminaire

This architectural, recessed patient room light offers both exam and ambient lighting in one streamlined fixture. The AIEA features innovative optical technology which provides powerful, focused illumination for examinations. It's unique design directs the light onto the bed and provides glare-free illumination for both the healthcare professional and patient. An architecturally styled design helps bring a relaxed, comfortable feel to any healthcare environment. Sealed lenses offer easy cleaning and maintenance.



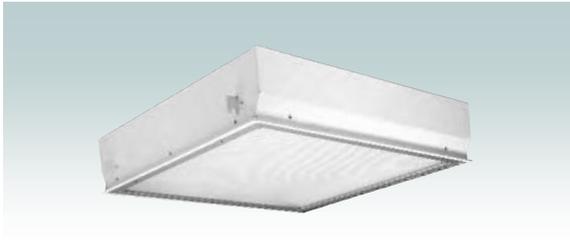
### Ordering Information

SAMPLE NUMBER: MAE-24-G-T5HO-120V-PR-EB52

<p><b>Product Family</b> MAE=Medical Ambient Exam Light</p>	<p><b>Lamp Type</b> 2' x 2' Width 424=(4) 24W T5 Lamps 517=(5) 17W T8 Lamps 2' x 4' Width 454=(4) 54W T5 Lamps 532=(5) 32W T8 Lamps Biaxial Fluorescents 440BX=(4) 40W Lamps 450BX=(4) 50W Lamps 455BX=(4) 55W Lamps</p>	<p><b>Lamp Shield - Ambient</b> Prismatic Acrylic Frost (Leave Blank) AC=Acrylic with Perforated Inlay</p>	<p><b>Options</b> LVCF=Low Voltage Controller EBP=Emergency Battery Pack<sup>1</sup> GLR=Fuse and Holder RIF=Radio Interference Filter AO=Ambient only (no side exam sections) AM=Antimicrobial Finish</p>	<p><b>Accessories</b> GGD-22H=Grid Mount 2' Hinged Door GGD-24H=Grid Mount 4' Hinged Door GGD-22C=Grid Mount 2' Cable Door GGD-24C=Grid Mount 4' Cable Door GGD-F-22H=Flange 2' Hinged Door GGD-F-24H=Flange 4' Hinged Door GGD-F-22C=Flange 2' Cable Door GGD-F-24C=Flange 4' Cable Door</p>
<p><b>Mounting</b> G=Grid 1" or 1-1/2" T-Grid F=Flange</p>	<p><b>Voltage</b> 120=120V 277=277V 347=347V UNV=120V through 277V</p>	<p><b>Ballast</b> EB52=(2)T5 EB82=(2)T8 D=Dimming</p>		

Notes: For additional options, consult your Cooper Lighting Representative. Specifications and dimensions subject to change without notice.

<sup>1</sup>When choosing emergency battery pack, dedicated voltage must be specified. Ambient lamp only. Not available in all configurations. Please consult factory. <sup>2</sup>Please specify dimming ballast preference.



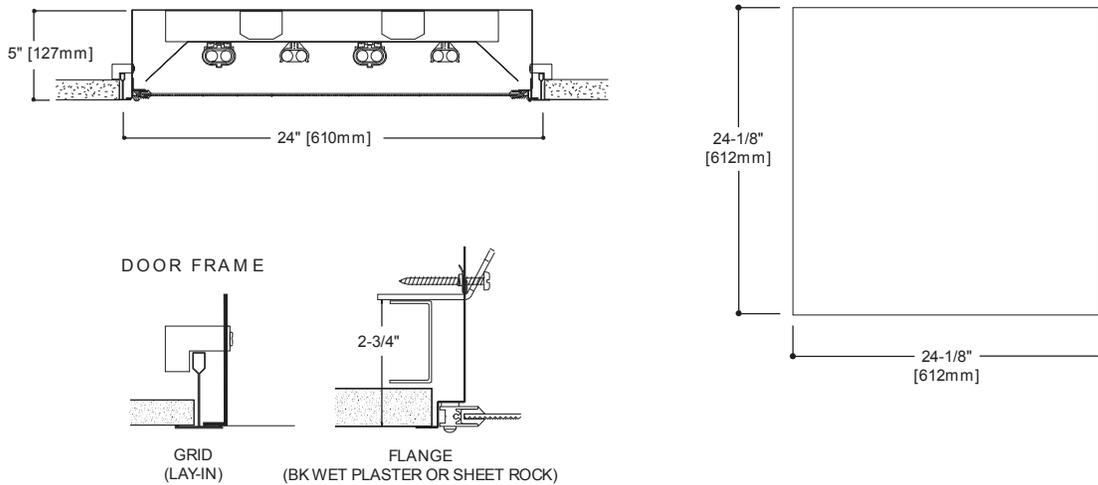
### MEX Recessed Examination Luminaire

- Die-formed, 20 ga. CRS housing contains no holes. Standard white polyester powder coat finish
- Fully gasketed, extruded aluminum, inset door
- Stainless steel screws
- Standard Class P CBM/ETL ballast
- Acrylic K-12 pattern with smooth side out for ease of cleaning
- UL listed, CSA certified

### MEX Recessed Examination Luminaire

The MEX examination luminaire offers precision focused illumination to the torso and extremities for accurate patient evaluation. It is the companion healthcare fixture to the MOR Series. Utilizing four 50 watt biaxial lamps and electronic ballasts, the MEX Series saves 20% of the energy produced by comparable 250 watt quartz units, offers safer and cooler operation without the need for timers, and provides six times longer lamp life.

LUMINAIRE CUT-OUT SECTION FOR MEX FLANGE FIXTURE



### Ordering Information

SAMPLE NUMBER: MEX-G-440BX-120-EBX2

<b>Product Family</b> MEX=Medical Examination Recessed Fluorescent Luminaire	<b>Ceiling Type</b> G=Grid F=Flange	<b>Lamp Type</b> Biaxial Fluorescents 440BX=(4) 40W Biaxial Lamps 450BX=(4) 50W Biaxial Lamps	<b>Voltage</b> 120=120V 277=277V 347=347V	<b>Ballast</b> EBX2=(2) Ballasts for use with biaxial lamps	<b>Options</b> EBP=Emergency Battery Pack FNL=Fluorescent Night Light (Lamp by others) LNL=LED Night Light (50,000 hrs ) provided by Cooper GLR=Fuse and Holder RIF=Radio Interference Filter
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Notes: For additional options, consult your Cooper Lighting Representative. Specifications and Dimensions subject to change without notice. Electronic ballast may cause interference with other electronic devices. If interference occurs, move the device away from the product or plug/connect into a different circuit/outlet.

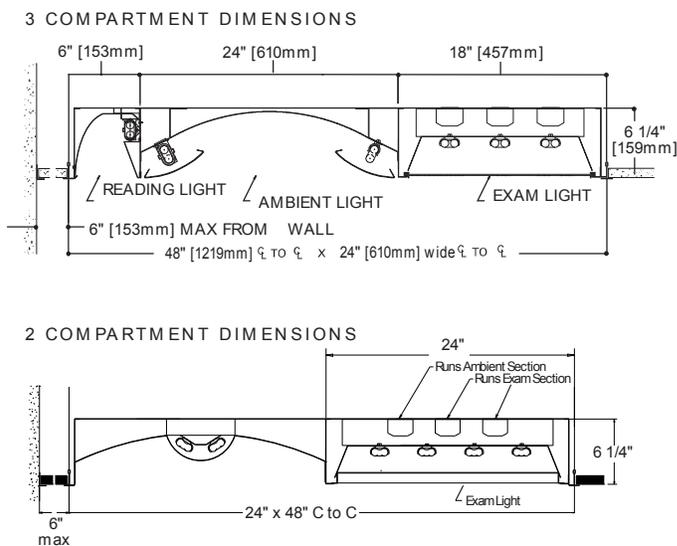


### MPR Patient Room Recessed Luminaire

- Recessed Grid or Flange, Ceiling Mount (supported from above)
- Standard, Class P, CBM/ETL Ballast, (3) circuit wiring
- Housing is Die-formed, 20 ga. cold rolled steel
- 20 gauge CRS housing formed fabricated for maximum strength and stability
- Each compartment is designed to provide a specific illumination function while allowing for commonality of branch circuit feeding
- High efficiency biaxial lamps provide excellent color rendering ability and high lumen output for nominal wattage draw
- Low gloss, electrostatically applied, baked white powder polyester finish
- UL listed, CSA certified

### MPR Patient Room Recessed Luminaire

The MPR removes all lighting elements from the walls, and incorporates them into a single 2 or 3 compartment patient room ceiling fixture. The sections provide independent task illumination: a patient reading light using (1) 40W biaxial lamp puts the light at the head of the bed for patient use; an ambient room light using (2) 40W biaxial lamps provides soft illumination via perforated wings while shielding direct source glare; and the examination light uses (3) 40W biaxial lamps and focuses high intensity illumination to the torso for maximum patient appraisal with minimal wattage consumption. The system is designed for one, two, or three feeds potentially reducing the overall installed cost. Also available for use with 50W biaxial lamps.

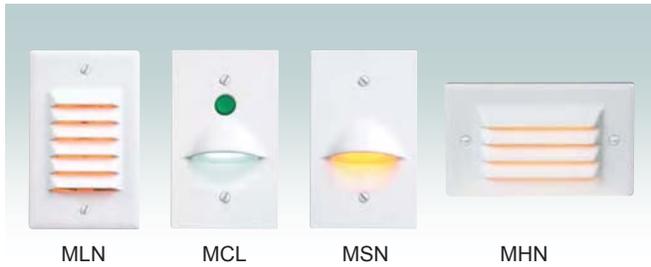


### Ordering Information

SAMPLE NUMBER: MPR2-G-640BX-120-EBX3

<p>Product Family MPR2=2 Compartment Medical Patient Room Recessed Luminaire Exam &amp; Ambient Section MPR= Standard 3 Compartment Medical Patient Room Recessed Luminaire Reading, Exam &amp; Ambient Section</p>	<p>Lamp Type Biaxial Fluorescents 640BX=(6) 40W Lamps 650BX=(6) 50W Lamps</p>	<p>Voltage 120=120V 277=277V 347=347V UNV=120V through 277V</p>	<p>Ambient Options If no option is chosen, then Standard 2 Basket Ambient will be provided SCPB=Single Perf Basket Centered SSCB=Single Sealed Lamp</p>	<p>Options EBP=Emergency Battery Pack FNL=Fluorescent Night Light (Lamp by others) LNL=LED Nightlight LVER=Louver 36 Cell Specular with Prismatic Acrylic Overlay (Exam section only) PBR=Parabolic 2-1/2" sq x 1-1/2" Deep Aluminum GLR=Fuse and Holder RIF=Radio Interference Filter LVRELAY=Low Voltage Relay</p>	<p>Accessories (order separately) MPR-GGD-1=Full Clear Poly Lens Door No Acrylic Over Exam Hinged Door<sup>2</sup> MPR-GGD-2=Two Compartment MPR (Lens Poly and Acrylic)<sup>2</sup> MPR-GGD-3=Three Compartment MPR Hinged Door (Lens Poly and Acrylic)<sup>2</sup></p>
<p>Ceiling Type G=Grid F=Flange S=Surface</p>		<p>Ballast EBX3=(3) Ballasts for use with biaxial lamps EBX4=(4) Ballasts for use with biaxial lamps<sup>1</sup></p>			

Notes: For additional options, consult your Cooper Lighting Representative. Specifications and dimensions subject to change without notice.  
<sup>1</sup> Required for 50BX lamps <sup>2</sup> Doors come with Phillips fasteners. This option will add 1-1/16" to the height of the fixture. Hinge is continuous piano hinge.



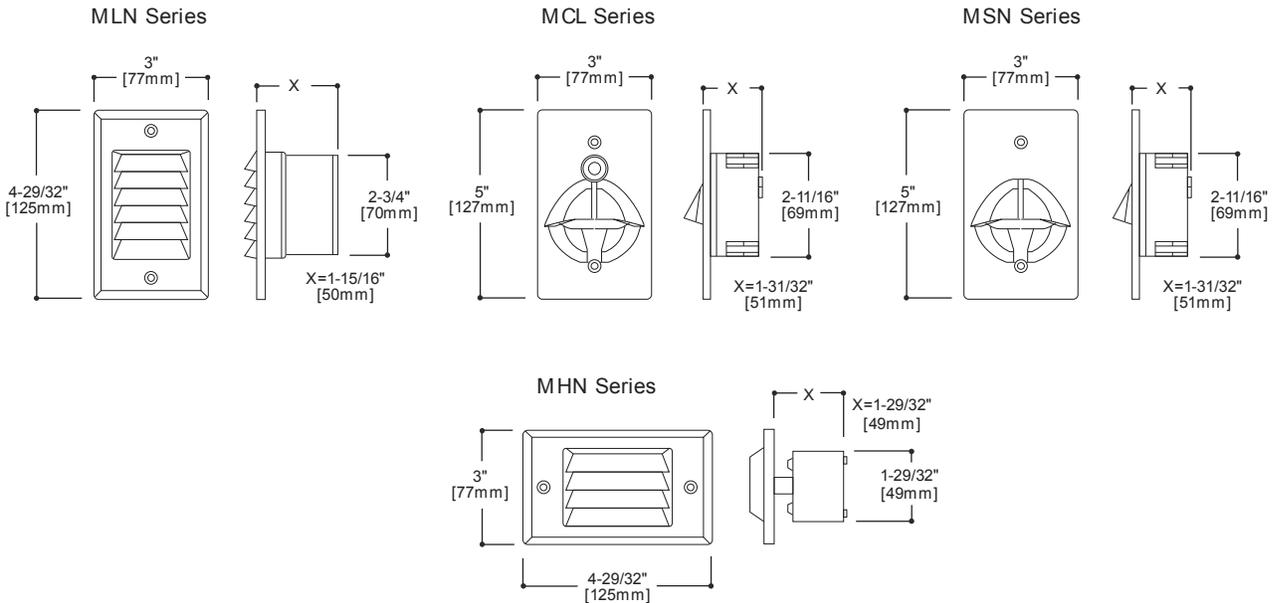
### Circadian Series Nightlights

This series of LED nightlights and chart lights bring soft, low level illumination to any healthcare environment. Fitting into a standard junction box for easy installation, the Circadian™ Series runs on 120V and offers up to 30 lumens of illumination. The MCL Chart Light has an illuminated, push button switch that can be used without disturbing the patient. Ideal for use in areas such as patient rooms, exam rooms, and corridors.

### Circadian Series Nightlights

- ☑ Energy-efficient LED light in white, amber and red colors
- ☑ Fits into standard 1900 junction box with 1-gang plaster ring for easy installation; runs on 120V\*
- ☑ Unique faceplate design distributes light evenly
- ☑ Aluminum louvered or scoop faceplates available; chart light available in scoop only
- ☑ Powerful illumination; 30 lumens for MSN and MCL models, 15 lumens for MLN model
- ☑ White painted faceplate is standard; black and brushed nickel paint options available
- ☑ Wet location and low voltage models available
- ☑ UL listed, CSA certified

\* For retrofit applications, check width, height and depth of existing box.



### Ordering Information

SAMPLE NUMBER: MSN-W-120-W

<p><b>Product Family</b>                  MSN= Medical Scoop Nightlight                  MLN= Medical Louver Nightlight<sup>1</sup>                  MCL= Medical Chart Light<sup>2</sup>                  MHN= Medical Horizontal Louver</p>	<p><b>LED Colors</b>                  W=White                  WW=Warm White<sup>3</sup>                  A=Amber                  R=Red</p>	<p><b>Voltage</b>                  120=120V*                  LV=12V-24V<sup>3</sup>                  * 120V standard (product ships with this voltage if not specified)</p>	<p><b>Faceplate Finish</b>                  W=White<sup>2</sup>                  B=Black                  BN=Brushed Nickel                  Custom Colors are available (specify or supply sample, requires a flat fee, consult customer service)</p>	<p><b>Options</b>                  WL=Wet Location                  PHC=Photocell (replaces on/off switch) MCL only</p>
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Notes: <sup>1</sup> Wet location standard on MLN series <sup>2</sup>MCL available in white LED and faceplate color only <sup>3</sup>Please allow 6-8 weeks for LV and warm white models  
 Specifications and dimensions subject to change without notice

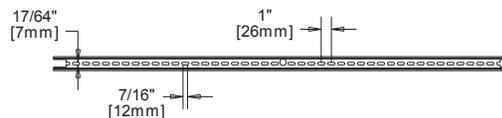
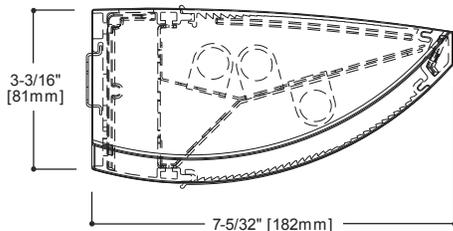


### Meditrine Series Bed Light

This architecturally styled wall mounted luminaire meets the demands of today's healthcare facilities. The Meditrine provides optimal reading and ambient light with specially designed optics. Its sleek, low profile design uses minimal wall space and helps enhance the look of any healthcare environment. A unique mounting system offers easy "no tool" installation and maintenance. The Meditrine is designed for use in healthcare facilities, specifically for use in patient rooms over beds to facilitate all tasks required by both patient and medical professional.

### Meditrine Series Bed Light

- ☑ Provides optimal reading and ambient light
- ☑ Low profile design uses minimal wall space
- ☑ Multi-position switching option for patient or facility control
- ☑ Unique "no-tool" mounting system for easy installation and maintenance
- ☑ High quality construction extruded aluminum housing with die cast aluminum end caps
- ☑ Both top and bottom smooth, prismatic acrylic lenses snap into place no tools required
- ☑ Designed for use with T5HO or T8 lamps
- ☑ UL listed, CSA certified



Din Rail used for Mounting Fixture Supplied by Cooper

### Ordering Information

SAMPLE NUMBER: MPBL-2/139-120-EB82-LVCP-MW

<b>Series</b> MPBL=Medical Patient Bed Light	<b>Lamp Type</b> <b>36" Nom Length</b> T5HO Fluorescents 2/139=(3) 39W Lamps 2 Up, 1 Down 1/139=(2) 39W Lamps 1 Up, 1 Down	<b>48" Nom Length</b> T5HO Fluorescents 2/154=(3) 54W Lamps 2 Up, 1 Down 1/154=(2) 54W Lamps 1 Up, 1 Down T8 Fluorescents 1/132=(2) 32W Lamps 1 Up, 1 Down 1/125=(2) 25W Lamps 1 Up, 1 Down	<b>Voltage</b> 120=120V 277=277V UNV=120V through 277V	<b>Ballast</b> (2 Electronic Ballasts are standard) EB52=T5 <sup>2</sup> EB82=T8 <sup>2</sup> D=Dimming Ballast <sup>2</sup>	<b>Options</b> LVCP=Low Voltage Controller <sup>1</sup> AM=Antimicrobial Paint GLR=Fuse and Holder PS4=Pull Chain <sup>3</sup> NRLL=White LED Nurse Chart Light – Left Side Mounted NRLR=White LED Nurse Chart Light – Right Side Mounted	<b>Finish Options</b> Matte White standard (if not specified, fixture ships with this color) IH=Almond Finish DP=Dark Platinum Custom Colors are available (specify or supply sample, requires a flat fee, consult customer service)
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Special Claims: When mounting, installer must verify fixture weight in selecting proper anchoring; when not anchoring directly to stud Refer to installation instructions

The depicted luminaire is not rated for hazardous locations or adverse environments. Illustrations and photographs depicted in this literature are representative examples only. Consult the appropriate certified and licensed lighting engineering and installation professionals for site-specific applications of products and codes.

Notes: <sup>1</sup> LVCP option only works with certain ballasts. Please consult factory if specific ballast is required. Not available with all options. <sup>2</sup> Maximum ballast dimensions are 1" height and 2" width. <sup>3</sup> 120V only. Specifications and dimensions subject to change without notice.



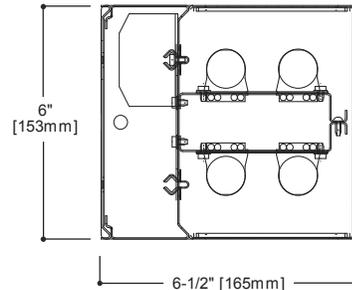
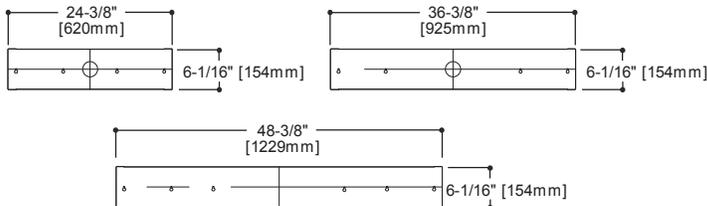
### MPWC Series Wall Mounted Luminaire

The MPWC series combines a multi-function, wall mounted fixture with contemporary styling. Through innovative features, the MPWC accommodates for multiple applications throughout the healthcare environment. One fixture supplies the patient room with task lighting for the room and offers practical solutions to the patient and medical staff for everyday tasks.

### MPWC Series Wall Mounted Luminaire

- 1 Lens is .125" thick, prismatic K12 pattern, acrylic lens is standard
- 2 Nickel-plated thumbscrews are standard (requires no tools to remove lens assembly)
- 3 Housing is 18 gauge, die-formed, cold rolled steel with seam-welded ends
- 4 MPWA uses T8 Linear Fluorescent and T5 HO Linear Fluorescent
- 5 Ballast options include T8 Electronic Instant Start, T5 Electronic Programmed Start and T8 Magnetic-HPF
- 6 High gloss white polyester powder coat finish is standard on exterior housing; interior reflector is high reflectance white
- 7 UL/CUL listed for damp locations

#### MOUNTING



### Ordering Information

SAMPLE NUMBER: MPWC-2/232-120-EB82-PS4-GCO-NRLL

<p><b>Series</b> MPWC= Medical Patient Wall Contemporary</p> <p><b>Lamp Type</b> 24" Nom Length T8 Fluorescents 1/ 117=(2) 17W Lamps 1 Up, 1 Down 1/ 217=(3) 17W Lamps 1 Up, 2 Down 2/ 117=(3) 17W Lamps 2 Up, 1 Down 2/ 217=(4) 17W Lamps 2 Up, 2 Down</p> <p>T5HO Fluorescents 1/ 124=(2) 24W Lamps 1 Up, 1 Down 1/ 224=(3) 24W Lamps 1 Up, 2 Down 2/ 124=(3) 24W Lamps 2 Up, 1 Down 2/ 224=(4) 24W Lamps 2 Up, 2 Down</p> <p><b>36" Nom Length</b> T8 Fluorescents 1/ 125=(2) 25W Lamps 1 Up, 1 Down 1/ 225=(3) 25W Lamps 1 Up, 2 Down 2/ 125=(3) 25W Lamps 2 Up, 1 Down 2/ 225=(4) 25W Lamps 2 Up, 2 Down</p> <p>T5HO Fluorescents 1/ 139=(2) 39W Lamps 1 Up, 1 Down 1/ 239=(3) 39W Lamps 1 Up, 2 Down 2/ 139=(3) 39W Lamps 2 Up, 1 Down 2/ 239=(4) 39W Lamps 2 Up, 2 Down</p>	<p><b>Voltage</b> 120=120V 277=277V 347=347V UNV=120V-277V</p>	<p><b>Ballast</b> 2 Electronic Ballasts are Standard EB82=T8 EB52=T5 LEOC8=Magnetic energy savings ballast (T8 only, min 2 per fixture)<sup>1</sup></p> <p><b>48" Nom Length</b> T8 Fluorescents 1/ 132=(2) 32W Lamps 1 Up, 1 Down 1/ 232=(3) 32W Lamps 1 Up, 2 Down 2/ 132=(3) 32W Lamps 2 Up, 1 Down 2/ 232=(4) 32W Lamps 2 Up, 2 Down</p> <p>T5HO Fluorescents 1/ 154=(2) 54W Lamps 1 Up, 1 Down 1/ 254=(3) 54W Lamps 1 Up, 2 Down 2/ 154=(3) 54W Lamps 2 Up, 1 Down 2/ 254=(4) 54W Lamps 2 Up, 2 Down</p>	<p><b>Switching Control Options</b> PICK ONE BELOW or (if no switching option is specified, fixture ships with leads left unwired for switch wiring completed in field)</p> <p>PS4=4 position pull chain<sup>2</sup></p> <p>PS1D=2 position pull chain (controls bottom lamp only, upper lamps on separate circuit)<sup>2</sup></p> <p>LVCP=Low voltage controller, patient controlled (patient controls all lamps)<sup>1</sup></p> <p>LVCF=Low voltage controller, facility controlled as needed<sup>1</sup></p>	<p><b>Options</b> EBP=Emergency battery pack<sup>1</sup> (no red, yellow, or green charge light will be provided) FNL=Fluorescent Night Light, 2-pin (G23 Base), 7 or 9W twin tube (Lamps by others) LNL=LED Night Light (50,000 hrs ) provided by Cooper GCO=Grounded Convenience Outlet, right side mounted facing unit<sup>2</sup> (Non Hospital Grade Only) GCOL=Grounded Convenience Outlet, left side mounted facing unit<sup>2</sup> GLR=Fuse and holder NRLR=White LED Nurse Chart Reading Light, right side mounted facing unit<sup>2</sup> NRLL=White LED Nurse Chart Reading Light, left side mounted facing unit<sup>2</sup> RIF=Radio Interference Filter For use with T8 magnetic ballast only (1 per ballast)<sup>1</sup> SFP=Machine Screws, Philips Head Natural Stainless Steel SF1=Tamper-proof Torx™-Head Fasteners DTP_ =Decorative Trim Panel (specify from choices available below or supply sample) Example: DTPBO=Decorative Trim Panel Bannister Oak BO=Bannister Oak WC=Wild Cherry LM=Limber Maple WM=Windsor Mahogany NT=Nepal Teak</p>	<p><b>Finish Options</b> (If not specified, fixture ships with standard high gloss white finish)</p> <p>MF=Metallic Finish DP=Dark Platinum IH=Almond Finish Custom Colors are available (specify or supply sample, requires a flat fee, consult customer service) SSN=Stainless Steel Natural (brushed finish) SSP=Stainless Steel Painted (Standard high gloss white or specify finish) (i.e SSP-DP)</p>
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Notes: For additional options, consult your Cooper Lighting Representative  
Special Claims: When mounting, installer must verify fixture weight in selecting proper anchoring; when not anchoring directly to stud Refer to installation instructions

The depicted luminaire is not rated for hazardous locations or adverse environments. Illustrations and photographs depicted in this literature are representative examples only. Consult the appropriate certified and licensed lighting engineering and installation professionals for site-specific applications of products and codes. Specifications and dimensions subject to change without notice

<sup>1</sup> Due to internal size limitations, some configurations and options are not available with other options. Consult customer service <sup>2</sup> 120V only

#### Accessories

(Order Separately)  
MBC=Momentary button cord switch May be used with LVCP or LVCF options to control lamps (See Switching Controls)  
VRSD=Tamper-proof TORX® -Head Screwdriver



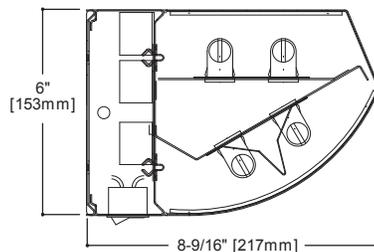
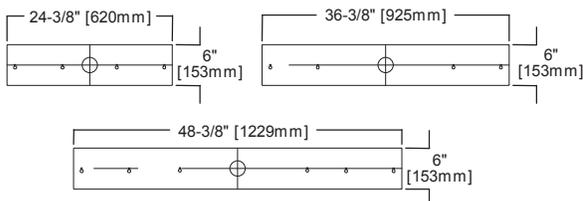
### MPWA Series Wall Mounted Luminaire

The MPWA series combines a multi-function, wall mounted luminaire with the architectural styling of today's healthcare environment. Through innovative features, the MPWA accommodates for multiple applications throughout the healthcare environment while offering an appealing design for all architectural tastes. The MPWA luminaire has been designed with the patient and healthcare professional in mind.

### MPWA Series Wall Mounted Luminaire

- Up light: .125" thick, prismatic K12 pattern, acrylic lens is standard;  
Down light: .125" thick, contoured drape formed, prismatic K12 pattern, acrylic lens is standard
- Nickel-plated thumbscrews are standard (requires no tools to remove lens assembly)
- Housing is 18 gauge, die-formed, cold rolled steel with seam-welded ends
- MPWA uses T8 Linear Fluorescent or T5 HO Linear Fluorescent
- Ballast options include T8 Electronic Instant Start, T5 Electronic Programmed Start and T8 Magnetic-HPF
- High gloss white polyester powder coat finish is standard on exterior housing, interior reflector is high reflectance white
- UL/CUL listed for damp locations

#### MOUNTING



### Ordering Information

SAMPLE NUMBER: MPWA-2/232-120-EB83-EXLL-PS4

<p><b>Series</b> MPWA = Medical Patient Wall Architectural</p>	<p><b>Voltage</b> 120=120V 277=277V 347=347V UNV=120V-277V</p>	<p><b>Ballast</b> 3 Electronic Ballasts are Standard  EB83=T8 EB53=T5  LEOC8=Magnetic energy savings ballast (T8 only, min 3 per fixture)<sup>1</sup></p>	<p><b>Switching Control Options</b> PICK ONE BELOW or (if no switching option is specified, fixture ships with leads left unwired for switch wiring completed in field)</p> <p>PS4=4 position pull chain<sup>2</sup></p> <p>PS1D=2 position pull chain (controls bottom lamp only, upper lamps on separate circuit)<sup>2</sup></p> <p>LVCP=Low voltage controller, patient controlled (patient controls all lamps)<sup>1</sup></p> <p>LVCF=Low voltage controller, facility controlled as needed<sup>1</sup></p>	<p><b>Options</b> EBP=Emergency battery pack<sup>1</sup> (no red, yellow, or green charge light will be provided) FNL=Fluorescent Night Light, 2-pin (G23 Base), 7 or 9w twin tube (Lamps by others) LNL=LED Night Light (50,000 hrs) provided by Cooper GCO=Grounded Convenience Outlet, right side mounted facing unit<sup>2</sup> (Non Hospital Grade Only) GCOL=Grounded Convenience Outlet, left side mounted facing unit<sup>2</sup> GLR=Fuse and holder NRLR=White LED Nurse Chart Reading Light, right side mounted facing unit<sup>2</sup> NRLL=White LED Nurse Chart Reading Light, left side mounted facing unit<sup>2</sup> RIF=Radio Interference Filter For use with T8 magnetic ballast only (1 per ballast)<sup>1</sup> SFP=Machine Screws, Philips Head Natural Stainless Steel SF1=Tamper-proof Torx™-Head Fasteners AM=Antimicrobial Paint</p>	<p><b>Finish Options</b> (If not specified, fixture ships with standard white finish) MF=Metallic Finish DP=Dark Platinum IH=Almond Finish Custom Colors are available (specify or supply sample, requires a flat fee, consult customer service) SSN=Stainless Steel Natural (brushed finish) SSP=Stainless Steel Painted (Standard high gloss white or specify finish) (i.e. SSP-DP)</p>
<p><b>Lamp Type</b> <u>24" Nom Length</u> T8 Fluorescents 1/217=(3) 17W Lamps 1 Up, 2 Down 2/217=(4) 17W Lamps 2 Up, 2 Down  T5HO Fluorescents 1/224=(3) 24W Lamps 1 Up, 2 Down 2/224=(4) 24W Lamps 2 Up, 2 Down  <u>36" Nom Length</u> T8 Fluorescents 1/225=(3) 25W Lamps 1 Up, 2 Down 2/225=(4) 25W Lamps 2 Up, 2 Down  T5HO Fluorescents 1/239=(3) 39W Lamps 1 Up, 2 Down 2/239=(4) 39W Lamps 2 Up, 2 Down  <u>48" Nom Length</u> T8 Fluorescents 1/232=(3) 32W Lamps 1 Up, 2 Down 2/232=(4) 32W Lamps 2 Up, 2 Down  T5HO Fluorescents 1/254=(3) 54W Lamps 1 Up, 2 Down 2/254=(4) 54W Lamps 2 Up, 2 Down</p>	<p><b>Exam Light</b> EXLR=Exam Light, Switch Right Side Mounted Facing Unit EXLL=Exam Light, Switch Left Side Mounted Facing Unit</p>	<p><b>Accessories</b> (Order Separately) MBC=Momentary button cord switch May be used with LVCP or LVCF options to control lamps (See Switching Controls) VRSD=Tamper-proof TORX® -Head Screwdriver</p>			

Notes: For additional options, consult your Cooper Lighting Representative  
Special Claims: When mounting, installer must verify fixture weight in selecting proper anchoring; when not anchoring directly to stud. Refer to installation instructions

The depicted luminaire is not rated for hazardous locations or adverse environments. Illustrations and photographs depicted in this literature are representative examples only. Consult the appropriate certified and licensed lighting engineering and installation professionals for site-specific applications of products and codes. Specifications and dimensions subject to change without notice

<sup>1</sup> Due to internal size limitations, some configurations and options are not available with other options. Consult customer service. <sup>2</sup> 120V only

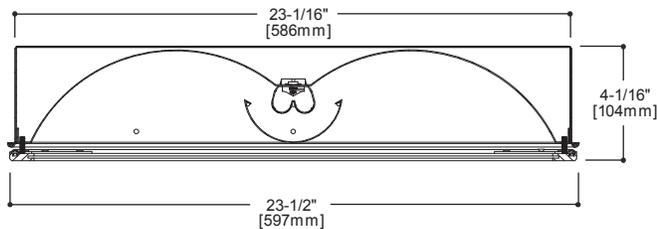


### SGI Series Sealed Indirect Fluorescent

The SGI Series meets the requirements for an architecturally styled, completely sealed indirect luminaire. For use in horizontal applications, the enclosed and gasketed housing, and one-piece door protects against infiltration of airborne bacteria. The die formed edges on the door frame, and the single stamped housing together prevent airborne bacteria from entering the fixture and plenum. Applications include patient rooms, hallways, exam and critical care areas.

### SGI Series Sealed Indirect Fluorescent

- Architectural design with perforated center basket provides soft indirect illumination
- Enclosed housing and door protect against infiltration of airborne bacteria
- Completely sealed luminaire is IP65 rated
- Designed for easy cleaning
- Manufactured in accordance with U.S.D.A., F.D.A., N.S.F. and Federal Standard 209E is standard
- UL listed, CSA certified



### Ordering Information

SAMPLE NUMBER: SGI-G-254-277-CA12-EB51-GLR

<p><b>Series</b> SGI=Indirect Fluorescent</p>	<p><b>Ceiling</b> G=Grid F=Flange</p>	<p><b>Lamp Type</b> <u>2' Fixture Length</u> T5 Fluorescents 214=(2) 14W Lamps 314=(3) 14W Lamps 217=(2) 17W Lamps 317=(3) 17W Lamps T5HO Fluorescents 224=(2) 24W Lamps 324=(3) 24W Lamps T8 Fluorescents 217=(2) 17W Lamps <u>4' Fixture Length</u> T5 Fluorescents 228=(2) 28W Lamps 328=(3) 28W Lamps T5 Fluorescents 254=(2) 54W Lamps 354=(3) 54W Lamps T8 Fluorescents 232=(2) 32W Lamps</p>	<p><b>Voltage</b> 120=120V 277=277V UNV=120V-277V</p> <p><b>Lens Type</b> CA08=Clear Acrylic 085 CP08=Clear Polycarbonate 085</p>	<p><b>Electronic Ballast</b> EB51=(1) Ballast for use with T5 Lamp EB52=(2) Ballasts for use with T5 Lamp EB81=(1) Ballast for use with T8 Lamp EB82=(2) Ballasts for use with T8 Lamp</p>	<p><b>Options</b> EBP=Emergency Battery Pack<sup>3</sup> GLR=Fuse and Holder RIF=Radio Frequency Interference Filter AM=Antimicrobial Finish</p>
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Notes: For additional options please consult Cooper Lighting Representative. Specifications and Dimensions are subject to change without notice. Electronic ballast may cause interference with other electronic devices. If interference occurs, move the device away from the product or plug/connect into a different circuit/outlet. <sup>1</sup> For specific electronic ballast, specify brand and catalog number. <sup>2</sup> Consult your Cooper Lighting Representative for dimensional details. <sup>3</sup> When choosing EBP option, dedicated voltage must be specified. Not available in all configurations. Please consult factory.

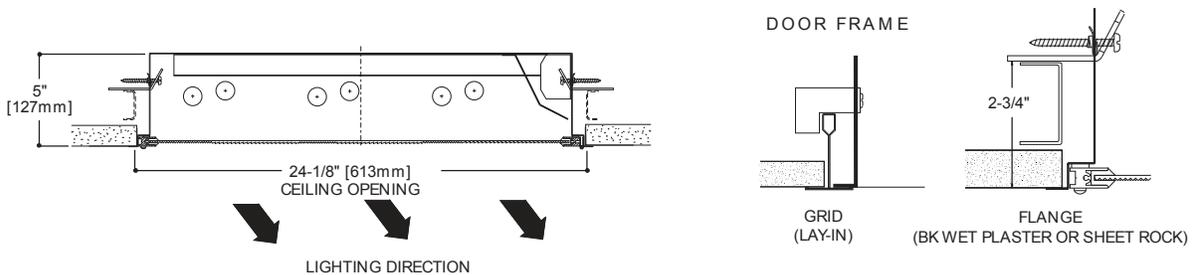


### MOR Series Surgical Luminaires

Fail-Safe's development of the asymmetric/symmetric MOR Series represents the latest technology in precise control of light to the surgical task and to the surrounding area, and allows multi-level lighting without changing the character of the lighting distribution. The MOR's high efficiency and precise lighting distribution delivers higher illumination to the surgical task area than similar luminaires, thus requiring less energy to achieve comparable illumination results. Quality and value are maintained to provide the best performance and the most cost effective solution for your design needs.

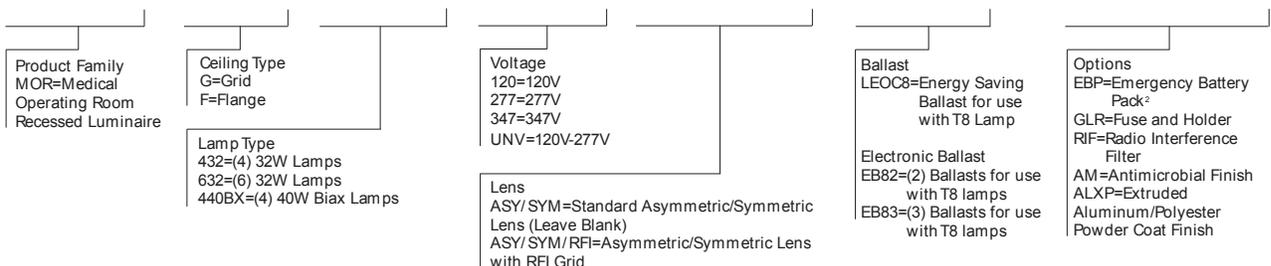
### MOR Series Surgical Luminaires

- 1 Surgical luminaire provides task and perimeter lighting for operating rooms
- 1 130" min. one piece injection molded UV stabilized polycarbonate lens
- 1 Four recessed stainless steel TORX® screws with center pin reject
- 1 16 ga. CRS reflector with white high reflectance polyester powder coat finish
- 1 Optional cast aluminum SCE Housing with black polyester powder coat finish available
- 1 One piece die-cut closed cell EPDM mounting gaskets seal entire lens and housing
- 1 Meets MIL-STD 461E for control of radiated and conducted EMI
- 1 UL listed, CSA certified



### Ordering Information

SAMPLE NUMBER: MOR-F-632-120-EB82



Notes: For additional options, consult your Cooper Lighting Representative. Specifications and Dimensions subject to change without notice. <sup>1</sup>Drawing of layout must be provided to Cooper for proper flange configuration. <sup>2</sup>When choosing EBP option, dedicated voltage must be specified. Not available in all configurations. Please consult factory.

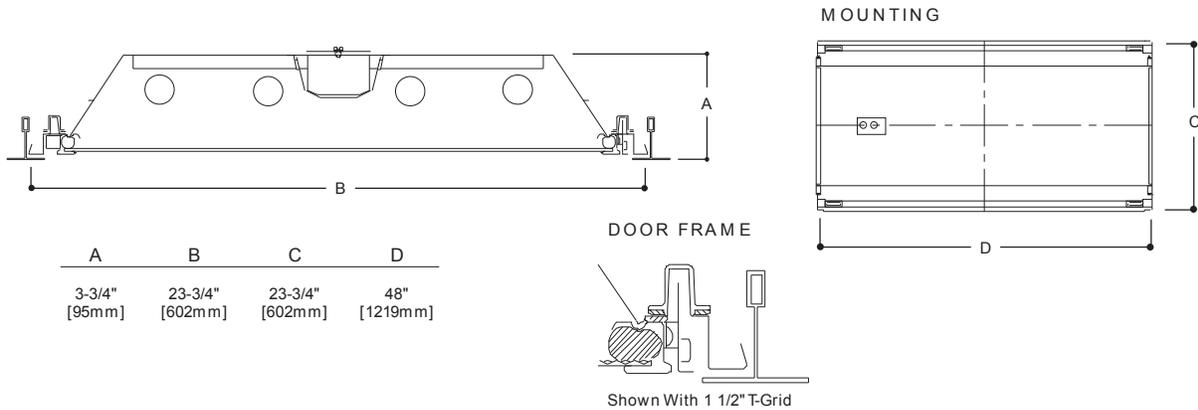


### CFD Series Cleanroom Troffers

The Fail-Safe CFD Series Cleanroom Troffer is enclosed and gasketed to maintain ceiling integrity and protect against infiltration of particles and airborne bacteria. The housing and door are designed to work with 1" and 1-1/2" inverted T-Grid ceilings. The sealed, hole-free housing prevents air exchange between the fixture and plenum and allows relamping without contamination of clean areas. Dedicated to today's T8 lamp technology, these luminaires are U.L. listed and C.S.A. certified for wet locations for covered ceiling applications and are manufactured in accordance with U.S.D.A., F.D.A., and Federal Standard 209E. Suitable for use in I.E.S. Class 1,000, 10,000 and 100,000 clean room environments.

### CFD Series Cleanroom Troffers

- Nominal 3-3/4" deep recessed housing consists of one-piece, code gauge, prime cold rolled steel. The hole-free embossed housing has full length die formed stiffeners for added strength. End plates are securely attached and completely sealed housing also has full length die formed stiffeners.
- Standard Class F, CBM/ETL ballast
- Electrostatically applied baked white polyester powder enamel finish. Minimum reflectance 90%. Multistage cleaning cycle, iron phosphate coating with rust inhibitor
- Die formed, heavy gauge, extruded aluminum door with reinforced corners and baked white enamel finish
- Lens retained by one piece continuous gasket secured into door frame-creating an environmental seal
- Positive cam action spring loaded, self-locking, black steel latches. Safety-lock hinges allow hinging and latching on either side
- One piece continuous gasket surrounds perimeter of lens and seals lens to door frame. Additional gasketing seals door to housing
- UL listed, CSA certified



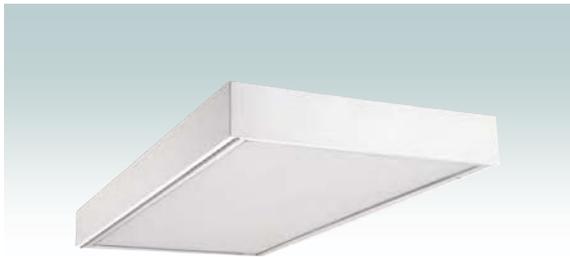
### Ordering Information

SAMPLE NUMBER: CFDSF-432A-120-EB81-EL4-U

<p><b>Series</b> CFD= Fluorescent Grid (Additional Models on the web)</p> <p><b>Door Frame</b> FA=Flat White Extruded Aluminum Door</p> <p><b>Number of Lamps</b> 2, 3 or 4 Lamps (Not included)</p> <p><b>Wattage (Length)</b> 32=32W T8 (48")</p>	<p><b>Lamp Type</b> A=#12 Pattern Acrylic A125=#12 Pattern Acrylic (125" Thick) A19/156=#19 Pattern Acrylic (156" Thick) KSH25¹ =Bat Wing Distribution POLY12/125=#12 Pattern Polycarbonate (125" Thick)</p> <p><b>Voltage</b> 120=120V 277=277V 347=347V UNV=120V-277V</p>	<p><b>Ballast Type</b> LEOC8= Energy Saving Ballast (T8 Lamp Only) EB81= (1) Generic Electronic Ballast EB82= (2) Generic Electronic Ballast</p> <p>(For Specific Electronic Ballast Specify Brand and Catalog Number)</p>	<p><b>Options (add as suffix)</b> GL=Internal Single Element Fusing EL4=Emergency Lighting (Self-Contained) RIF1=Radio Interference Suppressor EQ=T-BAR Safety Earthquake Clips PSI=200 PSI Hose Down Rating</p>	<p><b>Accessories (Order Separately)</b> EQ-Clip-U= Safety Earthquake Clips</p>
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Notes: For additional options, consult your Cooper Lighting Representative. Specifications and Dimensions subject to change without notice. Electronic ballast may cause interference with other electronic devices. If interference occurs, move the device away from the product or plug/connect into a different circuit/outlet.

¹ The KSH25 provides improved visual performance and wide angle distribution. This lens has an integral prism pattern designed so that prisms face the lamp cavity and still supply superior photometrics. Highly recommended for all high tech manufacturing environments.

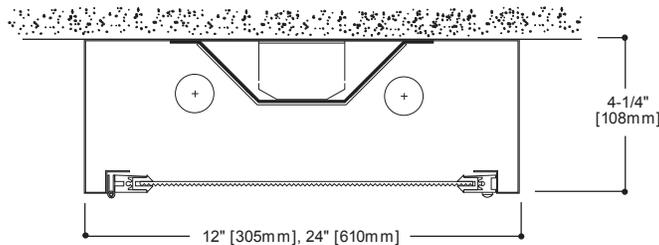


### MSM Series Medical Surface Mount

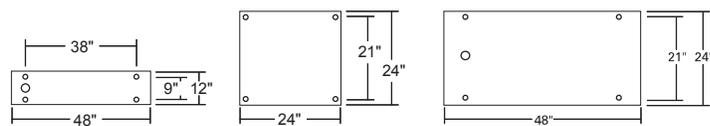
- ☑ Standard Class P, CBW/ETL ballast
- ☑ Housing is constructed of 20 ga. cold rolled steel
- ☑ Baked on low gloss white powder coated polyester-epoxy
- ☑ Lamps by Others
- ☑ Shielding options available include IK12 lexan prismatic lens, 93 tempered glass lens, and KSH25 acrylic prismatic lens
- ☑ UL listed, CSA certified

### MSM Series Medical Surface Mount

Enclosed and gasketed, rugged construction and three especially selected shielding elements make this fixture ideally suited for use in various types of public areas. The housing is a completely, enclosed steel chamber. The door is heavy gauge extruded aluminum with mitered corners. The door has a continuous aluminum piano hinge and tamper proof fasteners. The door and shielding are completely gasketed for minimum maintenance. Fixtures are installed as individual or continuous runs.



#### MOUNTING



#### LEGEND

- 7/8" DIA. K.O.
- 3/8" DIA. K.O.
- 11/16" x 2" K.O.
- ≡ TRIPLE 11/16" x 2" K.O.

### Ordering Information

SAMPLE NUMBER: MSM-24-228-277-93-EB82-RIF

<b>Series</b> MSM= Medical Surface Mount	<b>Width</b> 12=1' width (2 Lamps Max) 24=2' width	<b>Number of Lamps</b> 2= 2 Lamps 4= 4 Lamps	<b>Wattage</b> 2' Length 14=14W T5 Lamp 17=17W T8 Lamp 24=24W T5HO Lamp (2 Max for 1' width) (3 Max for 2' width)  4' Length 28=28W T5 Lamp 32=32W T8 Lamp 54=54W T5HO Lamp	<b>Voltage</b> 120=120V 277=277V 347=347V UNV=120V-277V	<b>Lens Type</b> IK12=K-12 Prismatic Acrylic IP12=K-12 Prismatic Polycarbonate KSH25=Bat Wing Distribution 93=Prismatic Tempered Glass	<b>Ballast</b> EB81=(1) Ballast for use with T8 Lamp EB82=(2) Ballasts for use with T8 Lamp EB51=(1) Ballast for use with T5 Lamp EB52=(2) Ballasts for use with T5 Lamp	<b>Options</b> EBP=Emergency Battery Pack <sup>1</sup> GLR=Fuse and Holder RIF=Radio Frequency Interference Filter FNL=Fluorescent Night Light, 2 pin (G23 Base), 7 or 9W twin tube (Lamps by others) LNL=LED Night Light (50,000 hrs) provided by Cooper
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Notes: <sup>1</sup>When choosing EBP option, dedicated voltage must be specified. Not available in all configurations. Please consult factory. For additional options, consult your Cooper Lighting Representative. Specifications and dimensions subject to change without notice.

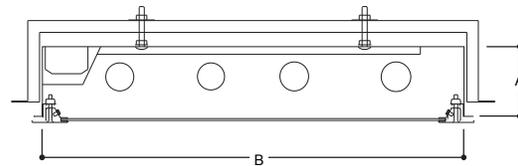


### MAF Series Fluorescent Flange

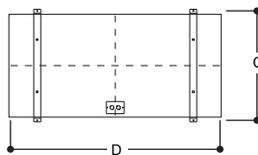
The Fail-Safe MAF Series is designed for use in horizontal or non-laminar air flow clean rooms. The enclosed and gasketed housing and one-piece, outside flanged door protect against infiltration of airborne bacteria. The die formed edges on the door frame and the hole-free design of the housing prevent air exchange between the fixture and plenum, allowing relamping without contamination of the clean areas. These luminaires are U.L. listed and C.S.A. certified for wet locations and are manufactured in accordance with U.S.D.A., F.D.A., N.S.F. and Federal Standard 209E. The MAF Series is suitable for use in I.E.S. Class 100, 1,000, 10,000 and 100,000 clean room environments.

### MAF Series Fluorescent Flange

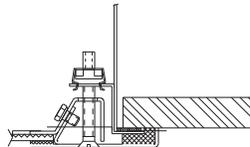
- ☑ Rated for high pressure hose down at 200 PSI
- ☑ Flush mounted, stainless steel machine screws
- ☑ Die-formed, 20 ga. CRS housing with tightly butted and seam welded, sealed end caps. Contains no holes that would allow air passage. Standard white high reflectance polyester powder coat finish
- ☑ Unique, Particulock™ lens retention system utilizes continuous, 18 ga. media dampdowns
- ☑ Two braided, stainless steel cables on one side of door provide hinging
- ☑ One-piece, 18 ga, fully gasketed, outside flanged door
- ☑ Standard Class P, CBM/ETL ballast
- ☑ White, closed cell, Flexiseal™ gasketing system
- ☑ Gasketed access plate with two flattened, 7/8" diameter knockouts
- ☑ UL listed, CSA certified



CEILING OPENING



DOOR FRAME



	A	B	C	D
MAF 1'x 4'	4" (102mm)	10 3/4" (273mm)	11 1/16" (281mm)	48 5/16" (1227mm)
MAF 2'x 2'	3 3/4" (95mm)	22 11/16" (576mm)	23 1/16" (586mm)	24 5/16" (617mm)
MAF 2'x 4'	3 3/4" (95mm)	22 11/16" (576mm)	23 1/16" (586mm)	48 5/16" (617mm)

### Ordering Information

SAMPLE NUMBER: MAF-24-632-277-ASY/SYM-EB82-GLR

<p><b>Product Family</b> MAF=Medical Asymmetric/Symmetric Fluorescent Flange</p> <p><b>Width</b> 12=12" 24=24"</p> <p><b>Lamp Type</b> 2' Fixture Length T8 Fluorescents 117=(1) 17W Lamp 217=(2) 17W Lamps 317=(3) 17W Lamps 417=(4) 17W Lamps T12 Fluorescents 120=(1) 20W Lamp 220=(2) 20W Lamps 320=(3) 20W Lamps 420=(4) 20W Lamps U Lamps 2U 1 5/8=(2) 31WT8 Lamps 3U 1 5/8=(3) 31WT8 Lamps 2U6T8=(2) 32WT8 Lamps 2U6=(2) 40WT12Lamps Biaxial Fluorescents 140BX=(1) 40W Lamp 240BX=(2) 40W Lamps 340BX=(3) 40W Lamps</p>	<p><b>Voltage<sup>3</sup></b> 120=120V 277=277V 347=347V UNV=120V-277V</p>	<p><b>Lens Type</b> IK12=K-12 Prismatic Acrylic IP12=K-12 Prismatic Polycarbonate KSH25<sup>1</sup>=Bat Wing Distribution ASY/SYM=Asymmetric / Symmetric Lens ASY/SYM/RFI=Asymmetric / Symmetric Lens with RFI grid</p>	<p><b>Ballast</b> LE3=Energy Saving Ballast for use with T12 lamp Electronic Ballast<sup>2,4</sup> EB81=(1) Ballast for use with T8 Lamp EB82=(2) Ballasts for use with T8 Lamp EB21=(1) Ballast for use with T12 Lamp EB22=(2) Ballasts for use with T12 Lamp EBX1=(1) Ballast for use with Biaxial Lamp EBX2=(2) Ballasts for use with Biaxial Lamp</p> <p><small>NOTE: Electronic ballast not recommended for surgical suites. Electronic ballast will nullify all RFI shielding. Please specify LE3 or LEOC8 ballast option.</small></p>	<p><b>Door/Finish Options</b> Blank=Standard, CRS with baked white finish SSN=Stainless Steel Door/Brushed 304 Finish SSP=Stainless Steel Door/Polyester Powder Coat Finish ALXP=Extruded Aluminum/Polyester Powder Coat Finish ALP=Formed Aluminum/Polyester Powder Coat Finish ALX=Extruded Aluminum/Anodized</p>	<p><b>Options</b> EBP=Emergency Battery Pack<sup>5</sup> GLR=Fuse and Holder RIF=Radio Frequency Interference Filter Housing Options SHN=Stainless Steel, Brushed 304 Finish SHP=Stainless Steel, Polyester Powder Finish ALH=Aluminum, Polyester Powder Finish</p>
<p><b>Accessories (Order Separately)</b> MFCF12-2FT=2FT Mounting Frame MFCF12-4FT=4FT Mounting Frame MFCF24-2FT=2FT Mounting Frame MFCF24-4FT=4FT Mounting Frame</p>					

Notes: For additional options, consult your Cooper Lighting Representative. Specifications and Dimensions subject to change without notice. Electronic ballast may cause interference with other electronic devices. If interference occurs move the device away from the product or plug/connect into a different circuit/outlet.

<sup>1</sup> The KSH25 provides improved visual performance and wide angle distribution. This lens has an integral prism pattern designed so that prisms face the lamp cavity and still supply superior photometrics. Highly recommended for all high tech manufacturing environments. <sup>2</sup> For specific electronic ballast, specify brand and catalog number. <sup>3</sup> Products available in non-US voltages and 50 Hz for international markets. Consult your Cooper Lighting Representative for availability and ordering information. <sup>4</sup> Electronic ballast not available with 20W lamps. <sup>5</sup> When choosing EBP option, dedicated voltage must be specified. Not available in all configurations. Please consult factory.

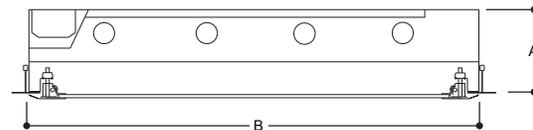


## MAG Series Fluorescent Grid

The Fail-Safe MAG Series is designed for use in horizontal or non-laminar air flow clean rooms. The enclosed and gasketed housing and one-piece, outside door frame protect against infiltration of particles and airborne bacteria. The housing and door are designed to work with standard 1" and 1 1/2" T-grid ceilings and most 2" T-grid ceilings. Door frames feature a gasket design which eliminates ledge or crevice exposure preventing the harboring of contaminants. The MAG Series sealed, hole-free housing prevents air exchange between the fixture and plenum and allows relamping without contamination of clean areas. These luminaires are U.L. listed and C.S.A. certified for wet locations and are manufactured in accordance with U.S.D.A., F.D.A., N.S.F. and Federal Standard 209E

## MAG Series Fluorescent Grid

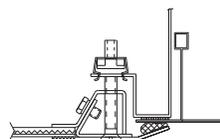
- ☑ Rated for high pressure hose down at 200 PSI
- ☑ Flush mounted, stainless steel machine screws
- ☑ Die-formed, 20 ga. CRS housing contains no holes. Standard white high reflectance polyester powder coat finish
- ☑ Unique, Particulock™ lens retention system utilizes continuous, 18 ga. media dampdowns
- ☑ Two braided, stainless steel cables on one side of door provide hinging.
- ☑ One-piece, 18 ga., fully gasketed, outside door with die-formed and beveled edges
- ☑ Standard Class P, CBW/ETL ballast
- ☑ White, closed cell, Flexiseal™ gasketing system
- ☑ UL listed, CSA certified



CEILING OPENING



DOOR FRAME



SHOWN WITH  
1 1/2" T-GRID

	A	B	C
MAG 1' x 4'	4 3/8" (135mm)	11 11/16" (297mm)	48" (1219mm)
MAG 2' x 2'	4 5/16" (110mm)	23 11/16" (602mm)	24" (602mm)
MAG 2' x 4'	4 5/16" (110mm)	23 11/16" (602mm)	48" (1219mm)

## Ordering Information

SAMPLE NUMBER: MAG-24-632-277-ASY/SYM-EB82-GLR

<p><b>Product Family</b> MAG=Medical Asymmetric/ Symmetric Fluorescent Grid</p>	<p><b>Voltage<sup>1</sup></b> 120=120V 277=277V 347=347V UNV=120V- 277V</p>	<p><b>Lens Type</b> IK12=K-12 Prismatic Acrylic IP12=K-12 Prismatic Polycarbonate KSH25<sup>5</sup>=Bat Wing Distribution) ASY/ SYM= Asymmetric/sym metric lens ASY/ SYM/ RFI= Asymmetric/sym metric lens with RFI grid</p>	<p><b>Ballast</b> LE3=Energy Saving Ballast for use with T12 Lamp</p> <p><b>Electronic Ballast<sup>2, 4</sup></b> EB81=(1) Ballast for use with T8 Lamp EB82=(2) Ballasts for use with T8 Lamp EB21=(1) Ballast for use with T12 Lamp EB22=(2) Ballasts for use with T12 Lamp EBX1=(1) Ballast for use with Biaxial Lamp EBX2=(2) Ballasts for use with Biaxial Lamp</p>	<p><b>Door/Finish Options</b> Blank=Standard, CRS with baked white finish SSN=Stainless Steel Door/ Brushed 304 Finish SSP=Stainless Steel Door/ Polyester Powder Coat Finish ALXP=Extruded Aluminum/Polyester Powder Coat Finish ALP=Formed Aluminum/Polyester Powder Coat Finish ALX=Extruded Aluminum/Anodized</p>	<p><b>Options</b> EBP=Emergency Battery Pack<sup>5</sup> GLR=Fuse and Holder RFI=Radio Frequency Interference Filter</p> <p><b>Housing Options</b> SHN=Stainless Steel, Brushed 304 Finish SHP=Stainless Steel, Polyester Powder Finish ALH= Aluminum, Polyester Powder Finish</p>
<p><b>Width</b> 12=12" 24=24"</p>	<p><b>Lamp Type</b> 24" Fixture Length T8 Fluorescents 117=(1) 17W Lamp 217=(2) 17W Lamps 317=(3) 17W Lamps 417=(4) 17W Lamps</p> <p>T12 Fluorescents 120=(1) 20W Lamp 220=(2) 20W Lamps 320=(3) 20W Lamps 420=(4) 20W Lamps</p> <p>U Lamps 2U 1 5/8=(2)31WT8 Lamps 3U 1 5/8=(3) 31WT8 Lamps 2U6T8=(2)32WT8 Lamps 2U6=(2)40WT12Lamps</p>	<p><b>Biaxial Fluorescents</b> 140BX=(1) 40W Lamp 240BX=(2) 40W Lamps 340BX=(3) 40W Lamps</p> <p><b>48" Fixture Length</b> T8 Fluorescents 132=(1) 32W Lamp 232=(2) 32W Lamps 332=(3) 32W Lamps 432=(4) 32W Lamps 632=(6) 32W Lamps</p> <p><b>T12 Fluorescents</b> 140=(1) 40W Lamp 240=(2) 40W Lamps 340=(3) 40W Lamps 440=(4) 40W Lamps</p>	<p><b>NOTE:</b> Electronic ballast not recommended for surgical suites. Electronic ballast will nullify all RFI shielding. Please specify LE3 or LEOC8 ballast option.</p>	<p><b>Notes:</b> For additional options, consult your Cooper Lighting Representative. Specifications and Dimensions subject to change without notice. Electronic ballast may cause interference with other electronic devices. If interference occurs move the device away from the product or plug/connect into a different circuit/outlet.</p>	<p><sup>1</sup> The KSH25 provides improved visual performance and wide angle distribution. This lens has an integral prism pattern designed so that prisms face the lamp cavity and still supply superior photometrics. Highly recommended for all high tech manufacturing environments. <sup>2</sup> For specific electronic ballast, specify brand and catalog number. <sup>3</sup> Products available in non-US voltages and 50 Hz for international markets. Consult your Cooper Lighting Representative for availability and ordering information. <sup>4</sup> Electronic ballast not available with 20W lamps. <sup>5</sup> When choosing EBP option, dedicated voltage must be specified. Not available in all configurations. Please consult factory.</p>

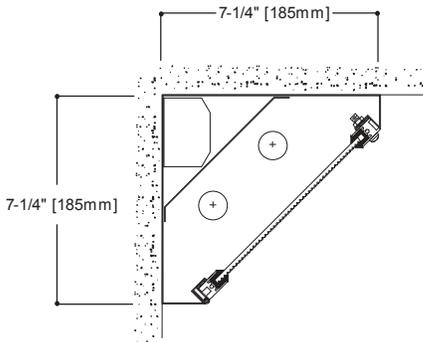


### MCM Medical Task/Luminaire

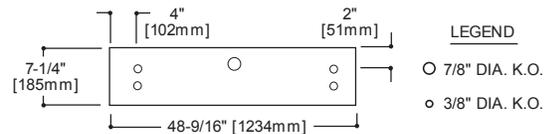
- ☐ (1) or (2) T8, 3' or 4' rapid start lamps
- ☐ Standard Class P, CBM/ETL ballast
- ☐ Housing is 20 ga cold rolled steel
- ☐ Baked on low gloss white powder coated polyester-epoxy finish
- ☐ Shielding options available are IK12 lexan prismatic lens, 93 tempered glass lens, and KSH25 acrylic prismatic lens
- ☐ UL listed, CSA certified

### MCM Medical Task/Luminaire

Rugged construction and three especially selected shielding elements make this fixture ideally suited for use in various types of security areas including psychiatric wards and public corridors. The housing is a completely enclosed steel chamber. The door is heavy gauge extruded aluminum with mitered corners. The door has a continuous aluminum piano hinge and tamper proof fasteners. Fixtures are installed individually or in continuous runs.



### MOUNTING



- LEGEND**
- 7/8" DIA. K.O.
  - 3/8" DIA. K.O.

## Ordering Information

SAMPLE NUMBER: MCM-232-120-IP12-EB82-SSP-EBP

<p><b>Series</b> MCM= Medical Corner Mount</p>	<p><b>Lamp Type</b> 132=(1) 32W T8 Lamp 232=(2) 32W T8 Lamps 128=(1) 28W T5 Lamp 228=(2) 28W T5 Lamps 154=(1) 54W T5HO Lamp 254=(2) 54W T5HO Lamps</p> <p><b>Voltage</b> 120=120V 277=277V 347=347V UNV=120V-277V</p>	<p><b>Lens Type</b> IK12=K-12 Prismatic Acrylic IP12=K-12 Prismatic Polycarbonate KSH25=Bat Wing Distribution 93=Prismatic Tempered Glass</p>	<p><b>Ballast</b> EB81=(1) Ballast for use with T8 Lamp EB82=(2) Ballasts for use with T8 Lamp EB51=(1) Ballast for use with T5 Lamp EB52=(2) Ballasts for use with T5 Lamp</p>	<p><b>Door Finish</b> Options SSN=Stainless Steel Door &amp; Trim / Brushed 304 Finish SSP=Stainless Steel Door &amp; Trim / Polyester Powder Coat Finish</p>	<p><b>Options</b> EBP=Emergency Battery Pack<sup>1</sup> GLR=Fuse and Holder RIF=Radio Frequency Interference Filter FNL=Fluorescent Night Light, 2 pin (G23 Base), 7 or 9W twin tube (Lamps by others) LNL=LED Night Light (50,000 hrs ) provided by Cooper</p>
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Notes: <sup>1</sup>When choosing EBP option, dedicated voltage must be specified. Not available in all configurations. Please consult factory. For additional options, consult your Cooper Lighting Representative. Specifications and dimensions subject to change without notice.

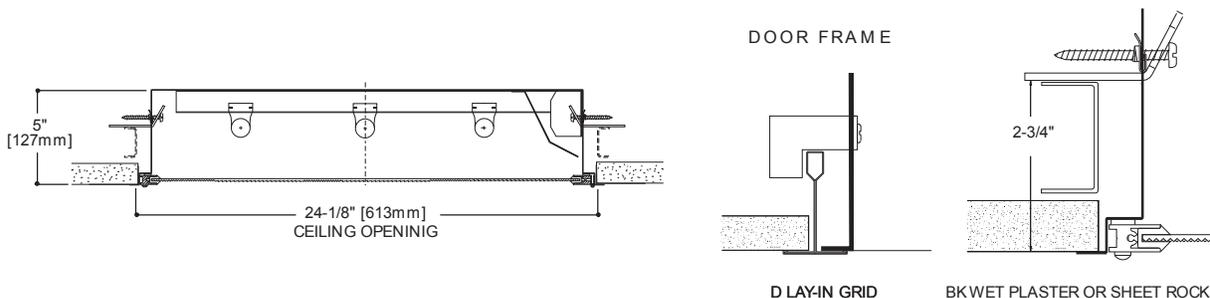


### MRM Series Medical Recessed Luminaire

- ☑ Recessed, 1/2" liquid tight connector
- ☑ Lamps by Others
- ☑ Housing is 20 ga cold rolled steel
- ☑ Baked on low gloss white powder coated polyester-epoxy finish
- ☑ Gasketed door for wet location
- ☑ Shielding options available are IK12 lexan prismatic lens, 93 tempered glass lens, and KSH25 acrylic prismatic lens
- ☑ UL listed, CSA certified

### MRM Series Medical Recessed Luminaire

Enclosed and gasketed, rugged construction and three especially selected shielding elements make this fixture ideally suited for use in various types of medical applications. The door is constructed of heavy gauge aluminum and has mitered corners. The doors have a continuous aluminum piano hinge and tamper proof fasteners. The trim, door, and shielding are completely gasketed to minimize maintenance. Flange or lay-in trim styles interface with plaster or mechanical ceilings. Fixtures are installed as individual or in continuous runs.

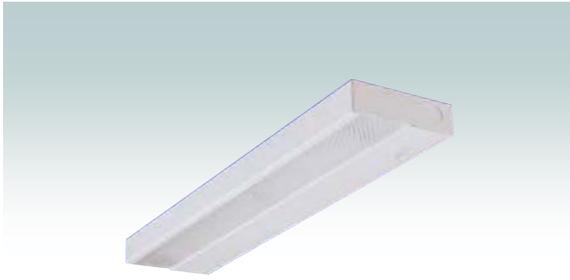


### Ordering Information

SAMPLE NUMBER: MRM-G-12-217-120-IP12-EB81-EBP

<b>Series</b> MRM= Medical Recessed (wet location standard)	<b>Mounting</b> G=Grid F=Flange	<b>Width</b> 12=1' width (2 Lamps Max) 24=2' width	<b>Number of Lamps</b> 1=1 Lamp 2=2 Lamps 3=3 Lamps 4=4 Lamps	<b>Voltage</b> 120=120V 277=277V 347=347V UNV=120V-277V	<b>Lens Type</b> IK12=K-12 Prismatic Acrylic IP12=K-12 Prismatic Polycarbonate KSH25=Bat Wing Distribution 93=Prismatic Tempered Glass	<b>Ballast</b> EB81=(1) Ballast for use with T8 Lamp EB82=(2) Ballasts for use with T8 Lamp EB51=(1) Ballast for use with T5 Lamp EB52=(2) Ballasts for use with T5 Lamp	<b>Options</b> EBP=Emergency Battery Pack <sup>1</sup> GLR=Fuse and Holder RIF=Radio Frequency Interference Filter FNL=Fluorescent Night Light, 2-pin (G23 Base), 7 or 9W twin tube (Lamps by others) LNL=LED Nightlight (50,000 hrs) provided by Cooper
			<b>Wattage</b> 2' Length 17W=17W T8 Lamp 40BW=40W Biax Lamp (2 Max for 1' width) (3 Max for 2' width)				
			4' Length 28W=28W T5 Lamp 32W=32W T8 Lamp 54W=54W T5HO Lamp				

Notes: <sup>1</sup>When choosing EBP option, dedicated voltage must be specified. Not available in all configurations. Please consult factory. For additional options, consult your Cooper Lighting Representative. Specifications and dimensions subject to change without notice.

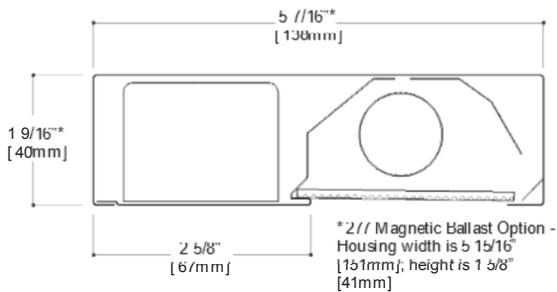


### MCS Series Undercabinet

The Fail-Safe Medical/Task Undercabinet Custom Length series provides effective task and enhancement lighting solutions for any application. This solid front specification grade fluorescent undercabinet series incorporates the latest energy efficient technology with fluorescent lamps and electronic or magnetic ballasts to efficiently improve the appearance and productivity of the illuminated environment. Custom lengths in 1/4" increments.

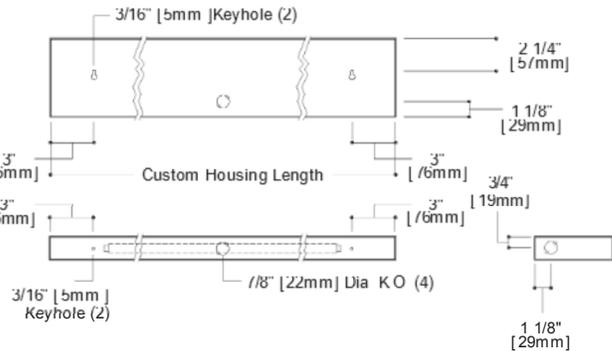
### MCS Series Undercabinet

- ☑ Choice of clear K12 prismatic acrylic diffuser or batwing symmetric
- ☑ Standard integral reflector for improved efficiency
- ☑ Internal front reflector optional
- ☑ Available in 1-9/16" deep, heavy gauge CRS or optional stainless steel housing construction
- ☑ Lamps by others
- ☑ Standard white high reflectance, polyester powder coat finish
- ☑ Standard, Class P, CBM/ETL ballast
- ☑ UL listed, CSA certified, standard damp label



Custom Length Range	Lamp
24-1/4" [616mm] to 59-3/4" [1518mm]	17W T-8/14WT5
36-1/4" [921mm] to 59-3/4" [1518mm]	25W T-8/21WT5
48-1/4" [1225mm] to 59-3/4" [1518mm]	32W T-8/28WT5

#### MOUNTING



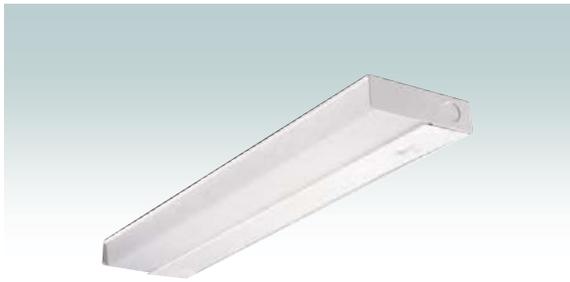
### Ordering Information

SAMPLE NUMBER: MCS-25-120-38 25-IK12-EB81

Product Family	Lamp Type	Voltage	Custom Length	Lens Type	Ballasts	Options
MCS=Medical Custom Length Solid Front	T8 Fluorescents 17=(1) 17W Lamp 25=(1) 25W Lamp 32=(1) 32W Lamp  T5 Fluorescents 14=(1) 14W Lamp 21=(1) 21W Lamp 28=(1) 28W Lamp 35=(1) 35W Lamp 24=(1) 24W HO Lamp 39=(1) 39W HO Lamp 54=(1) 54W HO Lamp 49=(1) 49W HO Lamp 80=(1) 80W HO Lamp	120=120V 277=277V <sup>1</sup> 347=347V UNV=120V-277V	24 25" to 59 75" for 17WT8 & 14, 24WT5  36 25" to 59 75" for 25WT8 & 21, 39WT5  48 25" to 59 75" for 32WT8 & 28, 35, 49, 54, 80WT5  Specify in decimal inches as required Factory tolerances ± 1/16"	IK12=K12 Acrylic KSH25=Bat Wing Distribution <sup>4</sup> LVR=Hex-Cell Metal Louver	LEOC8=Energy Saving Ballast for use with T8 Lamp  Electronic Ballast <sup>3</sup> EB81=(1) Ballast for use with T8 Lamp EB51=(1) Ballast for use with T5 Lamp	(add as suffix) 6CP=Six-foot Cord with Grounded Plug <sup>2</sup> GCO=Grounded Convenience Outlet (White) <sup>2</sup> GFI=Ground-Fault Outlet (Duplex) <sup>2</sup> GLR=GLR Fuseholder with Fuse IFR=Internal Front Reflector RSW=Rocker Switch (White)  Stainless Steel Housings SSN=Natural Brushed Finish SSP=White Polyester Powder Coat Finish

Notes: For additional options, consult your Cooper Lighting Representative. Specifications and Dimensions subject to change without notice. Electronic ballast may cause interference with other electronic devices. If interference occurs, move the device away from the product or plug/connect into a different circuit/outlet.

<sup>1</sup> 277V requires 1-5/8" x 5-15/16" housing for magnetic ballast. <sup>2</sup> For use with 120V only. <sup>3</sup> For specific electronic ballast, specify brand and catalog number. <sup>4</sup> The KSH25 provides improved visual performance and wide angle distribution. This lens has an integral prism pattern designed so that prisms face the lamp cavity and still supply superior photometrics. Highly recommended for all important visual task areas.

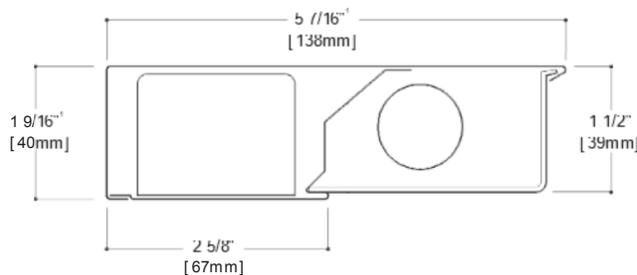


### MCT Series Medical/Task Undercabinet

The Fail-Safe Medical/Task Undercabinet series provides effective task and enhancement lighting solutions for any application. This wrap-around, specification grade fluorescent series incorporates the latest energy efficient technology with fluorescent lamps and electronic or magnetic ballasts to efficiently improve the appearance and productivity of the illuminated environment. Custom lengths in 1/4" increments.

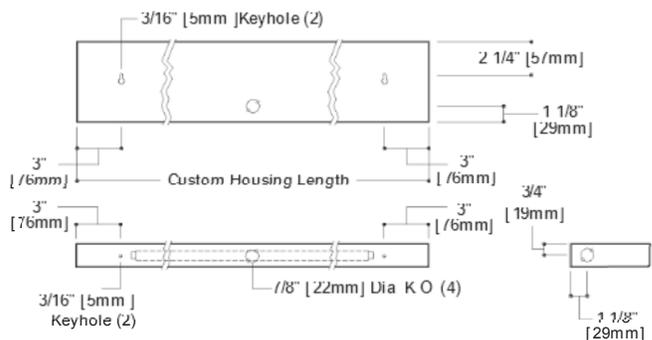
### MCT Series Medical/Task Undercabinet

- ☐ Choice of extruded 100% acrylic, linear ribbed diffuser with 50% DR additive, or co-extruded lens with opaque white front
- ☐ Standard integral reflector for improved efficiency
- ☐ Available in 1-9/16" deep, heavy gauge CRS or optional stainless steel housing construction
- ☐ Standard white high reflectance, polyester powder coat finish
- ☐ Lamps by others
- ☐ Standard, Class P, CBM/ETL ballast
- ☐ UL listed, CSA certified, standard damp label



Custom Length Range	Lamp
24 1/4" [616mm] to 59 3/4" [1518mm]	17W T-8/14WT5
36 1/4" [921mm] to 59 3/4" [1518mm]	25W T-8/21WT5
48 1/4" [1225mm] to 59 3/4" [1518mm]	32W T-8/28WT5

#### MOUNTING



### Ordering Information

SAMPLE NUMBER: MCT-25-120-38 25-OPL-EB81

<b>Product Family</b> MCT=Medical Custom Length Wraparound Lens	<b>Lamp Type</b> T8 Fluorescents 17=(1) 17W Lamp 25=(1) 25W Lamp 32=(1) 32W Lamp  T5 Fluorescents 14=(1) 14W Lamp 21=(1) 21W Lamp 28=(1) 28W Lamp 35=(1) 35W Lamp 24=(1) 24W HO Lamp 39=(1) 39W HO Lamp 54=(1) 54W HO Lamp 49=(1) 49W HO Lamp 80=(1) 80W HO Lamp	<b>Voltage</b> 120=120V 277=277V <sup>1</sup> 347=347V UNV=120V- 277V	<b>Custom Length</b> 24 25" to 59 75" for 17WT8 & 14, 24WT5  36 25" to 59 75" for 25WT8 & 21, 39WT5  48 25" to 59 75" for 32WT8 & 28, 35, 49, 54, 80WT5  Specify in decimal inches as required Factory tolerances ± 1/16"	<b>Lens Type</b> OPL= Opal Linear Prism CEX=Co-Extruded (Clear Linear Prism with Opaque White Front)	<b>Ballasts</b> LEOC8=Energy Saving Ballast for use with T8 Lamp  Electronic Ballast <sup>3</sup> EB81=(1) Ballast for use with T8 Lamp EB51=(1) Ballast for use with T5 Lamp	<b>Options</b> (add as suffix) 6CP=Six-foot Cord with Grounded Plug <sup>2</sup> GCO=Grounded Convenience Outlet (White) <sup>2</sup> GFI=Ground-Fault Outlet (Duplex) <sup>2</sup> GLR=GLR Fuseholder with Fuse RSW=Rocker Switch (White)  Stainless Steel Housings SSN=Natural Brushed Finish SSP=White Polyester Powder Coat Finish
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Notes: For additional options, consult your Cooper Lighting Representative. Specifications and Dimensions subject to change without notice. Electronic ballast may cause interference with other electronic devices. If interference occurs, move the device away from the product or plug/connect into a different circuit/outlet.

<sup>1</sup> 277V requires 1-5/8" x 5-15/16" housing for magnetic ballast. <sup>2</sup> For use with 120V only. <sup>3</sup> For specific electronic ballast, specify brand and catalog number.

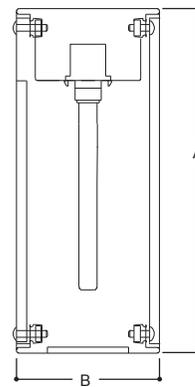


### DRX Medical/Task Signage

The sleek design of Fail-Safe's DRX Series dark room signage withstands the extreme abuses of hostile environments. Its 18 ga, die-formed, CRS housing utilizes a polycarbonate sign panel which is locked in place with heavy duty thru-studs. The door attaches to the housing with four tamper-resistant fasteners. Incandescent or fluorescent lamps power the unit for energy efficient, even illumination. Many other sign options available including "Open," "Closed," "Do Not Enter," "Caution," "X-Ray In Use", and the physically challenged symbol. UL listed, CSA certified, standard damp label.

### DRX Medical/Task Signage

- Die-formed, 14 ga. CRS housing and door frame. All spot welded construction with weld bands at stress points for added strength. Black polyester powder coat finish
- Four captive, stainless steel tamper-resistant TORX® -head screws prevent unauthorized access
- Lamps by others
- One-piece, .125", polycarbonate sign panel secured between door frame and housing bulkhead by flush head thru studs. Lettering is silkscreened in optional letter/panel color combinations
- UL listed, CSA certified

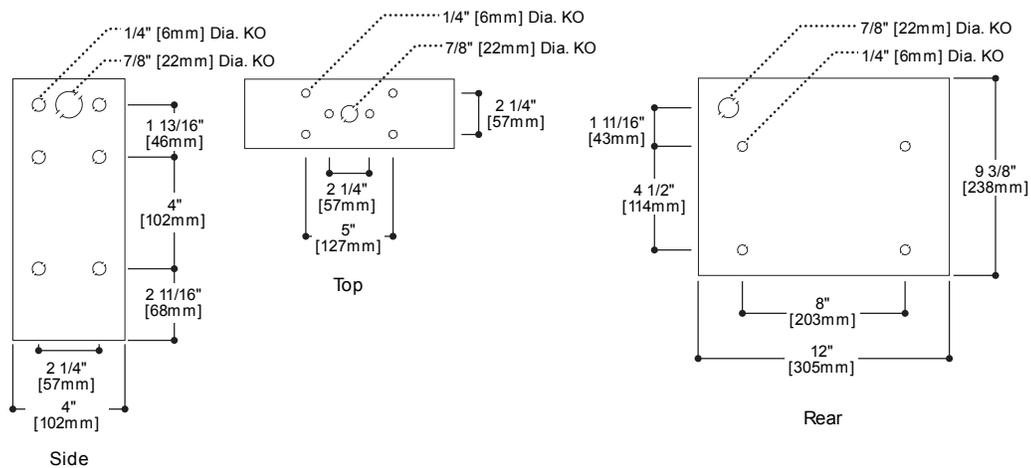


FRONT VIEW



A	B	C
9 3/8"	4"	12"
(238mm)	(102mm)	(305mm)

### MOUNTING



### Ordering Information

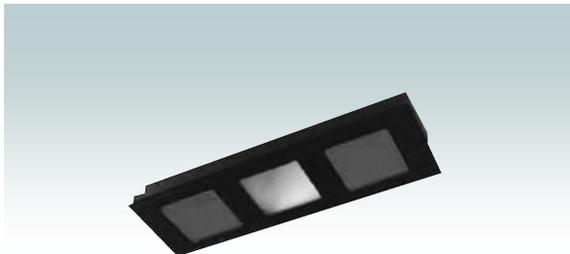
SAMPLE NUMBER: DRX-F-2-RW-120

Series DR=Dark Room	Product Family X=Signage	Lamp Type F=(2) 7-9W TwinTube I=(2) 20W T6Lamps	Face options 1=Single Face 2=Double Face	Panel Colors RW=Red Letters on White Face WR=White Letters on Red Face GW=Green Letters on White Face WG=White Letters on Green Face	Voltage <sup>1</sup> 120=120V 277=277V <sup>2</sup>	Options HPF=High Power Factor Capacitor Correction Housing Finishes Blank=Black (Standard) BRZ=Bronze Finish WHT=White Finish	Accessories VRSD=TORX®-Head Vandal Resistant Screwdriver 5460=End and Ceiling Mount Pedestal for "J" Box Mounting
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Note: Other signage available, consult Cooper Lighting Representative

Notes: For additional options, consult your Cooper Lighting Representative. Specifications and Dimensions subject to change without notice

<sup>1</sup> Products also available in non-US voltages and 50Hz for international markets. Consult your Cooper Lighting Representative for availability and ordering information. <sup>2</sup> Incandescent 277V comes with stepdown transformer



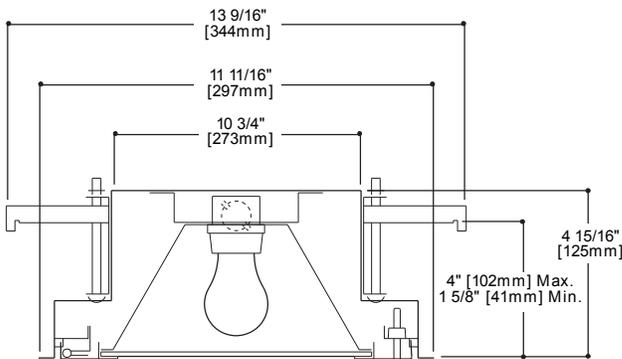
### DRR-F/DRR-G Dark Room Safelights

Fail-Safe's DRR-F and DRR-G Series are part of the Dark Room Safelights product line. These energy efficient, durable luminaires feature a die formed 20 gauge housing and door with integral lens/filter retainers, prismatic tempered glass lamp diffuser with up to (2) Kodak® dark room safelight filters, and a smooth black polyester powder coat finish. Gasketing surrounds the door frame and filter reflector(s) to prevent light leaks. Adjustable swing hangers are used for mounting for DRR-F. DRR-G mounts to 1" or 1-1/2" inverted "T" ceiling grids. UL listed, CSA certified, standard damp label.

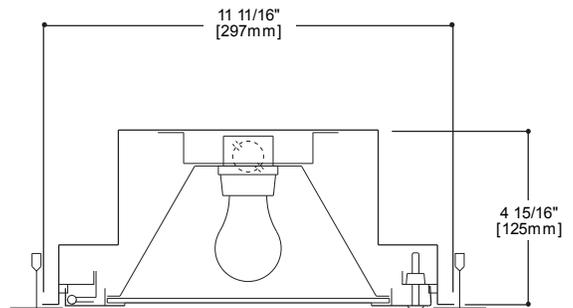
### DRR-F/DRR-G Dark Room Safelights

- Crystal 73 pattern prismatic tempered glass or glass fresnel task lamp diffuser. Choice of up to two (2) Kodak® dark room safelight filters
- Two captive Phillips-head screws standard
- Concealed continuous piano hinge
- Die-formed 20 ga. CRS housing. All spot welded construction. Satin black polyester powder coat finish
- One-piece die formed 20 ga. CRS door with integral lens/filter retainer brackets. Stainless steel door optional
- Lamps by others
- Porcelain socket(s), copper screwshell, silicone braid, 150°C wiring
- Die formed 20 ga. CRS reflector. All spot welded construction. (Filter reflector features one-piece seam welding)
- Door frame and filter reflector(s) are surrounded by gasketing to prevent light leaks
- Four adjustable swing hangers secure fixture to ceiling
- UL listed, CSA certified

DRR-F



DRR-G



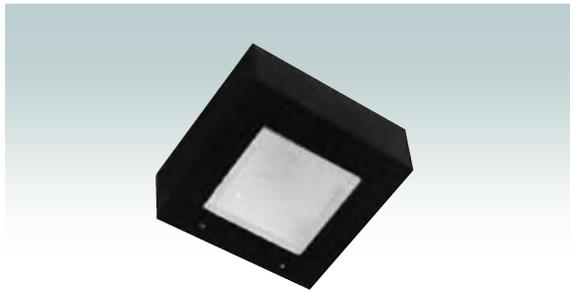
### Ordering Information

SAMPLE NUMBER: DRR-F-2/15I-200I-120-2/10-93-SSN

Series DR=Dark Room	Product Family R=Recessed Safelight	Ceiling F=Flange G-Grid	Lamp Type <sup>2</sup> 1/ 15I=(1) 15WA15 Filter Lamp 1/ 15I-200I=(1) 15WA15 Filter Lamp & (1) 200W A21 Task Lamp 2/ 15I-200I=(2) <sup>3</sup> 15WA15 Filter Lamps & (1) 200W A21 Task Lamp	Voltage 120=120V 277=277V (comes with stepdown transformer)	Filter <sup>1,3</sup> 2=Dark Red 1=Red 1A=Light Red 3=Dark Green 13=Deep Amber OC=Light Amber	Task Lens 93=Prismatic Tempered Glass GF=Glass Fresnel Lens	Options SSN=Stainless Steel Door/Natural Brushed Finish SF1=Tamperproof Fasteners
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Notes: For additional options, consult your Cooper Lighting Representative. Specifications and Dimensions subject to change without notice.

<sup>1</sup> Kodak recommends frequent filter replacement. <sup>2</sup> Kodak recommends no more than 15 watts for maximum filter effectiveness. <sup>3</sup> For DRR-F-2/15I-200I and DRR-G-2/15I-200I order (2) Filters.

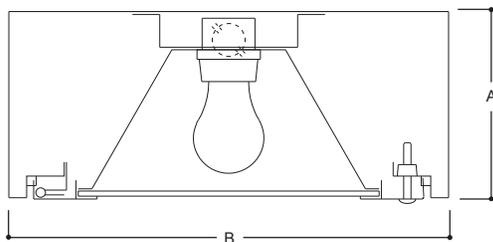


## DRS Series Dark Room Safe Lights

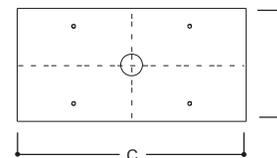
Fail-Safe's DRS Series is part of the Dark Room Safelights product line. These energy efficient, durable luminaires feature a die formed 20 gauge housing and door with integral lens/filter retainers, prismatic tempered glass lamp diffuser with up to (2) Kodak® dark room safelight filters, and a smooth black polyester powder coat finish. Gasketing surrounds the door frame and filter reflector(s) to prevent light leaks. UL listed, CSA certified, standard damp label.

## DRS Series Dark Room Safe Lights

- ☑ Crystal 73 pattern prismatic tempered glass or glass fresnel task lamp diffuser. Choice of up to two (2) Kodak® dark room safelight filters
- ☑ Two captive Phillips-head screws standard. Tamper-resistant TORX® screws are optional
- ☑ Concealed continuous piano hinge
- ☑ Die-formed 20 ga. CRS housing. Continuous seam welded construction. Satin black polyester powder coat finish
- ☑ One-piece die formed 20 ga. CRS door with integral lens/filter retainer brackets. Stainless steel door optional
- ☑ Lamps by others
- ☑ Porcelain socket(s), copper screwshell, silicone braid, 150°C wiring
- ☑ Die formed 20 ga. CRS reflector. All spot welded construction. (Filter reflector features one-piece seam welding.)
- ☑ Door frame and filter reflector(s) are surrounded by gasketing to prevent light leaks
- ☑ UL listed, CSA certified



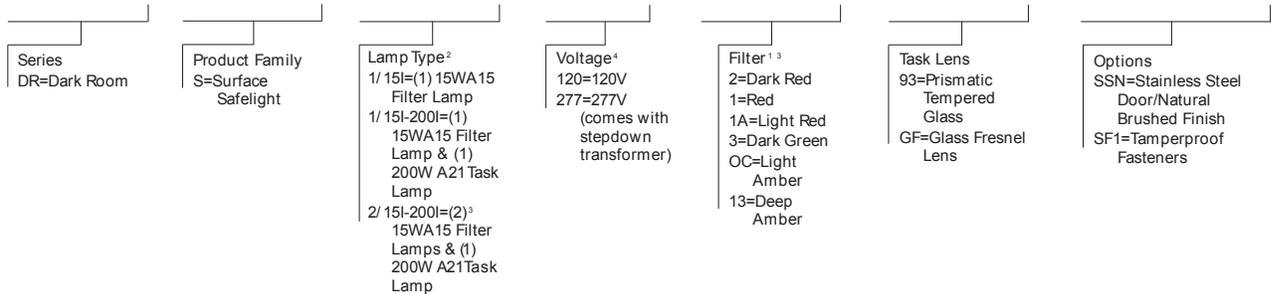
MOUNTING



	A	B	C
DRS 5"	5"	11 11/16"	11 11/16"
1'	(127mm)	(297mm)	(297mm)
DRS 5"	5"	11 11/16"	23 11/16"
2'	(127mm)	(297mm)	(602mm)
DRS 5"	5"	11 11/16"	35 11/16"
3'	(127mm)	(297mm)	(906mm)

## Ordering Information

SAMPLE NUMBER: DRS-2/15I-200I-120-2/10-93-SSN



Notes: For additional options, consult your Cooper Lighting Representative. Specifications and Dimensions subject to change without notice.

<sup>1</sup> Kodak recommends frequent filter replacement <sup>2</sup> Kodak recommends no more than 15W for maximum filter effectiveness <sup>3</sup> For DRS-2/15I-200I order (2) Filters <sup>4</sup> Products also available in non-US voltages and 50Hz for international markets. Consult your Cooper Lighting Representative for availability and ordering information.



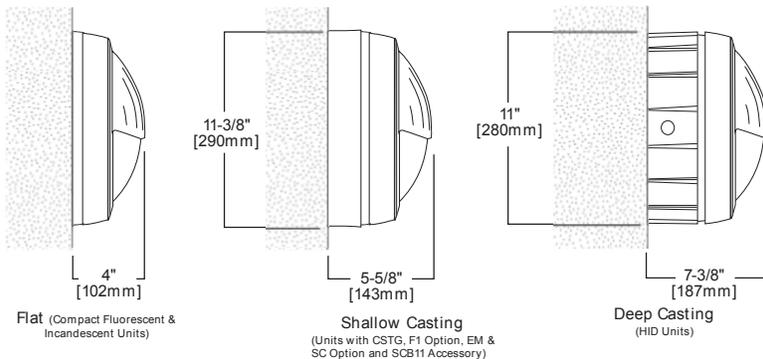
Decorative and Custom Faces shown

## Round Series 11" HarmonyVR

The Fail-Safe Terrapin Series provides exceptional aesthetics with remarkable strength. The wide variety of products allow an interior and exterior architectural theme throughout an entire facility. ADA compliant, the series is available up to 42W. Cast, extra-heavy aluminum walls of the housings offer rugged durability and afford efficient heat dissipation. AccUView UV-Guard coating protects the inside and outside of all UV stabilized polycarbonate lenses. The combination of narrow prismatic blondels on the interior and a prescription texture on the exterior of the lens provides exceptional lamp masking. Lifetime warranty against breakage.

## Round Series 11" HarmonyVR

- Lens** is one piece injection molded polycarbonate, .125" thick. In clear prismatic, opal, red, blue, green or yellow, the lens is scientifically designed to obscure lamp image while maintaining efficiency. All lenses are provided with AccUView UV guard on interior and exterior surfaces.
- Precision cast aluminum housing.** Extra-heavy thickness, minimum .125" thick, promotes durability and efficient heat dissipation. Marine-grade low-copper alloy aluminum resists corrosion.
- Faceplate designs** consist of high-impact, injection molded, .125" minimum thickness, polycarbonate overlay attached to lens with two recessed stainless steel TORX fasteners. Provide true 360° backlit halo effect. Custom faces available-consult Cooper Lighting Representative.
- HID and Incandescent sockets** are Porcelain medium base sockets with nickel-plated brass screw shell. Compact Fluorescent sockets are polycarbonate.
- HID Ballasts** are standard HPF with minimum starting temperatures of 40°C (-40°F) for HPS and -30°C (-20°F) for MH. Compact Fluorescent ballasts are electronic, universal voltage 120-277V, with minimum starting temperatures of -17°C (0°F).
- Available in various configurations see 5th Edition Buyer's Guide pgs. 1409-1412.
- UL listed, CSA certified**



## Ordering Information

SAMPLE NUMBER: TRE11-C-126CT-DT-BK-L

<b>Product</b> T=Terrapin	<b>Size</b> 11=11"	<b>Lamp Qty / Type</b> <b>Compact Fluorescent</b> 1/26CT 1/32CT 1/42CT <sup>2</sup> 1/57CT <sup>4 5 6</sup> <b>HID</b> 1/50MH 1/70MH <sup>3</sup> 1/100MH <sup>1 3</sup> 1/50HPS 1/70HPS 1/100HPS <sup>1 3</sup> <b>Incandescent</b> 1/50IN 1/60IN <sup>3</sup> 1/75IN <sup>3</sup>	<b>Voltage</b> Compact Fluorescent: DT=Universal 120-277V Ballast 347V=347V Ballast HID: DT=Dual-tap 120/277V Ballast (Wired 277) 347V=347V Ballast Incandescent: 120V=120V Fixture	<b>Options</b> EM=Emergency Battery Pack (Fluorescent Only) <sup>4</sup> F1=Single Fuse 120, 277, or 347V (with HID specify single voltage only) <sup>4</sup> L=With lamp <sup>7</sup> SC=Surface conduit taps w/plugs (standard with HID units) CSTG=Shallow Casting	<b>Accessories</b> (Order Separately) VRSD=TORX <sup>®</sup> screwdriver VRSB=TORX screwdriver bit SCB11=Surface conduit box, 11"
<b>Shape</b> R=Round	<b>Lens</b> C=Clear prismatic O=Opal RD=Red BL=Blue GN=Green YL=Yellow		Color BK=Black WH=White		
<b>Style</b> B=Border Paint S=Single Band E=Eyelid F=Four Quadrant O=Open Face R=Ring G=Mogul Q=Marquee T=Tri-Band M=Meridian K=Spoke C=Custom Dome <sup>8 9 10</sup>					

Notes: For additional options, consult your Cooper Lighting Representative. Specifications and dimensions subject to change without notice. Products also available in non-US voltages and 50Hz for international markets.

<sup>1</sup> Ceiling mount only <sup>2</sup> Ceiling mount requires CSTG Option <sup>3</sup> Shallow Casting, TRO11-C-142CT-DT-BK-CSTG <sup>4</sup> Not available with eyelid style <sup>5</sup> Supplied standard with shallow casting (CSTG) <sup>6</sup> Wall Mount Only <sup>7</sup> For use with compact triple fluorescent lamps (Sylvania Dulux T/E IN, 57W recommended); shipped standard with Terrapin 11" 57W CFL fixtures <sup>8</sup> Standard on all MH fixtures <sup>9</sup> Maximum wattage is 100 watts <sup>10</sup> Special handling required - consult your Cooper Lighting Representative <sup>11</sup> Please prefix with the letters PDR (Product Deviation Request) TORX<sup>®</sup> is a registered trademark of Camcar Division of Textron Inc

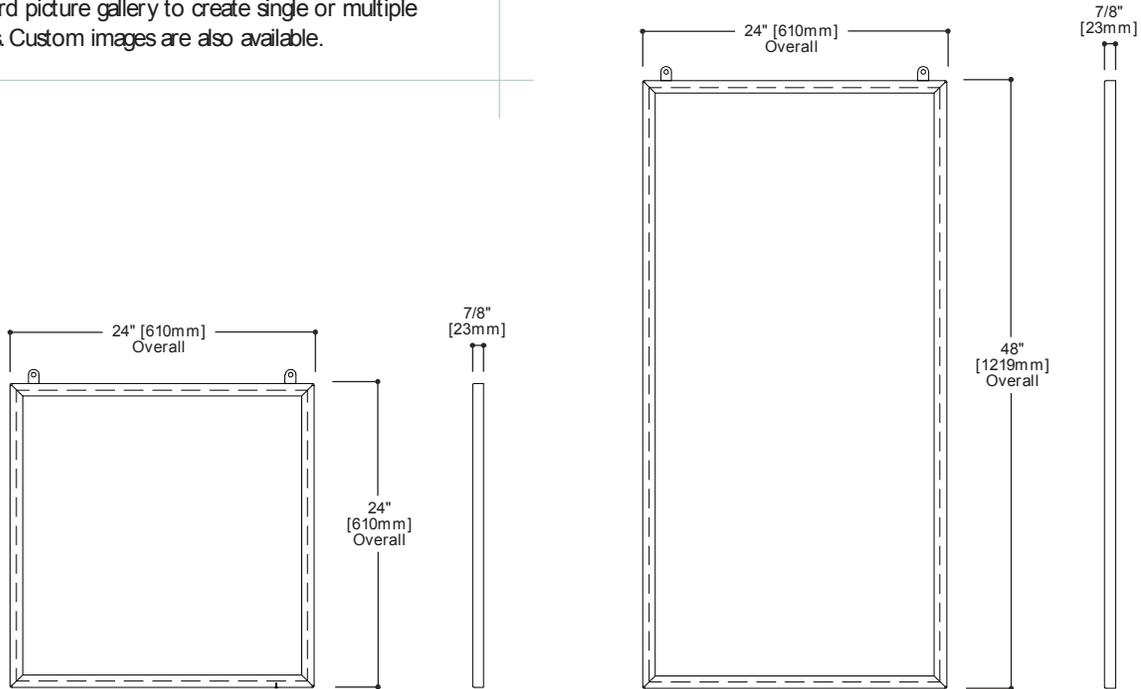


### CV-LEL ChangingViews LED Wall Luminaire

- ☑ Extremely thin profile
- ☑ Unique, LED edge lit design provides up to 100,000 hours of illumination
- ☑ Snap face frame for tool-free, quick and easy graphic change out
- ☑ 1/8" acrylic high quality photographic lens
- ☑ High quality, durable and lightweight construction
- ☑ Energy efficient
- ☑ ADA compliant
- ☑ Non-ferrous version available for MRI applications

### CV-LEL ChangingViews LED Wall

The Fail-Safe ChangingViews Series is a new series of visual therapy luminaires by Cooper Lighting. Designed to bring warmth, ambience, and positive energy into a variety of environments, these luminaires help create a calming influence throughout any facility. The CV Series is designed with an extremely thin profile and is ADA compliant. Choose from a variety of images in the standard picture gallery to create single or multiple murals. Custom images are also available.



### Ordering Information

SAMPLE NUMBER: CV-LEL-W-120-244-SCNPR613

<p>Product Family CV=Changing Views</p>	<p>Voltage 120=120V (Transformer will be supplied with a cord ) 277=277V (Transformer will be supplied with a cord )</p>	<p>Configuration Wall 22=22" x 28" 24=24" x 24" 243=24" x 36" 244=24" x 48" 30=30" x 40" 36=36" x 48" (Custom sizes available up to 48" x 96" for wall mount Consult Cooper Lighting for additional information)</p>	<p>Frame Anodized silver finish standard (leave blank) (Custom powder coat finishes available Consult Cooper Lighting for additional information)</p>	<p>Options MRI=Non-ferrous version</p>
<p>LEL=LED Edge Lit</p>			<p>Image Reference <a href="http://www.cooperhealthcaresolutions.com">www.cooperhealthcaresolutions.com</a> for image selection and part numbers</p>	
<p>Mounting W=Wall</p>				



### CV-LEL LED Recessed Grid Luminaire

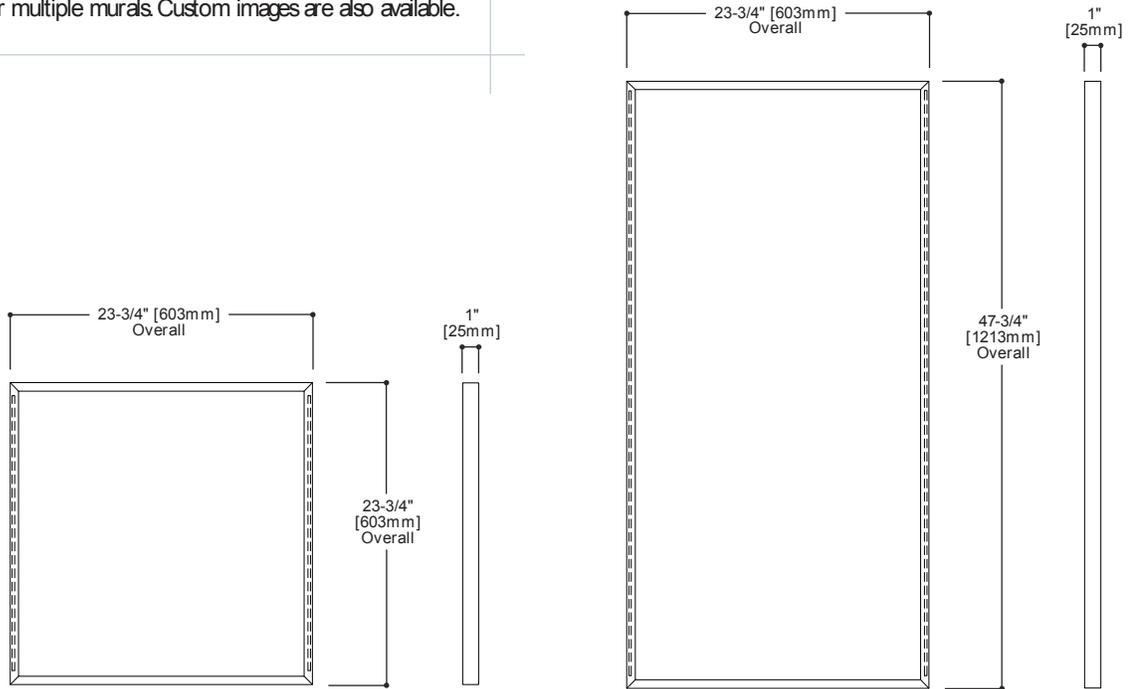
- ☑ Extremely thin profile
- ☑ Unique, LED edge lit design provides up to 100,000 hours of illumination
- ☑ 1/8" acrylic high quality photographic lens
- ☑ High quality, durable and lightweight construction
- ☑ Energy efficient
- ☑ ADA compliant
- ☑ Non-ferrous version available for MRI applications

### CV-LEL LED Recessed Grid

The Fail-Safe Changing Views Series is a new series of visual therapy luminaires by Cooper Lighting. Designed to bring warmth, ambience, and positive energy into a variety of environments, these luminaires help create a calming influence throughout any facility. The CV Series is designed with an extremely thin profile. Choose from a variety of images in the standard picture gallery to create single or multiple murals. Custom images are also available.

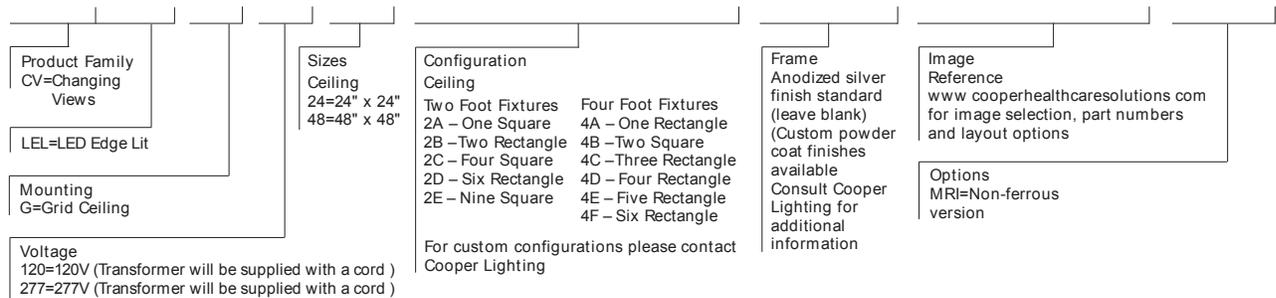
#### CONFIGURATION EXAMPLES

- Select desired imagery from the gallery (visit our web site at [www.cooperhealthcaresolutions.com](http://www.cooperhealthcaresolutions.com))
- Select a configuration and corresponding luminaire layout
- Indicate all the above information when placing an order



### Ordering Information

SAMPLE NUMBER: CV-LEL-G-120-244-SCNPR613



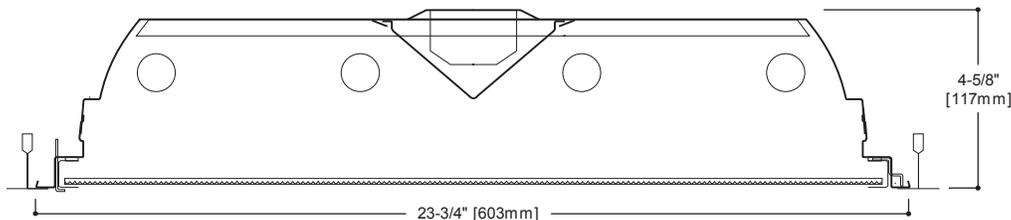


## CV-2VRGC ChangingViews Fluorescent Recessed

- Available in 2' x 2' and 2' x 4' configurations
- Choice of (3) or (4) T8 fluorescent lamps
- High quality photographic lens depicting nature imagery
- Dimming option available
- Includes four torx screws to ensure lens security
- UL and cUL listed
- Ideal for areas throughout the healthcare facility

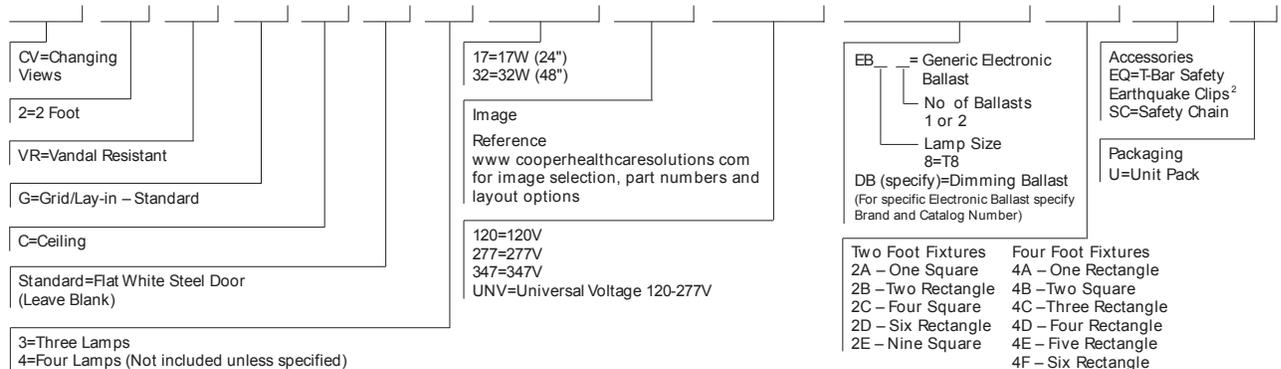
## CV-2VRGC Fluorescent Recessed Grid

The ChangingViews Series is a new series of visual therapy luminaires incorporating the 2VRGC by Fail-Safe. Designed to bring warmth, ambience, and positive energy into a variety of environments, these luminaires help create a calming influence throughout any facility. Choose from a variety of images in the standard picture gallery to create single or multiple murals.



## Ordering Information

SAMPLE NUMBER: CV-2VRGC-432-ARISP3940-UNV-PAF-EB81-4A-U



Notes: For additional options please consult Cooper Lighting Representative. Specifications and Dimensions subject to change without notice. <sup>1</sup>Two ballast in 2 or 4 lamp require LAO (less access opening). <sup>2</sup>EQ Grid Clip is recommended for all 9/16" ceiling systems. <sup>4</sup>Consult Pre Sales Technical Support

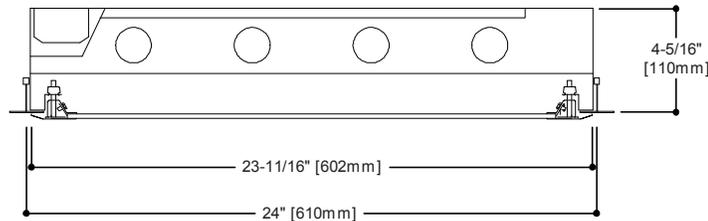


### CV-CFG Changing Views Recessed Luminaire

- Sealed, recessed fluorescent; clean room rated
- Available in 2' x 2' and 2' x 4' configurations
- High quality photographic lens depicting nature imagery
- Choice of (3) or (4) T8 or T5 lamps
- Enclosed and gasketed housing protects against airborne bacteria
- One piece, outside doorframe for added fixture protection
- Designed for 1" or 1-1/2" T-grid ceilings
- Dimming option available
- UL and CSA certified for wet locations

### CV-CFG Fluorescent Recessed Grid

The Changing Views Series is a new series of visual therapy luminaires incorporating the CFG by Fail-Safe. Designed to bring warmth, ambience, and positive energy into a variety of environments, these luminaires help create a calming influence throughout any facility. Choose from a variety of images in the standard picture gallery to create single or multiple murals. The CFG Series is designed for use in horizontal or non-laminar air flow clean rooms. The enclosed and gasketed housing and one-piece, outside door frame protect against infiltration of particles and airborne bacteria.



### Ordering Information

SAMPLE NUMBER: CV-CFG-24-417-UNV-ARINO3999-EB81-2C

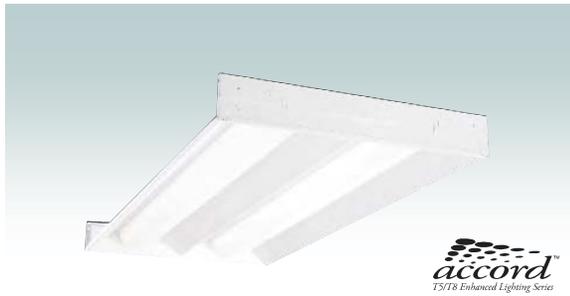
CV=Changing Views	120=120V 277=277V UNV=Universal Voltage 120-277V	EB81=(1) Ballast for use with T8 Lamp EB82=(2) Ballasts for use with T8 Lamp EB51=(1) Ballast for use with T5 Lamp EB52=(2) Ballasts for use with T5 Lamp D=Dimming Ballast (specify)	Door/Finish Options Blank=Standard CRS with Baked White Finish SSN=Stainless Steel Door/Brushed 304 Finish ALP=Aluminum Door/Polyester Powder Finish														
CFG=Fluorescent Grid Type	Image Reference <a href="http://www.cooperhealthcaresolutions.com">www.cooperhealthcaresolutions.com</a> for image selection, part numbers and layout options	Blank=Standard, CRS with baked white finish SSN=Stainless Steel Door/Brushed 304 Finish SSP=Stainless Steel Door/Polyester Powder Coat Finish ALP=Aluminum Door/Polyester Powder Coat Finish ALX=Extruded Aluminum Door/Clear Anodized Finish ALXP=Extruded Aluminum Door/Polyester Powder Coat Finish	Two Foot Fixtures 2A – One Square 2B – Two Rectangle 2C – Four Square 2D – Six Rectangle 2E – Nine Square														
24=24"	Image Reference <a href="http://www.cooperhealthcaresolutions.com">www.cooperhealthcaresolutions.com</a> for image selection, part numbers and layout options	Four Foot Fixtures 4A – One Rectangle 4B – Two Square 4C – Three Rectangle 4D – Four Rectangle 4E – Five Rectangle 4F – Six Rectangle															
<table border="0"> <tr> <td><u>2' Fixture Length</u></td> <td><u>4' Fixture Length</u></td> </tr> <tr> <td>T8 Fluorescents</td> <td>T8 Fluorescents</td> </tr> <tr> <td>317=(3) 17W Lamps</td> <td>332=(3) 32W Lamps</td> </tr> <tr> <td>417=(4) 17W Lamps</td> <td>432=(4) 32W Lamps</td> </tr> <tr> <td></td> <td>T5 Fluorescents</td> </tr> <tr> <td></td> <td>328=(3) 28W Lamps</td> </tr> <tr> <td></td> <td>428=(4) 28W Lamps</td> </tr> </table>	<u>2' Fixture Length</u>	<u>4' Fixture Length</u>	T8 Fluorescents	T8 Fluorescents	317=(3) 17W Lamps	332=(3) 32W Lamps	417=(4) 17W Lamps	432=(4) 32W Lamps		T5 Fluorescents		328=(3) 28W Lamps		428=(4) 28W Lamps			
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\*Lamps not included unless specified

Notes:  
For additional options please consult Cooper Lighting Representative. Specifications and Dimensions subject to change without notice. Electronic ballast may cause interference with other electronic devices. If interference occurs, move the device away from the product or plug/connect into a different circuit/outlet.  
1 For specific electronic ballast, specify brand and catalog number



Offices/Conference Rooms |

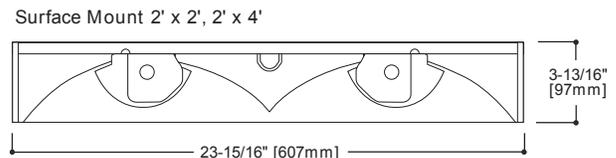
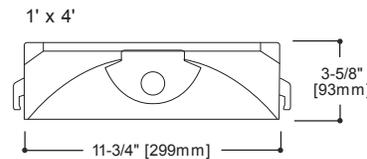
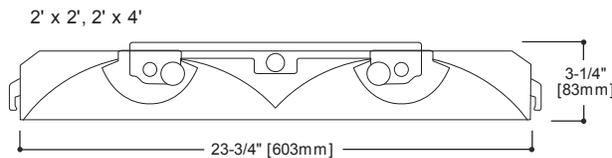


### accord Series Recessed Troffer

The accord redefines fluorescent lighting by improving on aesthetics, comfort and energy savings. The accord provides the right amount of light while eliminating surface shadows commonly found in parabolics and increases the comfort level while providing significant energy savings. Ideal for use throughout the entire healthcare facility.

### accord Series Recessed Troffer

- ☑ Improved visual perception
- ☑ Enhanced space
- ☑ Dark spots (cave effect) associated with parabolics are eliminated
- ☑ Attractive contemporary design
- ☑ Significant energy savings
- ☑ Concealed air return available in recessed, 2' x 2' and 2' x 4' sizes
- ☑ Diffuser options available in smooth, round perf and square perf
- ☑ Available in 1' x 4', 2' x 2' and 2' x 4' sizes. Surface mount available in 2' x 2' and 2' x 4' sizes (T5 only)
- ☑ Shallow depth (3-1/4") and structural integrity makes for a quick and easy installation
- ☑ Lamp maintenance is as simple as removing the refractors



### Ordering Information

SAMPLE NUMBER: 2AC-228T5-UNV-L5541-EBT1NDIM-U

<p><b>Rating</b> Blank= Standard NY=New York Rated ATW-SW4=Chicago Rated</p>	<p><b>Number of Lamps</b> (Not included) 1=1 Lamp (1' x 4' only) 2=2 Lamp (2' x 2', 2' x 4' only)</p>	<p><b>Shielding</b> Blank=Frosted Acrylic (standard) SQP=Lens with Square Pattern Insert<sup>4</sup> RDP=Lens with Round Pattern Insert<sup>4</sup></p>	<p><b>Lamps</b> T5 Lamps L5835=T5 Lamp, 3500K L5841=T5 Lamp, 4100K L5835HL=T5 Lamp, 28W, 3500K, 2770 Lumens L5841HL=T5 Lamp, 28W, 4100K, 2770 Lumens T8 Lamps L8835=T8 Lamp, 17W, 28W and 32W, 3500K<sup>5</sup> L8841=T8 Lamp, 17W, 28W and 32W, 4100K<sup>5</sup> L8835HL=T8 Lamp, 32W, 3500K, 3100 Lumens L8841HL=T8 Lamp, 32W, 4100K, 3100 Lumens</p>	<p><b>Ballast Type</b> EB5_ =T5 Biax Electronic Instant Start Total Harmonic Distortion &lt; 20%</p> <p>No of Ballast 1 or 2</p> <p>EBT_ =T5 Linear Electronic Program Rapid Start Total Harmonic Distortion &lt; 10%</p> <p>No of Ballast 1 or 2</p> <p><b>Ballast Factor/ Type</b> (For 14WT5 and 28WT5 Lamp Only) N=Normal Light Output 95 BF<sup>2</sup> H=High Light Output 115 BF<sup>2</sup> NDIM=Normal 95-10 BF Step Dimming<sup>3</sup> HDIM=High 115 BF Step Dimming<sup>3</sup></p> <p>EB8_ =T8 Electronic Instant Start Total Harmonic Distortion &lt; 10%</p> <p>No of Ballast 1 or 2</p> <p>EB8_/PLUS= T8 Electronic Instant Start High Ballast Factor &gt;113 Total Harmonic Distortion &lt; 20%</p> <p>No of Ballast 1 or 2</p> <p>ER8_ =T8 Electronic Program Start Total Harmonic Distortion &lt; 10%</p> <p>No of Ballast 1 or 2</p> <p>HPT8 Ballast</p> <p>HB8_L=T8 Electronic Instant Start Low Ballast Factor 77 HB8_=T8 Electronic Instant Start Ballast Factor 88 HB8_N=T8 Electronic Instant Start Normal Ballast Factor 10 HB8_H=T8 Electronic Instant Start High Ballast Factor 115-12 HR8_DIM=T8 Electronic Program Start Step Dimming Ballast Factor 88 HR8_L=T8 Electronic Program Start Low Ballast Factor 77 HR8_=T8 Electronic Program Start Ballast Factor 88 HR8_H=T8 Electronic Program Start High Ballast Factor 115-12</p>	<p><b>Packaging</b> U=Unit Pack PALC=Job Pack, in carton</p>
<p><b>Width</b> 2=2' Width Blank=1' Width</p>	<p><b>Wattage (Length)</b> 28T5=28W T5 (48") 54T5=54W T5HO (48") 14T5=14W T5 (24") 24T5=24W T5HO (24") BX40=40W Compact Fluorescent (24") 32=32W T8 (48") 28T8=28W T8 (48")<sup>5</sup> 17=17W T8 (24")</p>	<p><b>Voltage</b><sup>1</sup> UNV=Universal Voltage 120-277</p>			
<p><b>Series</b> AC=Accord Series</p>		<p><b>Options</b> GL=Single Element Fuse GM=Double Element Fuse Flex=Flex installed EL=Emergency Installed</p>			
<p><b>Type</b> A=Air (Recessed 2' x 2', 2' x 4' only) S=Surface (2' x 2', 2' x 4', T5 only)</p>					

Notes: <sup>1</sup> Products also available in non-US voltages and frequencies for international markets <sup>2</sup> 95 and 115 ballast factor available for 14WT5 and 28WT5 lamps only <sup>3</sup> Step Dimming Ballast available for 14WT5 and 28WT5 lamps only <sup>4</sup> 2' x 2' and 2' x 4' only <sup>5</sup> When utilizing 28W T8 lamps, HPT8 ballast must be specified. Other ballast restrictions may apply. For complete product data, reference the Fluorescent Specification binder. Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.



Offices/Conference Rooms |



### 2EP3 Series Parabolic

The Parallax III series features recessed aesthetics and the latest in energy efficient technology. The luminaire incorporates a 3" precision cell louver into a nominal 5-1/2" deep para-contoured fixture housing. This combination creates a total high performance parabolic optical assembly for optimum performance. The Parallax III series offers balanced illumination with reduced glare, increased VCPs and excellent shielding. The series is compatible with all of today's popular ceiling systems.

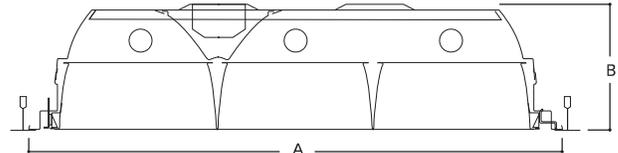
### Parallax III Parabolic

- ☑ Equipped with energy saving ballasts/complies with federal energy efficiency standards
- ☑ Computer designed, precision cell louver technology
- ☑ Field convertible feature
- ☑ Self locking spring loaded cam latches/T hinges
- ☑ Four auxiliary fixture end suspension points provided
- ☑ Interlocking tabs and screws secure end plates
- ☑ End plate grid-lock feature<sup>(1)</sup>
- ☑ Efficient air handling options
- ☑ DLS Dimming Ballasts are available
- ☑ Floating louver/black reveal
- ☑ UL/cUL Listed. Suitable for damp locations

Louver Options for Parallax III

Housing Size	Louver Cell Configuration*	Number of Cells
1' x 2'	13, 14, 23, 24	3, 4, 6, 8
1' x 4'	16, 18, 26, 28	6, 8, 12, 16
2' x 2'	23, 33, 34, 44	6, 9, 12, 16
20" x 24"	23, 24, 33, 34	6, 8, 9, 12
20" x 48"	26, 36, 38	12, 18, 24
2' x 4'	26, 28, 36, 38, 46, 48	12, 16, 18, 24, 24, 32

\*Example: 36= 3 rows of 6 (18 cells)



Nominal Size	A	B
1' x 4'	11-3/4" (298mm)	6-5/8" (168mm)
1' x 4' (OU)	11-3/4" (298mm)	8-1/4" (210mm)
2' x 2'	23-3/4" (603mm)	5-5/8" (143mm)
2' x 4'	23-3/4" (603mm)	5-5/8" (143mm)
20" x 24"	19-3/4" (502mm)	5-5/8" (143mm)
20" x 48"	19-3/4" (502mm)	5-5/8" (143mm)

### Ordering Information

SAMPLE NUMBER: 2EP3GAX-332S361-120V-EB81-U

<p>Width 2'=2' width Blank=1' width or 20" width</p> <p>EP=Parallax Louver</p> <p>3=3" Louver Depth</p> <p>Trim Type G=Grid/Lay-in (Standard) G or T=Concealed T G or T=Slot Grid<sup>2</sup> F=Flange Trim MZ=Modular Trim Convertible Fixture<sup>3</sup> Standard G (Grid) Type-Fixtures can be field converted to T-top or vice-versa Fixture also adaptable with flanged or modular trims</p> <p>AX=Air Supply Floating Louver X=Blank Side/Floating Louver - Non-Air Supply (Omit A) AVX=Air Supply Floating Louver with Directional Air Vane (Add V)</p> <p>2048=20" Width x 48" Length 2024=20" Width x 24" Length</p>	<p>Number of Lamps<sup>4</sup> 1, 2, 3 or 4 lamps (Not included)</p> <p>Wattage (Length) U6T8=31W T8 (24") 17=17W T8 (24") U15/8=31W T8 (24") BX40=40W Biax (24") 32=32W T8 (48") 28T8=28W T8 (48")<sup>7</sup></p> <p>Louver Color S=Silver W=White</p> <p>Cell Configuration* (See below for Louver Options)</p> <p>Louver Finish H=Semi-Specular/Haze (Gold only) I=Semi-Specular/Haze (Low Iridescent) Standard (Silver Only) M=Specular/Mirrored (Low Iridescent) (Silver Only) P=Painted (White only)</p>	<p>Voltage<sup>5</sup> 120V=120 Volt 277V=277 Volt 347V=347 Volt UNV=Universal Voltage 120-277<sup>5</sup></p> <p>Options GL=Single Element Fuse GM=Double Element Fuse WTR=White Reveal Lamps - for lamps installed Flex - for flex installed EL=Emergency Installed</p>	<p>Lamps T5 Lamps L5835=T5 Lamp, 3500K L5841=T5 Lamp, 4100K L5835HL=T5 Lamp, 28W, 3500K, 2770 Lumens L5841HL=T5 Lamp, 28W, 4100K, 2770 Lumens T8 Lamps L8835=T8 Lamp, 17W, 28W and 32W, 3500K<sup>7</sup> L8841=T8 Lamp, 17W, 28W and 32W, 4100K<sup>7</sup> L8835HL=T8 Lamp, 32W, 3500K, 3100 Lumens L8841HL=T8 Lamp, 32W, 4100K, 3100 Lumens</p>	<p>Ballast Type Blank=Standard Magnetic Ballast (40W Biax only) EB5_ =T5 Biax Electronic Instant Start Total Harmonic Distortion &lt; 20%</p> <p>No of Ballast 1 or 2</p> <p>EBT_ =T5 Linear Electronic Program Rapid Start Total Harmonic Distortion &lt; 10%</p> <p>No of Ballast 1 or 2</p> <p>Ballast Factor/Type (For 14W T5 and 28W T5 Lamp Only) N=Normal Light Output 95 BF<sup>2</sup> H=High Light Output 115 BF<sup>2</sup> NDIM=Normal 95-10 BF Step Dimming<sup>3</sup> HDIM=High 115 BF Step Dimming<sup>3</sup></p> <p>EB8_ =T8 Electronic Instant Start Total Harmonic Distortion &lt; 10%</p> <p>No of Ballast 1 or 2</p> <p>EB8_/PLUS= T8 Electronic Instant Start High Ballast Factor &gt; 113 Total Harmonic Distortion &lt; 20%</p> <p>No of Ballast 1 or 2</p> <p>ER8_ =T8 Electronic Program Start Total Harmonic Distortion &lt; 10%</p> <p>No of Ballast 1 or 2</p> <p>HPT8 Ballast HB8_L=T8 Electronic Instant Start Low Ballast Factor 77 HB8_=T8 Electronic Instant Start Ballast Factor 88 HB8_N=T8 Electronic Instant Start Normal Ballast Factor 110 HB8_H=T8 Electronic Instant Start High Ballast Factor 115-12 HR8_DIM=T8 Electronic Program Start Step Dimming Ballast Factor 88 HR8_L=T8 Electronic Program Start Low Ballast Factor 77 HR8_=T8 Electronic Program Start Ballast Factor 88 HR8_H=T8 Electronic Program Start High Ballast Factor 115-12</p>	<p>Options</p> <p>Packageing U=Unit Pack PAL=Job Pack, out of carton PALC=Job Pack, in carton</p>
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Notes: <sup>1</sup> Integral end plate grid lock feature not available in heat removal <sup>2</sup> An EQ Grid Clip is recommended for all 9/16" ceiling systems <sup>3</sup> Convertibility applies to housing only, appropriate shielding media assemblies must be utilized <sup>4</sup> Standard off-center ballast on 3-lamp fixtures <sup>5</sup> Products also available in non-US voltages and frequencies for international markets <sup>6</sup> Not available when specifying emergencies, voltage must be specific <sup>7</sup> When utilizing 28W T8 lamps, HPT8 ballast must be specified. Other ballast restrictions may apply. For complete product data, reference the Fluorescent Specification binder Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.



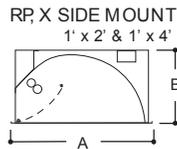
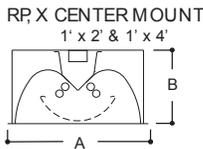
Offices/Conference Rooms |



*Ovation*

RDI Series Recessed Direct/Indirect

The Ovation RDI Series is a complete family of recessed direct/indirect luminaires featuring pleasant, modern architectural styling, computer-designed optics and the latest energy efficient lamp and ballast technology. The luminaire combines matte white components and perforated direct lamp shields to provide optimum brightness control. Ovation provides a dean architectural appearance in the finished space. Carefully balanced design elements combine to provide an efficient and exciting alternative to traditional general lighting.



Ordering Information

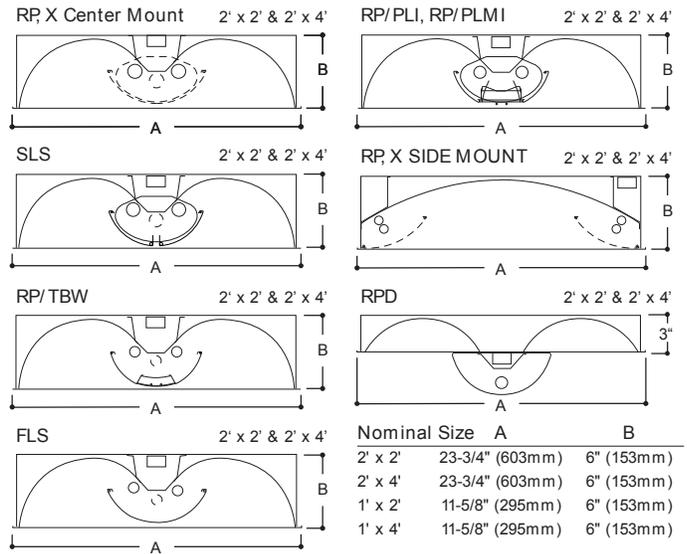
SAMPLE NUMBER: 2RDI-2BX40RP-120V-EB51-U

<p>Width Blank=1' Width<sup>2</sup> 2=2' Width</p>	<p>Number of Lamps (Not included) 1=1 Lamp 2=2 Lamp 3=3 Lamp 4=4 Lamp T1=2'x4' Fixture with One Biax Lamp at Each End T2=2'x4' Fixture with Two Biax Lamps at Each End T3=2'x4' Fixture with Three Biax Lamps at Each End</p>	<p>Lamp Shield X=Solid Matte White RP=Round Perforated White Steel RP/TBW=Round Perforated White Steel w/Thin Blade White Baffle<sup>1</sup> RP/PLI=Round Perforated White Steel w/Semi-Specular Parabolic Baffle<sup>1</sup> RP/PLMI=Round Perforated White Steel w/Perforated Parabolic Baffle<sup>1</sup> RPD=Round Perforated Steel Below Ceiling Lamp Shield<sup>4</sup> RPD/TBW=Round Perforated Below Ceiling Lamp Shield with Thin Blade White Baffle<sup>4</sup> FLS=Frosted Lamp Shield<sup>1</sup> SLS=Split Lamp Shield<sup>1</sup></p>	<p>Lamps T5 Lamps L5835=T5 Lamp, 3500K L5841=T5 Lamp, 4100K L5835HL=T5 Lamp, 28W, 3500K, 2770 Lumens L5841HL=T5 Lamp, 28W, 4100K, 2770 Lumens T8 Lamps L8835=T8 Lamp, 17W, 28W and 32W, 3500K<sup>4</sup> L8841=T8 Lamp, 17W, 28W and 32W, 4100K<sup>4</sup> L8835HL=T8 Lamp, 32W, 3500K, 3100 Lumens L8841HL=T8 Lamp, 32W, 4100K, 3100 Lumens</p>	<p>Ballast Type<sup>2</sup> Blank=Standard Magnetic Ballast (40W Biax only) EB5_=T5 Biax Electronic Instant Start Total Harmonic Distortion &lt; 20%</p> <p>No of Ballast 1 or 2</p> <p>EBT_=T5 Linear Electronic Program Rapid Start Total Harmonic Distortion &lt; 10%</p> <p>No of Ballast 1 or 2</p> <p>Ballast Factor/Type (For 14W T5 and 28W T5 Lamp Only) N=Normal Light Output 95 BF<sup>2</sup> H=High Light Output 115 BF<sup>2</sup> NDIM=Normal 95-10 BF Step Dimming<sup>3</sup> HDIM=High 115 BF Step Dimming<sup>3</sup></p> <p>EB8_=T8 Electronic Instant Start Total Harmonic Distortion &lt; 10%</p> <p>No of Ballast 1 or 2</p> <p>EB8_/PLUS= T8 Electronic Instant Start High Ballast Factor &gt;113 Total Harmonic Distortion &lt; 20%</p> <p>No of Ballast 1 or 2</p> <p>ER8_=T8 Electronic Program Start Total Harmonic Distortion &lt; 10%</p> <p>No of Ballast 1 or 2</p> <p>HPT8 Ballast HB8_L=T8 Electronic Instant Start Low Ballast Factor 77 HB8_=T8 Electronic Instant Start Ballast Factor 88 HB8_N=T8 Electronic Instant Start Normal Ballast Factor 10 HB8_H=T8 Electronic Instant Start High Ballast Factor 115-12 HR8_DIM=T8 Electronic Program Start Step Dimming Ballast Factor 88 HR8_L=T8 Electronic Program Start Low Ballast Factor 77 HR8_=T8 Electronic Program Start Ballast Factor 88 HR8_H=T8 Electronic Program Start High Ballast Factor 115-12</p>	<p>Options U=Unit Pack PALC=Job Pack, in carton</p>
<p>Series RDI=Ovation Series (Recessed Direct/Indirect)</p>	<p>Trim Type Leave Blank=Grid/Lay-in (Standard)</p>	<p>Lamp Position Leave Blank=Center mounted Lamps (standard) S=Side Mounted Lamps ASY=Asymmetric</p>	<p>Voltage<sup>2</sup> 120V=120 Volt 277V=277 Volt 347V=347 Volt UNV=Universal Voltage 120-277</p>	<p>Options GL=Single Element Fuse GM=Double Element Fuse Lamps - for lamps installed Flex - for flex installed EM=Emergency Installed</p>	<p>Wattage 17=17W T8 (24") 28T8=28W T8 (48")<sup>4</sup> 32=32W T8 (48") BX40=40W Biax (24") BX50=50W Biax (24")<sup>1</sup> BX55=55W Biax (24")<sup>1</sup> 14T5=14W T5 (24")<sup>1, 6</sup> 24T5=24W T5HO (24")<sup>1, 6</sup> 28T5=28W T5 (48")<sup>1, 6</sup> 54T5=54W T5HO (48")<sup>1, 6</sup></p>

Notes: <sup>1</sup>2' x 2' and 2' x 4' Center Lamp Shield models only <sup>2</sup>Products also available in non-US voltages and frequencies for international markets <sup>3</sup>Not available when specifying emergencies, voltage must be specific <sup>4</sup>When utilizing 28W T8 lamps, HPT8 ballast must be specified Other ballast restrictions may apply For complete product data, reference the Fluorescent Specification binder Specifications & dimensions subject to change without notice Consult your Cooper Lighting Representative for availability and ordering information

Ovation Recessed Direct/Indirect

- Available with Biaxial, T8, T5 and T5HO lamps
- Lamps and all hardware are completely shielded from view
- Available in center mount and side mount lamp shield configurations
- Available in 1, 2, 3 and 4 lamp modules
- High reflectance matte white finish provides optimum uniformity, efficiency and glare control
- UL/cUL Listed. Suitable for damp locations
- Can be used in drywall applications with drywall frame kit



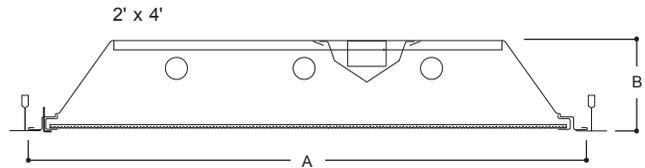
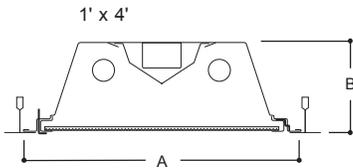


### GC8 Series Recessed Static Troffer

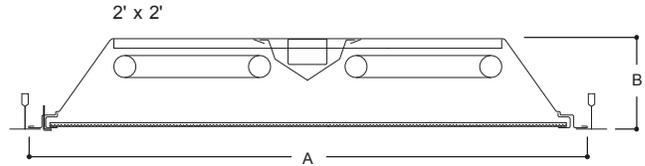
The GC8 series is a premium grade specification lensed troffer. This luminaire is dedicated to the latest T8 lamp and micro electronic ballast technology for optimal performance and energy efficiency. The GC8 is compatible with all of today's popular ceiling systems and is available with a number of options and accessories for application versatility. The GC8 Series features efficiency, quality and performance in a low profile luminaire.

### GC8 Recessed Static Troffer

- ☑ Equipped with energy saving ballasts/ complies with federal energy efficiency standards
- ☑ Innovative design provides superior lens brightness uniformity and visual comfort
- ☑ Standard reinforced flat white steel door and optional flat or regressed aluminum doors with mitered corners
- ☑ Spring loaded latch
- ☑ Min. 90% reflective white enamel finish for superior performance
- ☑ Optional "FAF" finish
- ☑ Positive light seal
- ☑ Die embossed housing
- ☑ Four auxiliary fixture end suspension points provided
- ☑ Endplate grid-lock feature
- ☑ UL/cUL Listed. Suitable for damp locations



Nominal Size	A	B
1' x 4'	11-3/4" (298mm)	3-3/4" (95mm)
2' x 2'	23-3/4" (603mm)	3-3/4" (95mm)
2' x 4'	23-3/4" (603mm)	3-3/4" (95mm)

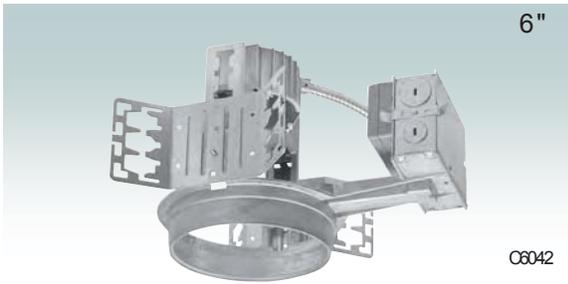


### Ordering Information

SAMPLE NUMBER: 2GC8-332-120V-EB81-U

<p>2=2' Width Blank=1' Width</p> <p>Trim Type G=Grid/Lay-in – Standard G=Concealed T G=Slot Grid (1) F=Flange Trim</p> <p>Series C8=Specification T8 Troffer</p> <p>Standard=Flat White Steel Door (Leave Blank) FA=Flat White Extruded Aluminum Door RA=3/8" Regressed White Extruded Aluminum Door FAN=Flat Natural Extruded Aluminum Door RAN=3/8" Regressed Natural Extruded Aluminum Door FAB=Flat Black Extruded Aluminum Door RAB=3/8" Regressed Black Extruded Aluminum Door</p>	<p>Number of Lamps<sup>2</sup> 2, 3, or 4 Lamps (Not included)</p> <p>Wattage (Length) U6T8=32W (24") 17=17W T8 (24") 28T8=28W T8 (48")<sup>5</sup> U1-5/8=31W T8 (24") 32=32W T8 (48") BX40=40W Biaxial (24")</p> <p>A=#12 Pattern Acrylic</p> <p>Voltage<sup>3</sup> 120V=120 Volt 277V=277 Volt 347V=347 Volt UNV=Universal Voltage 120-277<sup>4</sup></p> <p>Options GL=Single Element Fuse GM=Double Element Fuse Lamps - for lamps installed Flex - for flex installed EM=Emergency Installed</p>	<p>Lamps T8 Lamps L8835=T8 Lamp, 17W, 28W and 32W, 3500K<sup>5</sup> L8841=T8 Lamp, 17W, 28W and 32W, 4100K<sup>5</sup> L8835HL=T8 Lamp, 32W, 3500K, 3100 Lumens L8841HL=T8 Lamp, 32W, 4100K, 3100 Lumens</p>	<p>Options</p> <p>Ballast Type<sup>3</sup> Blank=Standard Magnetic Ballast (40W Biax only) EB8_=T8 Electronic Instant Start Total Harmonic Distortion &lt; 10% No of Ballast 1 or 2 EB8_/PLUS= T8 Electronic Instant Start High Ballast Factor &gt;1.13 Total Harmonic Distortion &lt; 20% No of Ballast 1 or 2 ER8_=T8 Electronic Program Start Total Harmonic Distortion &lt; 10% No of Ballast 1 or 2 HPT8 Ballast HB8_L=T8 Electronic Instant Start Low Ballast Factor 77 HB8_=T8 Electronic Instant Start Ballast Factor 88 HB8_N=T8 Electronic Instant Start Normal Ballast Factor 10 HB8_H=T8 Electronic Instant Start High Ballast Factor 115-12 HR8_DIM=T8 Electronic Program Start Step Dimming Ballast Factor 88 HR8_L=T8 Electronic Program Start Low Ballast Factor 77 HR8_=T8 Electronic Program Start Ballast Factor 88 HR8_H=T8 Electronic Program Start High Ballast Factor 115-12</p>	<p>Packaging U=Unit Pack PAL=Job Pack, out of carton PALC=Job Pack, in carton</p>
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Notes: <sup>1</sup> An EQ Grid Clip is recommended for all 9/16" ceiling systems <sup>2</sup> Standard off-center ballast compartment on 3-lamp fixtures <sup>3</sup> Products also available in non-US voltages and frequencies for international markets <sup>4</sup> Not available when specifying emergencies, voltage must be specific <sup>5</sup> When utilizing 28W T8 lamps, HPT8 ballast must be specified Other ballast restrictions may apply For complete product data, reference the Fluorescent Specification binder Specifications & dimensions subject to change without notice Consult your Cooper Lighting Representative for availability and ordering information



6"

C6042

### C6042 Vertical CFL 6"

Medium and wide beam distribution for general lighting from a single vertically mounted compact fluorescent lamp. Adjustable socket position maintains focus for varied reflector types.

Dimensions	Length	Width	Height	Output
Standard Housing	12"	11-1/2"	H	6-3/8"
Emergency	15-5/8"	16"	H	
Chicago Plenum	12"	11-1/2"	H	

Height varies with socket position; see reflector line drawing below for overall fixture height. Add 1/2" height for Chicago Plenum option

#### HOUSING

C6042 (1) 26/32/42W TTT Lamp

#### BALLAST

E 120V - 277V 50/60 Hz Electronic  
 3E 347V 50/60 Hz Electronic  
 1D26 26W 120V Dimming, Lutron® Compact SE  
 1D32 32W 120V Dimming, Lutron® Compact SE  
 1D42 42W 120V Dimming, Lutron® Compact SE  
 2D26 26W 277V Dimming, Lutron® Compact SE  
 2D32 32W 277V Dimming, Lutron® Compact SE  
 2D42 42W 277V Dimming, Lutron® Compact SE  
 EDR26 DeRated Wattage Label, 26W  
 EDR32 DeRated Wattage Label, 32W

### C6042 Vertical CFL 6"

- ☑ One piece Alzak® reflector with spun parabolic contour provides 45° cutoff to lamp and lamp image
- ☑ All finishes are low iridescent to eliminate rainbowing
- ☑ Positive reflector mounting via keyed holes and screws
- ☑ Integral reflector vents. One piece vented die cast aluminum cap
- ☑ Die-cast aluminum 1-1/2" deep collar
- ☑ Exclusive universal mounting bracket adjusts 5" vertically
- ☑ Junction box with 1/2" and 3/4" prouts, listed for eight #12 AWG 90°C conductors
- ☑ Electronic ballast have integral fuse, >99% power factor and 10% THD Electronic ballasts have current controlled preheat starting and End of Life protection standard.
- ☑ UL and cUL listed, feed through junction box, UL/cUL damp location

#### OPTIONS

CP Chicago Plenum  
 EM Emergency module with remote test switch  
 IEM Emergency module with integral test switch (must add "E" to Reflector)

#### ACCESSORIES

HB26 CChannel Bar Hanger, 26" Long, Pair  
 HB50 CChannel Bar Hanger, 50" Long, Pair  
 RMB22 Wood Joist Bar Hanger, 22" Long, Pair  
 HSA6 Slope Adapter for 6" Aperture Housings, Specify Slope  
 TRM6 Metal Trim Ring, Specify Finish\*  
 TRR6 Rimless Trim Ring, White\*  
 FK5 Field Installed Fuse Kit, 5 Amp  
 DT6 DecoTrims™\*  
 \*Not compatible with Self Flange

## TRIMS

### Open Downlight

1-26/32 TTT Medium Beam



#### TRIM

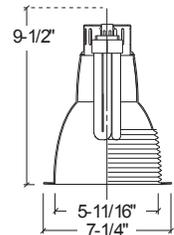
6001 Self Flanged  
 6000 Molded Trim Ring, White  
 6001E Self Flanged, use with IEM option  
 6000E Molded Trim Ring, White, use with IEM option

#### FINISH

LI Low Irdescent Clear  
 H Haze  
 WMH Warm Haze  
 G Gold  
 WH Wheat  
 W Gloss White  
 GP Graphite  
 GPH Graphite Haze  
 K Cognac  
 KH Cognac Haze

#### OPTIONS

WF White Painted Flange (Self Flanged only)



### Open Downlight

1-26/32 TTT Wide Beam



#### TRIM

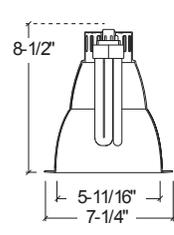
6051 Self Flanged  
 6050 Molded Trim Ring, White  
 6051E Self Flanged, use with IEM option  
 6050E Molded Trim Ring, White, use with IEM option

#### FINISH

LI Low Irdescent Clear  
 H Haze  
 WMH Warm Haze  
 G Gold  
 WH Wheat  
 W Gloss White  
 GP Graphite  
 GPH Graphite Haze  
 K Cognac  
 KH Cognac Haze

#### OPTIONS

WF White Painted Flange (Self Flanged only)



### Open Downlight

1-42 TTT



#### TRIM

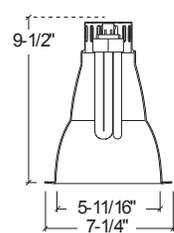
6451 Self Flanged  
 6450 Molded Trim Ring, White  
 6451E Self Flanged, use with IEM option  
 6450E Molded Trim Ring, White, use with IEM option

#### FINISH

LI Low Irdescent Clear  
 H Haze  
 G Gold  
 WH Wheat  
 WMH Warm Haze  
 W Gloss White  
 GP Graphite  
 GPH Graphite Haze  
 K Cognac  
 KH Cognac Haze

#### OPTIONS

WF White Painted Flange (Self Flanged only)



## TRIMS (CONTINUED)

## Open Wall Wash

Gradient Kicker  
1-26/32 TTT



## TRIM

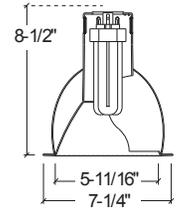
60111 Single Wall Wash, Self Flanged  
60121 Double Wall Wash, Self Flanged  
60131 Corner Wall Wash, Self Flanged

## FINISH

LI Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

## OPTIONS

WF White  
Painted Flange



## Open Wall Wash

Gradient Kicker  
1-42 TTT



## TRIM

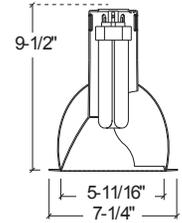
64111 Single Wall Wash, Self Flanged  
64121 Double Wall Wash, Self Flanged  
64131 Corner Wall Wash, Self Flanged

## FINISH

LI Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

## OPTIONS

WF White  
Painted Flange



## Open Wall Wash

GRJM  
1-26/32 TTT



## TRIM

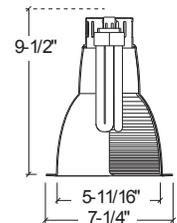
6011 Single Wall Wash, Self Flanged  
6010 Single Wall Wash,  
Molded Trim Ring, White  
6021 Double Wall Wash, Self Flanged  
6020 Double Wall Wash,  
Molded Trim Ring, White  
6031 Corner Wall Wash, Self Flanged  
6030 Corner Wall Wash,  
Molded Trim Ring, White

## FINISH

LI Low Iridescent Clear  
H Haze  
G Gold  
WH Wheat  
WMH Warm Haze  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

## OPTIONS

WF White  
Painted Flange  
(Self Flanged  
only)



## Lens Downlight

1-26/32/42 TTT



## TRIM

6081 Self Flanged  
6080 Molded Trim Ring,  
White

## FINISH

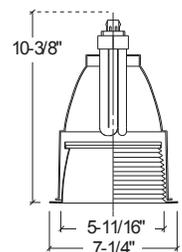
LI Low Iridescent Clear  
H Haze  
G Gold  
WH Wheat  
WMH Warm Haze  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze  
BB Black Baffle (6080 only)  
WB White Baffle (6080 only)

## LENS

1 Prismatic Acrylic  
2 Diffuse Acrylic  
3 Clear Polycarbonate  
1G Prismatic Glass  
2G Diffuse Glass  
3G Clear Glass  
4G Fresnel Glass

## OPTIONS

WF White  
Painted Flange  
(Self Flanged  
only)



## Ordering Example

Housing, Trim, Accessories and Lamps ordered as separate line items

Housing

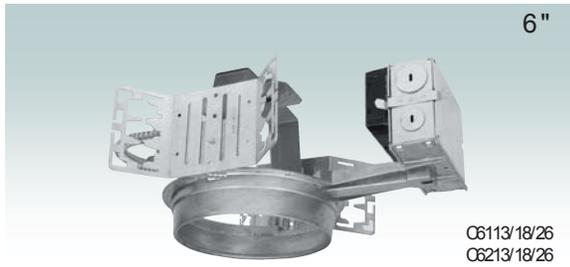
C6042E

Trim

60111LI

Accessories

HB26



6"

C6113/18/26  
C6213/18/26

### C6113, C6213 6" CFL Horizontal

Wide beam distribution for general and task lighting from one or two horizontally mounted compact fluorescent lamp. Accommodates various reflector types.

### C6113, C6213 6" CFL Horizontal

- ☑ One piece Alzak® reflector with spun parabolic contour provides 55° cutoff to lamp and lamp image
- ☑ Available in a broad range of low iridescent reflector finishes
- ☑ Die-cast aluminum socket housing provides venting for proper thermal performance
- ☑ Die-cast aluminum plaster frame with 1-1/2" deep collar accommodates ceiling up to 2" thick
- ☑ Junction box with 1/2" and 3/4" pryouts, listed for eight #12 AWG 90°C conductors
- ☑ Universal input 120-277V electronic ballast provides full light and rated lamp life. Provides flicker-free and noise-free starting and operation
- ☑ UL and cUL Listed for damp locations

Dimensions	Length	Width	Height	Output
Standard Housing	13"	11-1/2"	6-1/2"	6-3/8"
Emergency	15-5/8"	16"	6-1/2"	
Chicago Plenum	13"	11-1/2"	6-1/2"	

#### HOUSING

C6113 (1) 13W TTT Lamp  
C6118 (1) 18W TTT Lamp  
C6126 (1) 26W TTT Lamp

C6213 (2) 13W DTT Lamp  
C6218 (2) 18W DTT Lamp  
C6226 (2) 26W DTT Lamp

\*For (2) lamp housing only

#### BALLAST

E 120V - 277V 50/60 Hz Electronic  
3E 347V 50/60 Hz Electronic  
1D 120V Dimming, Lutron®  
Compact SE (18W TTT, 26W TTT only)  
2D 277V Dimming, Lutron®  
Compact SE (18W TTT, 26W TTT only)

#### OPTIONS

CP Chicago Plenum  
2C (2) Ballasts for Hi-Low Switching\*  
2CMS 2 Circuit Master Satellite (2 housings, order 2 trims)\*  
EM Emergency module with remote test switch  
IEM Emergency module with integral test switch (must add "E" to Reflector)

#### ACCESSORIES

HB26 C Channel Bar Hanger, 26" Long, Pair  
HB50 C Channel Bar Hanger, 50" Long, Pair  
RMB22 Wood Joist Bar Hanger, 22" Long, Pair  
HSA6 Slope Adapter for 6" Aperture Housings, Specify Slope (not recommended for wall wash)  
TRM6 Metal Trim Ring, Specify Finish\*  
TRF6 Rimless Trim Ring, White\*  
FK5 Field Installed Fuse Kit, 5 Amp  
DT6 DecoTrims™\*  
\*Not compatible with Self Range

### TRIMS

#### Open Downlight



#### TRIM

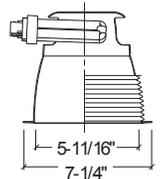
6251 Self Flanged  
6250 Molded Trim Ring, White  
6251E Self Flanged, use with IEM option  
6250E Molded Trim Ring, White, use with IEM option

#### FINISH

LI Low Iridescent Clear  
H Haze  
G Gold  
WH Wheat  
WMH Warm Haze  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze  
BB Black Baffle (6250 only)  
WB White Baffle (6250 only)

#### OPTIONS

WF White Painted Flange (Self Flanged only)



#### Open Wall Wash

GRUM



#### TRIM

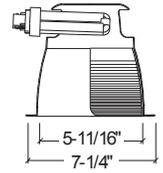
6211 Single Wall Wash, Self Flanged  
6210 Single Wall Wash, Molded Trim Ring, White  
6221 Double Wall Wash, Self Flanged  
6220 Double Wall Wash, Molded Trim Ring, White

#### FINISH

LI Low Iridescent Clear  
H Haze  
G Gold  
WH Wheat  
WMH Warm Haze  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

#### OPTIONS

WF White Painted Flange (Self Flanged only)



#### Cross Blade Downlight



#### TRIM

6281 Self Flanged  
6281E Self Flanged, use with IEM option

#### FINISH

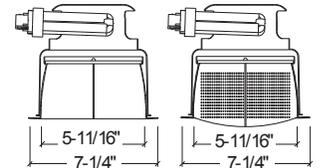
LI Low Iridescent Clear  
W Gloss White

#### LOUVER

5 Blade (LI or W Matching Blade Finish)  
6 Perforated Blade (Lt Grey Blades, W Finish only)

#### OPTIONS

WF White Painted Flange (Self Flanged only)



#### Lens Downlight



#### TRIM

6281 Self Flanged  
6281E Self Flanged, use with IEM option

#### FINISH

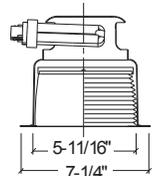
LI Low Iridescent Clear  
H Haze  
G Gold  
WH Wheat  
WMH Warm Haze  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze  
BB Black Baffle (6280 only)  
WB White Baffle (6280 only)

#### LENS

1 Prismatic Acrylic  
2 Diffuse Acrylic  
3 Clear Polycarbonate  
1G Prismatic Glass  
2G Diffuse Glass  
3G Clear Glass  
4G Fresnel Glass

#### OPTIONS

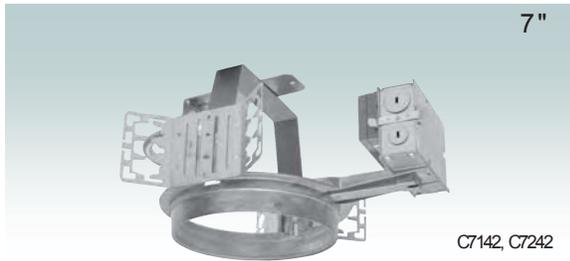
WF White Painted Flange (Self Flanged only)



#### Ordering Example

Housing, Trim, Accessories and Lamps ordered as separate line items

Housing	Trim	Accessories
C6113E	6250LI	HB26



7"

C7142, C7242

### C7142, C7242 7" CFL Horizontal

Wide beam distribution for general and task lighting from one or two horizontally mounted compact fluorescent lamps. Accommodates various reflector types. Adjustable socket bracket maintains proper lamp position.

### C7142, C7242 7" CFL Horizontal

- ☑ One piece Alzak® reflector with spun parabolic contour provides 55° cutoff to lamp and lamp image
- ☑ Available in a broad range of low iridescent reflector finishes
- ☑ Die-cast aluminum socket housing provides venting for proper thermal performance
- ☑ Die-cast aluminum plaster frame with 1-1/2" deep collar accommodates ceiling up to 2" thick
- ☑ Junction box with 1/2" and 3/4" pryouts, listed for eight #12 AWG 90°C conductors
- ☑ Universal input 120-277V electronic ballast provides full light and rated lamp life. Provides flicker-free and noise-free starting and operation
- ☑ UL and cUL Listed for damp locations

Dimensions	Length	Width	Height	Outout
Standard Housing	14"	13-5/16"	8"	8-1/8"
Emergency	17-5/8"	20"	8"	
Chicago Plenum	14"	13-5/16"	8"	

#### HOUSING

- C7142 (1) 26W TTT Lamp  
(1) 32W TTT Lamp  
(1) 42W TTT Lamp  
C7242 (2) 26W TTT Lamp  
(2) 32W TTT Lamp  
(2) 42W TTT Lamp

#### BALLAST

- E 120V - 277V 50/60 Hz Electronic  
3E 347V 50/60 Hz Electronic  
1D26 26W 120V Dimming, Lutron® Compact SE  
1D32 32W 120V Dimming, Lutron® Compact SE  
1D42 42W 120V Dimming, Lutron® Compact SE  
2D26 26W 277V Dimming, Lutron® Compact SE  
2D32 32W 277V Dimming, Lutron® Compact SE  
2D42 42W 277V Dimming, Lutron® Compact SE  
EDR26 DeRated Wattage Label, 26W  
EDR32 DeRated Wattage Label, 32W

#### OPTIONS

- CP Chicago Plenum  
2C (2) Ballasts for Hi-Low Switching  
2OMS 2 Circuit Master Satellite (2 housings, order 2 trims)  
EM Emergency module with remote test switch  
IEM Emergency module with integral test switch (must add "E" to Reflector)

#### ACCESSORIES

- HB26 C Channel Bar Hanger, 26" Long, Pair  
HB50 C Channel Bar Hanger, 50" Long, Pair  
RMB22 Wood Joist Bar Hanger, 22" Long, Pair  
FK5 Field Installed Fuse Kit, 5 Amp  
HSA7 Slope Adapter for 7" Aperture Housings, Specify Slope (not recommended for wall wash)  
TRM7 Metal Trim Ring, Specify Finish\*  
TRR7 Rimless Trim Ring, White\*  
FK5 Field Installed Fuse Kit, 5 Amp  
DT7 DecoTrims™  
\*Not compatible with Self Flange

### TRIMS

#### Open Downlight

1 or 2 26/32/42W TTT  
Wide Beam



#### TRIM

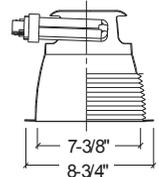
- 1 Lamp  
7151 Self Flanged  
7150 Molded Trim Ring, White  
7151E Self Flanged, use with IEM option  
7150E Molded Trim Ring, White, use with IEM option  
2 Lamp  
7351 Self Flanged  
7350 Molded Trim Ring, White  
7351E Self Flanged, use with IEM option  
7350E Molded Trim Ring, White, use with IEM option

#### FINISH

- LI Low Iridescent  
Clear  
H Haze  
G Gold  
WH Wheat  
WMH Warm Haze  
W Gloss White  
GP Graphite

#### OPTIONS

- WF White Painted Flange (Self Flanged only)



#### Open Wall Wash

GRUM 1 or 2 26/32/42W TTT



#### TRIM

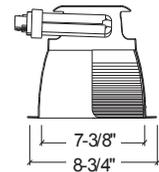
- 1 Lamp  
7111 Single Wall Wash, Self Flanged  
7110 Single Wall Wash, Molded Trim Ring, White  
7121 Double Wall Wash, Self Flanged  
7120 Double Wall Wash, Molded Trim Ring, White  
2 Lamp  
7311 Single Wall Wash, Self Flanged  
7310 Single Wall Wash, Molded Trim Ring, White  
7321 Double Wall Wash, Self Flanged  
7320 Double Wall Wash, Molded Trim Ring, White

#### FINISH

- LI Low Iridescent  
Clear  
H Haze  
G Gold  
WH Wheat  
WMH Warm Haze  
W Gloss White  
GP Graphite

#### OPTIONS

- WF White Painted Flange (Self Flanged only)



#### Cross Blade Downlight

1 or 2 26/32/42W TTT



#### TRIM

- 1 Lamp  
7181 Self Flanged  
2 Lamp  
7381 Self Flanged

#### FINISH

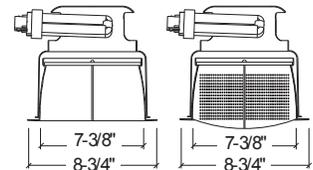
- LI Low Iridescent  
Clear  
W Gloss White

#### LOUVER

- 5 Blade (LI or W Matching Blade Finish)  
6 Perforated Blade (Lt Grey Blades, W Finish only)

#### OPTIONS

- WF White Painted Flange (Self Flanged only)



#### Lens Downlight

1 or 2 26/32/42W TTT



#### TRIM

- 1 Lamp  
7181 Self Flanged  
7180 Molded Trim Ring, White  
2 Lamp  
7381 Self Flanged  
7380 Molded Trim Ring, White

#### FINISH

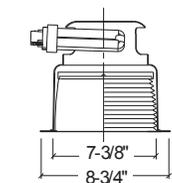
- LI Low Iridescent  
Clear  
H Haze  
G Gold  
WH Wheat  
WMH Warm Haze  
W Gloss White  
GP Graphite

#### LENS

- GP Graphite Haze  
K Cognac  
KH Cognac Haze  
BB Black Baffle (7180 and 7380 only)  
WB White Baffle (7180 and 7380 only)  
1 Prismatic Acrylic  
2 Diffuse Acrylic  
3 Clear  
Polycarbonate  
1G Prismatic Glass  
2G Diffuse Glass  
3G Clear Glass  
4G Fresnel Glass

#### OPTIONS

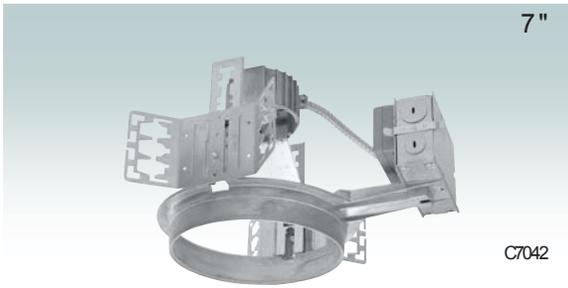
- WF White Painted Flange (Self Flanged only)



#### Ordering Example

Housing, Trim, Accessories and Lamps ordered as separate line items

Housing	Trim	Accessories
C7142E	7150LI	HB26



### C7042 CFL Vertical

Medium and wide beam distribution for general lighting from a single vertically mounted compact fluorescent lamp. Adjustable socket position maintains focus for varied reflector types.

Dimensions	Length	Width	Height	Output
Standard Housing	13-7/8"	13-5/16"	H	8-1/8"
Emergency	17-5/8"	17"	H	
Chicago Plenum	13-7/8"	13-5/16"	H	

Height varies with socket position; see reflector line drawing below for overall fixture height. Add 1/2" height for Chicago Plenum option

### C7042 CFL Vertical

- ☑ Geometric reflector for uniform vertical illumination (GRUVI)
- ☑ One piece Alzak® reflector with spun parabolic contour provides 45° cutoff to lamp and lamp image
- ☑ Available in single, double and corner wall wash
- ☑ All finishes are low iridescent to eliminate rainbowing
- ☑ Integral reflector vents. Positive reflector mounting via keyed holes and screws
- ☑ One piece vented die cast aluminum cap
- ☑ Die-cast aluminum 1-1/2" deep collar
- ☑ Exclusive universal mounting bracket adjusts 5" vertically
- ☑ Junction box with 1/2" and 3/4" pryouts, listed for eight #12 AWG 90°C conductors
- ☑ Electronic ballasts have integral fuse, >99% power factor and <10% THD. Electronic ballasts have current controlled preheat starting and End of Life protection standard
- ☑ UL and cUL listed, feed through junction box, UL/cUL wet location

#### HOUSING

C7042 (1) 26W DTT Lamp  
(1) 26/32/42W TTT Lamp

#### BALLAST

E 120V - 277V 50/60 Hz Electronic  
3E 347V 50/60 Hz Electronic  
1D26 26W 120V Dimming, Lutron® Compact SE  
1D32 32W 120V Dimming, Lutron® Compact SE  
1D42 42W 120V Dimming, Lutron® Compact SE  
2D26 26W 277V Dimming, Lutron® Compact SE  
2D32 32W 277V Dimming, Lutron® Compact SE  
2D42 42W 277V Dimming, Lutron® Compact SE  
EDR26 DeRated Wattage Label, 26W  
EDR32 DeRated Wattage Label, 32W

#### OPTIONS

CP Chicago Plenum  
EM Emergency module with remote test switch  
IEM Emergency module with integral test switch (must add "E" to Reflector)

#### ACCESSORIES

HB26 C Channel Bar Hanger, 26" Long, Pair  
HB50 C Channel Bar Hanger, 50" Long, Pair  
RMB22 Wood Joist Bar Hanger, 22" Long, Pair  
HSA7 Slope Adapter for 7" Aperture Housings, Specify Slope  
TRM7 Metal Trim Ring, Specify Finish\*  
TRR7 Rimless Trim Ring, White\*  
FK5 Field Installed Fuse Kit, 5 Amp  
DT7 DecoTrims™  
\*Not compatible with Self Flange

## TRIMS

### Open Downlight

1-26/32 TTT  
Medium Beam



#### TRIM

7001 Self Flanged  
7000 Molded Trim Ring, White  
7001E Self Flanged, use with IEM option  
7000E Molded Trim Ring, White, use with IEM option

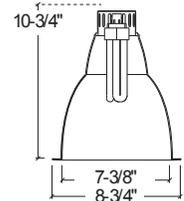
#### FINISH

LI Low Irdescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Goss White

GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

#### OPTIONS

WF White Painted Flange (Self Flanged only)



### Open Downlight

1-26/32 TTT  
Wide Beam



#### TRIM

7051 Self Flanged  
7050 Molded Trim Ring, White  
7051E Self Flanged, use with IEM option  
7050E Molded Trim Ring, White, use with IEM option

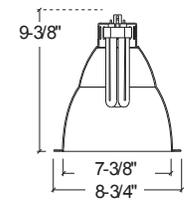
#### FINISH

LI Low Irdescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Goss White

GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

#### OPTIONS

WF White Painted Flange (Self Flanged only)



### Open Downlight

1-42 TTT Medium Beam



#### TRIM

7401 Self Flanged  
7400 Molded Trim Ring, White  
7401E Self Flanged, use with IEM option  
7400E Molded Trim Ring, White, use with IEM option

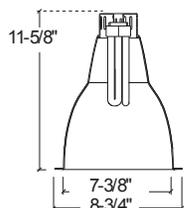
#### FINISH

LI Low Irdescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Goss White

GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

#### OPTIONS

WF White Painted Flange (Self Flanged only)



## TRIMS (CONTINUED)

## Open Downlight

1-42 TTT Wide Beam



## TRIM

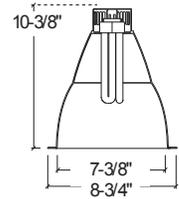
7451 Self Flanged  
7450 Molded Trim Ring, White  
7451E Self Flanged, use with IEM option  
7450E Molded Trim Ring, White, use with IEM option

## FINISH

LI Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

## OPTIONS

WF White Painted Flange (Self Flanged only)



## Lens Downlight

1-26 DTT, 1-26/32/42 TTT



## TRIM

7081 Self Flanged  
7080 Molded Trim Ring, White

## FINISH

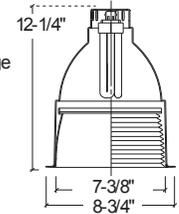
LI Low Iridescent Clear  
H Haze  
G Gold  
WH Wheat  
WMH Warm Haze  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze  
BB Black Baffle (7080 only)  
WB White Baffle (7080 only)

## LENS

1 Prismatic Acrylic  
2 Diffuse Acrylic  
3 Clear Polycarbonate  
1G Prismatic Glass  
2G Diffuse Glass  
3G Clear Glass  
4G Fresnel Glass

## OPTIONS

WF White Painted Flange (Self Flanged only)



## Open Wall Wash

Gradient Kicker  
1-26/32 TTT

## TRIM

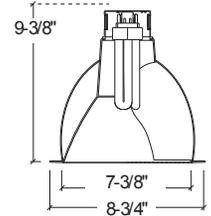
70111 Single Wall Wash, Self Flanged  
70121 Double Wall Wash, Self Flanged  
70131 Corner Wall Wash, Self Flanged

## FINISH

LI Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

## OPTIONS

WF White Painted Flange



## Open Wall Wash

Gradient Kicker  
1-26 DTT  
1-42 TTT

## TRIM

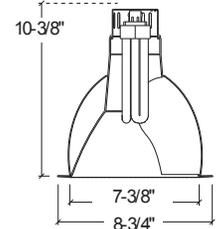
74111 Single Wall Wash, Self Flanged  
74121 Double Wall Wash, Self Flanged  
74131 Corner Wall Wash, Self Flanged

## FINISH

LI Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

## OPTIONS

WF White Painted Flange



## Open Wall Wash

GRJM  
1-26/32 TTT

## TRIM

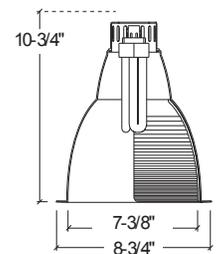
7011 Single Wall Wash, Self Flanged  
7010 Single Wall Wash, Molded Trim Ring, White  
7021 Double Wall Wash, Self Flanged  
7020 Double Wall Wash, Molded Trim Ring, White  
7031 Corner Wall Wash, Self Flanged  
7030 Corner Wall Wash, Molded Trim Ring, White

## FINISH

LI Low Iridescent Clear  
H Haze  
G Gold  
WH Wheat  
WMH Warm Haze  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

## OPTIONS

WF White Painted Flange (Self Flanged only)



## Open Wall Wash

GRJM  
1-42 TTT

## TRIM

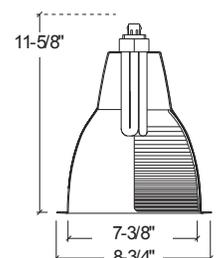
7411 Single Wall Wash, Self Flanged  
7410 Single Wall Wash, Molded Trim Ring, White  
7421 Double Wall Wash, Self Flanged  
7420 Double Wall Wash, Molded Trim Ring, White  
7431 Corner Wall Wash, Self Flanged  
7430 Corner Wall Wash, Molded Trim Ring, White

## FINISH

LI Low Iridescent Clear  
H Haze  
G Gold  
WH Wheat  
WMH Warm Haze  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

## OPTIONS

WF White Painted Flange (Self Flanged only)



## Ordering Example

Housing, Trim, Accessories and Lamps ordered as separate line items

Housing

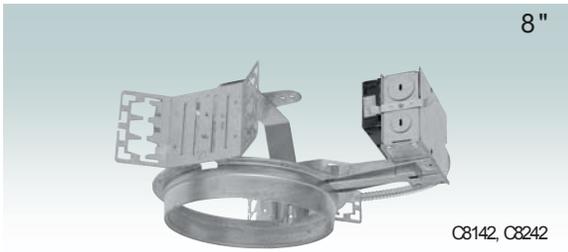
C7042E

Trim

70111LI

Accessories

HB26



8"

C8142, C8242

### C8142, C8242 8" CFL Horizontal

Wide beam distribution for general and task lighting from one or two horizontally mounted compact fluorescent lamps. Accommodates various reflector types. Adjustable socket bracket maintains proper lamp position.

### C8142, C8242 8" CFL Horizontal

- ☑ One piece Alzak® reflector with spun parabolic contour provides 55° cutoff to lamp and lamp image
- ☑ Available in a broad range of low iridescent reflector finishes
- ☑ Die-cast aluminum socket housing provides venting for proper thermal performance
- ☑ Die-cast aluminum plaster frame with 1-1/2" deep collar accommodates ceiling up to 2" thick
- ☑ Junction box with 1/2" and 3/4" pryouts, listed for eight #12 AWG 90°C conductors
- ☑ Universal input 120-277V electronic ballast provides full light and rated lamp life. Provides flicker-free and noise-free starting and operation
- ☑ UL and cUL Listed for damp locations

Dimensions	Length	Width	Height	Output
Standard Housing	14-3/4"	13-29/32"	7-3/4"	9-1/8"
Emergency	17-15/16"	13-29/32"	7-3/4"	
Chicago Plenum	14-3/4"	13-29/32"	7-3/4"	

#### HOUSING

- C8142 (1) 26W DTT Lamp  
 (1) 26W TTT Lamp  
 (1) 32W TTT Lamp  
 (1) 42W TTT Lamp  
 C8242 (2) 26W DTT Lamp  
 (2) 26W TTT Lamp  
 (2) 32W TTT Lamp  
 (2) 42W TTT Lamp

#### BALLAST

- E 120V - 277V 50/60 Hz Electronic  
 3E 347V 50/60 Hz Electronic  
 1D26 26W 120V Dimming, Lutron® Compact SE  
 1D32 32W 120V Dimming, Lutron® Compact SE  
 1D42 42W 120V Dimming, Lutron® Compact SE  
 2D26 26W 277V Dimming, Lutron® Compact SE  
 2D32 32W 277V Dimming, Lutron® Compact SE  
 2D42 42W 277V Dimming, Lutron® Compact SE  
 EDR26 DeRated Wattage Label, 26W  
 EDR32 DeRated Wattage Label, 32W

#### OPTIONS

- CP Chicago Plenum  
 2C (2) Ballasts for Hi-Low Switching  
 2CMS 2 Circuit Master Satellite (2 housings, order 2 trims)  
 EM Emergency module with remote test switch  
 IEM Emergency module with integral test switch (must add "E" to Reflector)

#### ACCESSORIES

- HB26 C Channel Bar Hanger, 26" Long, Pair  
 HB50 C Channel Bar Hanger, 50" Long, Pair  
 RMB22 Wood Joist Bar Hanger, 22" Long, Pair  
 RK5 Field Installed Fuse Kit, 5 Amp

## TRIMS

### Open Downlight

1 or 2 26/32/42W TTT  
 Wide Beam



#### TRIM

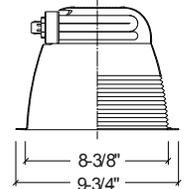
- 8351 Self Flanged  
 8350 Molded Trim Ring, White  
 8351E Self Flanged, use with IEM option  
 8350E Molded Trim Ring, White, use with IEM option

#### FINISH

- LI Low Iridescent Clear  
 H Haze  
 G Gold  
 WH Wheat  
 WMH Warm Haze  
 W Gloss White  
 GP Graphite

#### OPTIONS

- WF White Painted Flange (Self Flanged only)



### Open Wall Wash

1 or 2 26/32/42W TTT  
 GRUM



#### TRIM

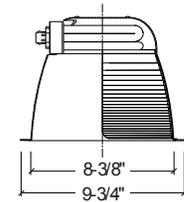
- 8311 Single Wall Wash, Self Flanged  
 8310 Single Wall Wash, Molded Trim Ring, White  
 8321 Double Wall Wash, Self Flanged  
 8320 Double Wall Wash, Molded Trim Ring, White

#### FINISH

- LI Low Iridescent Clear  
 H Haze  
 WMH Warm Haze  
 G Gold  
 WH Wheat  
 W Gloss White  
 GP Graphite

#### OPTIONS

- WF White Painted Flange (Self Flanged only)



### Lens Downlight

1 or 2 26/32/42W TTT



#### TRIM

- 8381 Self Flanged  
 8380 Molded Trim Ring, White

#### FINISH

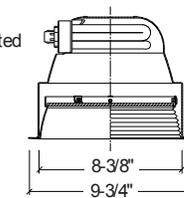
- LI Low Iridescent Clear  
 H Haze  
 WMH Warm Haze  
 G Gold  
 WH Wheat  
 W Gloss White  
 GP Graphite

#### LENS

- 1 Prismatic Acrylic  
 2 Diffuse Acrylic  
 3 Clear Polycarbonate  
 1G Prismatic Glass  
 2G Diffuse Glass  
 3G Clear Glass  
 4G Fresnel Glass

#### OPTIONS

- WF White Painted Flange (Self Flanged only)



### Crossblade Downlight

1 or 2 26/32/42W TTT



#### TRIM

- 8381 Self Flanged

#### FINISH

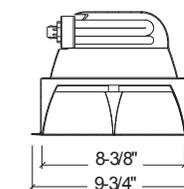
- LI Low Iridescent Clear  
 W Gloss White

#### LOUVER

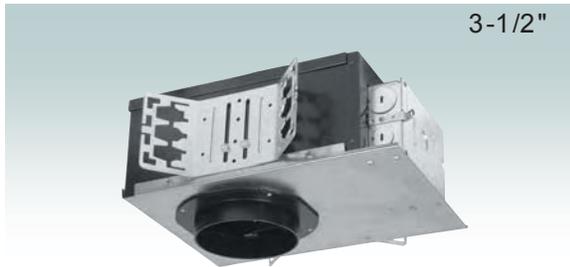
- 5 Blade (LI or W Matching Blade Finish)

#### OPTIONS

- WF White Painted Flange (Self Flanged only)



Ordering Example	Housing	Trim	Accessories
Housing, Trim, Accessories and Lamps ordered as separate line items	C82421D26	8350LI	HB26



3-1/2"

### HA3MR 3-1/2" MR16 Low Voltage Straight Downlight, Directional/Accent or Lens Wall Wash

Low Voltage MR16 adjustable fixture for flat or slope ceilings. Use open downlight for general and task lighting. Pinhole hides lamp and provides clean ceiling. Lens wall wash for even illumination along vertical surfaces. Lockable 361° rotation and 45° tilt with center beam optics provides full output with no flash back. Top lamp accessible. Integral magnetic transformer.

### HA3MR 3-1/2" MR16 Low Voltage Straight Downlight, Directional/Accent or Lens Wall Wash

- Die cast 1" deep collar, 18 gauge CRS housing painted matte black to eliminate stray light. Housing is top accessible
- Universal mounting brackets accept 1/2" EMT, C channel and bar hangers and provides 5" total height adjustment
- Junction listed for (6) #12 AWG 90°C conductors and has pryouts for 6-1/2" conduit fittings
- Integral magnetic step down transformer has dual tap 120/277V primary, 75VA max. output
- Lamp aiming mechanism provides 360° rotation and 45° tilt and locks into any aiming position
- Aluminum reflector is available in a broad range of Alzak® finishes as well as white or black baffles. Two torsion springs pull trim tight to ceiling. Available in self flanged or with a die cast metal trim ring

Dimensions	Length	Width	Height	Output
Standard Housing	12-1/8	12	5-9/16	9-1/4"
Chicago Plenum	15-11/16"	13-15/16"	5-5/16"	10-5/8" x

#### HOUSING

HA3MR Low Voltage MR16 Directional, 120/277V  
 HA3MRCP Low Voltage MR16 Directional, 120/277V  
 Chicago Plenum

#### OPTIONS

DR37 DeRated Wattage Label for 37W Maximum  
 DR50 DeRated Wattage Label for 50W Maximum

#### ACCESSORIES

HB26 C Channel Bar Hanger, 26" Long, Pair  
 HB50 C Channel Bar Hanger, 50" Long, Pair  
 RMB22 Wood Joist Bar Hanger, 22" Long, Pair  
 L100 Series Color Filter and Lens  
 FK5 Field Installed Fuse Kit, 5 Amp

## TRIMS

### Lens Wall Wash

MR16 75W Max

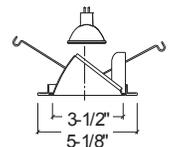


#### TRIM

3481 Self Flanged Lens Wall Wash  
 3480 Lens WW Metal Trim Ring

#### FINISH

L Low Iridescent Clear  
 H Haze  
 WMH Warm Haze  
 G Gold  
 WH Wheat  
 B Specular Black  
 W Gloss White  
 GP Graphite  
 GPH Graphite Haze  
 K Cognac  
 KH Cognac Haze



### Open Downlight

MR16 75W Max



#### TRIM

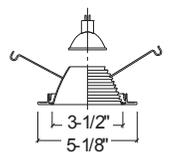
3451 Self Flanged  
 3450 Metal Trim Ring, White

#### FINISH

L Low Iridescent Clear  
 H Haze  
 WMH Warm Haze  
 G Gold  
 WH Wheat  
 B Black  
 W Gloss White  
 GP Graphite  
 GPH Graphite Haze  
 K Cognac  
 KH Cognac Haze  
 BB Black Baffle (3450 only)  
 WB White Baffle (3450 only)

#### OPTIONS

WF White Painted Flange (Self Flanged only)



### Angle Cut

MR16 75W Max



#### TRIM

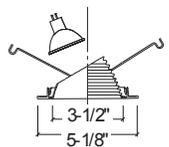
3471 Self Flanged  
 3470 Metal Trim Ring, White

#### FINISH

L Low Iridescent Clear  
 H Haze  
 WMH Warm Haze  
 G Gold  
 WH Wheat  
 B Black  
 W Gloss White  
 GP Graphite  
 GPH Graphite Haze  
 K Cognac  
 KH Cognac Haze  
 BB Black Baffle (3470 only)  
 WB White Baffle (3470 only)

#### OPTIONS

WF White Painted Flange (Self Flanged only)



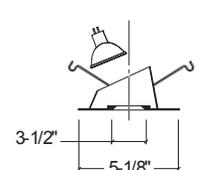
### Pinhole

MR16 75W Max

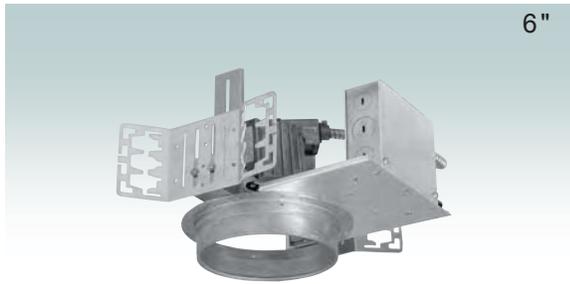


#### TRIM

3470PIN Pinhole, Black Shielding Cone and Oculus, White Metal Trim Ring



Ordering Example	Housing	Trim	Accessories
Housing, Trim, Accessories and Lamps ordered as separate line items	HA3MRDR50	3450LI	HB26



### HD6MRI Incandescent 6"

Non-ferrous downlight for MRI suites. Medium and wide beam distribution for general and task lighting from a variety of vertically mounted incandescent and halogen lamps. Adjustable socket position maintains focus for varied reflector types.

Dimensions	Length	Width	Height	Outout
Standard Housing	11-1/8"	13-5/8"	H"	6-3/8"
Chicago Plenum	11-1/8"	13-5/8"	H"	

Height varies with socket position; see reflector line drawing below for overall fixture height. Add 1/2" height for Chicago Plenum option

#### HOUSING

- HD6MRI Non-Ferrous Incandescent
- HD6MRI/CP Non-Ferrous Incandescent, Chicago Plenum

#### ACCESSORIES

- TRR6 Rimless Trim Ring, White\*
- \*Not compatible with Self Range

### HD6MRI Incandescent 6"

- ▣ Precisely formed non-imaging reflector provides 45° cutoff to lamp and lamp image
- ▣ One piece heat dissipating die-cast aluminum socket cap
- ▣ High impact polymer trim ring with satin white finish or self flanged reflector
- ▣ Precision die-cast aluminum 1-1/2" deep collar. Optical assembly adjusts within housing to accommodate ceilings up to 2" thick
- ▣ Exclusive universal mounting bracket adjusts 5" vertically
- ▣ Self-resetting insulation detector opens circuit if insulation is improperly installed
- ▣ Junction box with 1/2" and 3/4" knockouts, listed for eight #12 AWG 90° C conductors
- ▣ Modular housing system supports various downlight and wall wash reflectors
- ▣ Luminaire Efficacy Rating HD4-4501-12.22 HD6-6700-12.10
- ▣ UL and cUL listed, feed through junction box, UL/cUL damp location

## TRIMS

### Open Downlight

A19 100W Max, A21 200W Max  
Medium or Wide Beam



#### TRIM

6701 Self Flanged (Medium Beam)  
6700 Molded Trim Ring, White (Medium Beam)  
6751 Self Flanged (Wide Beam)  
6750 Molded Trim Ring, White (Wide Beam)

#### FINISH

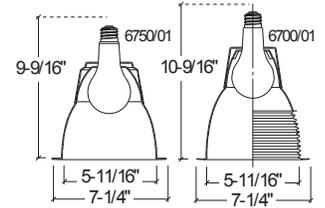
LI Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
B Black  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze  
BB Black Baffle (6700 only)  
WB White Baffle (6700 only)

#### OPTIONS

WF White Painted Flange (Self Flanged only)

#### DERATED WATTAGE LABEL

DR DeRated, Specify Wattage



### Open Downlight

PAR30 75W Max



#### TRIM

6301 Self Flanged  
6300 Molded Trim Ring, White

#### FINISH

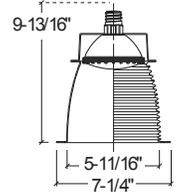
LI Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
B Black  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze  
BB Black Baffle (6300 only)  
WB White Baffle (6300 only)

#### OPTIONS

WF White Painted Flange (Self Flanged only)

#### DERATED WATTAGE LABEL

DR DeRated, Specify Wattage



### Open Downlight

PAR30L 75W Max



#### TRIM

6501 Self Flanged  
6500 Molded Trim Ring, White

#### FINISH

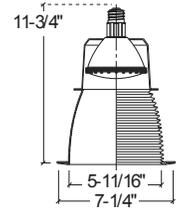
LI Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
B Black  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze  
BB Black Baffle (6500 only)  
WB White Baffle (6500 only)

#### OPTIONS

WF White Painted Flange (Self Flanged only)

#### DERATED WATTAGE LABEL

DR DeRated, Specify Wattage



### Open Downlight

PAR38 150W Max



#### TRIM

6601 Self Flanged  
6600 Molded Trim Ring, White

#### FINISH

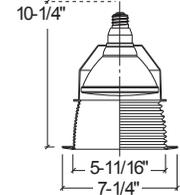
LI Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
B Black  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze  
BB Black Baffle (6300 only)  
WB White Baffle (6300 only)

#### OPTIONS

WF White Painted Flange (Self Flanged only)

#### DERATED WATTAGE LABEL

DR DeRated, Specify Wattage



### Open Wall Wash

GRUM  
A19 100W Max, A21 200W Max



#### TRIM

6711 Single Wall Wash, Self Flanged  
6710 Single Wall Wash, Molded Trim Ring, White  
6721 Double Wall Wash, Self Flanged  
6720 Double Wall Wash, Molded Trim Ring, White  
6731 Corner Wall Wash, Self Flanged  
6730 Corner Wall Wash, Molded Trim Ring, White

#### FINISH

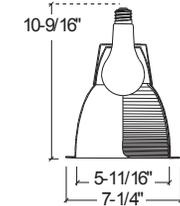
LI Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

#### OPTIONS

WF White Painted Flange (Self Flanged only)

#### DERATED WATTAGE LABEL

DR DeRated, Specify Wattage



#### Ordering Example

Housing, Trim, Accessories and Lamps ordered as separate line items

Housing

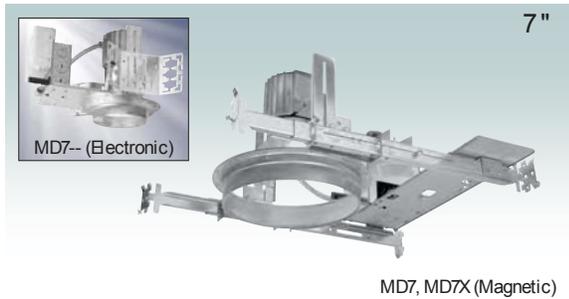
HD6MFI

Trim

6500K

Accessories

TRF6



## MD7 7" Downlight Metal Halide

Medium and wide beam downlight for general lighting from a single vertically mounted ED17P metal halide lamp or PAR lamp downlight for general and task lighting. Adjustable socket position maintains focus for varied reflector types. Medium base extended husk socket accepts lamps suitable for open fixture use only (except MD7X and MD7XCP). Optional quartz standby lamp installs through designated trim versions. Magnetic ballasts ordered separately installs rapidly to ballast bridge with electrical quick connects. Bar hangers provided with magnetic ballast housing.

## MD7 7" Downlight Metal Halide

- ☑ Precisely formed non-imaging reflector ensures 45° or 55° cutoff to lamp and lamp image
- ☑ For use with ceramic metal halide PAR38 lamps approved for use in open fixtures.
- ☑ Positive reflector mounting
- ☑ Thermally protected electronic ballast
- ☑ Die-cast aluminum 1-1/2" deep collar
- ☑ Exclusive universal mounting bracket adjust 5" vertically
- ☑ Junction box with 1/2" and 3/4" pryouts, listed for twelve #12 AWG 90°C conductors
- ☑ Self resetting insulation detector opens circuit if insulation is improperly installed
- ☑ cUL Listed, feed through junction box, UL damp location
- ☑ Electronic ballast with integral fuse, >99% power factor and <10%THD Offers excellent line voltage regulation resulting in increased color stability and flicker free operation.

Dimensions-Magnetic	Length	Width	Height	Outout
Standard Housing	24-7/16"	15-1/2"	H	8-1/8"
Chicago Plenum	24-7/16"	15-1/2"	H	

Dimensions-Electronic	Length	Width	Height	Outout
Standard Housing	14-1/2"	15-3/8"	H	8-1/8"
Chicago Plenum	14-1/2"	15-3/8"	H	

Height varies with socket position; see reflector line drawing below for over-all fixture height. Add 1/2" height for Chicago Plenum option

### HOUSING (Magnetic Ballast)

- MD7 Metal Halide
- MD7CP Metal Halide, Chicago Plenum
- MD7X Metal Halide, PAR38 only
- MD7XCP Metal Halide, PAR38 only, Chicago Plenum

### BALLAST

- 720 50W MH 120/277V Magnetic
- 728 50W MH 120/347V Magnetic
- 730 70W MH 120/277V Magnetic
- 738 70W MH 120/347V Magnetic
- 740 100W MH 120/277V Magnetic
- 748 100W MH 120/347V Magnetic
- 780 150W MH 120/277V Magnetic
- 788 150W MH 120/347V Magnetic

### ACCESSORIES

- HB26 C Channel Bar Hanger, 26" Long, Pair
  - HB50 C Channel Bar Hanger, 50" Long, Pair
  - HSA7 Slope Adapter for 7" Aperture Housings, Specify Slope
  - TRM7 Metal Trim Ring, Specify Finish\*
  - TRR7 Rimless Trim Ring, White\*
  - FK Field Installed Fuse Kit, Specify Amperage
  - EQL Emergency Circuit Quartz Standby Lamp Kit
  - ISL50150 Internal Quartz Standby Lamp Kit, 50-150W
- \*Not compatible with Self Range

### HOUSING (Electronic Ballast)

- MD750 50W Electronic Metal Halide
- MD750CP 50W Electronic Metal Halide, Chicago Plenum
- MD770 70W Electronic Metal Halide
- MD770CP 70W Electronic Metal Halide, Chicago Plenum
- MD770P38 70W Electronic Metal Halide, PAR38 only
- MD770P38CP 70W Electronic Metal Halide, PAR38 only, Chicago Plenum
- MD7100 6" 100W Electronic Metal Halide
- MD7100CP 6" 100W Electronic Metal Halide, Chicago Plenum
- MD7100P38 100W Electronic Metal Halide, PAR38 only
- MD7100P38CP 100W Electronic Metal Halide, PAR38 only, Chicago Plenum

### BALLAST

- 1E 120V 50/60 Hz Electronic
- 2E 277V 50/60 Hz Electronic

### OPTIONS

- Q Quartz Restrike System with Time Delay, 100W DC Bayonet Base Quartz Lamp (Included)

### ACCESSORIES

- HSA7 Slope Adapter for 7" Aperture Housings, Specify Slope
  - TRM7 Metal Trim Ring, Specify Finish
  - TRR7 Rimless Trim Ring, White
  - FK Field Installed Fuse Kit, Specify Amperage
- \*Not compatible with Self Range

## TRIMS

### Open Downlight

150W Max. ED17P  
Medium Beam



#### TRIM

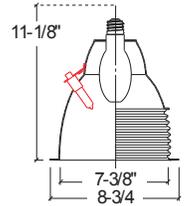
7701 Self Flanged  
7700 Molded Trim Ring, White  
7701X Self Flanged, Standby Lamp  
7700X Molded Trim Ring, White, Standby Lamp

#### FINISH

LJ Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze  
BB Black Baffle  
(7700 and 7700X only)  
WB White Baffle  
(7700 and 7700X only)

#### OPTIONS

WF White Painted Flange (Self Flanged only)



### Open Downlight

150W Max. ED17P  
Wide Beam



#### TRIM

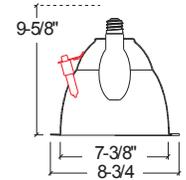
7751 Self Flanged  
7750 Molded Trim Ring, White  
7751X Self Flanged, Standby Lamp  
7750X Molded Trim Ring, White, Standby Lamp

#### FINISH

LJ Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

#### OPTIONS

WF White Painted Flange (Self Flanged only)



### Open Wall Wash

150W Max. ED17P  
GRJM



#### TRIM

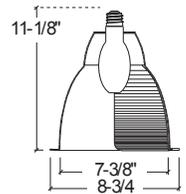
7711 Single Wall Wash, Self Flanged  
7710 Single Wall Wash, Molded Trim Ring, White  
7721 Double Wall Wash, Self Flanged  
7720 Double Wall Wash, Molded Trim Ring, White  
7731 Corner Wall Wash, Self Flanged  
7730 Corner Wall Wash, Molded Trim Ring, White

#### FINISH

LJ Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze

#### OPTIONS

WF White Painted Flange (Self Flanged only)



### Open Downlight

Magnetic: 150W Max ED17, PAR38  
Electronic: 100W Max ED17, PAR38



#### TRIM

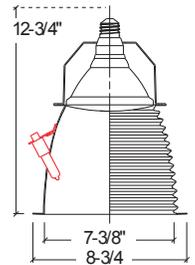
7601 Self Flanged  
7600 Molded Trim Ring, White  
7601X Self Flanged, Standby Lamp  
7600X Molded Trim Ring, White, Standby Lamp

#### FINISH

LJ Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze  
BB Black Baffle  
(7600 only)  
WB White Baffle  
(7600 only)

#### OPTIONS

WF White Painted Flange (Self Flanged only)



### Lens Downlight

100W Max ED17P, PAR38 or  
70W Max PAR30L



#### TRIM

7781 Self Flanged  
7780 Molded Trim Ring, White

#### FINISH

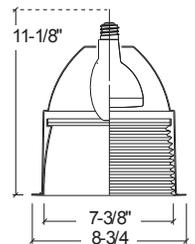
LJ Low Iridescent Clear  
H Haze  
WMH Warm Haze  
G Gold  
WH Wheat  
W Gloss White  
GP Graphite  
GPH Graphite Haze  
K Cognac  
KH Cognac Haze  
BB Black Baffle  
(7780 only)  
WB White Baffle  
(7780 only)

#### LENS

1G Prismatic Glass  
2G Diffuse Glass  
3G Clear Glass  
4G Fresnel Glass

#### OPTIONS

WF White Painted Flange (Self Flanged only)



Ordering Example*		Housing	Ballast	Trim	Accessories
Housing, Ballast, Trim, Accessories and Lamps ordered as separate line items		MD7100P382E		7601K	HB26

\*Magnetic Ballast - separate line item  
Electronic Ballast - ships with housing

### Accessories Deco Trims

DECO Trims are visually exciting accessories used with the 6" and 7" Portfolio housings. They enliven the appearance of any space and provide a subtle glow at the ceiling. DECO Trims are designed to replace the removable trim ring on open Portfolio reflectors. These complimentary accessories are not an option with Self-Flanged or Lensed Reflectors.

### Accessories Deco Trims

- A series of decorative trim accessories to be used with 6" and 7" Portfolio downlight reflectors
- May be installed with Incandescent, Compact Fluorescent or HID Housing
- The matte white flange replaces the existing polymer trim ring, and is clamped directly to the recessed plaster frame, providing a secure mounting (Not for use with self flanged or lensed reflectors - Not compatible with PDS).
- No assembly of ring is required, reflector fits through the aperture for quick installation and relamps easily from below
- Four, satin finish aluminum posts and decorative knobs are anodized clear to retain appearance over life
- Four steel threaded studs support weight of decorative element. Four hex head bolts tighten the flange securely and quickly to the recessed die cast plaster flange via preinstalled mounting hardware.
- For use in ceilings up to 2" thick
- UL listed and C.S.A. certified. To be used with Portfolio Product only, not PDS. Other installations will void warranty.

## DECO TRIMS

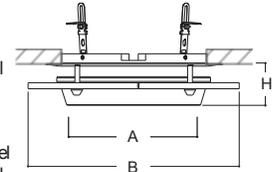


### Ring with Funnel

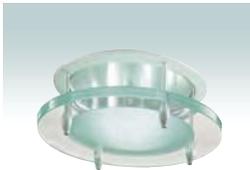
Glass and acrylic combination. Molded glass funnel, 0.250" thick has etched finish on both surfaces to diffuse the light and glow. Surrounding ring is acrylic, 0.250" thick, with upper surface frosted to diffuse the light. Available in a variety of color combinations

**SIZE**  
DT6 6" Deco Trim  
DT7 7" Deco Trim

**STYLE**  
R0F0 Matte with Frosted Funnel  
R1F0 Cobalt Blue with Frosted Funnel  
R2F0 Aqua Blue with Frosted Funnel  
R8F0 Ruby Red with Frosted Funnel  
R0F1 Matte with Cobalt Blue Funnel  
R2F1 Aqua Blue with Cobalt Blue Funnel  
R8F1 Ruby Red with Cobalt Blue Funnel



DIMENSIONS			
	A	B	H
6"	5-1/6"	8-3/4"	1-15/16"
7"	7-3/4"	10-3/8"	1-15/16"

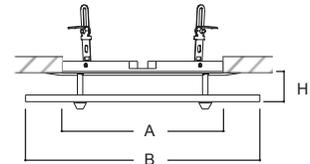


### Frosted Disc

Cut and polished glass disc with etched center to diffuse the light.

**SIZE**  
DT6 6" Deco Trim  
DT7 7" Deco Trim

**STYLE**  
DISC Etched Glass Disc



DIMENSIONS			
	A	B	H
6	6-1/8"	8-3/4"	2-1/4"
7	7-3/4"	10-3/8"	2-1/4"

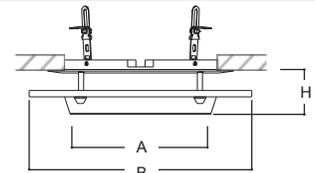


### Glass Funnel Decorative Trim

Molded glass funnel, 0.250" thick has etched finish on both surfaces to diffuse the light and glow. Crisp edge details provide an architectural appearance over normal slumped glass.

**SIZE**  
DT6 6" Deco Trim  
DT7 7" Deco Trim

**STYLE**  
LF Large Funnel  
**COLOR**  
0 Frosted  
1 Cobalt Blue



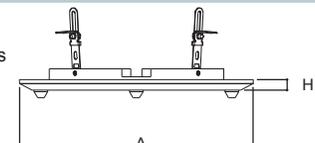
DIMENSIONS			
	A	B	H
6"	5-1/16"	8-3/4"	1-15/16"
7"	6-5/8"	10-3/8"	1-15/16"



### Lensed Decorative Trim

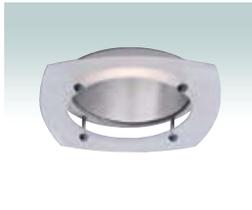
(UL Listed for Wet Locations)  
A glass lens 0.125" thick with upper surface frosted to diffuse the light. Held in an architectural mounting flange.

**SIZE**  
DT6 6" Deco Trim  
DT7 7" Deco Trim  
**STYLE**  
L Lensed  
**COLOR**  
0 Frosted Glass



DIMENSIONS		
	A	H
6"	8 1/8"	3/8"
7"	6 5/8"	3/8"

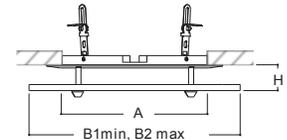
DECO TRIMS (CONTINUED)



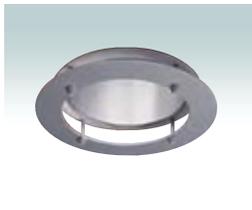
**Soft Square**

Acrylic decorative ring, 0.250" thick with upper surface frosted to diffuse the light. Edge of ring is polished to impart a clean look to the finished element. Single ring is available in a choice of colors.

<b>SIZE</b>	<b>STYLE</b>	<b>COLOR</b>
DT6 6" Deco Trim	SC Soft Square	0 Matte
DT7 7" Deco Trim		1 Cobalt Blue
		2 Aqua Blue
		8 Ruby Red



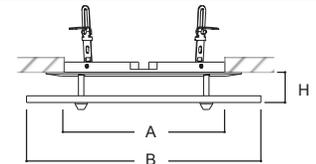
DIMENSIONS				
	A	B1	B2	H
6"	6-1/8"	8-3/4"	10-3/8"	2-3/4"
7"	7-3/4"	10-3/8"	12-1/8"	2-3/4"



**Anodized Single Ring**

Rings are solid aluminum, 0.09" thick with a brushed surface. Rings are anodized to retain their appearance over life.

<b>SIZE</b>	<b>STYLE</b>	<b>COLOR</b>
DT6 6" Deco Trim	R Single Ring	C Anodized Clear
DT7 7" Deco Trim		



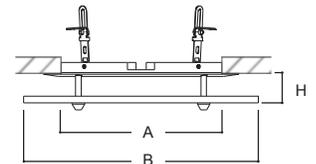
DIMENSIONS			
	A	B	H
6"	6-1/8"	8-3/4"	2-1/4"
7"	7-3/4"	10-3/8"	2-1/4"



**Translucent Single Ring**

Decorative ring is acrylic, 0.250" thick with upper surface frosted to diffuse the light. Edge of ring is polished to impart a clean look to the finished element. Single ring is available in a choice of colors.

<b>SIZE</b>	<b>STYLE</b>	<b>COLOR</b>
DT6 6" Deco Trim	R Single Ring	0 Matte
DT7 7" Deco Trim		1 Cobalt Blue
		2 Aqua Blue
		8 Ruby Red



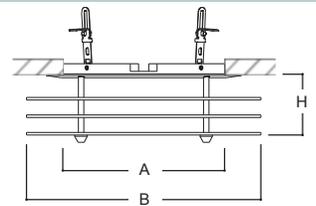
DIMENSIONS			
	A	B	H
6"	6-1/8"	8-3/4"	2-1/4"
7"	7-3/4"	10-3/8"	2-1/4"



**Anodized Triple Ring**

Each ring is solid aluminum, 0.09" thick, with satin surface. Rings are anodized to retain their appearance over life.

<b>SIZE</b>	<b>STYLE</b>	<b>COLOR</b>
DT6 6" Deco Trim	3R 3 Rings	C Anodized Clear
DT7 7" Deco Trim		



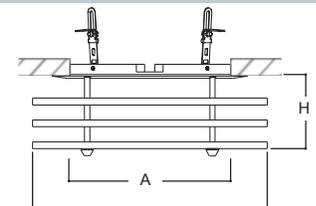
DIMENSIONS			
	A	B	H
6"	6-1/8"	8-3/4"	2-3/4"
7"	7-3/4"	10-3/8"	2-3/4"



**Translucent Triple Ring**

Acrylic decorative ring, 0.250" thick with upper surface frosted to diffuse the light. Edge of ring is polished to impart a clean look to the finished element. Three rings are available in a choice of colors.

<b>SIZE</b>	<b>STYLE</b>	<b>COLOR</b>
DT6 6" Deco Trim	3R 3 Rings	0 Matte
DT7 7" Deco Trim		2 Aqua Blue



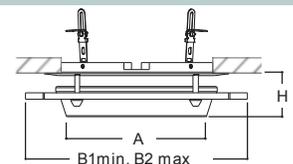
DIMENSIONS			
	A	B	H
6"	6-1/8"	8-3/4"	2-3/4"
7"	7-3/4"	10-3/8"	2-3/4"



**Soft Square with Funnel**

Glass and acrylic combination. Molded glass funnel, 0.250" thick has etched finish on both surfaces to diffuse the light and glow. Surrounding soft square ring is acrylic, 0.250" thick, with upper surface frosted to diffuse the light. Available in a variety of color combinations.

<b>SIZE</b>	<b>STYLE</b>
DT6 6" Deco Trim	SC0F0 Matte Square with Frosted Funnel
DT7 7" Deco Trim	SC1F0 Cobalt Blue with Frosted Funnel
	SC2F0 Aqua Blue with Frosted Funnel
	SC8F0 Ruby Red with Frosted Funnel
	SC0F1 Matte with Cobalt Blue Funnel
	SC2F1 Aqua Blue with Cobalt Blue Funnel
	SC8F1 Ruby Red with Cobalt Blue Funnel



DIMENSIONS				
	A	B1	B2	H
6"	5-1/6"	8-3/4"	10-3/8"	1-15/16"
7"	7-3/4"	10-3/8"	12-1/8"	1-15/16"

Ordering Example  
Complete Unit consists of size, style and/or color

Size	Style	Color
DT6	R	1



### H750ICAT Recessed Downlighting

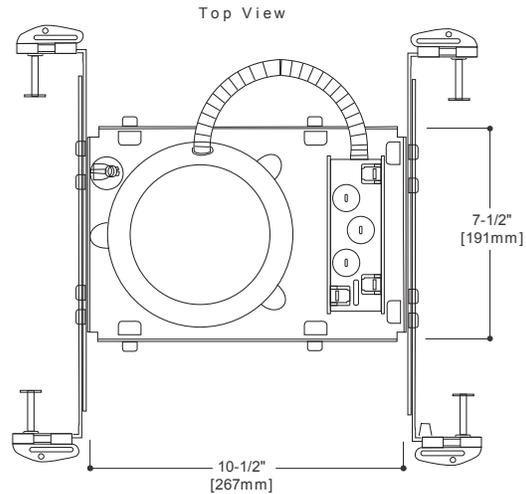
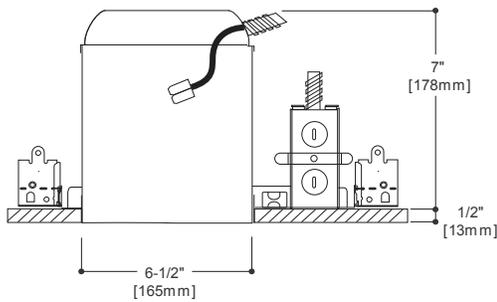
The H750ICAT housing is a LED dedicated New Construction housing and should be used in conjunction with the HALO LED module. HALO LED luminaires are designed for longevity and energy efficiency. The connector system allows for Title-24 compliance and the sustainable AIRTITE Luminaire meets the most stringent energy efficiency standards in the industry.

### H750ICAT Recessed Downlighting

- 6" aperture new construction housing
- Meets high efficiency California Title-24 2005 standard
- For use in insulated ceilings may be covered with insulation
- AIR-TITE to meet restricted airflow requirements
- For use with HALO 6" LED Modules
- Side-N-Side™ junction box and quick connect wiring
- Got Nail™ bar hangers make installation easy regardless of joist material
- Line voltage
- UL/cUL listed



### LED



### Available Trims



494P06

**494P06**  
White Trim Ring and White Reflector  
Die-cast trim ring and aluminum reflector  
Trim ring height of .160" at OD and .180" at ID  
Provides clearance for remodeler flange and gasket for AIR-TITE seal



494SC06

**494SC06**  
White Trim Ring and Specular Reflector  
Die-cast trim ring and aluminum reflector  
Trim ring height of .160" at OD and .180" at ID  
Provides clearance for remodeler flange and gasket for AIR-TITE seal



494H06

**494H06**  
White Trim Ring and Haze Reflector  
Die-cast trim ring and aluminum reflector  
Trim ring height of .160" at OD and .180" at ID  
Provides clearance for remodeler flange and gasket for AIR-TITE seal



494WB06

**494WB06**  
White Trim Ring and White Baffle  
Die-cast trim ring and aluminum reflector  
Trim ring height of .160" at OD and .180" at ID  
Provides clearance for remodeler flange and gasket for AIR-TITE seal



494PS06

**494PS06**  
Shower Trim with Regressed Frosted Glass Lens  
Wet Location Listed  
Metal Construction  
Trim ring height of .160" at OD and .180" at ID  
Provides clearance for remodeler flange and gasket for AIR-TITE seal



TRM490WH

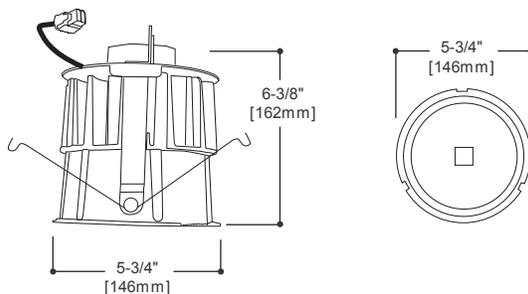
**TRM490WH**  
Low Profile  
Die-cast Trim Ring  
Trim ring height of .120" at OD and .180" at ID



### ML706830 LED Module

The HALO high efficiency LED Luminaire provides long life and energy savings. The LED module is designed for use in the dedicated H750ICAT housing for new construction applications or for retrofit applications with an Edison screw-base adapter (included with module) for use in existing HALO or ALL-PRO H7 housings. Delivers 600 lumens and superior optical design that yields productive beam lumens, good cutoff, and low glare. The HALO LED recessed product exceeds high efficacy requirements for California's Title 24, with energy savings in excess of 75% when compared with incandescent lamps.

### LED



### ML706830 LED Module

- ☑ Comparable in light output and distribution to a 65-Watt BR30 Incandescent or an 18-Watt Compact Fluorescent while consuming less than 15-Watts of Electricity
- ☑ Exceeds high efficacy requirements for California's Title-24 2005 standard
- ☑ Dimmable to 15% (nominal) of the total light output with most standard AC incandescent dimmers or to 5% (nominal) with dimmers that have a low-end adjustment
- ☑ Provides excellent color rendering and a warm white color temperature (3045K nominal)
- ☑ No mercury, eliminates special recycling requirements
- ☑ Does not emit damaging ultra-violet or infrared wavelengths that damage fabrics and merchandise
- ☑ Does not emit heat like traditional light sources
- ☑ Patent pending optical design yields productive beam lumens, 50° cutoff and low-glare
- ☑ Product life is rated for 50,000 hours at 70% lumen maintenance (or approximately 20 years based on six hours of use per day)
- ☑ Installation and replacement is simple
- ☑ Compatible HALO and ALL-PRO housings include model numbers: H750ICAT, H7ICAT, E700AT, H7ICATNB, E700ATNB, H7ICT, E700, H7ICTNB, E700NB, H7RICAT, E700RAT, H7RICT, E700R, H7RT, E700R, H7T, E700
- ☑ Multiple trim and reflector options in a variety of finishes and a shower-rated lensed trim
- ☑ High-efficiency driver with a power factor of >.90 at an input power of 120V, 60Hz
- ☑ Cooper Lighting provides a (3) year warranty on the HALO LED Module
- ☑ UL/cUL Listed

### Ordering Information

Order housing, trim and accessories separately

Housing H750ICAT=6" Dedicated LED IC Airtite Housing	LED Module ML706=6" LED Module	8=80 CRI	30=3,000 K	Trim Options 494P06=White Reflector w/White Trim Ring 494WB06=White Baffle w/White Trim Ring 494H06=Haze Reflector w/White Trim Ring 494SC06=Specular Clear Reflector w/White Trim Ring 492PS06=Wet Location Shower Trim w/Regressed Lens	Accessories TRM490WH=Thin Profile White Trim Ring
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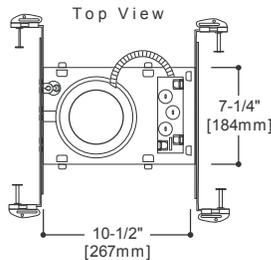
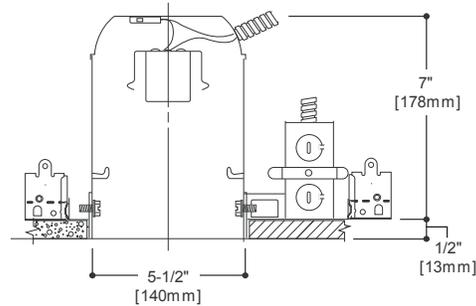


### H5ICAT Recessed Downlighting

- ☑ Thermally Protected IC Housing
- ☑ Housing may be covered with insulation
- ☑ AIR-TITE™ housing prevents airflow between attic and living areas
- ☑ For use with 120V Incandescent lamps

### H5ICAT Recessed Downlighting

The Halo H5 series utilizes a nominal 5" aperture designed to accommodate smaller sized PAR20 and PAR30 halogen lamps. The wide variety of trims available allows a number of different lighting effects to be created with one basic housing.



### Available Trims



- 5020 - Reflector Cone**  
60W BR30, 75W PAR30  
Finishes: (P) White Trim/White Reflector, (H) White Trim/ Haze Reflector, (SC) White Trim/ Clear Specular Reflector, (SN) Satin Nickel, (BL) White Trim, Black Reflector, (RG) White Trim/ Gold Reflector, (AC) Antique Copper, (TBZ) Tuscan Bronze
- 5021 - Full Reflector**  
40W A19  
Reflector Finishes: (SC) White Trim Clear Specular reflector, (H) White Trim/ Haze Reflector, (RG) White Trim/ Gold Reflector,
- 5001 - Baffle**  
50W R20, 50W PAR20, 65W BR30, 75W PAR30  
Finishes: (P) White Trim/White Baffle, (MB) White Trim/Black Baffle, (SN) Satin Nickel, (AC) Antique Copper, (TBZ) Tuscan Bronze
- 5010 - Step Baffle**  
60W BR30, 50W PAR30  
Finishes: 5010 White Trim/Black Baffle, (W) White Trim/ White Baffle, (SL) Silver Trim/ Black Baffle
- 5016 - Coilex Baffle with Reflector**  
50W PAR30, 65W BR30, 75W PAR30L  
Finishes: (P) White Trim/ Black Baffle, (W) White Trim/ White Baffle
- 5060 - Gimbal - 20° Tilt**  
50W PAR30  
Finishes: (P) White



- 5070 - Eyeball - 30° Tilt**  
75W PAR30  
Finishes: (P) White, (PB) Polished Brass, (SL) Silver, (SN) Satin Nickel, (AC) Antique Copper, (TBZ) Tuscan Bronze
- 5071 - Eyeball - 30° Tilt**  
50W R20, 50W PAR20  
Finishes: (P) White
- 5000 - Open Splay Trim**  
75W R30, 75W PAR30, 65W BR30  
Finishes: (P) White, (SN) Satin Nickel, (AC) Antique Copper, (TBZ) Tuscan Bronze
- 5054 - Dome Shower Light - Wet Location Listed Shower Light**  
40W A19, 50W PAR30  
Finishes: (PS) White, (SNS) Satin Nickel, (ACS) Antique Copper, (TBZS) Tuscan Bronze
- 5051PS - Frosted Lens - Wet Location Listed Shower Light**  
35W PAR30L  
Finishes: (PS) White Trim Ring/ Frosted Glass



### H2600/H2601 Surface Pendant

A pendant mounted downlight suspended by twin aircraft type cables with acrylic refractor for 70 watt ceramic metal halide light source. The Chorus series is available with acrylic refractor or aluminum reflector rated for 100 watt incandescent, 26/32/45 watt compact fluorescent and 70 watt ceramic metal halide light sources. Compact fluorescent and ceramic metal halide versions use universal input electronic ballast suitable for 120 to 277 VAC supply. These pendants are suitable for general ambient and task lighting for commercial and institutional spaces.

**H2600** Incandescent Chorus™ Pendant  
12" Acrylic Refractor Downlight

Finish: Silver (SL)  
Lamp: 100W A19

**H2600E42** Compact Fluorescent Chorus™ Pendant  
12" Acrylic Refractor Downlight with  
Universal Input 120/277V Electronic  
Ballast

Finish: Silver (SL)  
Lamp: 26/32/42 Watt Triple Twin Tube Compact  
Fluorescent

**H2600E70** Ceramic Metal Halide Chorus™ Pendant  
12" Acrylic Refractor Downlight  
with Universal Input 120/277V  
Electronic Ballast

Finish: Silver (SL)  
Lamp: 70W ED17P Ceramic Metal Halide

Accessories: GDK12 12" Glass Diffuser Kit

**H2601** Chorus™ Pendant - Incandescent  
12" Aluminum Reflector Downlight

Finish: Silver (SL)  
Lamp: 100W A19

**H2601E42** Compact Fluorescent - Chorus™  
Pendant 12" Aluminum Reflector  
with Universal Input 120/277V  
Electronic Ballast

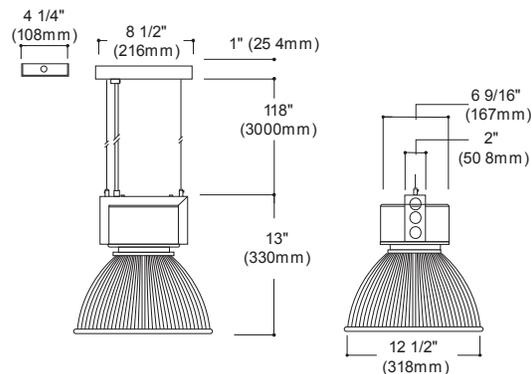
Finish: Silver (SL)  
Lamp: 26/32/42 Watt Triple Twin Tube Compact  
Fluorescent

**H2601E70** Chorus™ Pendant - Ceramic Metal  
Halide 12" Aluminum Reflector  
Downlight with Universal Input  
120/277V Electronic Ballast

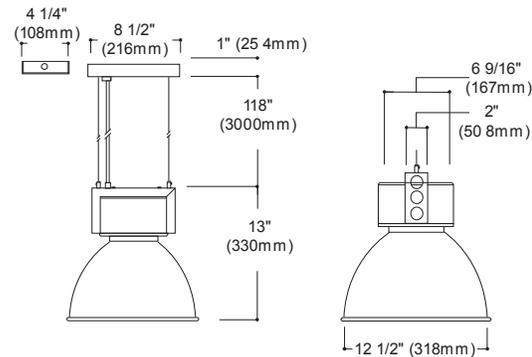
Finish: Silver (SL)  
Lamp: 70W ED17P Ceramic Metal Halide

Accessories: GDK12 12" Glass Diffuser Kit

H2600



H2601



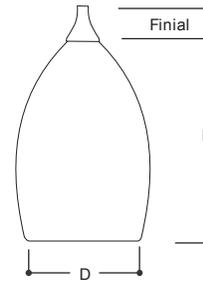
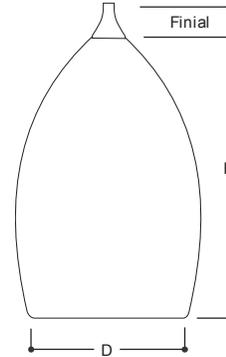
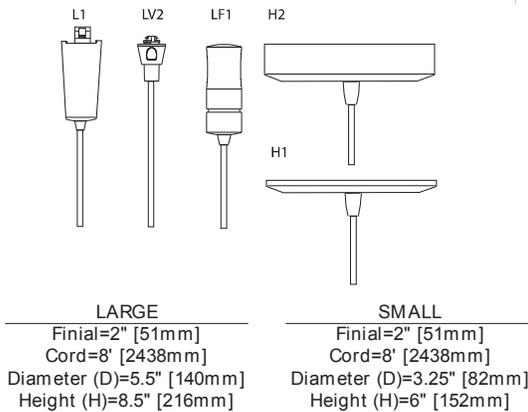


### Dome Pendants Art Glass

- Art Glass pendants offer the opportunity to add a truly unique touch to lighting needs in various spaces
- Art Glass Shades may vary in color, pattern and shape due to their handmade nature. Slight imperfections add to their unique charm
- Art Glass Shades are made in the the United States of America

### Dome Pendants Art Glass

Art glass pendants offer the opportunity to add a truly unique touch to lighting needs in both commercial and institutional spaces. They can add a pleasant free flowing accent in reception or hospitality areas or they can be used for general lighting with their inviting pools of muted illumination. Choose from 120V or low voltage 12V styles.



### Ordering Information

<b>Track</b> 120V Lamp L1=Halo Power-Trac LF1=Flexible Track H1=Surface Mount <b>12V Lamp</b> LV2=Linea Track <sup>1</sup> H2=Surface Low Voltage (includes electronic transformer)	<b>Style</b> DME=Dome	<b>Finial Finish</b> AH=Aluminum Haze BRZ=Bronze (except LF1)	<b>Adapter/ Canopy Finish</b> Blank=Same as Finial (LF1 only available in AH finish) Blank=Same as Finial BRZ=Bronze (except LV2) P=White MB=Black	<b>Shade Colors</b> AmberIce=Amber Ice AmberWeb=Amber Web Blueberry=Blueberry Swirl Butterscotch=Butterscotch Twist Candy=Candy Apple Caramel=Caramel Cherries=Cherries Jubilee Coconut=Tahitian Coconut Indigo=Indigo Irish=Irish Coffee Licorice=Black Licorice	Marshmallow=Marshmallow Swirl MossyIce=Mossy Ice MossyWeb=Mossy Web Plum=Plum Wine Rocky=Rocky Road Sandstone=Sandstone SeaMoss=Sea Moss Smoke=Smoke Spumoni=Spumoni
		<b>Lamp Type</b> (not included) 19=A15, G16 5 (LF1, L1, H1) 4=12V MR16, T4 (LV2, H2)	<b>Shade Size</b> SML=Small		

### Ordering Information

<b>Track</b> 120V Lamp L1=Halo Power-Trac LF1=Flexible Track H1=Surface Mount <b>12V Lamp</b> LV2=Linea Track <sup>1</sup> H2=Surface Low Voltage (includes electronic transformer)	<b>Style</b> DME=Dome	<b>Finial Finish</b> AH=Aluminum Haze BRZ=Bronze (except LF1)	<b>Adapter/ Canopy Finish</b> Blank=Same as Finial (AH finish) Blank=Same as Finial BRZ=Bronze (except LV2) P=White MB=Black	<b>Shade Colors</b> AmberIce=Amber Ice AmberWeb=Amber Web Blueberry=Blueberry Swirl Butterscotch=Butterscotch Twist Candy=Candy Apple Caramel=Caramel Cherries=Cherries Jubilee Coconut=Tahitian Coconut Indigo=Indigo Irish=Irish Coffee Licorice=Black Licorice	Marshmallow=Marshmallow Swirl MossyIce=Mossy Ice MossyWeb=Mossy Web Plum=Plum Wine Rocky=Rocky Road Sandstone=Sandstone SeaMoss=Sea Moss Smoke=Smoke Spumoni=Spumoni
		<b>Lamp Type</b> (not included) 19=A19, A15, G16 5 4=12V MR16, T4 (LV2, H2)	<b>Shade Size</b> LRG=Large		



### Span MR16 Open and Closed Back

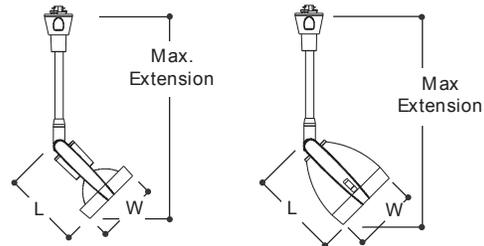
- Polycarbonate adapter. Attaches electrically and mechanically anywhere along track
- Round polycarbonate arm allows lampholder to rotate 330° and provides 0° to 90° vertical pivot for maximum aiming adjustability
- Lampholder tilt can be locked in place easily with the use of a M1.5 allen wrench
- Die Cast Aluminum housing provides durability and good thermal performance
- Fixture provided with cover glass (required for use with non-open fixture rated lamps). Can be replaced with colored or beam modifying lenses

### Span MR16 Open and Closed Back

A series of Open and Closed Back styled lampholders available for use with a variety of lamp types. The clean, minimal stem and tine design of the open back version allows the lamp to be part of the design, thus creating an altogether different aesthetic.

Length (L): 2.56" [65mm]  
 Width (W): W=2.56" [65mm]  
 Max Extension: LineaTrack 7.6" [193mm]

**IMPORTANT!**  
 Lampholder is ready to install on Linea track. To install lampholder on other Cooper Lighting Track Systems, Converters and/or transformers are required. Please see Transformers and Converters at [www.cooperlighting.com](http://www.cooperlighting.com)



### Ordering Information

Track LV=LineaTrack	Lamp Type 2=Low Voltage	Series 02=Span	Style Blank=Open Back CB=Closed Back	Lamp 16=MR16	Finish AH=Aluminum Haze	Accessories LM20216AH=Media Holder L100 Series Lenses L100MB Hex Cell Louver
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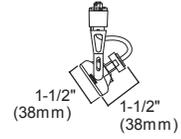


P

### LV303 Steel Gimbal

Finish: White (P), Black (MB), Silver (SL)  
Lamp: 35W Max. 12V or 24V MR11

12 V or 24 V 12V or 24V POWER SUPPLIES AVAILABLE	ACCEPTS COLOR FILTERS by others	ACCEPTS OPTICAL LENSES by others	35W 12V or 24V MR11
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Max Extension:  
2 7/8" (73mm)

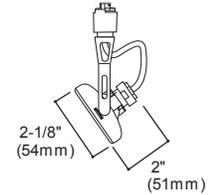


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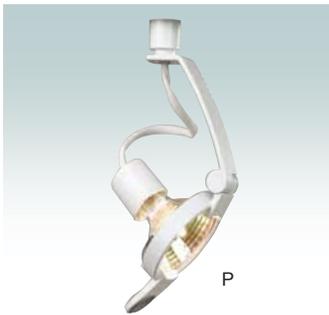
### LV304 Steel Gimbal

LV304 Steel Gimbal  
Finish: White (P), Black (MB), Silver (SL)  
Lamp: 50W Max. 12V or 24V MR16  
Accessories: L1982MB Barn Door Shutters,  
L100 Hex Cell Louver,  
L100 Series Color Filters, L100 Series  
Optical Filters (will accept one media).

12 V or 24 V 12V or 24V POWER SUPPLIES AVAILABLE	ACCEPTS COLOR FILTERS	ACCEPTS OPTICAL LENSES	BARN DOORS AVAILABLE	50W 12V or 24V MR16
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Max Extension:  
3 3/4" (95mm)

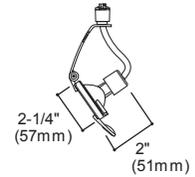


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### LV306 Contemporary Gimbal

LV306 Contemporary Gimbal  
Finish: White (P), Black (MB), Silver (SL)  
Lamp: 50W Max. 12V or 24V MR16  
Accessories: L100 Hex Cell Louver,  
L100 Series Color Filters,  
L100 Series Optical Filters (will accept one media).

12 V or 24 V 12V or 24V POWER SUPPLIES AVAILABLE	ACCEPTS COLOR FILTERS	ACCEPTS OPTICAL LENSES	35W 12V or 24V MR11
---	--------------------------	---------------------------	------------------------



Max Extension:  
7 3/8" (187mm)

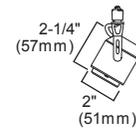


P

### LV307 Mini Alto

LV307 Mini Alto  
Finish: White (P), Black (MB), Silver (SL)  
Lamp: 35W Max. 12V or 24V MR11

12 V or 24 V 12V or 24V POWER SUPPLIES AVAILABLE	ACCEPTS COLOR FILTERS by others	ACCEPTS OPTICAL LENSES by others	35W 12V or 24V MR11
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Max Extension:  
4" (102mm)

#### Lampholder/Track Compatibility

LV303 LV304 LV306 LV307	<b>Linea Track</b> LV114, LV118 LV102, LV104, LV106, LV108	<b>Halo Track</b> L2004 or L2005 required for use with Halo Single & 2 Circuit L650, L651, L652, L653 L641, L642, L643 L611, L612, L613 L1631, L1632	<b>Flexible Track</b> LF2LV & LF2005 or LF2006 required for use with Halo "LF" FlexibleTrack: LF4, LF8	<b>Lazer Track</b> L2004 or L2005 Transformer required for LazerTrack: LZR102, LZR104, LZR106, LZR108
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## HALO Track Systems



### HALO Single Circuit Track

Miniature size, decorator finishes, push-in connectors, economy, all combine to make single-circuit Miniature Trac perfect for residential or commercial use.

650 2' Track. Actual length 20 1/8" (511mm).  
 Finishes: White (P), Black (MB), Bronze (BZ), Antique Brass (AB), Polished Brass (B), Silver (SL)

651 4' Track. Actual length 44 1/8" (1121mm).  
 Finishes: White (P), Black (MB), Bronze (BZ), Antique Brass (AB), Polished Brass (B), Silver (SL)

652 8' Track. Actual length 92 1/8" (2340mm).  
 Finishes: White (P), Black (MB), Bronze (BZ), Antique Brass (AB), Polished Brass (B), Silver (SL)

653 12' Track. Actual length 140 1/8" (3559mm).  
 Finishes: White (P), Black (MB), Silver (SL)



### HALO Two Circuit Track

Halo-2 Power-Trac system provides two separate 20 AMP circuits. Each circuit can be independently switched. Provides maximum flexibility, with a miniature profile. Suitable for a wide range of commercial, merchandising and residential applications.

641 4' Track. Actual length 42 5/8" (1083mm).  
 Finish: White (P), Black (MB), Silver (SL)

642 8' Track. Actual length 90 5/8" (2302mm).  
 Finish: White (P), Black (MB), Silver (SL)

643 12' Track. Actual length 138 5/8" (3521mm).  
 Finish: White (P), Black (MB), Silver (SL)



L900 Outlet Box Cover  
 Can be used at any electrical feed connection point (Live, Straight, L, T or X). Size: 5" sq. Screws included.  
 Finish: White (P), Black (MB)



Flexible Connector  
 Single Circuit: L902P, MB  
 Two Circuit: L942P, MB  
 To connect two track sections at any angle up to 90° in either plane or wall to ceiling or pitched ceiling applications.



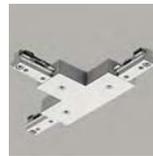
Live End Connector  
 Single Circuit: L901P, MB  
 Two Circuit: L941P, MB  
 To start a run.



Straight Connector  
 Single Circuit: L903P, MB  
 Two Circuit: L943P, MB  
 To connect two track sections end-to-end. May be used as feed point.



L Connector  
 Single Circuit: L904P, MB  
 Two Circuit: L943P, MB  
 To connect two track sections at a right angle. Field adjustable for either right hand or left hand application. May be used as feed point.



T Connector  
 Single Circuit: L905P, MB  
 Two Circuit: L945RP, MB L945LP, MS  
 To connect three track sections into a T configuration. Single circuit field adjustable for either right hand or left hand application. Two circuit must order correct polarity. Only L905 may be used as feed point.



X Connector  
 Single Circuit: L906P, MB  
 Two Circuit: L946P, MB  
 To connect four track sections into a cross configuration. May be used as feed point.



Mini Joiner  
 Single Circuit: L908P, MB  
 Two Circuit: L949P, MB  
 A low profile connector to cleanly and crisply join two straight track sections end-to-end. (Note: The L908 is not a feed point.)

## LINEA by HALO Track Systems



### LINEA by Halo Wireway Channels

Linea offers the ultimate in miniaturization. The low voltage lighting system includes track, connectors, lampholders and specialized power supplies and accessories. Linea lampholders can be used on Halo Track with the L2004 adapter

V114 4' Channel.  
 Actual length 44 1/16" (1122mm)  
 Finishes: White (P), Black (MB), Silver (SL)

V118 8' Channel.  
 Actual length 92 1/16" (2341mm)  
 Finishes: White (P), Black (MB), Silver (SL)



LV211 End Feed  
 For starting a run. Will accept Surface conduit  
 Finish: White (P), Black (MB)



LV212 Straight Joiner  
 For connecting two sections. May also be used as a feed point.  
 Finish: White (P), Black (MB)



LV213 Right-Angle Joiner  
 For connecting two sections at a 90° angle. May also be used as a feed point.  
 Finish: White (P), Black (MB)



LV216 T-Bar and J-Box Canopy Feed  
 For starting a run on a T-bar ceiling installation. Use with conduit fitting or with outlet box.  
 Finish: White (P), Black (MB)



LV215 Flexible Joiner  
 To connect two sections at an angle up to 90° or for connecting wall- and ceiling-mounted sections. Allows for continuation of wireway. May also be used as a feed point.  
 Finish: White (P), Black (MB)



### M248-MRI Interior Surface

M248 Luminous Bowl features available in two sizes.

#### Material

Aluminum trim and mounting pan with a matte white acrylic Elliptical (EL) or Deep Bowl (DB).

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Lamp/Socket

16": Two (2) 60W A-19 lamps.  
20": Three (2) 75W A-19 lamps. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

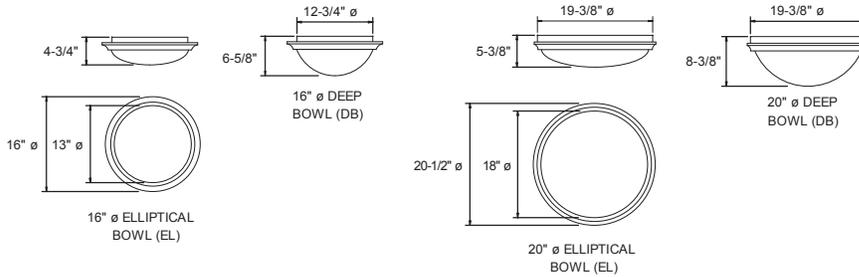
### Ordering Information

SAMPLE NUMBER: M248-DB-16-120V-PC-MRI

Series	Bowl	Size	Lamp	Voltage	Finish
M248=Bowl Surface w/ Trim Ring	EL = Elliptical DB = Deep Bowl	16" 20"	INC/2/75 <sup>1</sup> INC/3/75 <sup>2</sup>	120V 277V 347V	MW (standard), CC

#### Notes:

- 1 Available in 16"
- 2 Available in 20"



#### Material

Solid aluminum materials. Matte white acrylic bowl and optional Cone Diffuser (CD). Single stem is standard suspension. Minimum 18" (OA).

#### Installation

Supplied with either a circle strap mounting canopy or bar strap that mounts to a 4" Jbox or plaster ring. Integral safety cable provided.

#### Lamp/Socket

One (1)100W A-19 lamp. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.



### M418-MRI Pendant

M418 Direct/Indirect Luminous Bowl Pendant.

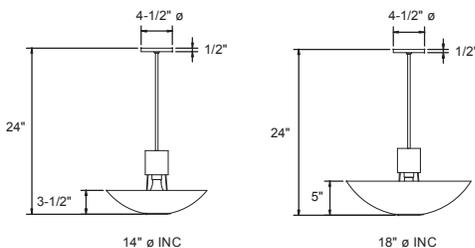
### Ordering Information

SAMPLE NUMBER: M418-18-INC/1/100-MRI-120V-NA-24

Series	Size	Lamp	Voltage	Finish	Options	OA
M418=	14"	INC/1/100	120V	NA (standard), CC, MW, SAL	1S CSJ DL SCA <sup>1</sup>	24"
Direct/Indirect Luminous Bowl	18"				Or Specify	

#### Notes:

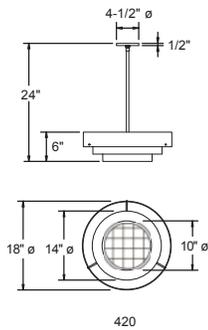
- 1 For Stem mounting only Specify up to 45"





### 420-MRI Ceiling/Pendant

420 Art Deco Ringed Baffle Pendant.



#### Material

Solid aluminum materials. White 1/2" x 1/2" cube cell louver. Optional Matte White Acrylic Lens (AL). Single stem is standard suspension. Minimum 18" (OA).

#### Installation

Supplied with a bar strap that mounts to a 4" Jbox or plaster ring. Integral safety cable provided.

#### Lamp/Socket

Three (3) 150W A-21 lamps. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

### Ordering Information

SAMPLE NUMBER: 420-MRI-INC/3/150-NA-24

Series	Lamp	Finish	Options	OA
420=Art Deco Ringed Baffle	INC/3/150	NA (standard), CC, MW, SAL	AL DL SCA <sup>1</sup> SJCAC SJIWAC	24" Or Specify

Notes:  
1 For Stem mounting only Specify up to 45"



### M648-MRI Interior Wall

M648 features a top mounted traditional trim with a luminous bowl. The 648/4 features a bottom mounted traditional trim with a luminous bowl and is ADA compliant.

#### Material

Painted aluminum base metal. White matte acrylic bowl. bowl. Optional hexcel top louver, natural aluminum.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Lamp/Socket

648: One (1) 75W A-19 lamp.  
648/4: One (1) 75W A-19 lamp. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

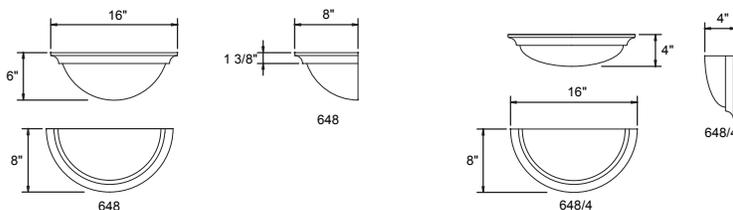
See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: M648-CFL-INC/1/60-120V-CC-MRI

Series	Lamp	Voltage	Finish	Options
M648=Luminous Bowl	INC/1/60 <sup>1</sup>	120V	MW (standard), CC	DL FB HL TF
M648/4=ADA Compliant Luminous Bowl	INC/1/75 <sup>2</sup>			

Notes:  
1 Available with 648/4M Series  
2 Available with 648M Series





### M649-MRI Ceiling/Interior Wall

M649 Direct/Indirect Trimmed Arm Mount Luminous Bowl.

#### Material

Aluminum arm and wall canopy. Aluminum or cold rolled steel trim.  
Matte white acrylic bowl.

#### Installation

Supplied with a mounting plate with an integral tenon for a standard 4" Jbox or plaster ring.

#### Lamp/Socket

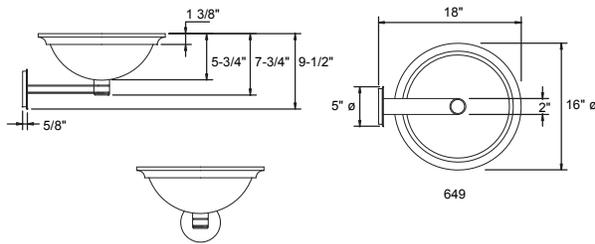
Two (2) 75W A-19 lamps. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

### Ordering Information

SAMPLE NUMBER: M649-INC/2/75-MRI

Series	Lamp	Voltage	Finish	Options
M649= Trimmed Arm Mount Luminous Bowl	INC/2/75	120V 277V <sup>1</sup> 347V <sup>1</sup>	NA (standard), CC, MW, SAL	DL FB

Notes:  
1 Available with 648\_4 Series  
2 Available with 648 Series



### M652-MRI Interior Surface

M652 Direct Cylinder with Luminous Edge and a double arm wall bracket.

#### Material

Solid aluminum. 1/4" Matte acrylic edge(s).

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Lamp/Socket

One (1) 50W PAR20H or 75W PAR30 lamp or one (1) 75W A-19 lamp.

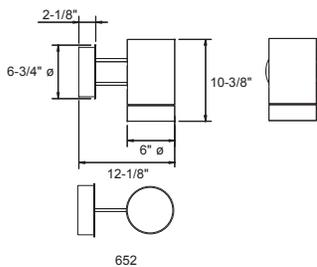
#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: M652-INC/1/75-120V-NA-MRI

Series	Lamp	Voltage	Finish	Options
M652 = Direct Cylinder w/ Luminous Edge	INC/1/75 PAR-H/1	120V	NA (standard) CC, MW	DL





### M653-MRI Interior Wall

M653 Direct/Indirect Cylinder with a Luminous Edges and a double arm wall bracket.

#### Material

Solid aluminum. 1/4" Matte acrylic edges.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Lamp/Socket

Two 50W PAR20H or 75W PAR30 lamps or two (2) 75W A-19 lamps. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

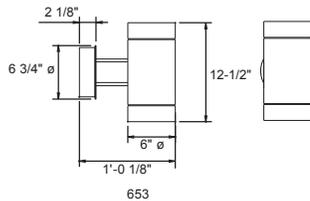
#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: M663-INC/2/75-CC-MRI

Series	Lamp	Voltage	Finish	Options
M663=Direct/Indirect Cylinder w/Luminous Edge	INC/2/75 PARH/2	120V	NA (standard), CC, MW	DL



### M658-MRI Interior Wall

M658 features a luminous shield with a modern die-cast base and is ADA compliant.

#### Material

Painted or plated solid die-cast aluminum with a 1/8" matte white acrylic shield.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Lamp/Socket

10": Two (2) 40W frosted T-10 lamps.

14": Two (2) 40W frosted -10 lamps. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

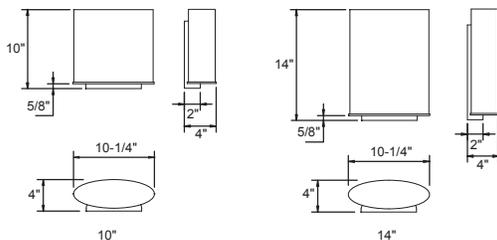
#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: M658-14-CFL/2/27-347V-PCP-MRI

Series	Size	Lamp	Voltage	Finish	Options
M658=Luminous Shield	10" 14"	INC/2/40	120V	MW (standard), CC, SAL	DL FD





### M661-MRI Interior Wall

M661 features a Luminous Diffuser in Acrylic, Perforated Metal or Parchment. ADA compliant.

#### Material

Plated or painted brushed die-cast aluminum with an aluminum mounting plate. Matte white acrylic diffuser.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Lamp/Socket

9": One (1) 60W frosted T-10 lamp.  
16": One (1) 60W frosted T-10 lamp. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

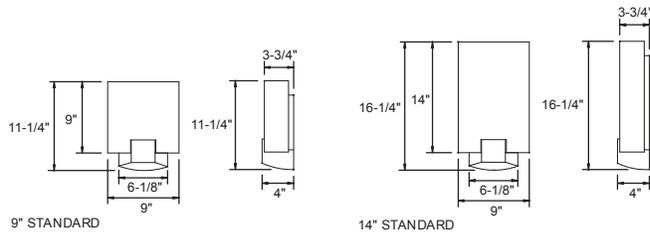
#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: M661-9-CFL/1-347V-MW-MRI

Series	Size	Lamp	Finish	Options
M661=Luminous Shield	9" 16"	INC/1/60	NA (standard), CC, MB, MW, SAL	DL PF FD



### 303 Bundle Pendant

303 Luminous Glass Pendant features a Triple Trim Ring with a Cast Emblems and various glass colors and texture options.

#### Material

Cast aluminum or cold rolled steel, powder coat white, support assembly. 3" ht. (5 -5/8" each) brass, steel or aluminum trim rings and cast "X" emblem assembly. Four stem is standard suspension. Minimum 24" (OA).

#### Installation

Supplied with either a circle strap mounting canopy or bar strap that mounts to a 4" Jbox or plaster ring. Integral safety cable provided.

#### Ballast

Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

24": Four (4) 18W (GX24q-2) or 26W (GX24q-3) 4-pin triple CFL lamps or four (4) 75W A-19 incandescent lamps. 30": Four (4) 18W (GX24q-2), 26W, 32W (GX24q-3) or 42W (GX24q-4) 4-pin triple CFL lamps or four (4) 100W A-19 incandescent lamps. 36": Four (4) 18W (GX24q-2), 26W, 32W (GX24q-3), 42W (GX24q-4) or 57W-HO (GX24q-5) 4-pin triple CFL lamps or four (4) 150W A-19 incandescent lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

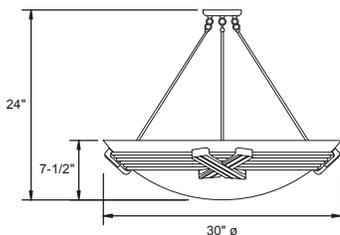
See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 303-30-CFL/4/42-120V-GSML-SC-42

Series	Lamp	Glass Finish	Options	OA
303 = Bundle	CFL/4/18 <sup>2,3</sup> CFL/4/57 <sup>6</sup>	GAW	DM <sup>5</sup>	24" OA-24" dia
Interior Pendant	CFL/4/26 <sup>2,3</sup> INC/4/75 <sup>6</sup>	Finish	REM <sup>1,6</sup>	32" OA-30" dia
	CFL/4/32 <sup>2,3</sup> INC/4/100 <sup>6</sup>	NA (standard), CC, GNM, MW, OBFS, COP, PB, PC, PCP, PN, SAL, SB, SC, SCP, SN, SZ	SCA	42" OA-36" dia or specify
Size	CFL/4/42 <sup>2,3</sup> INC/4/150 <sup>6</sup>			
24"	Voltage			
30"	120V			
36"	277V <sup>4</sup>			
	347V <sup>4</sup>			

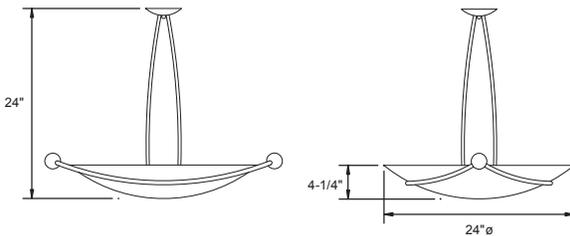
Notes: 1 Available in 24"  
2 Available in 30"  
3 Available in 36"  
4 Available with CFL only  
5 Consult the factory for available options  
6 Supplied by others





### 330 Farallon Pendant

330 Luminous Glass Pendant is cradled by a Bowed Trim Ring with Decorative Balls. Available with various glass colors and texture options.



#### Material

Cast aluminum or cold rolled steel, powder coat white, support assembly. Brass, steel or aluminum trim and balls. Four bowed stems is standard suspension. Minimum 18" (OA).

#### Installation

Supplied with either a circle strap mounting canopy or bar strap that mounts to a 4" Jbox or plaster ring. Integral safety cable provided.

#### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

24": Four (4) 18W (GX24q-2), 26W (GX24q-3) 4-pin triple CFL lamps or four (4) 75W A-19 incandescent lamps. 30": Four (4) 18W (GX24q-2), 26W, 32W (GX24q-3) or 42W (GX24q-4) 4-pin triple CFL lamps or four (4) 100W A-19 incandescent lamps. 36": Four (4) 18W (GX24q-2), 26W, 32W (GX24q-3), 42W (GX24q-4) or 57W-HO (GX24q-5) 4-pin triple CFL lamps or four (4) 150W A-19 incandescent lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

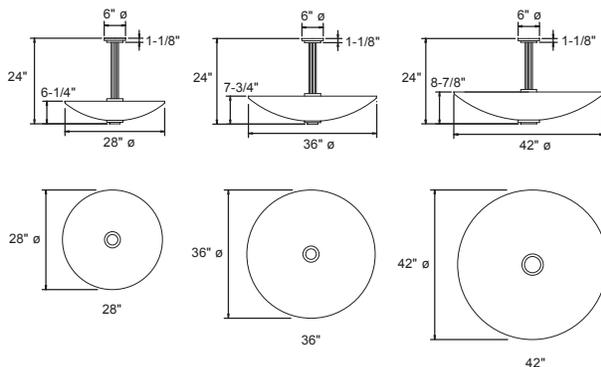
SAMPLE NUMBER: 330-30-INC/4/100-120V-GAM L-OBRS-47

Series	Lamp	Voltage	Glass Finish	Finish	OA
330=Starlight Interior Pendant	CFL/4/18 <sup>1,2,3</sup> CFL/4/26 <sup>1,2,3</sup> CFL/4/32 <sup>1,3</sup>	120V 277V <sup>4</sup> 347V <sup>4</sup>	GAW	NA (standard), CC, GNM, MW, CBRS, OCP, PB, PC, PCP, PN, SAL, SB, SC, SCP, SN, SZ	24" OA-24 dia 32 OA-30 dia 42 OA-36 dia or specify
Size	CFL/4/42 <sup>1,3</sup> CFL/4/57 <sup>1</sup> INC/4/75 <sup>1</sup> INC/4/100 <sup>2</sup> INC/4/150 <sup>3</sup>	Notes: 1 Available in 24" 2 Available in 30" 3 Available in 36" 4 Available with CFL only 5 Consult the factory for available options 6 Supplied by others		Options DM <sup>5</sup> , IEM <sup>2,3</sup> REM <sup>1,6</sup> , SCA	



### 404 Pendant

404 Direct/Indirect Pendant features a low profile bowl and is available in three diameters with multiple mounting options.



#### Material

Painted and plated cold rolled steel, solid brass or aluminum with a matte white acrylic bowl. Optional cold rolled steel, solid brass or stainless steel coming ring. Three stem is standard suspension. Minimum 18" (OA).

#### Installation

Supplied with either a circle strap mounting canopy or bar strap that mounts to a 4" Jbox or plaster ring. Integral safety cable provided.

#### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

28": Four (4) 13W (2GX7) 4-pin low wattage CFL lamps, 26W or 32W (GX24q-3) triple 4-pin CFL lamps or three (3) 75W A-19 lamps. 36": Four (4) or eight (8) 27W (2G11) high lumen CFL lamps, four (4) 42W (GX24q-4) 4-pin triple CFL lamps or six (6) 75W A-19 lamps. 42": Four (4) or eight (8) 39W (2G11) high lumen CFL lamps, four (4) or eight (8) 42W (GX24q-4) 4-pin triple CFL lamps or six (6) 100W A-19 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

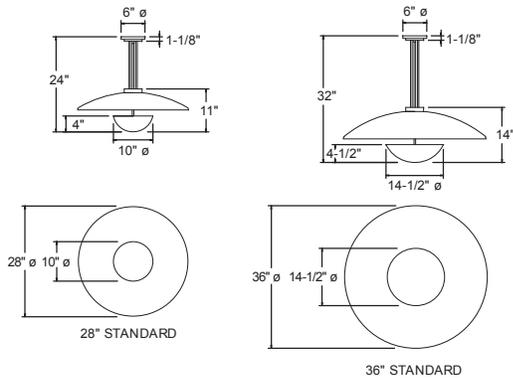
SAMPLE NUMBER: 404-36-CFL/4/26-347V-OBRS-\_\_\_

Series	Lamp	Voltage	Options	Finish	
404=Luminous Shallow Bowl	CFL/4/13 <sup>1</sup> CFL/4/26 <sup>1</sup> CFL/4/27 <sup>2</sup> CFL/4/32 <sup>1</sup> CFL/4/39 <sup>3</sup> CFL/4/42 <sup>1,2,3</sup> CFL/8/27 <sup>2</sup> CFL/8/39 <sup>3</sup> CFL/8/42 <sup>3</sup> INC/3/75 <sup>1</sup> INC/6/75 <sup>2</sup> INC/6/100 <sup>3</sup>	120V 277V <sup>4</sup> 347V <sup>4</sup>	1S 1SAC QP CT SJCAC SJCAC SJCAC TPB TSS2B TSS3B TSS4B 2TBF	2TRB TR CC, CBRS, PB, PC, PCP, PN, CFL DL DM <sup>5,6,7</sup> CFL SNL IEM <sup>2,3</sup> REM <sup>8</sup> SCA <sup>9</sup> FB	MW (standard), CC, CBRS, PB, PC, PCP, PN, SAL, SB, SC, SCL, SCP, SN, SNL OA 24" Or Specify
Size	28" 36" 42"	Notes: 1 Available in 28" 2 Available in 36" 3 Available in 42" 4 Available with CFL only 5 Not available in 13W 6 Not available in 27W 7 Consult the factory for available options 8 Supplied by others 9 Not available with 1SAC, SJWAC or SJCAC Specify up to 45"			



### 406 Direct/Indirect Pendant

406 Direct/Indirect Pendant features a luminous, perforated or solid upper dome with an indirect solid lower bowl and is available in two diameters with multiple mounting options.



#### Material

Painted and plated cold rolled steel or aluminum. Optional Caming Trim, luminous dome. Matte white acrylic Luminous Upper Dome (LUD), Perforated Upper Dome with acrylic liner and caming trim (PUD) or Solid Upper Dome (SUD) that is supplied with a painted white interior, exterior as per finish specification. Three stem is standard suspension. Minimum 18" (OA).

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring. Safety cable provided.

#### Ballast

Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

28": Two (2) 26W, 32W (GX24q-3) or 42W (GX24q-4) 4-pin triple CFL lamps or two (2) 75W A-19 lamps. 36": Four (4) 26W, 32W (GX24q-3) or 4-pin triple CFL lamps or three (3) 75W A-19 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 406-LUD-36-CFL/4/26-347V-OBRS-24

Series	Lamp	Voltage	Options	
406=Direct/Indirect Dome	CFL/2/26 <sup>1</sup>	120V	1S DM <sup>7</sup>	
	CFL/2/32 <sup>1</sup>	277V <sup>3</sup>	TSS2B REM <sup>8</sup>	
Bowl	CFL/4/42 <sup>1</sup>	347V <sup>3</sup>	TSS3B SCA <sup>9</sup>	
LUD = Luminous Upper Dome	CFL/4/26 <sup>1</sup>	Finish	TSS4B	
PUD = Perforated Upper Dome	CFL/4/32 <sup>1</sup>		CT <sup>7</sup>	
SUD = Solid Upper Dome	INC/2/75 <sup>1</sup>		MW (standard),	DL
	INC/3/75 <sup>1</sup>		CC, CBRS, FB <sup>8</sup> , PC,	
Size		PO <sup>7</sup> , PN <sup>7</sup> , SAL, SB,	OA	
28"		SC, SCL, SCP, SN,	24" Or Specify	
36"		SNL		

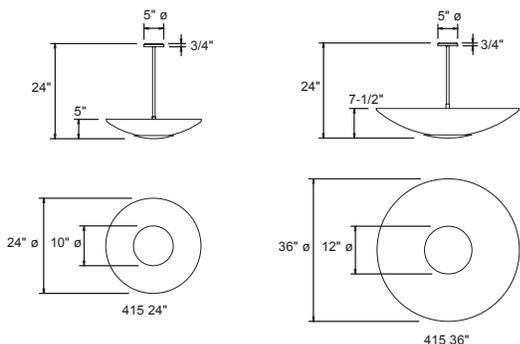
#### Notes:

1 Available in 28" 2 Available in 36" 3 Available with CFL only 4 LUD and 28" SUD only 5 28" SUD only 6 LUD only 7 Consult the factory for available options 8 Supplied by others 9 Specify up to 45"



### 415 Direct/Indirect Pendant

The 415 Solid, Perforated or Luminous Pendant features direct/indirect illumination with an Accent Disc available in two diameters with multiple mounting options.



#### Material

Painted and plated cold rolled steel, solid brass or aluminum. Matte acrylic Luminous Bowl with center accent disc (LBD) or Aluminum Perforated Bowl with acrylic liner, caming trim and accent disc (PFD) or cold rolled steel, aluminum or natural brass Solid Bowl with center accent disc (SBD). Cold rolled steel, solid brass or stainless steel Caming Trim (CT) optional for the Luminous Bowl. Single stem is standard suspension. Minimum 18" (OA). Supplied with a swivel canopy which will accommodate up to 45° total adjustment.

#### Installation

Supplied with either a circle strap mounting canopy or bar strap that mounts to a 4" Jbox or plaster ring. Integral safety cable provided.

#### Ballast

Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

24": Four (4) 26W, 32W (GX24q-3) or 42W (GX24q-4) 4-pin triple CFL lamps or three (3) 75W A-19 lamps. 36": Four (4) or eight (8) 39W (2G11) high lumen CFL lamps, 42W (GX24q-4) 4-pin triple CFL lamps or three (3) 100W A-19 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 415-SBD-36-CFL/4/26-347V-OBRS-24

Series	Size	Lamp	Voltage	Options	OA	
415=Bowl	24"	CFL/4/26 <sup>1</sup>	120V	1SAC	OPP <sup>6</sup> 24"	
	36"	CFL/4/32 <sup>1</sup>	277V <sup>3</sup>	3S	CT <sup>7</sup> Or Specify	
Bowl		CFL/4/39 <sup>2</sup>	347V <sup>3</sup>	CPB	DL	
LBD = Luminous Bowl		CFL/4/42 <sup>1,2</sup>	Finish	SJCAC	DM <sup>8</sup>	
PFD = Perforated Bowl		CFL/8/39 <sup>2</sup>		SJWAC	LEM <sup>2</sup>	
SBD = Solid Bowl		CFL/8/42 <sup>2</sup>		MW (standard),	TPB	REM <sup>8</sup>
		INC/3/75 <sup>1</sup>		CC, CBRS, PB, PC,	TSP2B	SCA <sup>10</sup>
		INC/3/100 <sup>2</sup>	PO <sup>7</sup> , PN <sup>7</sup> , SAL, SB, SC,	TSP3B	FB <sup>7</sup>	
			SCL, SCP, SN, SNL	TSP4B	TR	

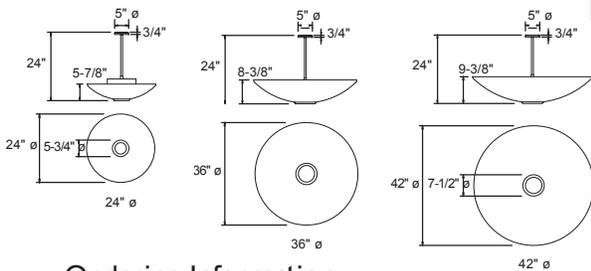
#### Notes:

1 Available in 24" 2 Available in 36" 3 Available with CFL only 4 Note available with PFD 5 SBD and 24" LBD only 6 SBD only 7 Luminous Bowl only 8 Consult the factory for available options 9 Supplied by others 10 Not available with 1SAC, SJWAC or SJCAC. Specify up to 45"



### 415-D Pendant

The 415-D Solid, Perforated or Luminous Pendant features direct/indirect illumination with an integral downlight. Available in three diameters with multiple mounting options.



### Ordering Information

SAMPLE NUMBER: 415-D-SMB-36-CFL/4/26-PAR30H/1/75-347V-OBRS-24

Series	Bowl	Size	Lamp	Downlight Lamp	Voltage	Finish	Options	OA
415-D= Bowl w/ Integral Downlight	LB = Luminous Bowl PFC = Perforated Bowl SMB = Solid Bowl	24" 36" 42"	CFL/4/13 <sup>1</sup> CFL/4/26 <sup>1</sup> CFL/4/27 <sup>2</sup> CFL/4/32 <sup>1</sup> CFL/4/39 <sup>3</sup>	CFL/4/42 <sup>3</sup> INC/3/75 <sup>1</sup> INC/6/75 <sup>2</sup> INC/6/100 <sup>3</sup>	120V 277V <sup>4</sup> 347V <sup>4</sup>	MW (standard), CC, OBRS <sup>5</sup> , PB <sup>6</sup> , PC <sup>7</sup> , PCP <sup>8</sup> , PN <sup>9</sup> , SAL, SB <sup>10</sup> , SC <sup>11</sup> , SOL, SCP <sup>12</sup> , SN <sup>13</sup> , SNL	1SAC 3S QPB SJCAC SJIWAC TPB TSS2B TSS3B	TSS4B CT <sup>7</sup> DL DM <sup>8 9 10</sup> IEM <sup>13</sup> REM <sup>11</sup> SCA <sup>12</sup> FB <sup>7</sup>

**Notes:**

1 Available in 24" 2 Available in 36" 3 Available in 42" 4 Available with CFL only 5 Not available with PFC 6 24" LB only 7 Luminous Bowl only 8 Not available in 13W  
9 Not available in 27W 10 Consult the factory for available options 11 Supplied by others 12 Not available with 1SAC, SJIWAC or SJCAC. Specify up to 45°

### Material

Painted and plated cold rolled steel, solid brass or aluminum. Matte white acrylic Luminous Bowl (LB) or aluminum Perforated Bowl with matte white acrylic liner and caming trim (PFC) or cold rolled steel, aluminum, natural bronze brass Solid Bowl (SMB). Cold rolled steel, solid brass or stainless steel Caming Trim (CT) optional for the Luminous Bowl. Downlight trim is cold rolled steel, solid brass or aluminum. Single stem is standard suspension. Minimum 18" (OA). Supplied with a swivel canopy which will accommodate up to 45° total adjustment.

### Installation

Supplied with either a circle strap mounting canopy or bar strap that mounts to a 4" J-box or plaster ring. Integral safety cable provided.

### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

### Lamp/Socket

24" Bowl: Four (4) 13W (2GX7) 4-pin low wattage CFL lamps, 26W or 32W (GX24q-3) 4-pin triple CFL lamps or three (3) 75W A-19 lamps. Downlight: One (1) 13W (G24q-3) 4-pin quad CFL lamp or one (1) 50W PAR20H. 36" Bowl: Four (4) 27W (2G11) high lumen CFL lamps, 42W (GX24q-4) 4-pin triple CFL lamps or six (6) 75W A-19 lamps. Downlight: One (1) 26W (GX24q-3) 4-pin triple CFL lamp or one (1) 75W PAR30H. 42" Bowl: Four (4) 39W (2G11) high lumen CFL lamps, 42W (GX24q-4) 4-pin triple CFL lamps or six (6) 100W A-19 lamps. Downlight: One (1) 32W (GX24q-3) 4-pin triple CFL lamp or one (1) 75W PAR30H. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

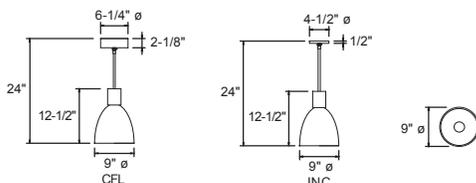
### Finish and Options

See pages 77-80 for finish details and options.



### 416 Pendant

416 Luminous Shade Pendant.



### Material

Solid aluminum or solid copper materials. Matte white acrylic diffuser. Supplied with an SJ cord assembly. Minimum 18" (OA).

### Installation

Supplied with either a circle strap mounting canopy or bar strap that mounts to a 4" J-box or plaster ring. Integral safety cable provided with option stem.

### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

### Lamp/Socket

One (1) 26W, 32W (GX24q-3) or 42W (GX24q-4) 4-pin triple CFL lamps or one (1) 100W A-19 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 416-CFL/1/26-347V-SAL-24

Series	Lamp	Voltage	Finish	Options	OA
416=Luminous Shade	CFL/1/26 CFL/1/32 CFL/1/42 INC/1/100	120V 277V <sup>1</sup> 347V <sup>1</sup>	NA (standard), CC, MW, PCP, SAL, SCP	1S CSJ PSS2SD PSS3SD PSS4SD	24" Or Specify

**Notes:**

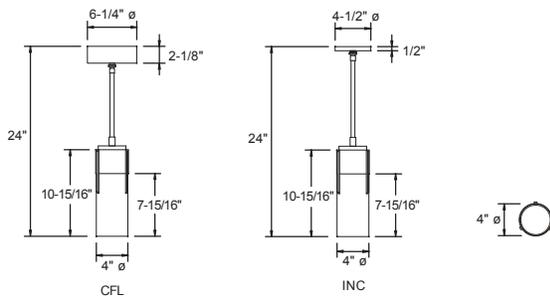
1 Available with CFL only  
2 Consult the factory for available options  
3 Supplied by others  
4 For Stem mounting only. Specify up to 45°

DL  
DM<sup>2</sup>  
REM<sup>3</sup>  
SCA<sup>4</sup>



## 422 Pendant

422 Luminous Cylinder Pendant features Three Accent Trim Bars.



### Material

Solid brass or aluminum housing and clear sanded decorative trim. Matte acrylic 4" Dia. luminous cylinder. Supplied with a single stem with a standard overall hang height 24" (OA), minimum 18" (OA).

### Installation

Supplied with either a circle strap mounting canopy or bar strap that mounts to a 4" Jbox or plaster ring. Integral safety cable provided.

### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

### Lamp/Socket

One (1) 18W (G24q-2), or 26W (G24q-3) 4-pin quad CFL lamp or one (1) 40W T-10 lamp. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.

## Ordering Information

SAMPLE NUMBER: 422-CFL/1/18-347V-OBRS-30

Series	Lamp	Voltage	Finish	Options	OA
422=Luminous Cylinder w/ Trim Bars	CFL/1/18 CFL/1/26 INC/1/40	120V 277V <sup>1</sup> 347V <sup>2</sup>	NA (standard), CC, MW, CBRS, PB, FC, PCP, PN, SAL, SB, SC, SCL, SCP, SN, SNL	CSJ WSJ DL DM <sup>2</sup> REM <sup>3</sup> SCA <sup>4</sup> FC	24" Or Specify

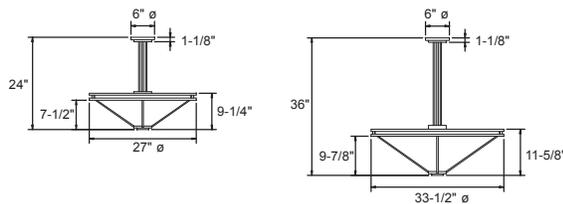
### Notes:

- 1 Available with CFL only
- 2 Consult the factory for available options
- 3 Supplied by others
- 4 Specify up to 45°



## 444 Pendant

444 Conical Pendant with Decorative Trim Bars/Finial available in two diameters with multiple mounting options.



### Material

Painted and plated cold rolled steel with a matte white acrylic bowl and 1/4" x 3/8" accent trim. Three stem is standard suspension. Minimum 20" (OA) for 27" bowl and minimum 30" (OA) for 36" bowl.

### Installation

Supplied with either a circle strap mounting canopy or bar strap that mounts to a 4" Jbox or plaster ring. Integral safety cable provided.

### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

### Lamp/Socket

27": Four (4) 26W, 32W (GX24q-3) or 42W (GX24q-4) 4-pin triple CFL lamps or three (3) 100W A-19 lamps. 34": Four (4) 26W, 32W (GX24q-3) or 42W (GX24q-4) 4-pin triple CFL lamps or three (3) 150W A-21 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.

## Ordering Information

SAMPLE NUMBER: 444-27-CFL/4/26-347V-OBRS-\_\_

Series	Size	Voltage	Finish <sup>4</sup>	Options	OA
444=Conical w/ Decorative Trim	27" 34"	120V 277V <sup>5</sup> 347V <sup>6</sup>	MW (standard), CC, CBRS, PB, PC, PCP, PN, SAL, SB, SC, SCL, SCP, SN, SNL	1S 1SAC SJCAC SJCAC SJVAC TSP2B TSP3B	TSP4B DL DM <sup>4</sup> IEM <sup>2</sup> REM <sup>3</sup> SCA <sup>4</sup> FB TX

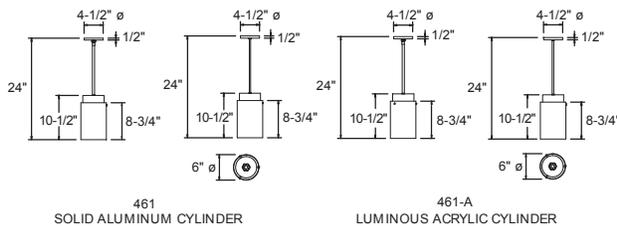
### Notes:

- 1 Available in 27"
- 2 Available in 34"
- 3 Available with CFL only
- 4 For polished finishes the bottom inside edge of the ring is satin to prevent upper ring reflections
- 5 Consult the factory for available options
- 6 Supplied by others
- 7 For Stem mounting only Specify up to 45°



## 461 & 461-A Pendant

461 Solid Aluminum or 461-A Luminous Cylinder Pendants.



461  
SOLID ALUMINUM CYLINDER

461-A  
LUMINOUS ACRYLIC CYLINDER

### Material

Base metal is solid aluminum. Matte white acrylic cylinder. Single stem is standard suspension. Minimum 18" (OA).

### Installation

Supplied with a bar strap that mounts to a 4" Jbox or plaster ring. Integral safety cable provided with stem option.

### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

### Lamp/Socket

461: One (1) 18W (GX24q-2) or 26W (GX24q-3) 4-pin triple CFL lamp or one (1) 100W A-19 or 50PAR20H, 75PAR30H or 90PAR38H lamp.  
461-A: One (1) 18W (GX24q-2) or 26W (GX24q-3) 4-pin triple CFL lamp or one (1) 75W A-19 lamp. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.

## Ordering Information

SAMPLE NUMBER: 461-CFL/1/26-347V-SAL-32

Series	Lamp	Voltage	Finish	Options	OA
461 = Solid Aluminum Cylinder	CFL/1/18 CFL/1/26	120V 277V <sup>3</sup>	NA (standard), CC, MW, SAL	1S DL 2CL DM <sup>5</sup> 3CL REM <sup>4</sup> 4CL SCA <sup>7</sup>	24" Or Specify
461-A = Luminous Cylinder	INC/1/75 <sup>1</sup> INC/1/100 <sup>2</sup> HAL/1 <sup>2</sup>	347V <sup>3</sup>		CSJ LUB 2BD <sup>4</sup> PFB 2TB	

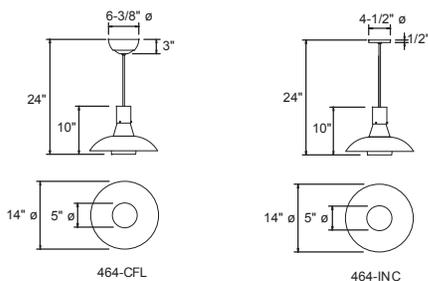
### Notes:

- 1 Available with 461-A
- 2 Available with 461
- 3 Available with CFL only
- 4 Stem only
- 5 Consult the factory for available options
- 6 Supplied by others
- 7 Specify up to 45"



## 464 Pendant

464 Direct/Indirect Solid Shade Pendant.



464-CFL

464-INC

### Material

Base metal is solid aluminum. Metal shade is solid brass, solid copper or solid aluminum. Matte white polyethylene two piece cone. Optional Decorative Baffle (BL). One 3 (INC) or 5 (CFL) conductor clear SJ cord with a standard overall hang height of 24" (OA), minimum 18" (OA).

### Installation

Supplied with a bar strap that mounts to a 4" Jbox or plaster ring. Integral safety cable provided with stem option.

### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

### Lamp/Socket

One (1) 26W, 32W (GX24q-3) or 42W (GX24q-4) 4-pin triple CFL lamp or one (1) 75W A-19 lamp. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.

## Ordering Information

SAMPLE NUMBER: 464-CFL/1/26-347V-SAL-24

Series	Lamp	Voltage	Finish	Options	OA
464 = Solid Shade	CFL/1/26 CFL/1/32 CFL/1/42 INC/1/75	120V 277V <sup>1</sup> 347V <sup>1</sup>	NA (standard), CC, MW, PCP, SAL, SB, SCP	1S BLDL CSJ DM <sup>2,3</sup> SSS2SD REM <sup>4</sup> SSS3SD SCA <sup>5</sup> SSS4SD	24" Or Specify

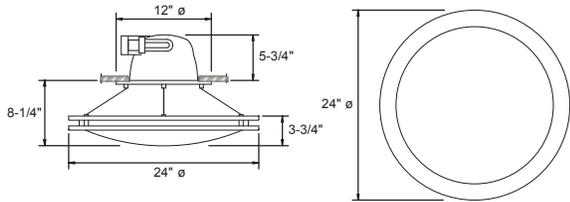
### Notes:

- 1 Available with CFL only
- 2 Consult the factory for available options
- 3 26W and 32W only
- 4 Supplied by others
- 5 For Stem mounting only Specify up to 45"



### 494-RP Recessed Pendant

494-RP features a 24" pendant designed for low ceiling applications and offers performance optics by Portfolio.



#### Material

Painted or plated cold rolled steel trim ring with a matte white acrylic bowl.

#### Installation

Recessed mounting requires 9" (23cm) diameter by 6 3/8" (16cm) deep opening in ceiling. Accommodates ceilings up to 2" (5 cm) thick. No Fuss Bar Hangers (tm) and T-Bar provided with centering mechanism that allows consistent centering of luminaire. Thermal protection deactivates unit if improper lamp type or wattage is used or if insulation is placed too close to the housing. Decorative trim/bowl assembly is securely suspended from the mounting ring by three stainless steel cables (provided). No measuring, cutting or adjustment of cables is required to achieve standard overall height and level mounting.

#### Ballast/Emergency Battery Pack

One (1) integral multi-voltage (120V/277V) electronic CFL (347V Canada) ballast for 26W, 32W or 42W CFL lamps. One (1) integral emergency battery pack option (EM) is shipped pre-wired. Sealed Ni-Cad battery powers CFL lamps for 90 minutes of emergency illumination. Integral test switch/indicator light is located inside the reflector, out of view but easily accessible for testing.

#### Lamp/Socket

Two (2) 26W, 32W (GX24q-3) or 42W (GX24q-4) 4-pin triple CFL lamps. Universal 4-pin CFL socket injection molded plastic with guide post inserts reject 2-pin lamp to ensure proper lamping. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

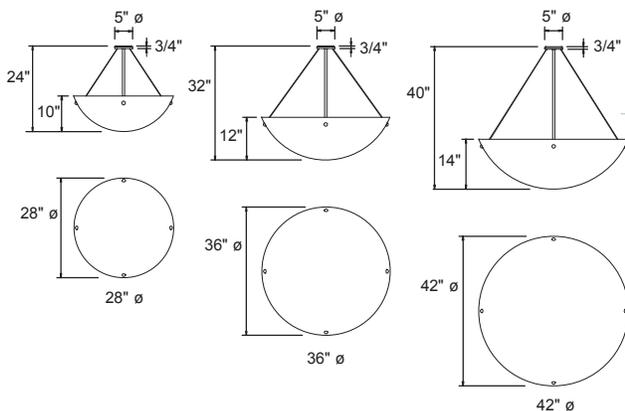
SAMPLE NUMBER: 494-RP-CFL/2/32-347V-PC

Series	Lamp	Voltage	Finish	Options	Options
494-RP=24"	CFL/2/26	120V	MW (standard), CC, FB, PC,	DL, EM, FB	DL, DM <sup>1,5</sup>
Pendant	CFL/2/32	277V	PCP, SB, SC, SOL, SCP, SN, SNL		REM <sup>6</sup> , FD
	CFL/2/42	347V			



### 499 Pendant

499 Direct/Indirect Pendant features a luminous bowl and is available in three diameters with multiple mounting options.



#### Material

Painted and plated cold rolled steel or natural aluminum. Optional Trim Ring. Matte white acrylic bowl. Single Stem Aircraft Cable (Standard): One 5/8" stem and three or four 3/32" cables with a standard hang height of 24" (OA) for the 28" dia, 32" (OA) for the 36" dia and 40" (OA) for the 42" dia, minimum 20" (OA).

#### Installation

Supplied with either a circle strap mounting canopy or bar strap that mounts to a 4" Jbox or plaster ring. Integral safety cable provided.

#### Ballast

Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

28": Four (4) 26W or 32W (GX24q-3) 4-pin triple CFL lamps or three (3) 150W A-19 lamps. 36": Four (4) 27W (2G11) or four (4) or six (6) 40W (2G11) high lumen CFL lamps or six (6) 100W A-19 lamps. 42": Four (4) or eight (8) 40W or 50W (2G11) high lumen CFL lamps or six (6) 150W A-21 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 499-36-CFL/4/26-347V-OBR3-32

Series	Size	Lamp	Voltage	Options	OA
499=Direct/	28"	CFL/4/26 <sup>1</sup>	120V	1S	24" (OA) - 28' dia
Indirect Bowl	36"	CFL/4/27 <sup>2</sup>	277V <sup>4</sup>	3S	32" (OA) - 36' dia
	42"	CFL/4/32 <sup>2</sup>	347V <sup>4</sup>	QPB	40" (OA) - 42' dia
		CFL/4/40 <sup>2,3</sup>		SJCAC	Or Specify
		CFL/4/50 <sup>3</sup>	Finish	SJWAC	IBM 2, 3
		CFL/6/40 <sup>2</sup>	MW (standard),	TSS2B	REM 7
		CFL/8/40 <sup>3</sup>	CC, CBRS, FB,	TSS3B	SCA 8
		CFL/8/50 <sup>3</sup>	PC, PCP, SAL,	TSS4B	FB
		INC/3/150 <sup>1</sup>	SB, SC, SOL,	SCP	TR
		INC/6/100 <sup>2</sup>			
		INC/6/150 <sup>3</sup>			

#### Notes:

- 1 Available in 28"
- 2 Available in 36"
- 3 Available in 42"
- 4 Available with CFL only
- 5 Not available in 27W
- 6 Consult the factory for available options
- 7 Supplied by others
- 8 Not available with 1SAC, SJWAC or SJCAC. Specify up to 45"



## 1215-2TR & TTR HP Pendant

The 1215 Shallow Direct/Indirect High Performance Luminous Pendant features a Double Trim Ring (2TR) or a Traditional Trim Ring (TTR) and is available in three diameters with multiple mounting options.

### Material

Painted and plated cold rolled steel or natural aluminum pan with a matte white acrylic bowl.

### Installation

Supplied with either a circle strap mounting canopy or bar strap that mounts to a 4" Jbox or plaster ring. Internal safety cable provided. Refer to specification sheet for additional mounting requirements.

### Lamp/Socket

26" - Three (3) or six (6) 27W (2G11) high lumen CFL lamps, three (3) 32W (GX24q-3) or 42W (GX24q-4) 4-pin triple CFL lamps, or three (3) 39W or 70W T6 CDM metal halide lamps, or three (3) 150W T4 (DC Bay) clear linear halogen lamps. One (1) 22W (2GX13) T5 circular lamp (bowl illumination).

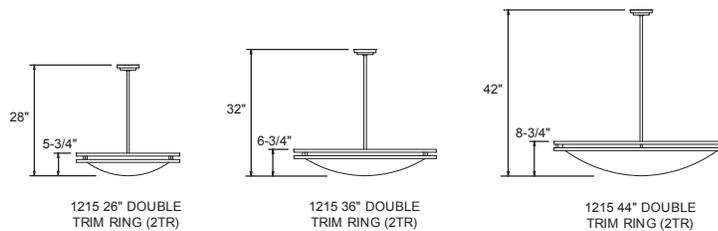
36" - Three (3) or six (6) 27W, 39W, 40W, 50W or 55W (2G11) high lumen CFL lamps, three (3) 32W (GX24q-3), 42W (GX24q-4) 4-pin triple or 57W (GX24q-5) or 70W (GX24q-6) 4-pin triple HO CFL lamps or three (3) 39W, 70W or 150W T6 CDM metal halide lamps or three (3) 150W T4 (DC Bay) clear linear halogen lamps. One (1) 40W (2GX13) T5 circular lamp (bowl illumination).

44" - Four (4) or eight (8) 27W, 39W, 40W, 50W or 55W (2G11) high lumen CFL lamps, four (4) 57W (GX24q-5) or 70W (GX24q-6) 4-pin triple HO CFL lamps or four (4) 70W or 150W T6 CDM metal halide lamps, or four (4) 150W T4 (DC Bay) clear linear halogen lamps. One (1) 40W (2GX13) T5 circular lamp (bowl illumination).

CFL sockets injection molded plastic. Metal halide socket ceramic pulse-rated, 4KV. Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.



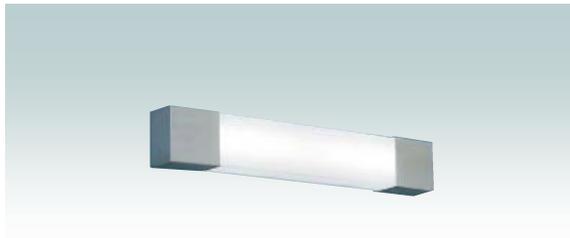
## Ordering Information

SAMPLE NUMBER: 1215-2TR-26-CFL/3/27 + T5/1/22-120V-PC-DIM-28

Series	Size	Lamp	Lamp (Bowl)	Voltage	Finish	Pattern <sup>5</sup>	Stem and Canopy Finish <sup>5</sup>	Options	OA
Series 1215-2TR	26"	CFL/3/27 <sup>1,2</sup>	CFL/6/40 <sup>2</sup>	120V	Standard - MW	CCL = Coral	Standard - MW	1SAC	28" (OA) - 26" dia
Series 1215-TTR	36"	CFL/3/32 <sup>2</sup>	CFL/6/50 <sup>2</sup>	277V	Premium - CC, NA, CBRS, PB <sup>4</sup> , PC <sup>4</sup> , PCP <sup>4</sup> , PN <sup>4</sup> , SAL, SB, SC, SCL, SCP, SN, SNL	SHL = Seashell SMT = Smooth	Premium - CC, NA, CBRS, PB <sup>4</sup> , PC <sup>4</sup> , PCP <sup>4</sup> , PN <sup>4</sup> , SAL, SB, SC, SCP, SN	3S QP SJCAC SJVWAC	32" (OA) - 36" dia
	44"	CFL/3/39 <sup>2</sup>	CFL/6/55 <sup>2</sup>	347V	Custom Decorative Metals Color CLR, CBT, SPE, SGE, BRS, CPR, BPL, SGN, QMP, QLE, IDO, RBE, PWR			TP D DL DM <sup>6</sup> FF REM SCA SSW FB	42" (OA) - 44" dia Or Specify
		CFL/3/40 <sup>2</sup>	CFL/8/27 <sup>3</sup>		(must choose either a standard finish or custom metals color and pattern)				
		CFL/3/42 <sup>2</sup>	CFL/8/39 <sup>3</sup>						
		CFL/3/50 <sup>2</sup>	CFL/8/40 <sup>3</sup>						
		CFL/3/55 <sup>2</sup>	CFL/8/50 <sup>3</sup>						
		CFL/3/57 <sup>2</sup>	CFL/8/55 <sup>3</sup>						
		CFL/3/70 <sup>2</sup>	HAL/3/150 <sup>1,2</sup>						
		CFL/4/27 <sup>3</sup>	HAL/4/150 <sup>3</sup>						
		CFL/4/39 <sup>3</sup>	MH/3/39 <sup>1,2</sup>						
		CFL/4/40 <sup>3</sup>	MH/3/70 <sup>1,2</sup>						
		CFL/4/50 <sup>3</sup>	MH/3/150 <sup>2</sup>						
		CFL/4/55 <sup>3</sup>	MH/4/70 <sup>3</sup>						
		CFL/4/57 <sup>3</sup>	MH/4/150 <sup>3</sup>						
		CFL/4/70 <sup>3</sup>							
		CFL/6/27 <sup>1,2</sup>							
		CFL/6/39 <sup>2</sup>							

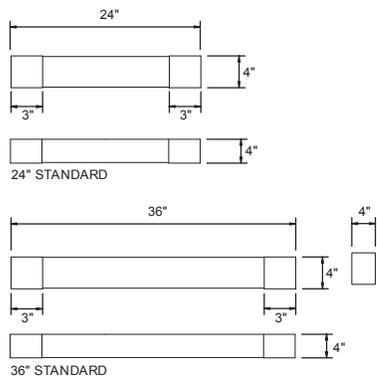
### Notes:

- 1 Available in 26"
- 2 Available in 36"
- 3 Available in 44"
- 4 Available in 26" Only
- 5 Available with Custom Decorative Metal Finish only
- 6 Not available in 27W



## 600 Interior Wall

600 Luminous Square Vanity Luminaire. ADA compliant.



### Material

Painted or plated cold-rolled steel, brass, copper or aluminum end caps and an aluminum body with an extruded matte white acrylic diffuser.

### Installation

Supplied with a universal mounting back for a standard 3" plaster ring or switch-box. 36" Luminaire has additional mounting holes to ensure secure attachment. Horizontal or vertical mount.

### Ballast

Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

### Lamp/Socket

24": Two (2) 14W T5 linear fluorescent lamps.

36": Two (2) 21W T5 linear fluorescent lamps. Fluorescent socket injection molded plastic. Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.

## Ordering Information

SAMPLE NUMBER: 600-36-T5/2/21-347V-PCP

Series	Size	Lamp	Voltage	Finish	Options
600=Luminous	24"	T5/2/14'	120V	NA (standard),	DL
Square Vanity	36"	T5/2/21'	277V <sup>1</sup>	CC, MW, PB, PC, PCP, PN,	DM <sup>3</sup>
			347V <sup>4</sup>	SAL, SB, SC, SCP, SCL, SN,	REM <sup>4</sup>
				SNL, SSS	

### Notes:

- 1 Available in 24"
- 2 Available in 36"
- 3 Consult the factory for available options
- 4 Supplied by others



## 601 Interior Wall

Interior Wall Luminaire Mirror Luminaire with Integral Lamps.

### Material

Solid extruded aluminum lamp housing with an extruded prismatic acrylic lense and matte white diffuser. Formed aluminum cross bracing and mounting structure. Mirror by others.

### Installation

Housing Supplied with four (4) 1/4" bolt holes for secure installation. Provided with a universal circle strap for standard JBox. Mirror (supplied by others) slides into groove for secure assembly. Mirror: Refer to shaperlighting.com for drawings for the slide-in mirror dimensions, provided by others.

### Ballast

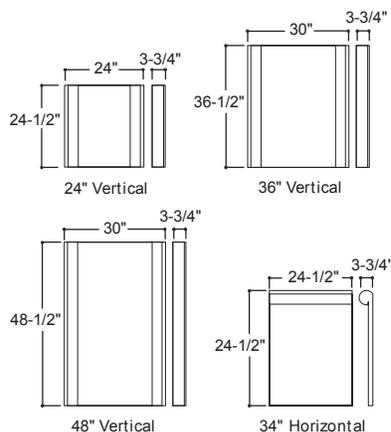
Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

### Lamp/Socket

Horizontal Lamp Orientation. 34": One (1) 17W T8 linear fluorescent lamp  
Contact the factory for incandescent lamping.

### Finish and Options

See pages 77-80 for finish details and options.



## Ordering Information

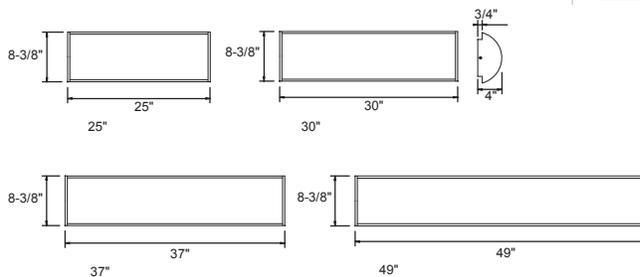
SAMPLE NUMBER: 601-H-34-T8/1/17-120V-OBRS

Series	Dimension	Lamp	Voltage	Finish	Options
601-H	Vertical	Vertical	120V	NA, SAL, MW,	DL, SH4,
601-V	24" (24" Ht x 24" W)	T8/2/17 (24")	277V	SB, PB, PC,	SH6
	36" (36" Ht x 30" W)	T8/2/25 (36")	347V	SC, SCP, PCP,	
	48" (48" Ht x 30" W)	T8/2/32 (48")		SN, PN, SCL,	
	Horizontal	Horizontal		SNL, CBRS or	
	34" (34" Ht x 24" W)	T8/1/17		CC	



## 605 Interior Wall

605 LuminousWall Sconce features a variety of decorative options such as perforated metal, colored acrylic trim bars and is ADA compliant.



### Material

Painted or plated solid aluminum with a 1/8" matte white extruded acrylic panel.

### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring. Horizontal or vertical mount.

### Ballast

Integral Electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

### Lamp/Socket

25": Two (2) 14W T-5 liner fluorescent lamps.  
 30": Two (2) 40W (2G11) high lumen CFL lamps.  
 37": Two (2) 21W T-5 or 25W T-8 linear fluorescent lamps.  
 49": Two (2) 28W T-5 or 32W T-8 linear fluorescent lamps. CFL socket injection molded plastic. Lamps furnished by others.

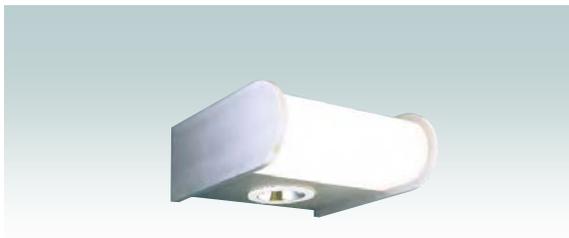
### Finish and Options

See pages 77-80 for finish details and options.

## Ordering Information

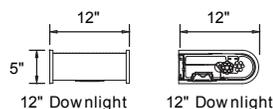
SAMPLE NUMBER: 605-24-T5/2/14-347V-PCP

Series	Size	Lamp	Voltage	Finish	Options
605-Luminous Sconce	25"	CFL/2/40 <sup>2</sup>	120V	NA (standard),	2HTB,
	30"	T5/2/14 <sup>1</sup>	277V	CC, MW, CBRS, FB, PC,	2HTB/2CTVB,
	37"	T5/2/21 <sup>1</sup>	347V	POP, PN, SAL, SB, SC,	2HTB/CBC,
	49"	T5/2/28 <sup>1</sup>		SCP, SCL, SN, SNL	2HTB/PC,
		T8/2/25 <sup>1</sup>			2VTB,
		T8/2/32 <sup>1</sup>			2VTB/CBP,
				Notes:	2VTB/PE,
				1 Available in 24"	DL, DM <sup>5</sup> , IEM, FP
				2 Available in 30"	
				3 Available in 37"	
				4 Available in 49"	
				5 Consult the factory for available options	



## 609 Interior Wall Luminaire

609 LuminousVanity Sconce with a MR-16 Downlight. Indirect and direct illumination. Downlight can be switched separately.



### Material

Solid aluminum with a matte white formed acrylic panel. Semi-open top. 12" has one (1) Halo 3" adjustable reflector with a cast aluminum white trim ring and specular clear reflector. Each trim includes a soft focus cover glass lense. 35° vertical adjustment and 360° rotation.

### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring with additional mounting holes. Refer to the specification sheet for additional drawings.

### Ballast

Integral Electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

### Lamp/Socket

Contact factory for INC uplight.  
 12": Two (2) 32W (G24q-3) 4-pin triple CFL lamps and one (1) 50W MR-16 12V incandescent lamp. Fluorescent socket injection molded plastic. Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.

## Ordering Information

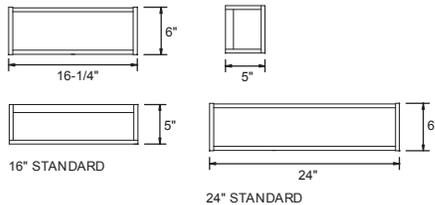
SAMPLE NUMBER: 609-D-37-T5/1/21-OBRS-FP

Series	Length	Lamp	Voltage	Finish	Options
609	12"	CFL/2/32	120V	MW, NA, SAL,	FP, REM,
			277V	SC, PC, SB, PB,	DM, DL
			347V	SCP, PCP, SN,	
				PN, CBRS, SCL,	
				SNL or CC	



### 607 Interior Wall

607 Luminous Wall Sconce features a classic "craftsman" style which provides forward, direct and indirect illumination.



#### Material

Solid brass (PB, SB, SC or PC finishes) with 1/8" matte acrylic panels.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring. Mounting centered on the back of the luminaire. For vertical or horizontal mount.

#### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

16": Two (2) 13W (2GX7) 4-pin low watt CFL lamps or two (2) 60W A-19 lamps.

24": Two (2) 26W (GX24q-3) 4-pin quad CFL lamps or three (3) 60W A-19 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

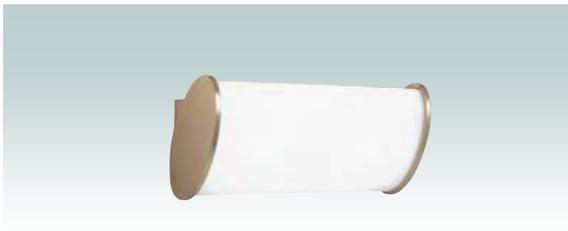
### Ordering Information

SAMPLE NUMBER: 607-24-CFL/2/26-347V-OBRS

Series	Size	Lamp	Voltage	Finish	Options
607=Craftsman	16"	CFL/2/13 <sup>1</sup>	120V	MW (standard),	DL
Vanity	24"	CFL/2/26 <sup>2</sup>	277V <sup>3</sup>	CC, OBRS, PB, PC, PCP, PN, SB, SC, SCL, SCP, SN, SNL	DM <sup>4</sup> OG REM <sup>5</sup> FP MP <sup>6</sup> PP
		INC/2/60 <sup>1</sup>	347V <sup>3</sup>		
		INC/3/60 <sup>2</sup>			

#### Notes:

- 1 Available in 16"
- 2 Available in 24"
- 3 Available with CFL only
- 4 Consult the factory for available options
- 5 Supplied by others
- 6 Recommended for side and front panels only



### 608 Interior Wall

608 Angled Luminous Wall Sconce features a streamlined geometric design with soft, uniform illumination.

#### Material

Painted or plated solid aluminum with a 1/8" matte white frosted acrylic diffuser.

#### Installation

Supplied with a mounting back for a standard 4" Jbox or plaster ring. The 26" and 38" luminaires are provided with extra mounting holes to provide secure attachment to the wall.

#### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

18": Two (2) 27W (2G11) high lumen CFL lamps or two (2) 60W A-19 lamps.

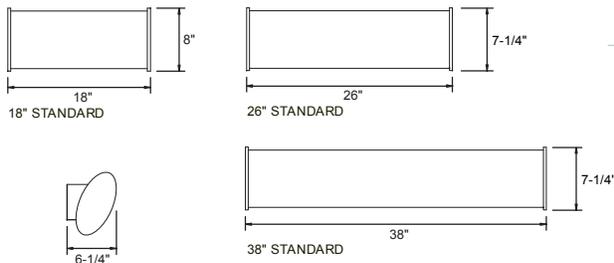
26": Two (2) 14W mini bi-pin linear fluorescent T-5 lamps or three (3) 60W A-19 lamps.

38": Two (2) 21W mini bi-pin linear T-5 lamps, two (2) 25W bi-pin linear fluorescent T8 lamps or four (4) 60W A-19 lamps.

CFL socket injection molded plastic. INC socket fired ceramic rated for 660-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.



### Ordering Information

SAMPLE NUMBER: 608-26-INC/3/60-120V-OBRS

Series	Size	Lamp	Voltage	Finish	Options
608= Angled	18"	T5/2/14 <sup>2</sup>	120V	MW (standard),	DL
Luminous	26"	T5/2/21 <sup>3</sup>	277V <sup>4</sup>	CC, OBRS, PB, PC, PCP, PN, SAL, SB, SC, SCL, SCP, SN, SNL	IEM <sup>2,3</sup> REM <sup>1,5</sup>
Sconce	38"	T8/2/25 <sup>3</sup>	347V <sup>4</sup>		
		CFL/2/27 <sup>1</sup>			
		INC/2/60 <sup>1</sup>			
		INC/3/60 <sup>2</sup>			
		INC/4/60 <sup>2</sup>			

#### Notes:

- 1 Available in 18"
- 2 Available in 26"
- 3 Available in 38"
- 4 Available with CFL only
- 5 Supplied by others



## 611 Interior Wall

611 Tapered Flute is available in two sizes.

### Material

Solid aluminum with a formed matte white acrylic diffuser.

### Installation

Supplied with a universal mounting plate for a standard 4" Jbox or plaster ring.

### Ballast

Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

### Lamp/Socket

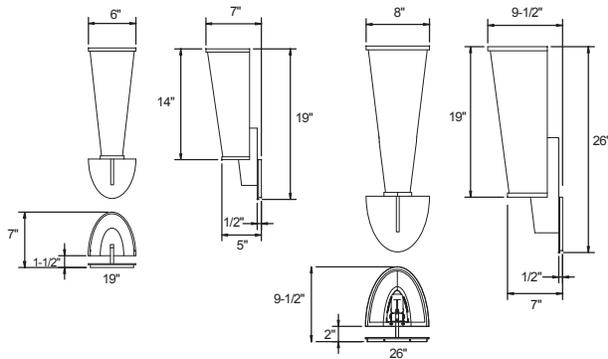
19": One (1) 27W (2G11) 4-pin high lumen CFL lamp or one (1) 60W frosted T-10 lamps.

26": One (1) 39W (2G11) 4-pin high lumen CFL lamp or one (1) 60W frosted T-10 lamps.

CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.



## Ordering Information

SAMPLE NUMBER: 611-26-CFL/1/39-347V-PCP

Series	Size	Lamp	Voltage	Finish	Options
611=Tapered Flute	19"	CFL/1/27 <sup>1</sup>	120V	NA (standard),	DL
	26"	CFL/1/39 <sup>2</sup>	277V <sup>2</sup>	CC, MB, MW, PB, PC,	DM <sup>3,5</sup>
		INC/1/60	347V <sup>3</sup>	PCP, FN, SAL, SB, SC, SQL, SCP, SN, SNL	REM <sup>6</sup> FD

### Notes:

- 1 Available in 19"
- 2 Available in 26"
- 3 Available with CFL only
- 4 Not available in 27W
- 5 Consult the factory for available options
- 6 Supplied by others



## 612 Interior Wall

612-LB features a Luminous Bowl and the 612-SM features a Solid Bowl with an arm mount bracket.

### Material

Painted or plated cold-rolled steel base metal. Matte white acrylic bowl (612-LB). Optional hexcel louver. Natural aluminum, solid brass, stainless steel or painted steel trim ring.

### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

### Ballast

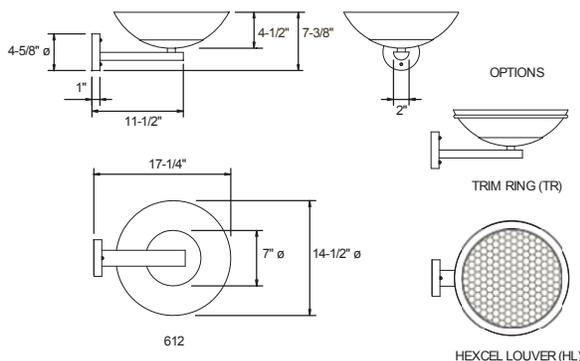
Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage

### Lamp/Socket

Two (2) 13W (2GX7) 4-pin low wattage CFL lamps, two (2) 26W (G24q-3) 4-pin quad CFL lamps, two (2) 60W A-19 lamps or one (1) 300W T3-RSC double-ended linear halogen lamp (612-SM only). CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.



## Ordering Information

SAMPLE NUMBER: 612-SM-CFL/2/13-347V-PCP

Series	Lamp	Voltage	Finish	Options
612-LB=Luminous Bowl	CFL/2/13	120V	MB, MW (standard),	DL
w/ Arm Mount Bracket	CFL/2/26	277V <sup>2</sup>	CC, CBRS, PB, PC,	DM <sup>3,4</sup>
612-SM=Solid Bowl w/	INC/2/60	347V <sup>2</sup>	PCP, FN, SB, SC,	REM <sup>5</sup>
Arm Mount Bracket	HAL/1/300 <sup>1</sup>		SQL, SCP, SN, SNL	FB <sup>6</sup> HL TR

### Notes:

- 1 612-SM only
- 2 Available with CFL only
- 3 Not available in 13W
- 4 Consult the factory for available options
- 5 Supplied by others
- 6 Luminous Bowl only



### 622 Interior Wall

622 Arm Mount Luminous Cylinder features Three Accent Trim Bars.

#### Material

Solid brass or aluminum housing and decorative trim. Matte white acrylic 4" dia. luminous cylinder.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Ballast

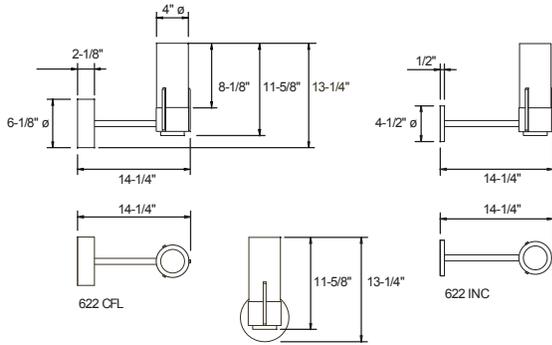
Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

One (1) 18W (G24q-2) or 26W (G24q-3) 4-pin quad CFL lamp or one (1) 40W A-19 lamp. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.



### Ordering Information

SAMPLE NUMBER: 622-CFL/1/18-347V-PCP

Series	Lamp	Voltage	Finish	Options
622=Arm Mount Luminous Cylinder	CFL/1/18	120V	NA (standard),	DL
	CFL/1/26	277V <sup>1</sup>	CC, MW, OBRS, PB, PC,	DM <sup>2</sup>
	INC/1/40	347V <sup>1</sup>	PCP, PN, SAL, SB, SC, SCL, SOP, SN, SNL	REM <sup>3</sup> FC

- Notes:  
 1 Available with CFL only  
 2 Consult the factory for available options  
 3 Supplied by others



### 624 & 624/4 Interior Wall

624 Wall Bracket features a clean modern shape with direct/indirect illumination. The 624/4 is ADA compliant.

#### Material

Solid brass or aluminum housing and decorative trim. Matte white acrylic 4" dia. luminous cylinder. Optional frosted white acrylic bottom lense or white aluminum cube cell top louver.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Ballast

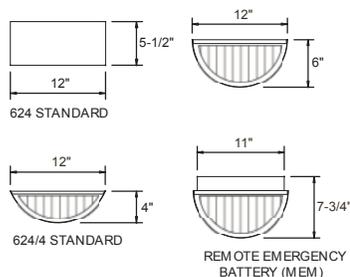
Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

624: Two (2) 13W (2GX7) 4-pin low wattage CFL or 26W (G24q-3) 4-pin quad CFL lamps, or one (1) 75W A-19 lamp. 624/4: One (1) 13W (2GX7) 4-pin low wattage CFL or 26W (G24q-3) 4-pin quad CFL lamp, or one (1) 75W A-19 lamp. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.



### Ordering Information

SAMPLE NUMBER: 624-CFL/2/13-347V-PCP

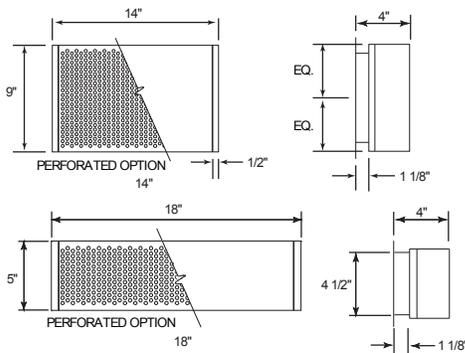
Series	Lamp	Voltage	Finish	Options
624=Wall Bracket	CFL/1/13 <sup>1</sup>	120V	MW (standard),	BLN
624/4=ADA Compliant Wall Bracket	CFL/1/26 <sup>1</sup>	277V <sup>2</sup>	CC, PB, PC, PCP, PN,	CL
	CFL/2/13 <sup>2</sup>	347V <sup>2</sup>	RSS, SB, SC, SCL,	DL
	CFL/2/26 <sup>2</sup>		SOP, SN, SNL	DM <sup>4</sup>
	INC/1/75			MEM REM

- Notes:  
 1 Available with 624/4 Series  
 2 Available with 624 Series  
 3 Available with CFL only  
 4 Consult the factory for available options



### 635 Interior Wall

635 features a Luminous Shield, Perforated Shield or a Blue Punch Pattern Shield. ADA compliant.



#### Material

Solid aluminum construction. Extruded matte white acrylic lense.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

14": Two (2) 13W (2GX7) 4-pin low wattage CFL or one (1) or two (2) 26W (G24q-3) 4-pin quad tube CFL lamps, or one (1) 60W frosted T-10 lamp. 18": One (1) 27W (2611) high lumen CFL lamp. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 635-PSH-14-CFL/2/13-347V-SN

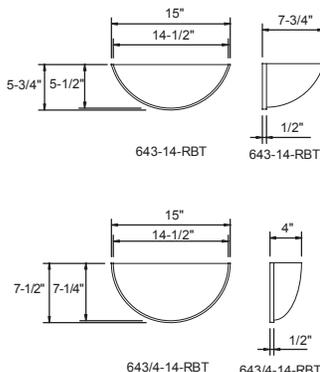
Series	Shield	Size	Lamp	Voltage	Finish	Options
635=Wall Shield	LS=Luminous Shield	14"	CFL/1/26 <sup>1</sup>	120V	NA (standard),	DL
	PSH=Perforated Shield	18"	CFL/1/27 <sup>2</sup>	277V <sup>3</sup>	CC, MW,	DM <sup>5,6</sup>
	PPSW= White Punch Pattern Shield		CFL/2/13 <sup>1</sup>	347V <sup>3</sup>	CBRS, PB <sup>4</sup> , PCP <sup>4</sup> , FN <sup>4</sup> , SAL, SB, SCP, SN, SNL	MEM
			INC/1/60 <sup>1</sup>			FSH <sup>7</sup> , PPSB

- Notes:
- 1 Available in 14"
  - 2 Available in 18"
  - 3 Available with CFL only
  - 4 Not available with Perf Shield (PSH)
  - 5 Consult the factory for available options
  - 6 26W Only
  - 7 Luminous Shield only



### 643 & 643/4 Interior Wall

643 Luminous Quarter Sphere Wall Sconce features three Back Trim options. 643/4 is ADA compliant.



#### Material

Painted or plated cold rolled steel back plate with a 1/8" thick matte white acrylic bowl. 1/4" Reduced Back Trim (RBT) or 3/4" Standard Back Trim (SBT) or Large Back Trim (LBT) in painted or plated cold-rolled steel base metal.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

643: Two (2) 13W (2GX7) 4-pin low wattage CFL lamps, two (2) 26W (G24q-3) 4-pin quad CFL lamps or one (1) 75W A-19 lamp. 643/4-14": One (1) 13W (2GX7) 4-pin low wattage CFL lamp. 643/4-18": Two (2) 13W (2GX7) 4-pin low wattage CFL lamps or one (1) 60W T-10 lamp. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 643-14-SBT-CFL/2/26-347V-SCL

Series	Style	Voltage	Options
643=Luminous Quarter Sphere Wall	LBT=Large Back Trim <sup>2</sup>	120V	2TRB
643/4=ADA Compliant Luminous Quarter Sphere	RBT=1/4" Reduced Back Trim	277V <sup>5</sup>	TR
	SBT=3/4" Standard Back Trim	347V <sup>5</sup>	DL
			MEM <sup>2</sup>
			REM <sup>6,1</sup>
			FD
			HL

Size	Lamp	Finish	Options
14"	CFL/1/13 <sup>1,1</sup>	MW (standard),	
18"	CFL/2/13 <sup>1,1</sup>	CC, PB, PC, PCP,	
	CFL/2/26 <sup>2</sup>	FN, SB, SC, SCL,	
	INC/1/60 <sup>1,1</sup>	SCP, SN, SNL	
	INC/1/75 <sup>2</sup>		

- Notes:
- 1 Available with 643/4 Series
  - 2 Available with 643 Series
  - 3 Available in 14"
  - 4 Available in 18"
  - 5 Available with CFL only
  - 6 Supplied by others



### 658 Interior Wall

M658 features a luminous shield with a modern die-cast base and is ADA compliant.

#### Material

Painted or plated solid die-cast aluminum with a 1/8" matte white acrylic shield.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Ballast

Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

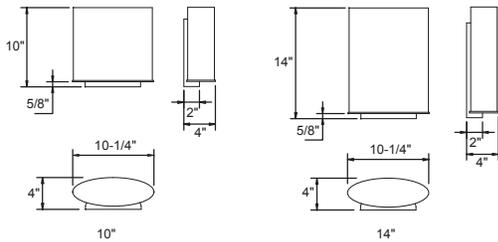
#### Lamp/Socket

10": Two (2) 13W (GX7) low voltage CFL, two (2) 26W (G24q-3) 4-pin quad CFL lamps or two (2) 40W frosted T-10 lamps.

14": Two (2) 27W (2G11) high lumen CFL lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.



### Ordering Information

SAMPLE NUMBER: 658-14-CFL/2/27-347V-PCP

Series	Size	Lamp	Voltage	Finish	Options
658=Luminous Shield	10"	CFL/2/13 <sup>1</sup>	120V	MW (standard), CC, PB, FC, PCP, PN, SAL, SB, SC, SQ, SCP, SN, SNL	DL, REM <sup>4</sup> , FD
	14"	CFL/2/26 <sup>1</sup> CFL/2/27 <sup>2</sup> INC/2/40 <sup>1</sup>	277V <sup>3</sup> 347V <sup>3</sup>		

Notes:  
 1 Available in 10"  
 2 Available in 14"  
 3 Available with CFL only  
 4 Supplied by others



### 662 Interior Wall

662 features a curved luminous shield. ADA compliant.

#### Material

Painted white aluminum back plate. Plated or painted die-cast aluminum trim bars. Matte white sanded acrylic shield. Optional sanded plate glass, "green glass" matte acrylic, acrylic top and bottom covers and square (3/8" O.C.) perforated aluminum with matte white acrylic liner.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Ballast

Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

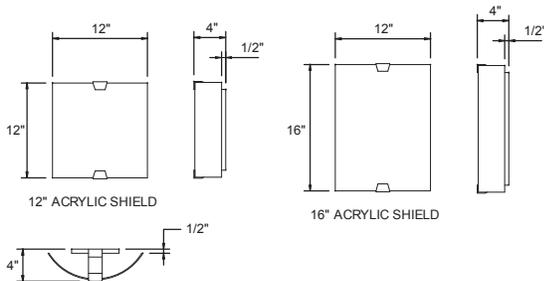
#### Lamp/Socket

12": Two (2) 13W (2GX7) 4-pin low wattage CFL lamps or two (2) 26W (G24q-3) 4-pin quad CFL lamps or two (2) 60W frosted T-10 lamps.

16": Two (2) 27W (2G11) high lumen CFL lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.



### Ordering Information

SAMPLE NUMBER: 662-12-CFL/2/13-347V-PCP

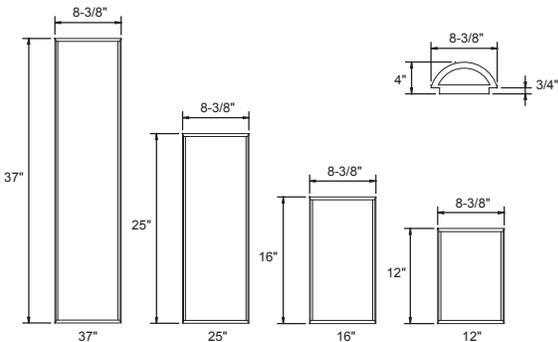
Series	Size	Lamp	Voltage	Finish	Options
662=Luminous Curved Shield	12"	CFL/2/13 <sup>1</sup>	120V	MW (standard), CC, PB, FC, PCP, PN, SAL, SB, SC, SQ, SCP, SN, SNL	ATBC, PTBC, DL, DM <sup>4</sup> , GGA, MEM, PSH, FD, GL
	16"	CFL/2/26 <sup>1</sup> CFL/2/27 <sup>2</sup> INC/2/60 <sup>1</sup>	277V <sup>3</sup> 347V <sup>3</sup>		

Notes:  
 1 Available in 12"  
 2 Available in 16"  
 3 Available with CFL only  
 4 Consult the factory for available options



### 673 Interior Wall

673 luminous Half Cylinder features a variety of decorative options such as perforated metal, colored acrylic, trim bars and is ADA compliant.



#### Material

Painted or plated solid aluminum with a 1/8" matte white extruded acrylic panel.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

12": One (1) or two (2) 18W (2G11) 4-pin high lumen CFL lamps or one (1) 60W frosted T-10 lamp.

16": Two (2) 27W (2G11) 4-pin high lumen CFL lamps or two (2) 60W frosted T-10 lamps.

25": One (1) or two (2) 14W T5 linear fluorescent lamps.

37": One (1) or two (2) 21W T5 linear fluorescent lamps. CFL lamps or two (2) 60W Frosted T-10 lamps. CFL socket injection molded plastic. Lamps furnished by others.

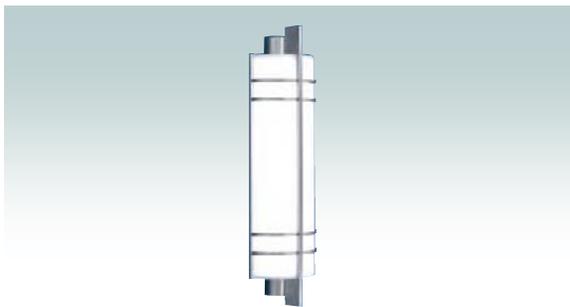
#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

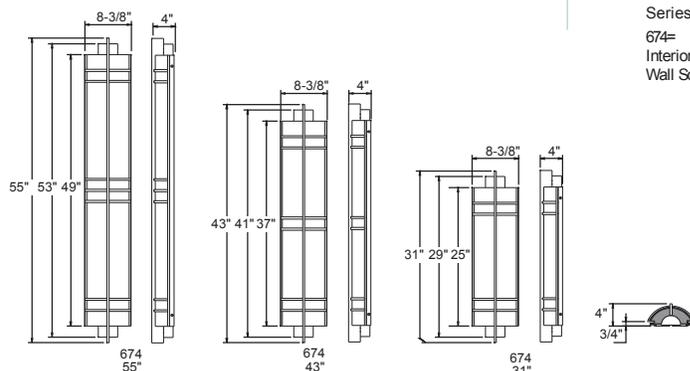
SAMPLE NUMBER: 673-25-T5/2/14-347V-PCP

Series	Size	Lamp	Voltage	Finish	Options	
673=Luminous	12"	CFL/1/18'	120V	NA (standard),	2-HTB	DL
Half Cylinder	16"	CFL/2/18'	277V <sup>6</sup>	CC, MW, CBRS,	2-HTB/1P/VTB	DM <sup>8</sup>
	25"	CFL/2/27'	347V <sup>6</sup>	PB, PC, PCP, FN,	2-HTB/2/VTB	IEM <sup>3,4</sup>
	37"	INC/1/60'		SAL, SB, SCP, SN,	2-HTB/2/VTB/PC	REM <sup>1,7</sup>
		INC/2/60'		SNL	2-F/VTB	FD
Notes:		T5/1/14'			2/VTB	TBC
1 Available in 12"		T5/1/21'			2/VTB/4/VTB	
2 Available in 16"		T5/2/14'			2/VTB/PS	
3 Available in 24"		T5/2/14'			3-HTB/1/VTB/P	
4 Available in 37"		T5/2/21'			ACB	
5 Available with CFL only						
6 Consult the factory for available options						
7 Supplied by others						



### 674 Interior Wall

674 Luminous Wall Sconce features horizontal trim bars with a vertical fin detail and is ADA compliant. Design options, such as perforated metal, colored acrylic, and different trim bar configurations are available.



#### Material

Painted, natural or plated solid aluminum with a 1/8" matte white acrylic panel. Open top and bottom with a regressed aluminum perf shield.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Ballast

Integral electronic HFF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

31": Two (2) 14W T5 linear miniature bi-pin fluorescent lamps.

43": Two (2) 21W T5 linear miniature bi-pin fluorescent lamps.

55": Two (2) 28W T5 linear miniature bi-pin fluorescent lamps.

Fluorescent socket injection molded plastic. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 674-55-T5/2/28-347V-OBRS

Series	Size	Lamp	Voltage	Finish	Options
674=	31"	T5/2/14'	120V	BK, BM, CC, DP, GM,	DL
Interior Luminous	43"	T5/2/21'	277V	GRM, GY, MW, NA,	CGA
Wall Sconce	55"	T5/2/28'	347V	CBRS, FB, PCP, FN,	IEM <sup>2,3</sup>
				SAL, SB, SCP, SM, SN,	REM <sup>4</sup>
				SNL, WH	FD

#### Notes:

- 1 Available in 31"
- 2 Available in 43"
- 3 Available in 55"
- 4 Supplied by others



### 683 & 683/4 Interior Wall

683 Direct/Indirect Economical Wall Sconce features an aluminum cylinder. 683/4 is ADA compliant.

#### Material

Painted, natural or plated solid aluminum with a 1/8" matte white acrylic panel. Open top and bottom with a regressed aluminum perf shield.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Ballast

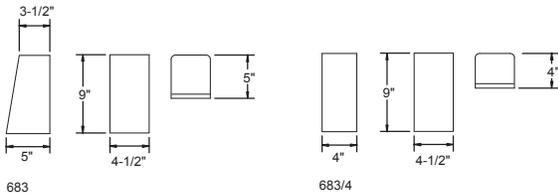
Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

One (1) 13W (G24q-1) 4-pin quad CFL lamp, one (1) 26W (GX24q-3) triple tube CFL lamp or one (1) 60W A-19 lamp. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.



683

683/4

### Ordering Information

SAMPLE NUMBER: 683/4-CFL/1/26-347V-BK

Series	Lamp	Voltage	Finish	Options
683=Wall Sconce	CFL/1/13	120V	NA (Interior standard),	DL
683/4=ADA Compliant	CFL/1/26	277V <sup>1</sup>	CC, MW (Interior premium)	REM <sup>2</sup>
Wall Sconce	INC/1/60	347V <sup>1</sup>	WH, BK, BM, CC, DP, GM, GRM, GY, SM	

#### Notes:

- 1 Available with CFL only
- 2 Supplied by others



### 687 Interior Wall

687 features classic Geometric Wedge shape with indirect illumination. The 687-4 features similar geometry and is ADA compliant.

#### Material

Painted or plated cold-rolled steel base metal. Optional aluminum cube cell louver, white.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Ballast

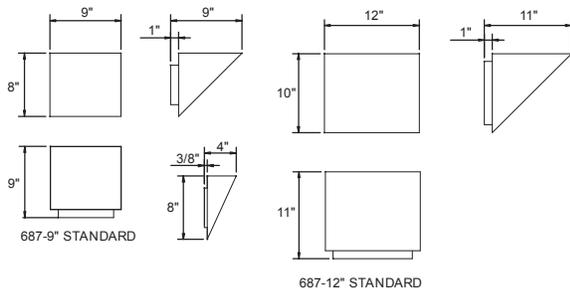
Integral Electronic HPF multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage. Metal Halide Ballast are HPF core and coil type, multi-volt 120/277V for the specified wattage. Contact factory for 347V.

#### Lamp/Socket

687 - 9": One (1) 26W or 32W (GX24q-3) 4-pin triple CFL lamp or one (1) 75W A-19 lamp. 687/4 - 9": One (1) 13W (2GX7) 4-pin low wattage CFL lamp, one (1) 26W (G24q-3) 4-pin quad CFL lamp or one (1) 75W A-19 lamp. 687 - 12": Two (2) 26W or 32W (GX24q-3) 4-pin triple CFL lamps, two (2) 75W A-19 lamps, one (1) 300W double-ended T-3 halogen lamp or one (1) 50W, 70W or 100W ED-17 metal halide (open burn) lamp. 687/4 - 12": Two (2) 26W (G24q-3) quad CFL lamps or two (2) 75W A-19 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.



687-9" STANDARD

687-12" STANDARD

### Ordering Information

SAMPLE NUMBER: 687-12-HAL/1/300-120V-OBRS

Series	Size	Lamp	Voltage	Finish	Options
687 =	9"	CFL/1/13 <sup>1,2</sup>	120V	MB, MW (standard),	BPP
Geometric	12"	CFL/1/26 <sup>1,3,2</sup>	277V <sup>5</sup>	CC, CBRS, CBZ, FB, FC,	GFP
Wedge		CFL/1/32 <sup>1,3</sup>	347V <sup>6</sup>	PCP, PN, SAL, SB, SC, SCL,	RFP
687/4 =		CFL/2/26 <sup>3,4</sup>		SCP, SN, SNL	WPP
Geometric		CFL/2/32 <sup>4</sup>			YPP
Wedge		INC/1/75 <sup>1,2,3</sup>			CL
		INC/2/75 <sup>3,4</sup>			DL
		HAL/1/300 <sup>3,4</sup>			MEM <sup>3,4</sup>
		MH/1/50 <sup>3,4</sup>			QR <sup>3,4</sup>
		MH/1/70 <sup>3,4</sup>			REM
		MH/1/100 <sup>3,4</sup>			TGL <sup>7</sup>

#### Notes:

- 1 Available in 9"
- 2 Available with 687/4 Series
- 3 Available with 687 Series
- 4 Available in 12"
- 5 CFL and MH only
- 6 Available with CFL only
- 7 MH only



## 691 Interior Wall

691 features a Floating Silhouette Dome.

### Material

Painted or plated cold-rolled steel base metal.

### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

### Ballast

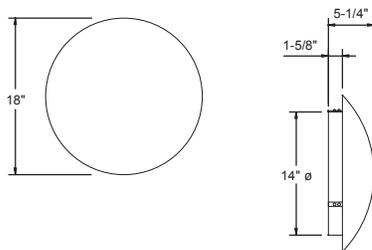
Integral electronic HFF multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate 13W, 26W, or 32W lamps.

### Lamp/Socket

Two (2) 13W (2GX7) 4-pin low wattage CFL, two (2) 26W or 32W (GX24q-3) 4-pin triple CFL lamps or two (2) 75W A-19 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.



## Ordering Information

SAMPLE NUMBER: 691-CFL/2/32-347V-PC

Series	Lamp	Voltage	Finish	Options
691 =Floating Silhouette Dome	CFL/2/26	120V	MW (standard),	DL
	CFL/2/32	277V <sup>1</sup>	CC, PB, PC, PCP, PN, SB,	PFD
	CFL/2/13	347V <sup>1</sup>	SC, SCL, SCP, SN, SNL	REM <sup>2</sup>

### Notes:

- 1 Available with CFL only
- 2 Supplied by others



## 698 Interior Wall

The ADA compliant 698 Medallion Wall Luminaire features soft omni-directional illumination.

### Material

Pre-painted white aluminum mounting pan with a matte white acrylic diffuser and clear acrylic round or square panel with frosted center. Optional frame is cold rolled steel, brass, aluminum, or bronze.

### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

### Ballast

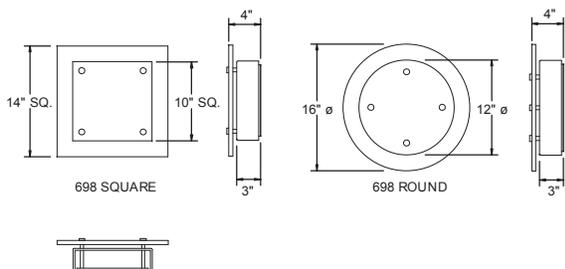
Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

### Lamp/Socket

Two (2) 13W (2GX7) 4-pin low wattage CFL lamps, two (2) 26W (G24q-3) 4-pin quad CFL lamps or two (2) 40W T-10 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.



## Ordering Information

SAMPLE NUMBER: 698-RD-CFL/2/13-347V-PCP

Series	Style	Lamp	Voltage	Finish	Options
698=Luminous Medallion	RD=Rbund SQ=Square	CFL/2/13 CFL/2/26 INC/2/40	120V 277V <sup>1</sup> 347V <sup>1</sup>	MB, MW (standard), CC, CBRS, PB, PC, PCP, PN, SAL, SB, SC, SCL, SCP, SN, SNL	AE DM <sup>3</sup> EO <sup>2</sup> GGA GL F MO <sup>2</sup> REM <sup>4</sup> PCH TBC CZ VRD DL

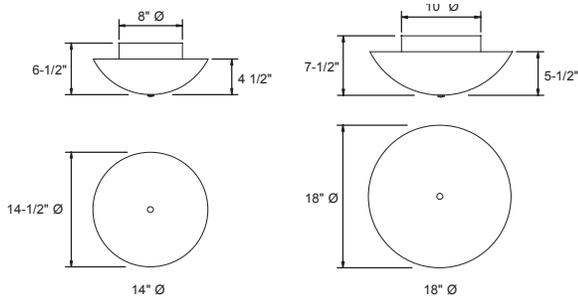
### Note:

- 1 Available with CFL only
- 2 Evo and Mezzo are two examples of a new material from 3Form®, referred to as ECO Resin panels and are just two of the hundreds of the options available. Consult the factory
- 3 Consult the factory for available options
- 4 Supplied by others



### 210 Interior Surface

210 Luminous Bowl features trim options and is available in two sizes.



#### Material

Cold rolled steel mounting pan with a matte white acrylic bowl. Optional Caming Trim.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Ballast

Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

14": Two (2) 13W (2GX7) 4-pin low wattage CFL lamps or two (2) 60W A-19 lamps. 18": Two (2) 26W or 32W (GX24q-3) 4-pin triple CFL lamps or two (2) 75W A-19 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 210-18-INC/2/75-120V-PC

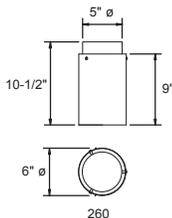
Series	Size	Lamp	Voltage	Finish	Options
210=Bowl Surface Luminaire	14"	CFL/2/26 <sup>1</sup>	120V	MW (standard), CC, CBRS, FB, FC,	CT, DL, DM <sup>4</sup> , MEM, DF2B, SFCT, SFR
	18"	CFL/2/32 <sup>1</sup>	277V <sup>2</sup>	POP, SB, SC, SOP, SN, SNL	TF, FB
		CFL/2/13 <sup>2</sup>	347V <sup>3</sup>		
		INC/2/60 <sup>2</sup>			
		INC/2/75 <sup>1</sup>			

Notes:  
 1 Available in 18"  
 2 Available in 14"  
 3 Available with CFL only  
 4 Consult the factory for available options



### 260-A Interior Surface

260-A Luminous Cylinder features a direct downlight component.



#### Material

Solid aluminum with a matte white acrylic cylinder.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Ballast

Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

One (1) 18W (GX24q-2) or 26W (GX24q-3) 4-pin triple CFL lamp or 75W A-19 lamp. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 260-A-CFL/1/18-347V-CAL

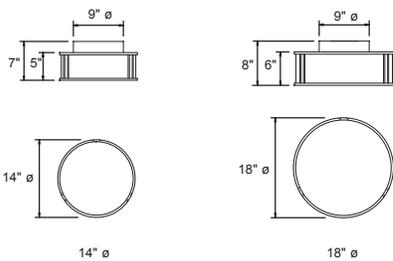
Series	Lamp	Voltage	Finish	Options
260-A = Cylinder Surface	CFL/1/18	120V	NA (standard), CAL, CC, MW, SAL	DL, REM <sup>2</sup> , PFB
	CFL/1/26	277V <sup>1</sup>		
	INC/1/75	347V <sup>1</sup>		

Notes:  
 1 Available with CFL only  
 2 Supplied by others



### 273 Interior Surface

273 Architectural Luminous Drum features trim bars and is available in two sizes.



#### Material

Painted cold rolled steel mounting pan and painted aluminum or brass trim with a matte white acrylic diffuser.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or plaster ring.

#### Ballast

Integral electronic HFF; multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

14": Two (2) 13W (2GX7) 4-pin low wattage CFL lamps or two (2) 26W (GX24q-3) 4-pin triple CFL lamps or two (2) 60W A-19 lamps.

18": Two (2) 26W (GX24q-3) 4-pin triple CFL lamps or two (2) 75W A-19 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 273-14-CFL/2/26-120V-SAL

Series	Size	Lamp	Voltage	Finish	Options
273=Architectural	14"	CFL/2/13 <sup>1</sup>	120V	MW, NA (standard),	CBI
Drum Surface	18"	CFL/2/26	277V <sup>2</sup>	CC, CBRS, PAL, PB,	DL
		INC/2/60 <sup>3</sup>	347V <sup>2</sup>	SAL, SB	DM <sup>4</sup>
		INC/2/75 <sup>4</sup>			MEM
					PF
					CTB
					FS

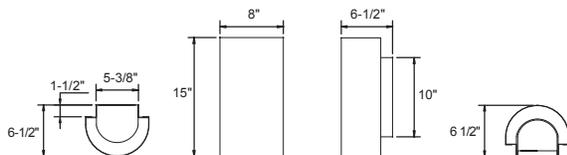
#### Notes:

- 1 Available in 14"
- 2 Available in 18"
- 3 Available with CFL only
- 4 Consult the factory for available options



### 676-WP Exterior Wall

676-WP Floating Curved Shield Wall Sconce features bronze construction with a fully enclosed lamp compartment.



#### Material

Solid bronze with open top, sides and bottom.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or stucco ring.

#### Ballast

Integral electronic HFF; multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

One (1) 26W (G24q-3) quad CFL or 32W (GX24q-3) triple CFL lamp or one (1) 60W A-19 lamp. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

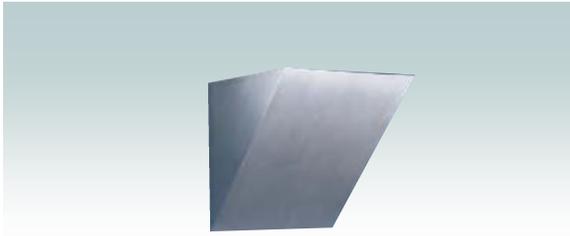
### Ordering Information

SAMPLE NUMBER: 676-WP-CFL/1/26-277V-GM

Series	Lamp	Voltage	Finish <sup>2 3</sup>	Options
676-WP=Floating	CFL/1/26	120V	NBZ (standard),	ACB
Curved Shield	CFL/1/32	277V <sup>1</sup>	BK, BM, CC, DP,	FCT
	INC/1/60	347V <sup>1</sup>	GM, GRM, GY, SCL,	
			SM, SNL, VG, WH	

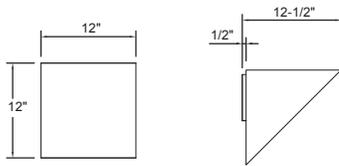
#### Notes:

- 1 Available with CFL only
- 2 Premium TGC polyester powder coat paint, 25 mil nominal thickness for superior protection against fade and wear
- 3 Bronze will weather to a dark bronze patina



### 687-WP Exterior Wall

687-WP Classic Geometric Wedge shape with indirect illumination.



#### Material

Painted aluminum or solid bronze. Internal lamp assembly is cast aluminum. Clear acrylic lense (CFL) or clear tempered glass lense (INC & MH).

#### Installation

Supplied with a mounting back for a standard 4" Jbox or stucco ring. Optional rear (through wall) feed conduit mounting. Surface mount conduit power feed Contact factory.

#### Ballast

Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate 26W, 32W or 42W lamps. Integral metal halide ballast is electronic HPF multi-volt 120/277V for the specified lamp wattage. 347V ballast for metal halide - Contact factory.

#### Lamp/Socket

One (1) 26W, 32W (GX24q-3) or 42W (GX24q-4) 4-pin triple tube CFL lamp, one (1) 50W, 70W or 100W ED-17 metal halide lamp or one (1) 150W A-19 lamp. CFL socket injection molded plastic. Metal halide socket is ceramic pulse-rated, 4KV. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 687-WP-MH/1/70-277V-GM

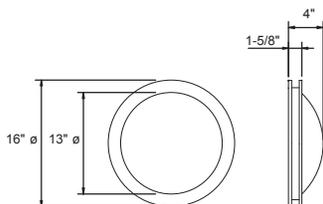
Series	Size	Lamp	Voltage	Finish <sup>3,4</sup>	Options
687-WP =	9"	CFL/1	120V	NBZ (standard),	C
Classic Geometric Wedge	12"	(26/32/42W-Triple) CFL/1/13 CFL/2/26 INC/1/150 MH/1/50 MH/1/70 MH/1/100	277V <sup>1</sup> 347V <sup>2</sup>	BK, BM, CC, DP, GM, GRM, GY, SCL, SM, SNL, VG, WH	

Notes:  
1 CFL and MH only  
2 Available with CFL only  
3 Premium TGIC polyester powder coat paint, 25 mil nominal thickness for superior protection against fade and wear  
4 Bronze will weather to a dark bronze patina



### 693-WP Exterior Wall

693-WP Medallion Ring features a floating ring with a luminous bowl and is ADA compliant.



#### Material

Painted aluminum or solid bronze with a matte white acrylic lense.

#### Installation

Supplied with a universal circular strap for a standard 4" Jbox or stucco ring.

#### Ballast

Integral electronic HPF, multi-volt 120/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate the specified lamp wattage.

#### Lamp/Socket

One (1) 22W or 40W (2GX13) T5 circular fluorescent lamp or two (2) 40W A-19 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Lamps furnished by others.

#### Finish and Options

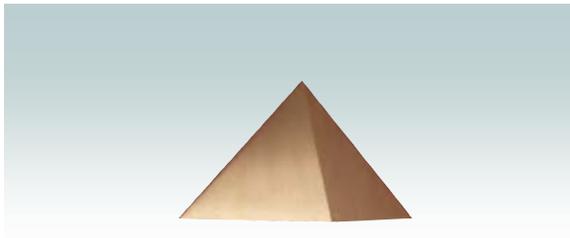
See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 693-WP-T5C/140-277V-OBZ

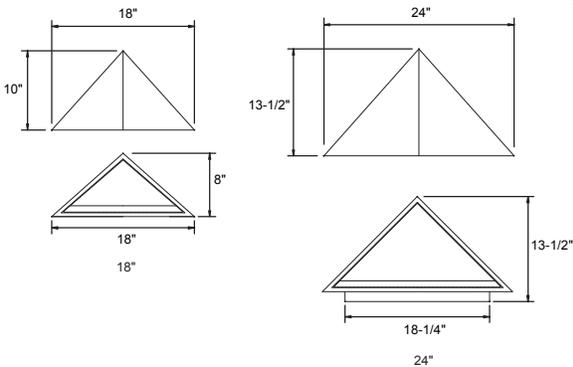
Series	Lamp	Voltage	Finish <sup>2</sup>	Options
693-WP =	T5C/1/22	120V	NBZ (standard),	1PHTB/1PVTB
Medallion Ring	T5C/1/40 INC/2/40	277V <sup>1</sup> 347V <sup>1</sup>	BK, BM, CC, DP, GM, GRM, GY, CBZ, SCL, SM, SNL, WH	

Notes:  
1 Available with CFL only  
2 Bronze will weather to a dark bronze patina



### 695-WP Exterior Wall

695-WP Half Pyramid with direct illumination.



#### Material

Solid bronze construction with a clear textured refractive glass lens for MH or white acrylic lens for incandescent and CFL lamps. Optional tempered clear lens for full cut-off applications.

#### Installation

Supplied with a universal mounting back for a standard 4" Jbox or plaster ring. Optional rear (through wall) feed conduit mounting.

#### Ballast

Integral electronic CFL, HPF multi-volt 120V/277V (347V Canada), thermally protected with end-of-life circuitry to accommodate specified lamp wattage. Integral metal halide ballast is magnetic HPF, coil and core multi-volt 120/277V for the specified lamp wattage. 347V ballast for metal halide - Contact factory.

#### Lamp/Socket

18": One (1) 26W or 32W (GX24q-3) 4-pin triple tube CFL lamp or one (1) 75W A-19 lamp. 24": Two (2) 26W or 32W (GX24q-3) 4-pin triple tube CFL lamps or one (1) 50W, 70W or 100W ED-17 metal halide lamp or two (2) 75W A-19 lamps. CFL socket injection molded plastic. INC socket fired ceramic rated for 660W-250V. Metal halide socket is ceramic pulse-rated, 4KV. Lamps furnished by others.

#### Finish and Options

See pages 77-80 for finish details and options.

### Ordering Information

SAMPLE NUMBER: 695-WP-24-CFL/2-277V-GM

Series	Size	Lamp	Voltage	Finish <sup>5</sup>	Options
695-WP =	18"	CFL/1 (26/32W-Triple)	120V	NBZ (standard)	C
Half Pyramid	24"	CFL/2 (26/32W-Triple)	277V <sup>2</sup>	BK, BM, CC, DP,	PH
		INC/1/75 <sup>3</sup>	347V <sup>4</sup>	GM, GRM, GY, SCL,	QR <sup>6</sup>
		INC/2/75 <sup>3</sup>		SM, SNL, WH	TGL <sup>6</sup>
		MH/1/50 <sup>3</sup>			
		MH/1/70 <sup>3</sup>			
		MH/1/100 <sup>3</sup>			

#### Notes:

- 1 Available in 18"
- 2 Available in 24"
- 3 CFL and MH only
- 4 Available with CFL only
- 5 Bronze will weather to a dark bronze patina
- 6 MH only



## 902 Bollard

The 902 Bollard features a frosted glass diffuser with two distinct shade options offered in two sizes. The various shade options provide a soft "glow" with compact fluorescent, and is also available with incandescent or metal halide lamp technology.

### Material

Post and Fixture: 3 5/8" Diameter seamless pure copper tube attached to a sand cast natural bronze alloy base. The sand cast collar and support arms are natural bronze with a frosted glass diffuser. Optional perforated copper brightness baffle.

Curved Shade Options: Spun natural bronze large curved shade (LCS) 5" H x 12" dia, or spun natural bronze curved shade (CS) 2 3/4" x 10" dia.

Hipped Hood Shade Options: Formed natural bronze large hipped hood shade (LHHS) 4 1/4" H x 12" Sq. or formed natural bronze hipped hood shade (HHS) 3 1/2" H x 10" Sq.

Aluminum components are used with a painted finish.

### Installation

Post is mounted on a cast base collar with three 3/8" x 6" Jbolts. The post is a wire way. The electrical connection is below the removable head and conduit enters at the center of the base plate. Supplied with anchor bolts, mounting hardware and template.

### Ballast

One (1) low temperature (0°F, -18°C) AC electronic CFL multi-volt 120V/277V (347V-Canada) ballast. One (1) metal halide electronic 120V/277V ballast. CFL and MH electronic ballast mounted in post.

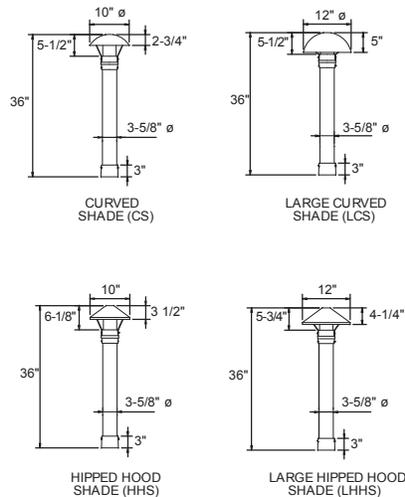
### Lamp/Socket

One (1) 26W (GX24q-3 base), 32W (GX24q-3 base) or 42W (GX24q-4 base) 4-pin triple tube CFL lamp, one (1) 50W ED-17 medium base metal halide lamp or one (1) 100W A-19 incandescent lamp. CFL socket injection molded plastic. MH and INC socket fired ceramic rated for 4KV.

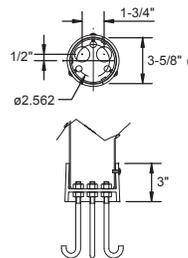
Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.



### MOUNTING DETAILS



## Ordering Information

SAMPLE NUMBER: 902-LCS-CFL/1-347V-SM-DP-36

Series	Style	Lamp	Voltage	Post Finish	Finish <sup>3</sup>	Mounting Height	Option
902 =	CS = Curved Shade	CFL/1	120V	NBZ (standard), BK, BM, CC, DP, GM, GRM, GY, SM, WH	NBZ (standard), BK, BM, CC, DP, GM, GRM, GY, SM, VG, WH	36"	BBL
Multi-Shade Luminaire	HHS = Hipped Hood Shade LCS = Large Curved Shade LHHS = Large Hipped Hood Shade	(26/32/42W-Triple) INC/1/100 MH/1/50	277V <sup>1</sup> 347V <sup>2</sup>				

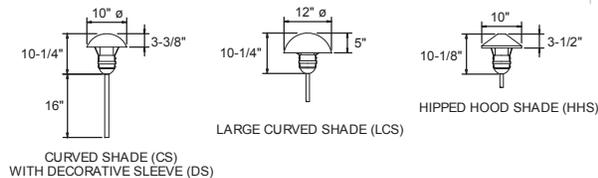
### Notes:

- CFL and MH only
- Available with CFL only
- Natural bronze or two component polyurethane paint, 25 mil nominal thickness for superior protection against fade or wear



## 911 Bollard

The 911 Garden Bollard features a frosted glass jar with two distinct shade options offered in two sizes. The various shade options provide a soft "glowing" effect with either compact fluorescent or incandescent lamp technology.



Notes:  
1 Natural bronze or two component polyurethane paint, 2.5 mil nominal thickness for superior protection against fade or wear

### Material

Post and Fixture: Optional natural copper or aluminum sleeve. The sand cast collar and support arms are natural bronze with a frosted glass jar. Optional perforated copper brightness baffle.  
Curved Shade Options: Spun .32" natural bronze large curved shade (LCS) 5" H x 12" dia., or spun .32" natural bronze curved shade (CS) 2 3/4" H x 10" dia. Hipped Hood Shade Options: Formed .32" natural bronze hipped hood shade (HHS) 3 1/2" H x 10" Sq. (G24q-1).  
Aluminum components are used with a paint finish.

### Installation

Mounts to a 1/2" I.P. pipe (supplied by others). Ballast mounted in bottom of fixture.

### Ballast

One (1) low temperature 120V (20°F, 6°C) integral AC HPF magnetic CFL ballast.

### Lamp/Socket

One (1) 13W Quad (G24q-1) 4-pin CFL lamp, or one (1) 100W A-19 incandescent lamp. CFL socket injection molded plastic. INC socket fired ceramic rated for 4KV. Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.

## Ordering Information

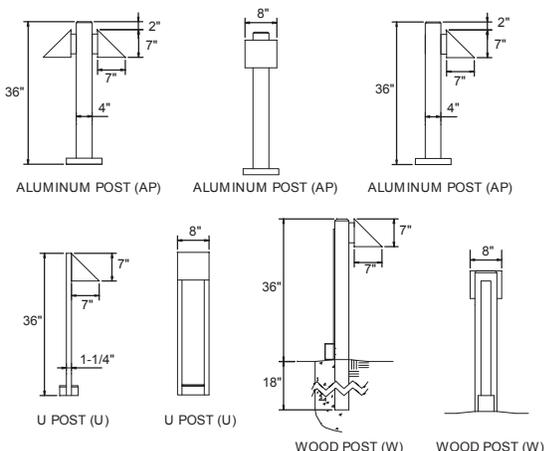
SAMPLE NUMBER: 911-LCS-CFL/1113-120V-SM-DP-26

Series	Style <sup>1</sup>	Voltage	Finish <sup>1</sup>	Mounting Height
911 =	CS = Curved Shade	120V	NBZ (standard), BK, BM, CC, DP, GM, GRM, GY, SM, VG, WH	26"
Garden Luminaire	HHS = Hipped Hood Shade			Option
	LCS = Large Curved Shade			BBL
	Lamp			DS
	CFL/113			
	INC/100			



## 982 Bollard

The 982 Bollard features an architectural wedge in a one or two fixture configuration. The fixture(s) provide a direct, glare free symmetrical distribution with either compact fluorescent or incandescent lamp technology.



### Material

Post: 4" Square Aluminum Post (AP) with an aluminum base plate. U Post (U): 8" W x 1 1/2" D aluminum post with an aluminum base plate. Wood Post (W): 5 1/2" W x 3 1/2" D Select tight-knotted cedar direct burial wood post. Fixture: One (1) or two (2) 7" H x 8" W x 7" D formed natural bronze housing with either a clear refractive glass lense (INC) or frosted acrylic lense (CFL). Optional clear tempered lense to achieve full cut-off [Sustainable Design]. Aluminum components are used with a painted finish.

### Installation

AP and U posts are mounted on base plate with four 3/8" x 6" Jbolts. Three conduit feeds through the center of the base. Supplied with base plate, bolts, mounting hardware and template. W post is direct burial and is supplied with a waterproof JBox which is mounted at the rear of the wood post.

### Ballast

One (1) low temperature (0°F, -18°C) AC electronic CFL multi-volt 120/277V (347V-Canada) ballast.

### Lamp/Socket

One (1) or two (2) 26W quad (GX24q-3 base), 32W triple (GX24q-3 base) or one (1) 42W triple (GX24q-4 base) 4-pin CFL lamp(s), or one (1) 75W A-19 incandescent lamp. CFL socket injection molded plastic. INC socket fired ceramic rated for 4KV. Lamps furnished by others.

### Finish and Options

See pages 77-80 for finish details and options.

## Ordering Information

SAMPLE NUMBER: 982-U-1-CFL/1-347V-SM-DP-36

Series	Fixture Number	Voltage	Finish <sup>3</sup>	Option
982 =	1 = 1 Fixture	120V	NBZ (standard), BK, BM, CC, DP, GM, GRM, GY, SM, VG, WH	BN
Architectural Wedge Bollard	2 = 2 Fixtures	277V <sup>2</sup>		PH
		347V <sup>2</sup>		TGL
Style	Lamp	Post Finish <sup>3,4</sup>		Mounting Height <sup>1</sup>
AP = Aluminum Post	CFL/1 (26/32/42W-Triple)	BK, WH (standard), BM, CC, DP, GM, GRM, GY, SM		36"
U = Post	CFL/2 (26/32/42W-Triple)			
W = Wood Post <sup>1</sup>	INC/1/75			

### Notes:

- The tight-knotted cedar post will naturally weather over time to a dark gray-brown appearance
- Available with CFL only
- Natural bronze or two component polyurethane paint, 2.5 mil nominal thickness for superior protection against fade or wear
- Not available with Wood Post (W)



### Cove Solo Asymmetric Cove

Corelite's small scale Cove Solo is an asymmetric lighting solution for the interior environment that offers flexibility in application and installation. The Cove Solo optimizes T5 performance and efficiency with an engineered optical system, which produces a smooth even gradient of light across the illuminated surface. The Cove Solo is ideal to accent architectural details or simply create an ambient layer of illumination in corridors, lobbies and public spaces.

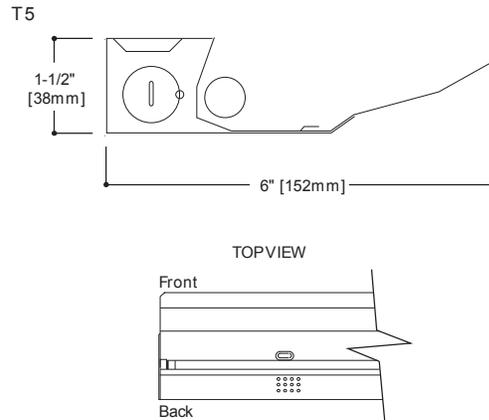
### Cove Solo Asymmetric Cove

- ☑ Optimizes single 1T5 lamp performance
- ☑ Plus5™ Adjustable Aiming System allows up to thirty degrees of angle adjustment above or below nadir at the time of installation
- ☑ Die-formed reflectors are highly specular anodized aluminum
- ☑ Mounts directly to architectural cove (by others) or to wall structure
- ☑ Standard 2', 3', 4' and 8' nominal fixture lengths
- ☑ Nominal fixture housing lengths guarantee butted sockets and reduce socket shadows behind the fixture.
- ☑ Optional dust cover available



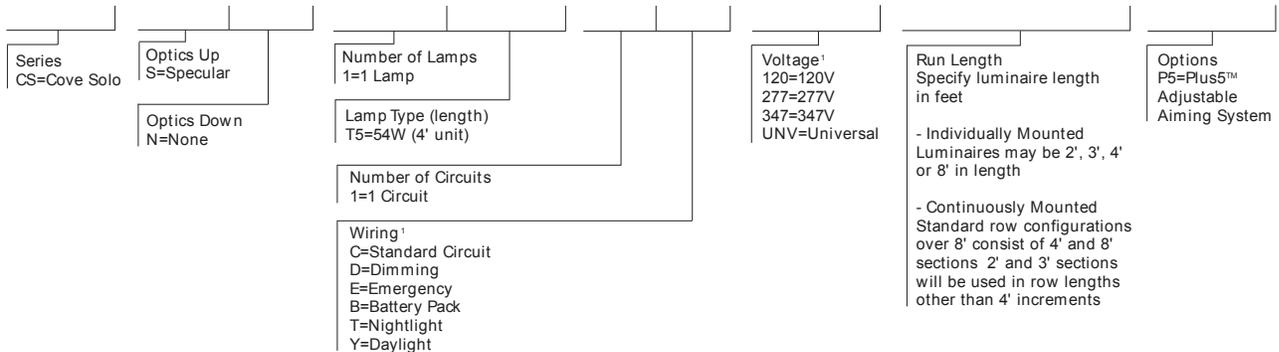
Dimensions with Plus5™ Adjustable Aiming

Front Mount	Degree of Lift	Back Mount
1 1/2 x 6	0 (Standard)	1 1/2 x 6
2 x 6	5	1 7/8 x 6 1/8
2 1/2 x 6	10	2 1/8 x 6 1/4
3 x 5 3/4	15	2 1/2 x 6 1/4
3 1/2 x 5 5/8	20	2 3/4 x 6 1/8
3 7/8 x 5 1/2	25	3 x 6
4 1/4 x 5 1/4	30	3 3/8 x 6



### Ordering Information

SAMPLE NUMBER: CS-SN-1T5-1C-UNV-32'-P5



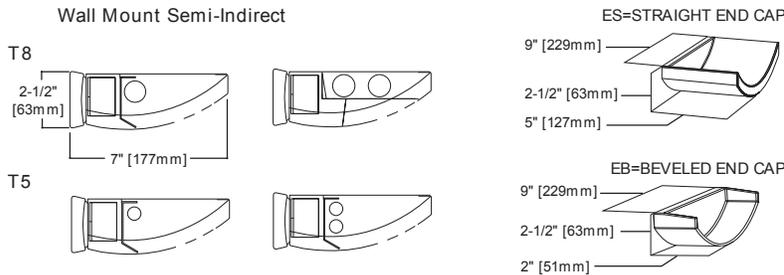


### Iridium Perf Wall Mount Semi-Indirect

Corelite's Iridium Perf Wall Mount semi-indirect fluorescent luminaire features elegant styling with a sleek profile and end caps. The engineered optical system provides an asymmetric forward throw distribution. Iridium Perf Wall may be mounted over standard 2" x 4" Jboxes for individual or continuous configurations using 4' and 8' modular sections. The Iridium Perf Wall is suited for open office perimeters, private offices, conference rooms, corridors and patient room bed lights.

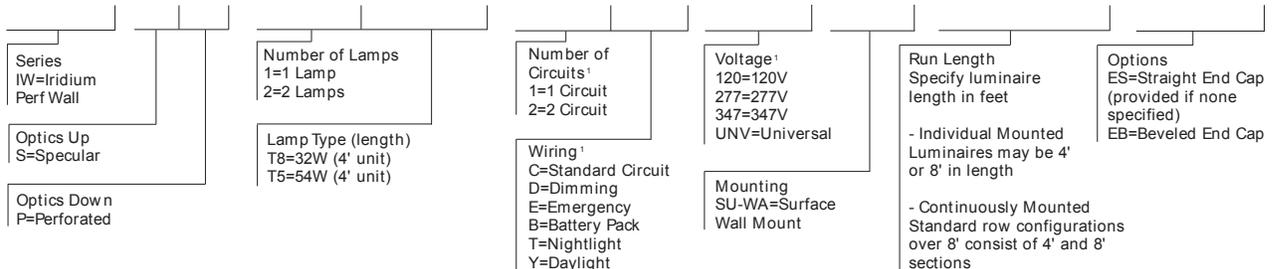
### Iridium Perf Wall Mount Semi-Indirect

- Standard straight and optional beveled end caps are precision die-cast aluminum and mechanically attached without exposed fasteners
- Housing is one piece, die-formed, cold rolled steel
- Mounts directly to existing structure over a 2" x 4" standard electrical box
- Individual or continuous mounting with 4' or 8' modular sections
- Optional dust cover available



## Ordering Information

SAMPLE NUMBER: IW-SP-1T8-1C-UNV-SU-WA-32'-ES



Notes: <sup>1</sup> Not all options available. Please consult your Cooper Lighting Representative for availability. Specifications & dimensions subject to change without notice.

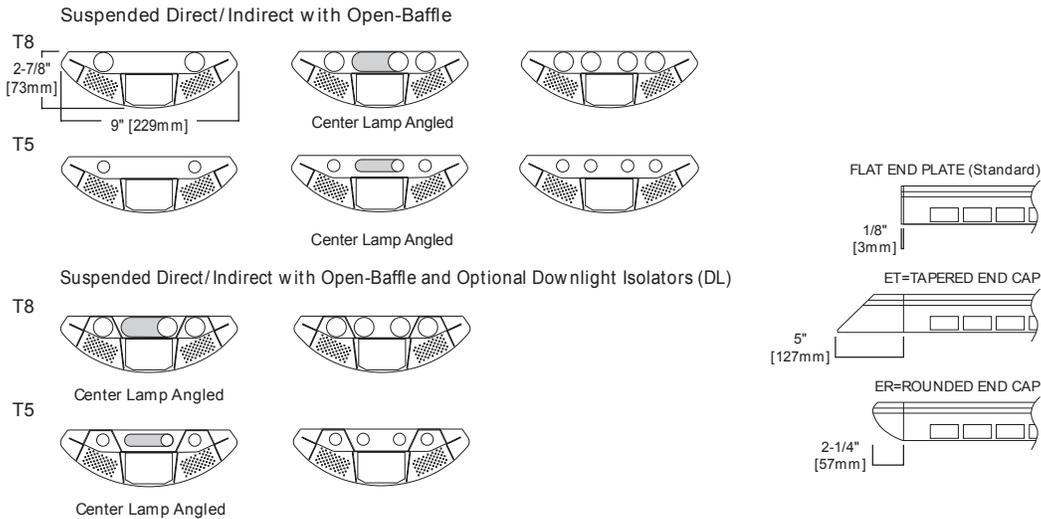


### Class A D/I Suspended Direct/indirect

Corelite's Class A D/I suspended direct-indirect fluorescent luminaire features a classic design and increased downlight via two segmented side apertures with an open baffle and perforated blades or a variety of acrylic lens styles. The optional Eclipse louver for the open baffle significantly reduces direct lamp glare at critical angles. The Class A D/I is suited for open and private offices, conference rooms, laboratories, corridors and nurse stations.

### Class A D/I Suspended Direct/indirect

- Increased downlight via two segmented open baffle or lensed apertures
- Additional glare-reducing capability with the Eclipse louver
- Ability to isolate uplight and downlight when combined with lamp isolators and dual circuit wiring
- Optional tapered or rounded die-cast aluminum end caps
- Individual or continuous mounting with 4', 8' or 12' modular sections
- Optional dust cover available
- Matching wall mounted companion available



### Ordering Information

SAMPLE NUMBER: AB-WB-4T5-1C-UNV-AC18-T1-32'-ET

<p>Series AB=Class A D/I Suspended</p>	<p>Number of Lamps 2=2 Lamps 3=3 Lamps 4=4 Lamps</p>	<p>Wiring<sup>1</sup> C=Standard Circuit D=Dimming E=Emergency B=Battery Pack T=Nightlight Y=Daylight</p>	<p>Power Feed<sup>1</sup> C=Standard Cord K=Kurly Cord P=Rigid Pendant</p>	<p>Ceiling Type<sup>1</sup> T1=1" T-Bar T9=9/16" T-Bar TS=Slotted T-Bar ST=Structure JB=4" Octagonal J-Box</p>	<p>Run Length Specify luminaire length in feet</p> <p>-Individually Mounted Luminaires may be 4', 8' or 12' in length</p> <p>-Continuously Mounted Standard row configurations over 12' consist of 8' and 12' sections</p>
<p>Optics Up W=White</p>	<p>Lamp Type (length) T8=32W (4' unit) T5=54W (4' unit)</p>	<p>Voltage<sup>1</sup> 120=120V 277=277V 347=347V UNV=Universal</p>	<p>Suspension Length - Fixed Cable 12", 15", 18", 21", 24" or 27" (+/- 1/2" adjustment) - Adjustable Cable 48", 120", 240", 300" or 360" (infinite adjustment along entire length of cable)</p>	<p>Options ET=Tapered End Cap ER=Rounded End Cap DL100=100% Downlight Isolator DL80=80% Downlight Isolator</p>	
<p>Optics Down B=Perforated Baffle E=Eclipse Louver</p>	<p>Number of Circuits 1=1 Circuit 2=2 Circuit</p>	<p>Suspension A=Aircraft Cable P=Rigid Pendant</p>	<p>- Rigid Pendant 12", 15", 18", 21", 24" or 27"</p>		

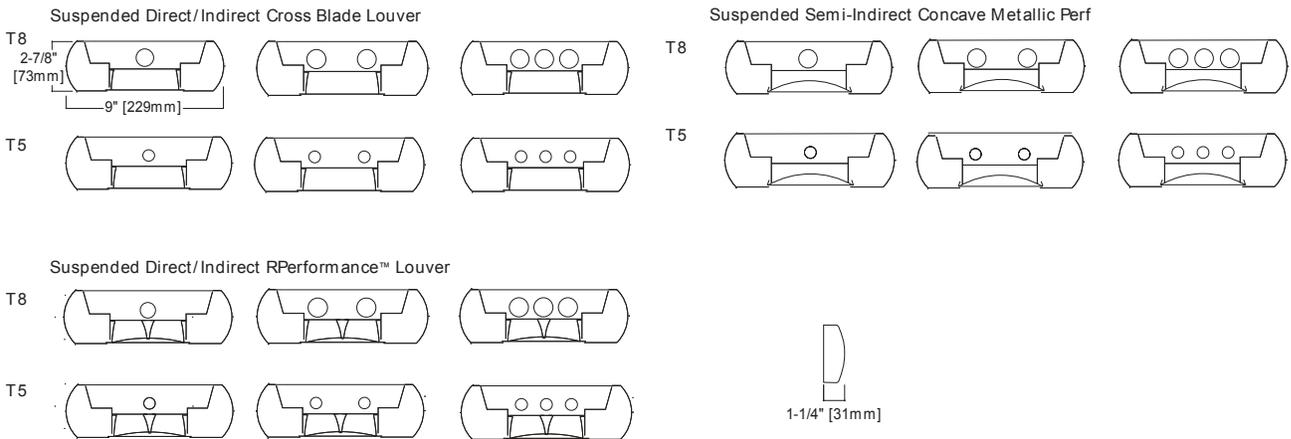


### Navigator II Suspended Direct/Indirect

Corelite's Navigator II suspended direct-indirect fluorescent luminaire features a rugged aluminum construction, elegant styling and three louver options (Cross Blade, RPerformance™ and Concave Metallic Perf). The Side-N-Lock™ optics accessory allows the designer to adjust the amount of uplight and downlight for a particular application with 8 settings in 5% increments. The Navigator II is suited for open and private offices, conference rooms, nurse stations and waiting rooms.

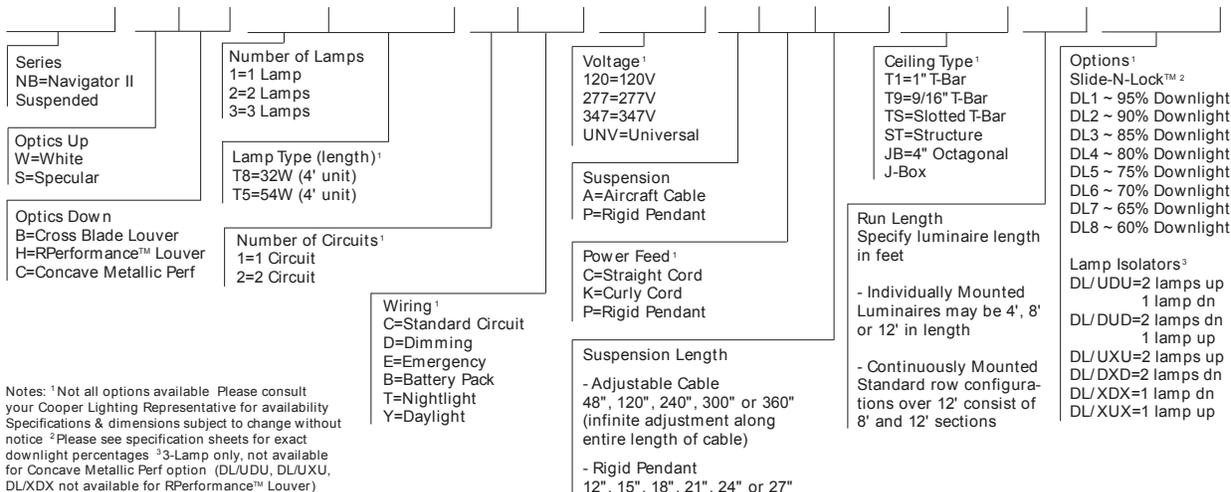
### Navigator II Suspended Direct/Indirect

- ☑ Three louver options (Cross Blade, RPerformance™ and Concave Metallic Perf)
- ☑ Meets RP1 requirements for downlight in 1T5 configuration with RPerformance™ louver
- ☑ Optional Side-N-Lock optics with eight field adjustable uplight/downlight settings
- ☑ Ability to isolate uplight and downlight when combined with lamp isolators and dual circuit wiring
- ☑ Standard end caps are precision die-cast aluminum
- ☑ Individual or continuous mounting with 4', 8' or 12' modular sections
- ☑ Optional dust cover available
- ☑ Matching wall mounted companion available



### Ordering Information

SAMPLE NUMBER: NB-SH-2T5-1C-UNV-AC18-T1-32'-DL2



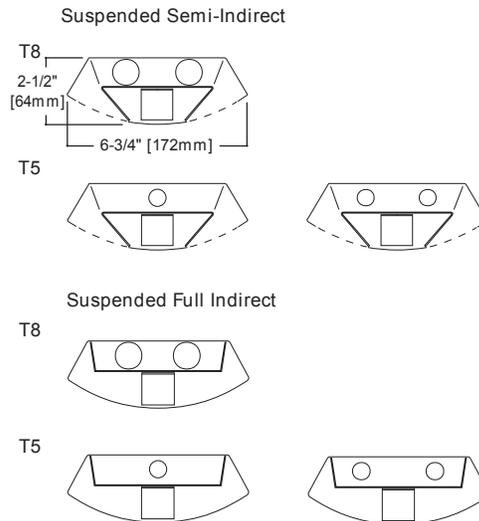
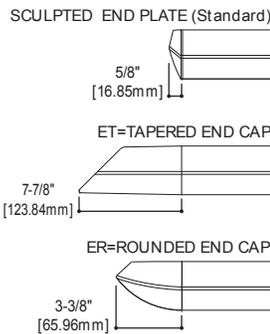


### Feros Perf Suspended Semi-Indirect

- ☑ Standard sculpted die-cast aluminum end caps
- ☑ Optional Tapered or Rounded die-cast aluminum end caps
- ☑ Individual or continuous mounting with 4', 8' or 12' modular sections
- ☑ Full indirect distribution also available
- ☑ Optional dust cover available

### Feros Perf Suspended Semi-Indirect

Corelite's Feros Perf suspended semi-indirect fluorescent luminaire offers a petite contemporary design perfect for today's interior spaces. The performance of the Feros series of luminaires was developed to meet IES requirements for ceiling uniformity. Further, the perforated fixture housing creates a soft, sparkling downlight component to closely match ceiling brightness, which minimizes contrast on computer screens. The Feros perf is suited for open and private offices, corridors, laboratories and NICU applications.

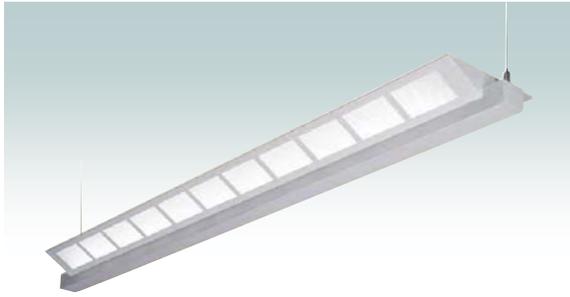


### Ordering Information

SAMPLE NUMBER: FP-WP-1T5-1C-UNV-AC18-T1-32'-ET

<p><b>Series</b> FP=Feros Perf Suspended</p>	<p><b>Number of Lamps<sup>1</sup></b> 1=1 Lamp 2=2 Lamps</p>	<p><b>Voltage<sup>1</sup></b> 120=120V 277=277V 347=347V UNV=Universal</p>	<p><b>Ceiling Type<sup>1</sup></b> T1=1" T-Bar T9=9/16" T-Bar TS=Slotted T-Bar ST=Structure JB=4" Squared Box</p>	<p><b>Run Length</b> Specify luminaire length in feet</p> <p>-Individually Mounted Luminaires may be 4', 8' or 12' in length</p> <p>-Continuously Mounted Standard row configurations over 12' consist of 8' and 12' sections</p>
<p><b>Optics Up</b> W=White S=Specular</p>	<p><b>Lamp Type (length)</b> T8=32W (4' unit) T5=54W (4' unit)</p>	<p><b>Suspension</b> A=Aircraft Cable P=Rigid Pendant</p>	<p><b>Power Feed<sup>1</sup></b> C=Straight Cord K=Curly Cord P=Rigid Pendant</p>	<p><b>Options</b> ET=Tapered End Cap ER=Rounded End Cap</p>
<p><b>Optics Down</b> P=Perforated</p>	<p><b>Number of Circuits<sup>1</sup></b> 1=1 Circuit 2=2 Circuit</p>	<p><b>Power Feed<sup>1</sup></b> C=Straight Cord K=Curly Cord P=Rigid Pendant</p>	<p><b>Suspension Length</b> - Fixed Cable 12", 15", 18", 21", 24" or 27" (+/-1/2" adjustment) - Adjustable Cable 48", 120", 240", 300" or 360" (infinite adjustment along entire length of cable) - Rigid Pendant 12", 15", 18", 21", 24" or 27"</p>	
	<p><b>Wiring<sup>1</sup></b> C=Standard Circuit D=Dimming E=Emergency B=Battery Pack T=Nightlight</p>			

Notes: <sup>1</sup> Not all options available. Please consult your Cooper Lighting Representative for availability. Specifications & dimensions subject to change without notice.

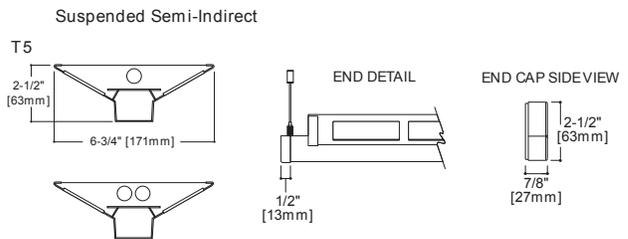


### Rave Suspended & Wall Semi-Indirect

Corelite's Rave and Rave Wall semi-indirect fluorescent luminaires feature a stylish petite profile designed for the energy efficient T5 lamp. The Rave series is available with various lens options consisting of round and square silkscreened perf acrylic or colored acrylic in a variety of hues (White Opal, Absolute Orange, Blue Haze or Grasshopper Green). The Rave series is suited to ambient perimeter lighting in NICU applications or color-coded lighting in corridors and nurse stations.

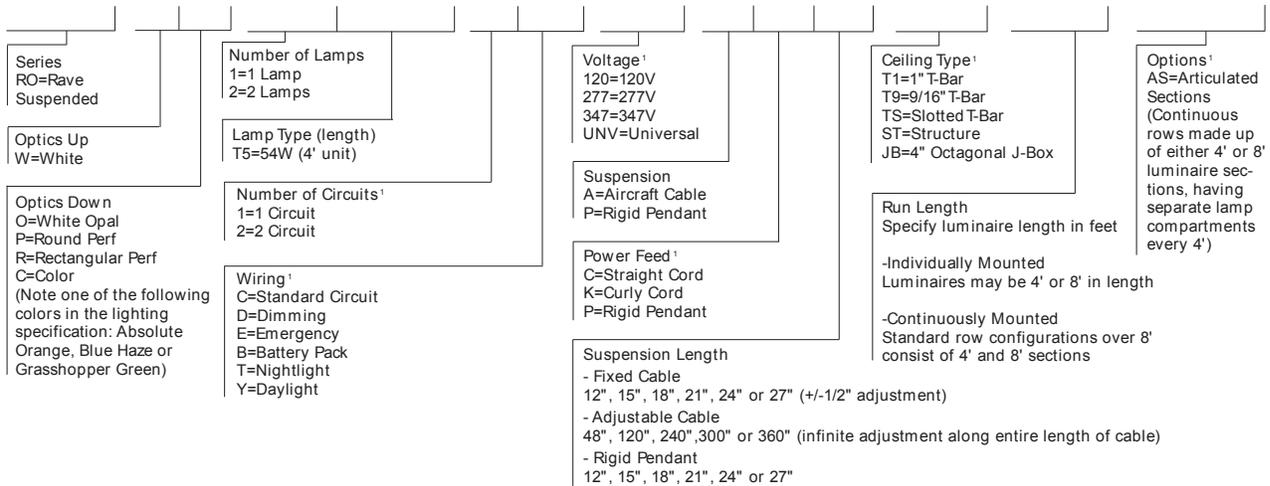
### Rave Suspended & Wall Semi-Indirect

- ☑ Lens options consist of round or square silkscreened perf and colored acrylic
- ☑ Optional articulated sections (suspended only)
- ☑ T5 specific housing design
- ☑ Rave suspended may be mounted individually or continuously with 4', 8', and 12' modular sections
- ☑ Rave Wall and Rave suspended with optional articulated sections are available in 4' and 8' fixture lengths
- ☑ Optional dust cover available



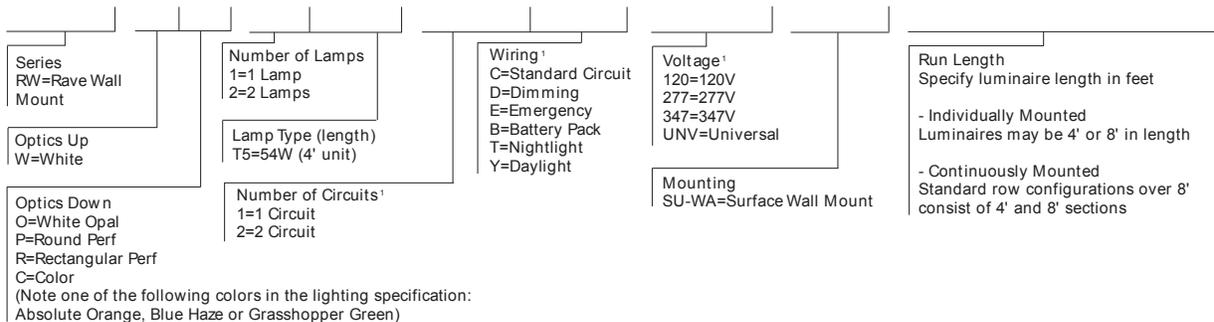
### Ordering Information

SAMPLE NUMBER: RO-WO-2T5-1C-UNV-AC18-T1-32'-AS



### Ordering Information

SAMPLE NUMBER: RW-WO-1T5-1C-UNV-SU-WA-32'



Notes: 1 Not all options available. Please consult your Cooper Lighting Representative for availability. Specifications & dimensions subject to change without notice.



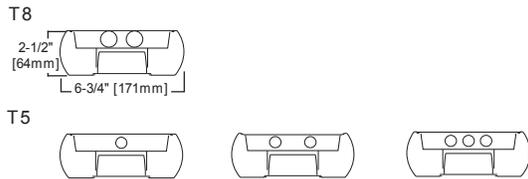
### Minigator Suspended Direct/Indirect

Corelite's Minigator suspended direct indirect fluorescent luminaire features a rugged aluminum construction, elegant styling and three louver options (Cross Blade, RPerformance™ and Concave Metallic Perf). The Side-N-Lock™ optics accessory allows the designer to adjust the amount of uplight and downlight for a particular application with 8 settings in 5% increments. The Minigator is suited for open and private offices, nurse stations, waiting rooms and laboratories.

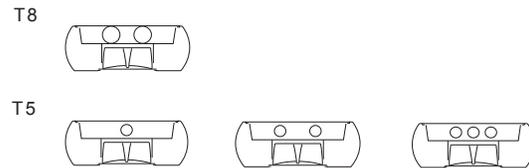
### Minigator Suspended Direct/Indirect

- ☑ Three louver options (Cross Blade, RPerformance™ and Concave Metallic Perf)
- ☑ Meets RP1 requirements for downlight in 1T5 configuration with RPerformance™ louver
- ☑ Optional Side-N-Lock™ optics with eight field adjustable uplight/downlight settings
- ☑ Ability to isolate uplight and downlight when combined with lamp isolators and dual circuit wiring
- ☑ Standard end caps are precision die-cast aluminum
- ☑ Individual or continuous mounting with 4', 8' or 12' modular sections
- ☑ Optional dust cover available
- ☑ Matching wall mounted companion available

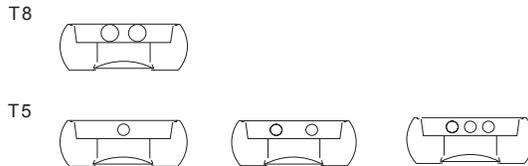
Suspended Direct/Indirect Cross Blade Louver



Suspended Direct/Indirect RPerformance™ Louver



Suspended Semi-Indirect Concave Metallic Perf



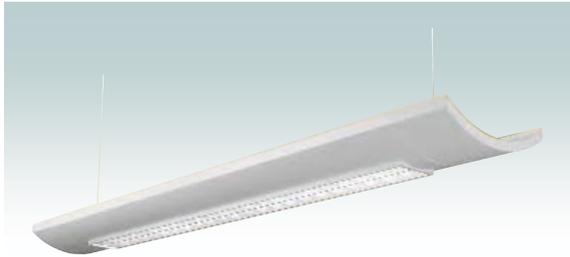
ND CAP SIDEVIEW



### Ordering Information

SAMPLE NUMBER: MB-WB-2T5-1C-UNV-AC18-T1-32'-DL2

<p><b>Series</b> MB=Minigator Suspended</p>	<p><b>Number of Lamps<sup>1</sup></b> 1=1 Lamp 2=2 Lamps 3=3 Lamps</p>	<p><b>Voltage<sup>1</sup></b> 120=120V 277=277V 347=347V UNV=Universal</p>	<p><b>Ceiling Type<sup>1</sup></b> T1=1" T-Bar T9=9/16" T-Bar TS=Slotted T-Bar ST=Structure JB=4" Octagonal J-Box</p>	<p><b>Options<sup>1</sup></b> Slide-N-Lock™<sup>2</sup> DL1 ~ 95% Downlight DL2 ~ 90% Downlight DL3 ~ 85% Downlight DL4 ~ 80% Downlight DL5 ~ 75% Downlight DL6 ~ 70% Downlight DL7 ~ 65% Downlight DL8 ~ 60% Downlight</p>
<p><b>Optics Up</b> W=White S=Specular</p>	<p><b>Lamp Type (length)</b> T8=32W (4' unit) T5=54W (4' unit)</p>	<p><b>Suspension</b> A=Aircraft Cable P=Rigid Pendant</p>	<p><b>Run Length</b> Specify luminaire length in feet</p>	<p><b>Lamp Isolators<sup>3</sup></b> DL/UDU=2 lamps up 1 lamp dn DL/DUD=2 lamps dn 1 lamp up DL/UXU=2 lamps up DL/DXD=2 lamps dn DL/XDX=1 lamp dn DL/UXX=1 lamp up</p>
<p><b>Optics Down</b> B=Cross Blade Louver H=RPerformance™ Louver C=Concave Metallic Perf</p>	<p><b>Number of Circuits<sup>1</sup></b> 1=1 Circuit 2=2 Circuit</p>	<p><b>Power Feed<sup>1</sup></b> C=Straight Cord K=Curly Cord P=Rigid Pendant</p>	<p>- Individually Mounted Luminaires may be 4', 8' or 12' in length</p>	
<p><b>Notes:</b> <sup>1</sup> Not all options available Please consult your Cooper Lighting Representative for availability Specifications and dimensions subject to change without notice <sup>2</sup> Please see specification sheets for exact downlight percentages <sup>3</sup> 3-Lamp only, not available for Concave Metallic Perf option (DL/UDU, DL/UXU, DL/XDX not available for RPerformance™ Louver)</p>	<p><b>Wiring<sup>1</sup></b> C=Standard Circuit D=Dimming E=Emergency B=Battery Pack T=Nightlight Y=Daylight</p>	<p><b>Suspension Length</b></p> <p>- Adjustable Cable 48", 120", 240", 300" or 360" (infinite adjustment along entire length of cable)</p> <p>- Rigid Pendant<sup>2</sup> 12", 15", 18", 21", 24" or 27"</p>	<p>- Continuously Mounted Standard row configurations over 12' consist of 8' and 12' sections</p>	



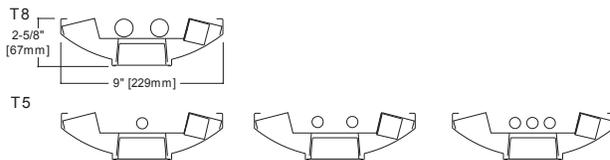
### Iridium D/I Suspended Direct/Indirect

Corelite's Iridium D/I suspended direct-indirect fluorescent luminaire features elegant styling with a sleek profile and end caps. The Iridium D/I is available with three louver options (Cross Blade, RPerformance™ and Concave Metallic Perf). The Side-N-Lock® optics accessory allows the designer to adjust the amount of uplight and downlight for a particular application with 8 settings in 5% increments. Iridium D/I is suited for open offices, private offices, conference rooms, corridors and laboratories.

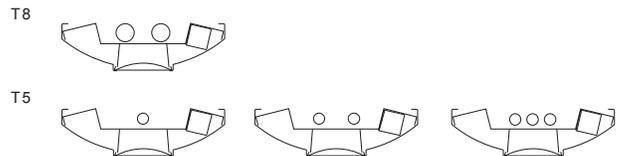
### Iridium D/I Suspended Direct/Indirect

- ☑ Three louver options (Cross Blade, RPerformance™ and Concave Metallic Perf)
- ☑ Meets RP1 requirements for downlight in 1T5 configuration with RPerformance™ louver
- ☑ Optional Side-N-Lock™ optics with eight field adjustable uplight/downlight settings
- ☑ Ability to isolate uplight and downlight when combined with lamp isolators and dual circuit wiring
- ☑ Standard straight and optional beveled end caps are precision die-cast aluminum mechanically attached without exposed fasteners
- ☑ Individual or continuous mounting with 4' or 8' modular sections
- ☑ Optional dust cover available

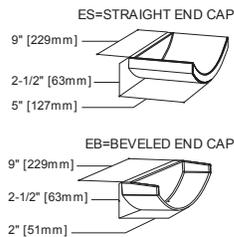
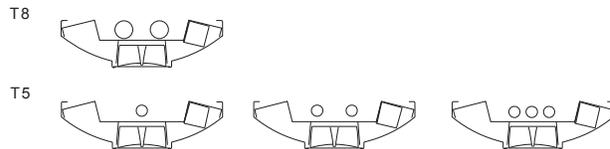
Suspended Direct/Indirect Cross Blade Louver



Suspended Semi-Indirect Concave Metallic Perf



Suspended Direct/Indirect RPerformance™ Louver



### Ordering Information

SAMPLE NUMBER: IB-WB-2T5-1C-UNV-AC18-T1-32'-DL2

<p><b>Series</b> IB=Iridium D/I Suspended</p>	<p><b>Number of Lamps<sup>1</sup></b> 1=1 Lamp 2=2 Lamps 3=3 Lamps</p>	<p><b>Voltage<sup>1</sup></b> 120=120V 277=277V 347=347V UNV=Universal</p>	<p><b>Ceiling Type<sup>1</sup></b> T1=1" T-Bar T9=9/16" T-Bar TS=Slotted T-Bar ST=Structure JB=4" Octagonal J-Box</p>	<p><b>Options<sup>1</sup></b> ES=Straight End Cap (Provided if none specified) EB=Beveled End Cap</p>
<p><b>Optics Up</b> W=White S=Specular</p>	<p><b>Lamp Type (length)</b> T8=32W (4' unit) T5=54W (4' unit)</p>	<p><b>Suspension</b> A=Aircraft Cable P=Rigid Pendant</p>	<p><b>Run Length</b> Specify luminaire length in feet</p>	<p><b>Slide-N-Lock™<sup>2</sup></b> DL1 ~ 95% Downlight DL2 ~ 90% Downlight DL3 ~ 85% Downlight DL4 ~ 80% Downlight DL5 ~ 75% Downlight DL6 ~ 70% Downlight DL7 ~ 65% Downlight DL8 ~ 60% Downlight</p>
<p><b>Optics Down</b> B=Cross Blade Louver H=RPerformance™ Louver C=Concave Metallic Perf</p>	<p><b>Number of Circuits<sup>1</sup></b> 1=1 Circuit 2=2 Circuit</p>	<p><b>Power Feed<sup>1</sup></b> C=Straight Cord K=Curly Cord P=Rigid Pendant</p>	<p>- Individually Mounted Luminaires may be 4' or 8' in length</p>	<p><b>Lamp Isolators<sup>3</sup></b> DL/UDU=2 lamps up 1 lamp dn DL/DUD=2 lamps dn 1 lamp up DL/UXU=2 lamps up DL/DXD=2 lamps dn DL/XDX=1 lamp dn DL/XUX=1 lamp up</p>
<p><b>Notes:</b> <sup>1</sup> Not all options available. Please consult your Cooper Lighting Representative for availability. Specifications and dimensions subject to change without notice. <sup>2</sup> Please see specification sheets for exact downlight percentages. <sup>3</sup> 3-Lamp only, not available for Concave Metallic Perf option (DL/UDU, DL/UXU, DL/XDX not available for RPerformance™ Louver).</p>	<p><b>Wiring<sup>1</sup></b> C=Standard Circuit D=Dimming E=Emergency B=Battery Pack T=Nightlight Y=Daylight</p>	<p><b>Suspension Length</b> - Fixed Cable 12", 15", 18", 21", 24" or 27" (+/-1/2" adjustment) - Adjustable Cable 48", 120", 240", 300" or 360" (infinite adjustment along entire length of cable) - Rigid Pendant 12", 15", 18", 21", 24" or 27"</p>	<p>- Continuously Mounted Standard row configurations over 8' consist of 4' and 8' sections</p>	



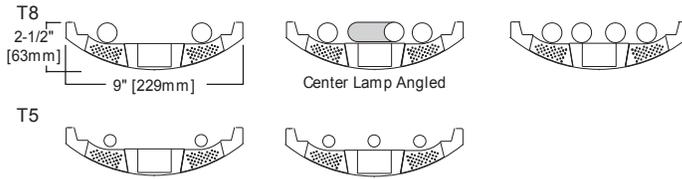
## Iridium IQ Suspended Direct/Indirect

- ☑ Additional glare-reducing capability with the Eclipse Louver
- ☑ Optional Side-N-Lock™ optics with eight field adjustable uplight/downlight settings
- ☑ Ability to isolate uplight and downlight when combined with lamp isolators and dual circuit wiring
- ☑ Standard straight and optional beveled end caps are precision die-cast aluminum mechanically attached without exposed fasteners
- ☑ Individual or continuous mounting with 4', 8' or 12' modular sections
- ☑ Optional dust cover available

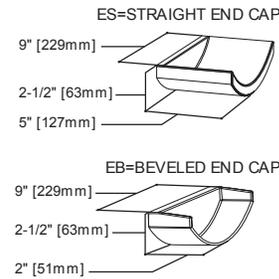
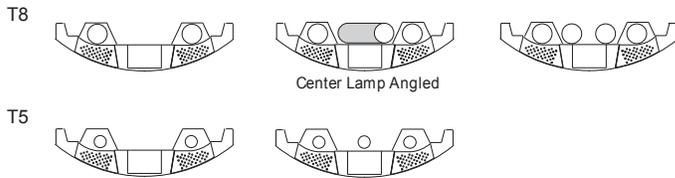
## Iridium IQ Suspended Direct/Indirect

Corelite's Iridium IQ suspended direct-indirect fluorescent luminaire features elegant styling with a sleek profile and end caps. The Iridium IQ is available with two open baffle options including the glare-reducing Eclipse Louver. The Side-N-Lock™ optics accessory allows the designer to adjust the amount of uplight and downlight for a particular application with 8 settings in 5% increments. Iridium IQ is suited for administrative offices, private offices, conference rooms, corridors and mixed-media training rooms.

### Suspended Direct/Indirect with Open Baffle



### Suspended Direct/Indirect with Open-Baffle and Optional Downlight Isolators (DL)

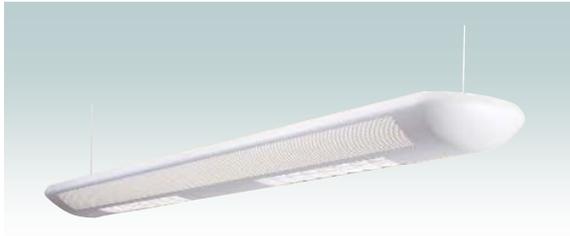


## Ordering Information

SAMPLE NUMBER: IQ-WE-3T5-1C-UNV-AC18-T1-32'-EB

<p>Series IQ=Iridium IQ Suspended</p>	<p>Number of Lamps<sup>1</sup> 2=2 Lamps 3=3 Lamps 4=4 Lamps</p>	<p>Voltage<sup>1</sup> 120=120V 277=277V 347=347V UNV=Universal</p>	<p>Ceiling Type<sup>1</sup> T1=1" T-Bar T9=9/16" T-Bar TS=Slotted T-Bar ST=Structure JB=4" Octagonal J-Box</p>	<p>Options ES=Straight End Cap (provided if none specified) EB=Beveled End Cap DL=Downlight Isolators</p>
<p>Optics Up W=White S=Specular</p>	<p>Lamp Type (length) T8=32W (4' unit) T5=54W (4' unit)</p>	<p>Suspension A=Aircraft Cable P=Rigid Pendant</p>	<p>Run Length Specify luminaire length in feet</p>	<p>Slide-N-Lock™<sup>2</sup> DL1 ~ 95% Downlight DL2 ~ 90% Downlight DL3 ~ 85% Downlight DL4 ~ 80% Downlight DL5 ~ 75% Downlight DL6 ~ 70% Downlight DL7 ~ 65% Downlight DL8 ~ 60% Downlight</p>
<p>Optics Down B=Perforated Baffle E=Eclipse Louver</p>	<p>Number of Circuits<sup>1</sup> 1=1 Circuit 2=2 Circuit</p>	<p>Power Feed<sup>1</sup> C=Straight Cord K=Curly Cord P=Rigid Pendant</p>	<p>- Individually Mounted Luminaires may be 4', 8' or 12' in length</p>	
	<p>Wiring<sup>1</sup> C=Standard Circuit D=Dimming E=Emergency B=Battery Pack T=Nightlight Y=Daylight</p>	<p>Suspension Length</p>	<p>- Continuously Mounted Standard row configurations over 12' consist of 8' and 12' sections</p>	
		<p>- Fixed Cable 12", 15", 18", 21", 24" or 27" (+/- 1/2" adjustment)</p>		
		<p>- Adjustable Cable 48", 120", 240", 300" or 360" (infinite adjustment along entire length of cable)</p>		
		<p>- Rigid Pendant 12", 15", 18", 21", 24" or 27"</p>		

Notes: <sup>1</sup> Not all options available. Please consult your Cooper Lighting Representative for availability. Specifications and dimensions subject to change without notice. <sup>2</sup> Please see specification sheets for exact downlight percentages.

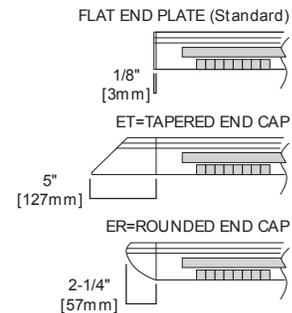
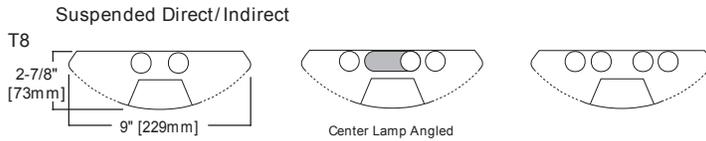


### Class A Perf D/I Suspended Direct/Indirect

Corelite's Class A Perf D/I suspended direct-indirect fluorescent luminaire combines classic design with an additional direct component via two 13" long center downlight apertures. The baffles can be outfitted with a variety of media options including colored acrylic and semi-specular bladed or slotted aluminum. The perforated fixture housing creates a soft downlight component to closely match the ceiling brightness. The Class A Perf D/I is suited for conference rooms, administrative offices and mixed-media training rooms.

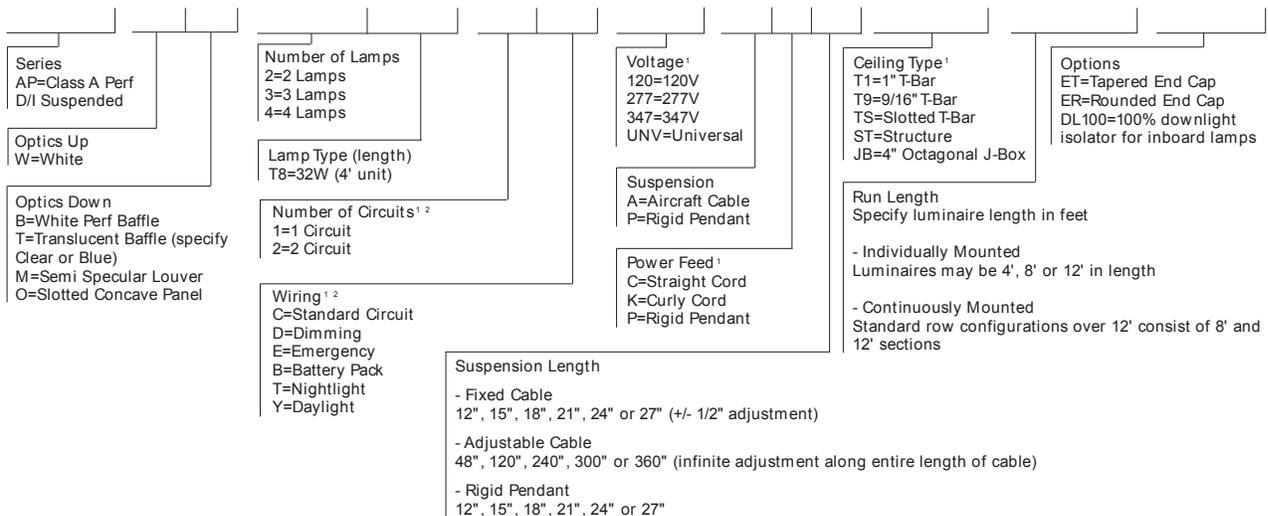
### Class A Perf D/I Suspended Direct/Indirect

- Two 13" long open baffle sections with standard 1-5/8" blade spacing
- 0.0625" diameter perforations create a soft downlight component
- Optional Tapered or Rounded die-cast aluminum end caps
- Ability to isolate uplight and downlight when combined with lamp isolators and dual circuit wiring
- Individual or continuous mounting with 4', 8' or 12' modular sections
- Optional dust cover available

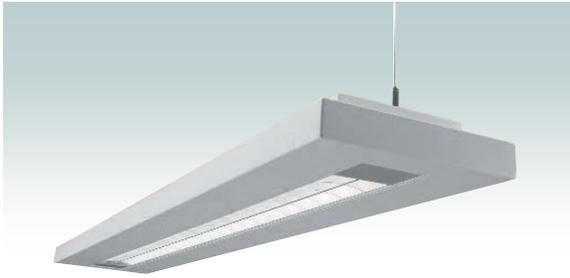


### Ordering Information

SAMPLE NUMBER: AP-WB-4T8-1C-UNV-AC18-T1-32'-ET



Notes: <sup>1</sup> Not all options available. Please consult your Cooper Lighting Representative for availability. Specifications & dimensions subject to change without notice. <sup>2</sup> Only 1 ballast per 4' section.



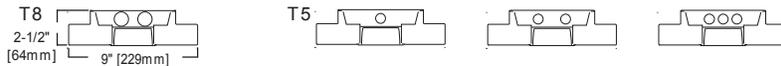
## Vertechs Suspended Direct/Indirect

- ☑ Three louver options (Cross Blade, RPerformance™ and Concave Metallic Perf)
- ☑ Meets RP1 requirements for downlight in 1T5 configuration with RPerformance™ louver
- ☑ Optional Side-N-Lock™ optics with eight field adjustable uplight/downlight settings
- ☑ Ability to isolate uplight and downlight when combined with lamp isolators and dual circuit wiring
- ☑ Individual or continuous mounting with 4', 8' or 12' modular sections
- ☑ Optional dust cover available
- ☑ Matching wall mounted companion available

## Vertechs Suspended Direct/Indirect

Corelite's Vertechs suspended direct-indirect fluorescent luminaire features a sleek rectangular profile, aluminum construction and three louver options (Cross Blade, RPerformance™ and Concave Metallic Perf). Corelite's Side-N-Lock™ optics accessory allows the designer to adjust the amount of uplight and downlight for a particular application with 8 settings in 5% increments. The Vertechs is suited for administrative offices, conference rooms, laboratories and mixed-media training rooms.

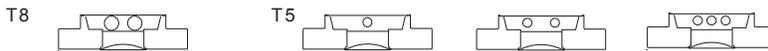
Suspended Direct/Indirect Cross Blade Louver



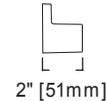
Suspended Direct/Indirect RPerformance™ Louver



Suspended Semi-Indirect Concave Metallic Perf



END CAP SIDE VIEW



## Ordering Information

SAMPLE NUMBER: VB-WB-2T5-1C-UNV-AC18-T1-32'-DL2

<p><b>Series</b> VB=Vertechs Suspended</p>	<p><b>Number of Lamps<sup>1</sup></b> 1=1 Lamp 2=2 Lamps 3=3 Lamps</p>	<p><b>Voltage<sup>1</sup></b> 120=120V 277=277V 347=347V UNV=Universal</p>	<p><b>Ceiling Type<sup>1</sup></b> T1=1" T-Bar T9=9/16" T-Bar TS=Slotted T-Bar ST=Structure JB=4" Octagonal J-Box</p>	<p><b>Options<sup>1</sup></b> Slide-N-Lock™<sup>2</sup> DL1 ~ 95% Downlight DL2 ~ 90% Downlight DL3 ~ 85% Downlight DL4 ~ 80% Downlight DL5 ~ 75% Downlight DL6 ~ 70% Downlight DL7 ~ 65% Downlight DL8 ~ 60% Downlight</p>
<p><b>Optics Up</b> W=White S=Specular</p>	<p><b>Lamp Type (length)</b> T8=32W (4' unit) T5=54W (4' unit)</p>	<p><b>Suspension</b> A=Aircraft Cable P=Rigid Pendant</p>	<p><b>Run Length</b> Specify luminaire length in feet</p>	<p><b>Lamp Isolators<sup>3</sup></b> DL/UDU=2 lamps up 1 lamp dn DL/DUD=2 lamps dn 1 lamp up DL/UXU=2 lamps up DL/DXD=2 lamps dn DL/XDX=1 lamp dn DL/UXU=1 lamp up</p>
<p><b>Optics Down</b> B=Cross Blade Louver H=RPerformance™ Louver C=Concave Metallic Perf</p>	<p><b>Number of Circuits<sup>1</sup></b> 1=1 Circuit 2=2 Circuit</p>	<p><b>Power Feed<sup>1</sup></b> C=Straight Cord K=Curly Cord P=Rigid Pendant</p>	<p>- Individually Mounted Luminaires may be 4' or 8' in length</p>	
	<p><b>Wiring<sup>1</sup></b> C=Standard Circuit D=Dimming E=Emergency B=Battery Pack T=Nightlight Y=Daylight</p>	<p><b>Suspension Length</b> - Adjustable Cable 48", 120", 240", 300" or 360" (infinite adjustment along entire length of cable) - Rigid Pendant<sup>2</sup> 12", 15", 18", 21", 24" or 27"</p>	<p>- Continuously Mounted Standard row configurations over 12' consist of 8' and 12' sections</p>	

Notes: <sup>1</sup> Not all options available. Please consult your Cooper Lighting Representative for availability. Specifications and dimensions subject to change without notice.  
<sup>2</sup> Please see specification sheets for exact downlight percentages. <sup>3</sup> Lamp only, not available for Concave Metallic Perf option (DL/UDU, DL/UXU, DL/XDX not available for RPerformance™ Louver)

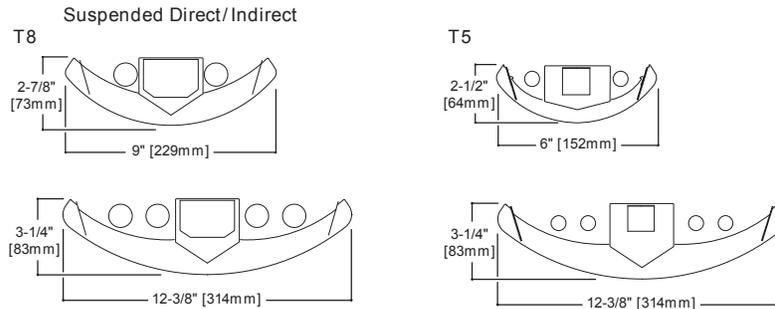


### Stellar Suspended Direct/Indirect

- ☑ Three housing scales: 6" (2T5), 9" (2T8) and 12" (4T5 and 4T8)
- ☑ Aluminum baffle construction with 0.625" perforated side rails
- ☑ Optional 70% or 100% downlight kits
- ☑ Individual or continuous mounting with 4', 8' or 12' modular sections
- ☑ Optional dust cover available
- ☑ Matching wall mounted companion available

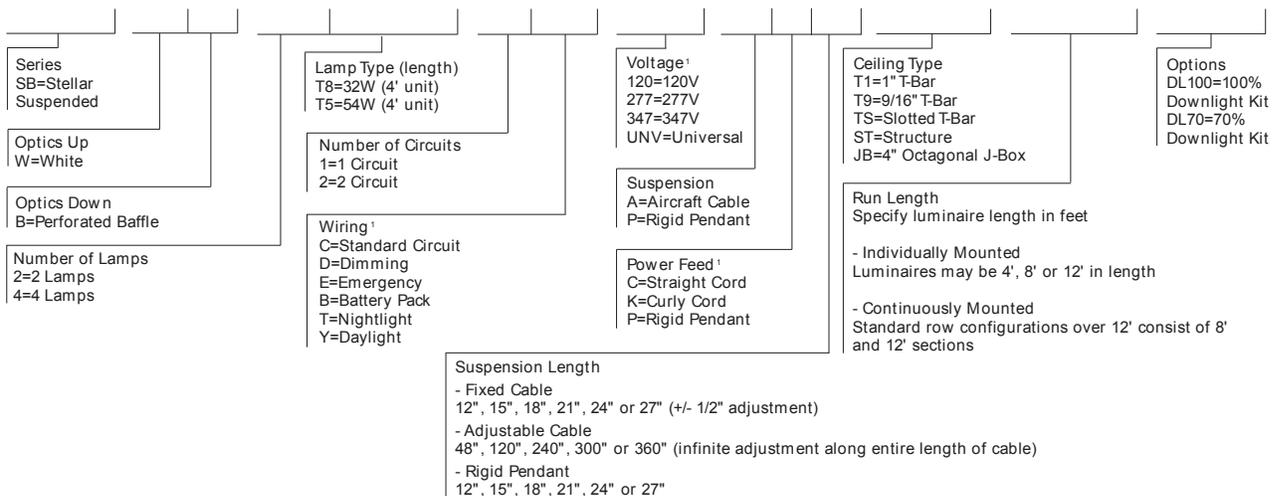
### Stellar Suspended Direct/Indirect

Corelite's Stellar suspended direct-indirect fluorescent luminaire produces energy efficient ambient illumination. The rugged painted aluminum baffle assembly delivers high vertical footcandles ideal for high ceilings and room perimeters. The Stellar series is available in three scales and can be combined with either 70% or 100% downlight kits to achieve the desired distribution. Stellar is best suited for high-ceiling open offices, private offices, conference rooms, corridors, laboratories and public spaces.



### Ordering Information

SAMPLE NUMBER: SB-WB-2T8-1C-UNV-AC18-T1-32'-DL70



Notes: <sup>1</sup> Not all options available. Please consult your Cooper Lighting Representative for availability. Specifications & dimensions subject to change without notice.



2' x 4' with Micro Baffle (B)

## Class R1 Ultra Shallow Recessed

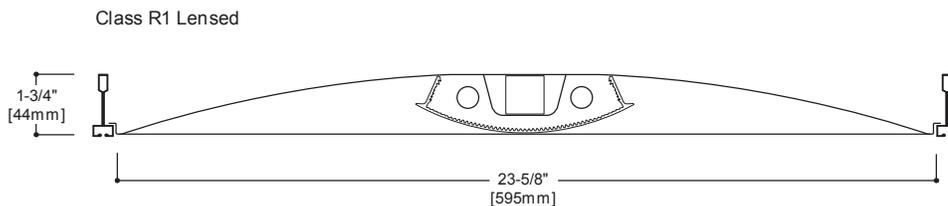
- ☑ T5 specific design
- ☑ 1-3/4" installed depth
- ☑ 82.8% efficiency (R1-WL-2N5-24)
- ☑ Available with 4 unique shielding options
- ☑ Installs in half the space of traditional lay-ins
- ☑ Supports energy saving ballasts and controls

## Class R1 Ultra Shallow Recessed

Class R1 is the ultra shallow direct-indirect recessed luminaire designed specifically for shallow and obstructed plenum applications. The 1-3/4" installed depth allows the R1 to fit seamlessly within the height of a standard ceiling grid. Its T5 specific design and optically engineered shielding options deliver highly efficient direct-indirect illumination, creating both excellent task lighting and softly luminous vertical wall surfaces.



Lens (L)

Rectangular Perf (R)  
Round Perf (P) also available

## Ordering Information

SAMPLE NUMBER: R1-WL-2N5-1C-UNV-22-T1

Series R1=Class R1 (1-3/4")	Number of Lamps 2=2 Lamps	Voltage <sup>1</sup> 120=120V 277=277V 347=347V UNV=Universal (120V-277V)	Options <sup>1</sup> AR=Air Return CP=Chicago Plenum NY=New York City Construction AM=Anti-Microbial Coating LG=Lens Gasketing WG=6' Whip Flex W12=12' Whip Flex
Reflector W=White	Lamp Type N5=T5 Normal Output T5=T5 High Output (not recommended for use below 12')	Size 24=2' x 4' 22=2' x 2' 14=1' x 4'	
Shielding L=Lens B=Micro Baffle P=Round Perf R=Rectangular Perf	Number of Circuits <sup>1</sup> 1=1 Circuit 2=2 Circuits	Ceiling Type <sup>1</sup> T1=1" Grid, Slot Grid, 9/16" Tegular T9=9/16" Grid CC=Concealed Ceiling (see note)	
	Wiring <sup>1</sup> C=Standard Circuit B=Battery D=Dimming/Step Dimming E=Emergency Y=Daylight T=Nightlight		



2 x 2 with Lens (L)

### Class R2 Ultra Shallow Recessed

- 2-7/8" installed depth
- 85% efficiency (R2-WL-2N5-24)
- Accommodates up to 3 T5 lamps
- Available with 4 unique shielding options
- Installs in half the space of traditional lay-ins
- Supports energy saving ballasts and controls

### Class R2 Ultra Shallow Recessed

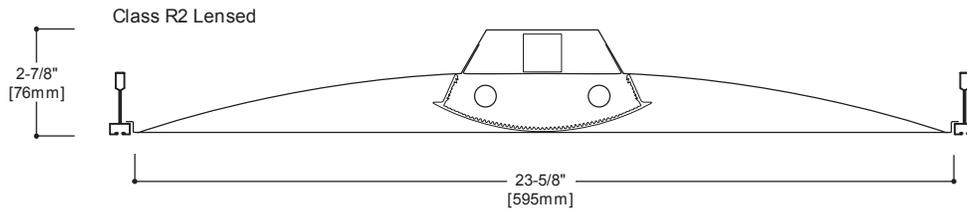
Class R2 is a shallow recessed direct-indirect luminaire designed not only for shallow plenum applications, but ALL recessed ambient applications. The R2 delivers highly efficient illumination (80-95%) to meet energy code requirements, in a uniquely shallow 2-7/8" deep housing. It's T5 specific design and optically engineered shielding options deliver highly efficient direct-indirect illumination, creating both excellent task lighting and softly luminous vertical wall surfaces.



Micro Baffle (B)



Rectangular Perf (R)  
Round Perf (P) also available



### Ordering Information

SAMPLE NUMBER: R2-WL-2N5-1C-UNV-22-T1

<p>Series R2=Class R2 (2-7/8")</p>	<p>Number of Lamps 1=2 Lamp 2=2 Lamps 3=3 Lamps</p>	<p>Voltage<sup>1</sup> 120=120V 277=277V 347=347V UNV=Universal (120V-277V)</p>	<p>Options<sup>1</sup> AR=Air Return CP=Chicago Plenum NY=New York City Construction AM=Anti-Microbial Coating LG=Lens Gasketing WG=6' Whip Flex W12=12' Whip Flex</p>
<p>Reflector W=White</p>	<p>Lamp Type N5=T5 Normal Output T5=T5 High Output (not recommended for use with 2 or 3 lamp configurations below 12')</p>	<p>Size 24=2' x 4' 22=2' x 2' 14=1' x 4'</p>	<p>Ceiling Type<sup>1</sup> T1=1" Grid, Slot-Grid, 9/16" Tegular T9=9/16" Grid CC=Concealed Ceiling (see note)</p>
<p>Shielding L=Lens B=Micro Baffle P=Round Perf R=Rectangular Perf</p>	<p>Number of Circuits<sup>1</sup> 1=1 Circuit 2=2 Circuits</p>	<p>Wiring<sup>1</sup> C=Standard Circuit B=Battery D=Dimming/Step Dimming E=Emergency Y=Daylight T=Nightlight</p>	

Notes: <sup>1</sup> Not all options available. Please consult your Cooper Lighting Representative for availability. Specifications and dimensions subject to change without notice.

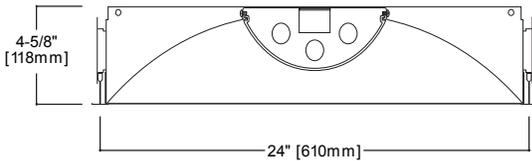


### Fenestra Architectural Recessed

Make an architectural statement with ambient illumination. The Fenestra center basket series places indirect lighting performance into a recessed housing. The end result is a near shadowless, low-glare environment. Vertical room surfaces are more uniformly illuminated when compared to environments with recessed parabolics. This series is ideal for use throughout the healthcare facility.

### Fenestra Architectural Recessed

- ☑ Opal white diffuser fully encloses lamp compartment for easy wipe down
- ☑ Perfect for facilities that require simple, easy cleaning and minimized contagion accumulation
- ☑ T5 or T8 Lamping
- ☑ Highly efficient linear prismatic diffuser offers low glare, broad distribution
- ☑ Combine the three lamp profile with dual switching for three levels of lighting through basic switches for complete, trustworthy control
- ☑ Consult factory for dimming and emergency options
- ☑ Recessed Mounting for T-grid, sheet rock ceiling and 9/16" slot T-grid
- ☑ End-to-end and side-to-side mounting available

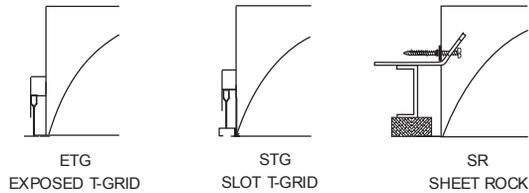


STANDARD LUMINAIRE PLAN - VIEW - VIEW



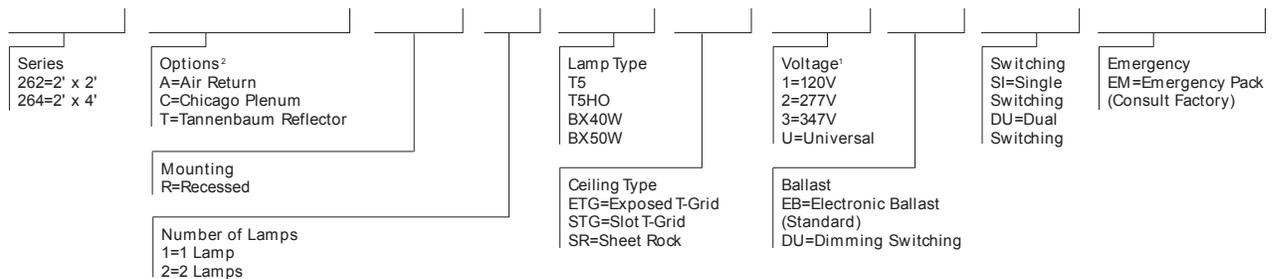
Tannenbaum Reflector

MOUNTING INFORMATION



### Ordering Information

SAMPLE NUMBER: 262R-1BX40W-ETG-1EB-SI-EM



Notes: <sup>1</sup> Due to various constraints, some options may not be combined with others <sup>2</sup> Can be left blank or more than one option may be available, consult factory For complete product data, refer to the Neo-Ray Specification Binder Specifications and dimensions subject to change without notice Products may be modified for use in international markets Please contact your Cooper Lighting Sales Representative for availability and ordering information



### 79-OS Perimeter/Indirect

79OS is the recent addition to the perimeter wall wash family. This open slot wall washer has no wall side rails or reflectors to mount, align and miter, just a wall disappearing into an open slot trimmed out with a room side extrusion, resulting in no lamp visibility at any angle. Providing smooth graduated wall illumination without any hint of lamp socket shadows.

### 79-OS Perimeter/Indirect

- Direct wall wash light distribution
- T5 and T8 lamping
- Softly graduated wall illumination without lamp socket shadows
- Factory prepared inside and outside mitered corners, create a refined finished detail at the ceiling line
- Lamps shielded from all viewing angles
- Die formed steel housing
- Runs are field adjustable
- Illuminated wall continues above the ceiling line to create floating ceiling effect
- 90 degree mitered corners
- Contractor friendly installation

#### Construction

20-gauge steel housing

#### Electrical

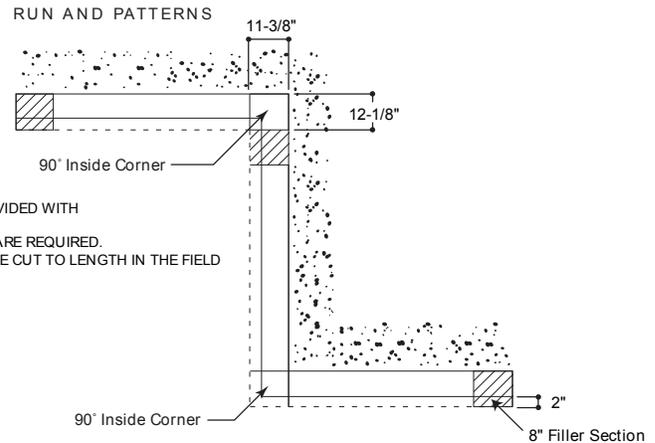
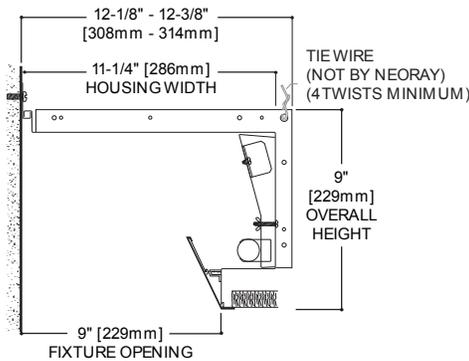
120, 277, 347 or Universal Voltage electronic ballast. Fixtures and electrical components certified to UL and cUL standards.

#### Finish

Durable, low gloss, white, powder coated acrylic finish.

#### Mounting

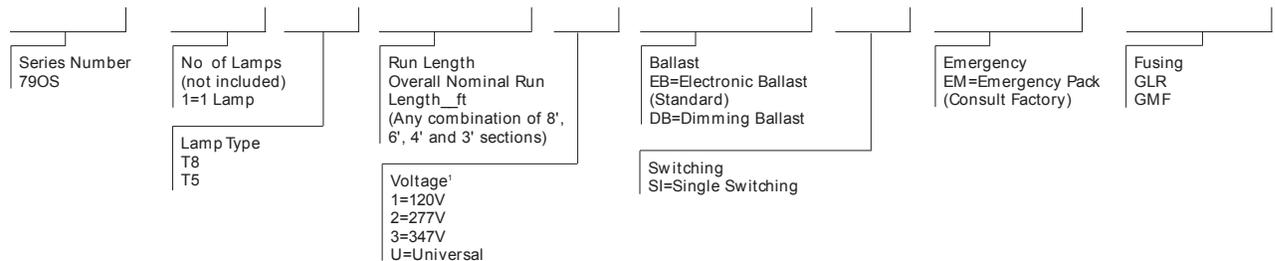
Recessed.



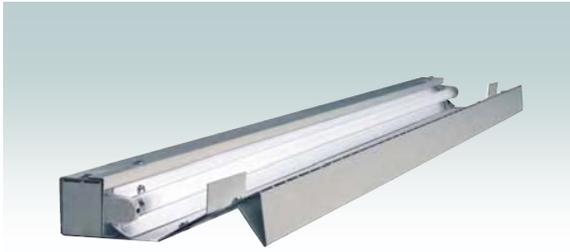
PATTERNS ARE PROVIDED WITH CORNER SECTIONS. FIELD DIMENSIONS ARE REQUIRED. FILLER SECTIONS ARE CUT TO LENGTH IN THE FIELD

### Ordering Information

SAMPLE NUMBER: 79OS-1T8-4-1EB-S1



Notes: <sup>1</sup> Due to various constraints, some options may not be combined with others. For complete product data, refer to the Neo-Ray Specification Binder. Specifications and dimensions subject to change without notice. Products may be modified for use in international markets. Please contact your Cooper Lighting Sales Representative for availability and ordering information.



### 74IC Indirect Cove

- ☑ Indirect cove light distribution
- ☑ Smooth ceiling light gradation free of lamp socket shadows
- ☑ Die-formed steel housing

#### Construction

Housing is die-formed 20-gauge cold rolled steel. Nominal 3', 4', 6', or 8' illuminated sections

#### Reflector

Specular aluminum and white steel assembly

#### Electrical

120, 277, 347 or Universal Voltage electronic ballast. Luminaires and electrical components certified to UL and cUL standards.

#### Finish

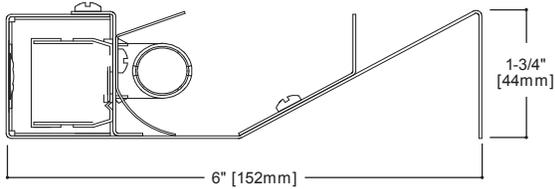
Durable, low gloss, white, powder coated acrylic finish.

#### Mounting

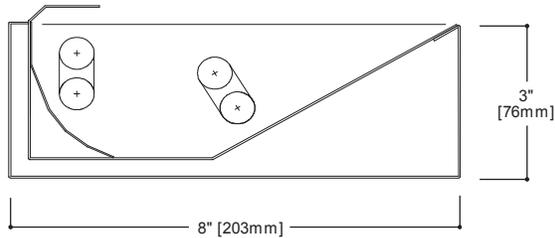
Lay-in at wall cove. Lay into base of cove or mount vertically firing downward to illuminate wall from soffit.

### 74IC Indirect Cove

A properly designed Indirect Cove Lighting system. The optically designed semi-specular reflector directs the light outward to the ceiling at low angles providing uniform, efficient glare free lighting. The wall deflector intercepts and redirects the light away from the wall, providing uniform light with no socket shadows on the wall.



(1) T5 or T5HO



(1 or 2) T8 or (1 or 2) BX

#### 74IC T8

- ☉ 57% of the fixture light output is in the critical 90 to 130 degree vertical angle zone.
- ☑ Fixture efficiency 63%

#### 74IC 2T8

- ☉ 54.8% of the fixture light output is in the critical 90 to 130 degree vertical angle zone.
- ☑ Fixture efficiency 55%

#### 74IC T5/T5HO

- ☉ 50% of the fixture light output is in the critical 90 to 130 degree vertical angle zone.
- ☑ Fixture efficiency 81.7%

#### 74IC 2T5/T5HO

- ☉ 50% of the fixture light output is in the critical 90 to 130 degree vertical angle zone.
- ☑ Fixture efficiency 69%

#### 74IC 1BX

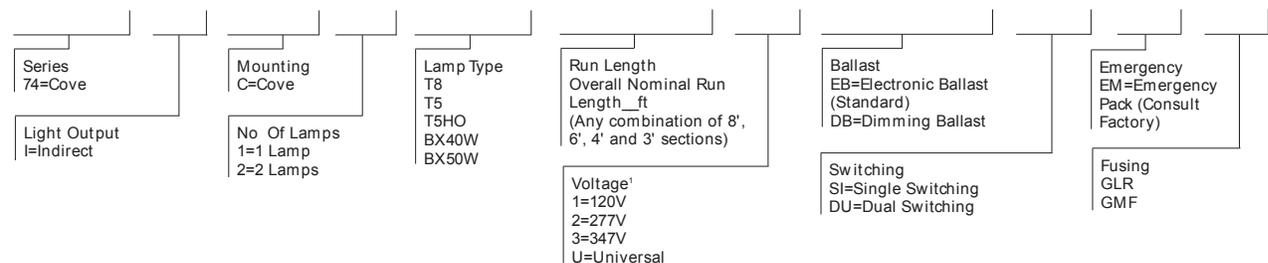
- ☉ 63% of the fixture light output is in the critical 90 to 130 degree vertical angle zone.
- ☑ Fixture efficiency 73.8%

#### 74IC 2BX

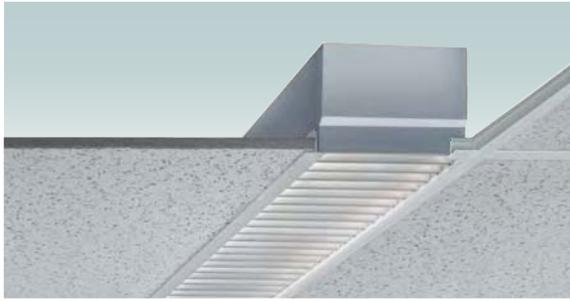
- ☉ 46% of the fixture light output is in the critical 90 to 130 degree vertical angle zone.
- ☑ Fixture efficiency 50%

## Ordering Information

SAMPLE NUMBER: 74IC-1T5-60-1EB-SI-EM-GMF



Notes: <sup>1</sup> Due to various constraints, some options may not be combined with others. For complete product data, refer to the Neo-Ray Specification Binder. Specifications and dimensions subject to change without notice. Products may be modified for use in international markets. Please contact your Cooper Lighting Sales Representative for availability and ordering information.



### 81 Direct

Series 81 can be used individually or in back to back illuminated runs and patterns. This fixture is uniquely suited to achieve many functional and aesthetic spatial effects. Shielding locks in place without hardware. The trim is rigid "U" shaped, double formed with a 3/8" regress soft lit edge.

### 81 Direct

- EB Direct light distribution
- T5 and T8 lamplng
- Die formed steel housing, nominal illuminated sections 3' and 4'
- Rigid "U" shaped trim is double formed with 3/8" regress soft lit edge
- For individual fixtures mounted in ETG Ceilings in 3' or 4' sections
- For runs see Series 82 fixture on website

#### Construction

20-gauge steel housing. Nominal 3' or 4' illuminated sections

#### Shielding

Acrylic diffuser or lens, parabolic or bold baffle shielding.

#### Electrical

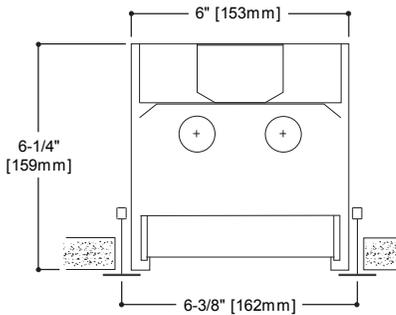
120, 277, 347 or Universal Voltage electronic ballast. Fixtures and electrical components certified to UL and cUL standards.

#### Finish

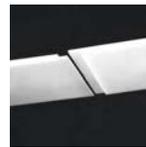
Durable, low gloss, white, powder coated acrylic finish.

#### Mounting

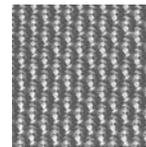
Recessed



#### SHIELDING OPTIONS



S22 Acrylic Diffuser



S58 Acrylic Lens



S72 Bold Baffle



S79 Parabolic Baffle

### Ordering Information

SAMPLE NUMBER: 81R-2T5HO-ETG-2EB-SI-S72

Series Number 81 (ETG-Exposed "T" grid ceiling only)	No. of Lamps (not included) 1=1 Lamp 2=2 Lamps	Ceiling Type ETG=Exposed T-Grid (81)	Voltage <sup>1</sup> 1=120V 2=277V 3=347V U=Universal	Ballast EB=Electronic Ballast (Standard) DB=Dimming Ballast	Emergency EM=Emergency Pack (Consult Factory)	Shielding S22=White Acrylic Diffuser with Mullion S58=KSH-12 Clear Acrylic Prismatic Lens with Mullion S72=White Bold Baffle S79=semi-Specular Aluminum Parabolic Baffle
Mounting R=Recessed	Lamp Type (Length) T8 T5 T5HO	Length 3' or 4' individuals only	Switching SI=Single Switching DU=Dual Switching	Fusing GLR GMF		

Notes: <sup>1</sup> Due to various constraints, some options may not be combined with others. <sup>2</sup> Can be left blank or more than one option may be available, consult factory. For complete product data, refer to the Neo-Ray Specification Binder. Specifications and dimensions subject to change without notice. Products may be modified for use in international markets. Please contact your Cooper Lighting Sales Representative for availability and ordering information.



## 22 Series Straight & Narrow Wall

- ☑ The Straight and Narrow Series embodies architectural detail as well as lighting performance
- ☑ Continuous and unbroken light
- ☑ Extruded aluminum housing offers precise in-line appearance
- ☑ Runs are provided to nearest foot

### Construction

Extruded aluminum housing. Nominal 3', 4', 6' or 8' illuminated sections.

### Shielding

Trimless, snap-in white high transmission acrylic diffuser. Snap-in high performance semi-specular or white parabolic louver.

### Electrical

120, 277 or universal voltage, electronic ballast. Fixtures and electrical components certified to UL and cUL standards.

### Finish

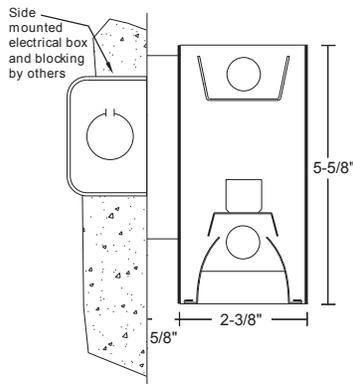
Durable, low gloss, white powder coated acrylic. Optional custom finish.

### Mounting

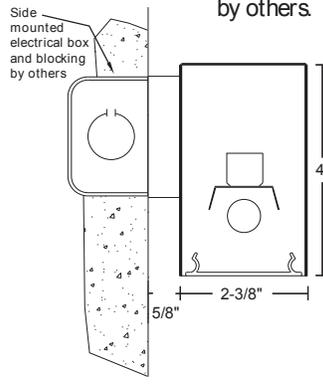
Fixture mounts directly to existing structure over a standard electrical box (not supplied by Neo-Ray). Blocking provided by others.

## 22 Series Straight & Narrow Wall

A return to simplicity, elegance and minimalism. Sander lines of unbroken light set in an architectural environment are what the essence of Straight and Narrow is all about. Accommodates most architectural lighting design applications.



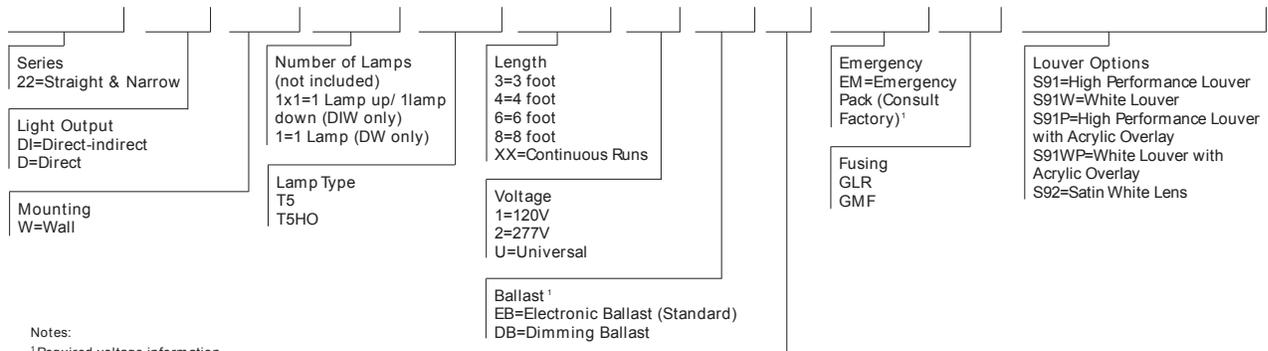
22DIW 1x1 with high performance louver (S91)



22DW with satin white lens (S92)

## Ordering Information

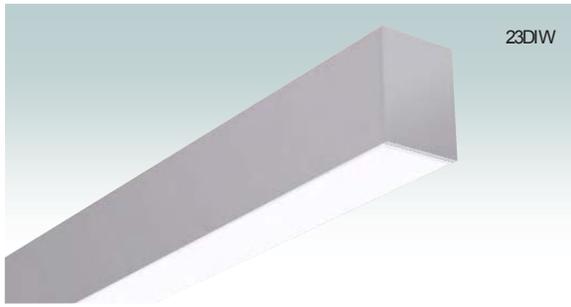
SAMPLE NUMBER: S22DIW/1X1T5HO/4/1EB-SI-EM-GLR-S91



**Notes:**

- <sup>1</sup>Required voltage information
- ☑ For some electronic, dimming and EM battery pack ballast combinations fixture has space limitation (consult factory)
- ☑ Not all option combination available, please consult your COOPER Lighting representative for additional information
- ☑ 22DW dual switching is half level

**Switching Options**  
SI=Single Switching  
DU=Dual Switching



### 23 Series Straight & Narrow Wall

A return to simplicity, elegance and minimalism. Slender lines of unbroken light set in an architectural environment are what the essence of Straight and Narrow is all about. Accommodates most architectural lighting design applications.

### 23 Series Straight & Narrow Wall

- The Straight and Narrow Series embodies architectural detail as well as lighting performance
- Continuous and unbroken light
- Extruded aluminum housing offers precise in-line appearance
- Runs are provided to nearest foot

#### Construction

Extruded aluminum housing. Nominal 3', 4', 6' or 8' illuminated sections.

#### Shielding

Trimless, snap-in white, high transmission, acrylic diffuser. Snap-in high performance semi-specular or white parabolic louver.

#### Electrical

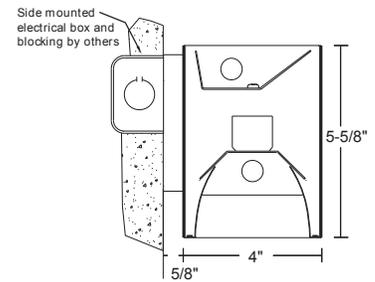
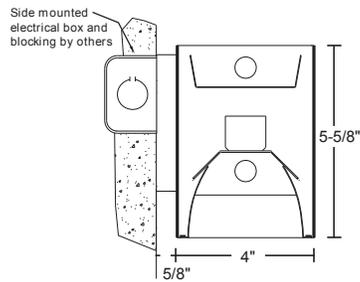
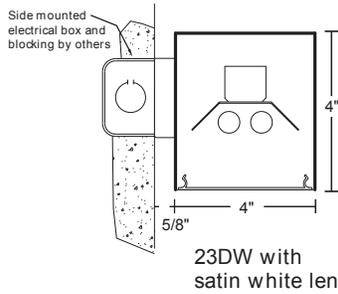
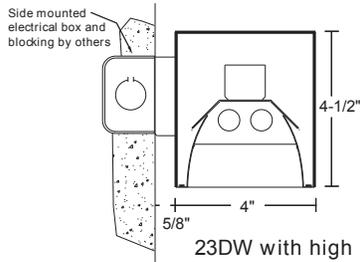
120, 277, 347 or Universal Voltage, electronic ballast. Fixtures and electrical components certified to UL and cUL standards.

#### Finish

Durable, low gloss, white powder coated acrylic. Optional custom finish.

#### Mounting

Fixture mounts directly to existing structure over a standard electrical box (not supplied by Neo-Ray). Blocking provided by others.

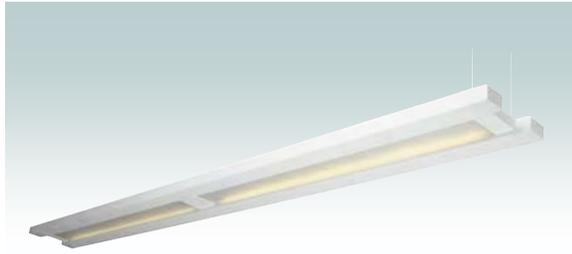


### Ordering Information

SAMPLE NUMBER: S23DIW/1X1T5/4/1EB-SI-EM-GLR-S90

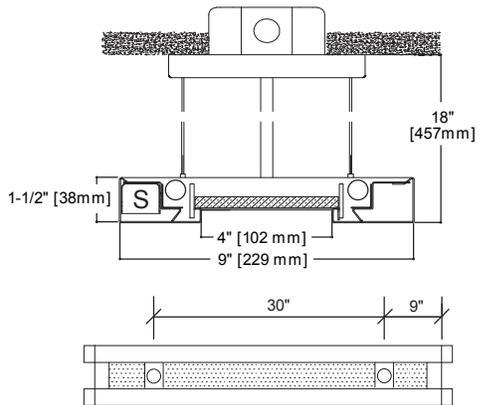
<p>Series 23=Straight &amp; Narrow 23A=Asymmetric Straight &amp; Narrow</p>	<p>Number of Lamps (not included) 1=1 Lamp (DW only) 2=2 Lamp (DW only) 1x1=1 Lamp up/ 1 Lamp down (DIW only) 1x2=1 Lamp up/ 2 Lamps down (DIW only) 2x2=2 Lamps up/ 2 Lamps down (23 Series DIW only) 2x1=2 Lamps up/ 1 Lamp down (23 Series DIW only)</p>	<p>Length 3=3 foot 4=4 foot 6=6 foot 8=8 foot XX=Continuous Runs</p>	<p>Emergency EM=Emergency Pack (Consult Factory)<sup>1</sup></p>	<p>Louver Options S22R=Regressed white acrylic diffuser S90=High performance louver S90W=White louver S90P=High performance louver with acrylic overlay S90WP=White louver with acrylic overlay S93=Satin white lens</p>
<p>Light Output DI=Direct-indirect D=Direct</p>	<p>Voltage 1=120V 2=277V 3=347V U=Universal</p>	<p>Fusing GLR GMF</p>		
<p>Mounting W=Wall</p>	<p>Ballast<sup>1</sup> EB=Electronic Ballast (Standard) DB=Dimming Ballast</p>			
<p>Lamp Type T8 T5 T5HO</p>		<p>Switching Options SI=Single Switching DU=Dual Switching</p>		

Notes:  
<sup>1</sup>Required voltage information  
 23DW T5 or T5HO standard with 6" staggered lamps  
 1x lamp not staggered  
 For some electronic, dimming and EM battery pack ballast combinations fixture has space limitation (consult factory)  
 Not all option combination available, please consult your COOPER Lighting rep for additional information



### Scala Architectural Suspended

This pendant luminaire consists of 2 T5 or T5HO lamps, a slim profile of 1.5" high by 9" wide, modular housing lengths of 4' and 8', with a variety of standard as well as custom diffusing media. The new ribbed semi-transparent/translucent diffusing media gives the visual mystery of edge glow while seeing through and beyond the center of the luminaire with the appearance of some direct light. The fixture housings and hangers are modular and incremental, exactly on 4'-0" and 8'-0" centers resulting in cohesive ceiling geometry and contractor friendly, cost effective installation.



Position of accent lamp kits as above or specify custom location

**S** = Slim Line Ballast only

### Scala Architectural Suspended

- Housing is die formed cold rolled steel
- Slim profile of 1.5" high by 9" wide
- Modular housing lengths of 8', 6', 4' and 3'
- Variety of diffusing media give the visual mystery of edge glow

**Construction:** Housing is die-formed cold rolled steel forming a 1-1/2" high x 9" wide classic rectangular profile. Standard 8'-0", 6'-0", 4'-0" and 3'-0" nominal housing lengths are available as individual or combine for continuous runs.

**End Caps:** End caps are precision die-cast aluminum mechanically attached without exposed fasteners.

**Reflector:** Side and center reflectors are die-formed, semi-specular aluminum.

**Electrical:** Luminaires are prewired with quick wire connectors and use UL listed Class P/T5 program rapid start electronic ballasts. Power factor of 97% with less than 10% THD. Fixtures and electrical components certified to UL and CUL standards.

**Diffusing Media:** Standard ribbed semi-transparent/translucent diffusing lens are available. Custom diffusers can be specified (consult factory).

**Finish:** Luminaire housings are standard white using electrostatically applied acrylic powder coat paint. Chrome or Satin Chrome finishes available (see options).

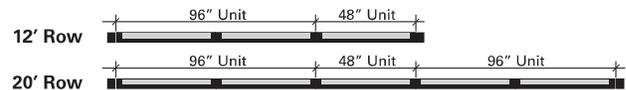
**Mounting:** Dual aircraft cable for all ceiling types. Square Canopy - white finish. Feed Canopy - 5" square, Non Feed Canopy = 5" x 2-1/4"

#### STANDARD LUMINAIRE LENGTHS



#### MODULAR ROW CONFIGURATION

- Standard length sections join easily to create rows
- Sections align with T-grid
- All sections prewired for through-wiring with quick connectors



### Ordering Information

SAMPLE NUMBER: 801B-S-L-2T5HO-1C-120-DC-18-TS-24-28A

<p><b>Series</b> 801-B=Scala</p>	<p><b>No. of Lamps (not included)</b> 2=2 Lamps</p>	<p><b>Voltage<sup>1</sup></b> 120=120V 277=277V UNV=Universal</p>	<p><b>Ceiling Type</b> T1=1" T-Bar ST=Structure T9=9/16" T-Bar TS=Slotted T-Bar JB=4" Octagonal J-Box</p>	<p><b>Options</b> WT=White Finish CB=Chrome Housing with Matching Ends SB=Satin Housing with Matching Ends AS=20 Watt AR70 Halogen Spot Kit (2) per 4' section (see note) AF=20 Watt AR70 Halogen Flood Kit (2) per 4' section (see note)</p>
<p><b>Optics Up</b> S=Specular</p>	<p><b>Lamp Type (Length)</b> N5=T5 (28W)</p>	<p><b>Suspension</b> D=Dual Cable</p>	<p><b>Run Length</b> (Any combination of 8', 6', 4' and 3' sections) 03=3' Section 04=4' Section 06=6' Section 08=8' Section Rows will primarily consist of 8' sections</p>	
<p><b>Optics Down</b> L=Refer to Diffuser Types</p>	<p><b>Number of Circuits</b> 1=1 Circuit 2=2 Circuits (Side by Side)</p>	<p><b>Power Feed<sup>1</sup></b> C=Straight Cord K=Curly Cord</p>	<p><b>Diffuser Type</b> 28A=Ribbed Clear Plastic 28B=Ribbed Texture Plastic 28C=Ribbed Blue Plastic 28D=Ribbed Green Plastic PT=Perforated Top Diffuser</p>	
	<p><b>Wiring<sup>1</sup></b> C=Standard Circuit D=Dimming E=Emergency/Nightlight B=Battery Pack T=Nightlight * Slim line ballast only (small case)</p>	<p><b>Suspension Length</b> Fixed Cable 12", 15", 18", 21", 24" or 27" (+/- 1/2" Adjustment)</p>		
		<p><b>Adjustable Cable</b> 48", 120", 240", 300" or 360" (Infinite adjustment along entire length of cable)</p>		

Notes: <sup>1</sup> Due to various constraints, some options may not be combined with others. For complete product data, refer to the Neo-Ray Specification Binder. Specifications and dimensions subject to change without notice. Products may be modified for use in international markets. Please contact your Cooper Lighting Sales Representative for availability and ordering information.



### Symbio Architectural Recessed

The exquisitely detailed louver, ultra minimal trim and the optically precise reflector harmoniously work to deliver low glare illumination to the space efficiently. The computer generated optical design results in fixture efficiencies in the high 70's and low 80 percent range with low direct glare, enabling designers to light spaces comfortably with less energy and fewer luminaires bottom line, lowering install and annual energy costs. Louver shielding options are perforated white cross blades, frosted acrylic cross blades or tannenbaum cross blades each render a unique fixture appearance. Symbio's high efficiency and well controlled light distribution has a broad range of applications such as private offices, open plan offices, conference rooms, training rooms and classrooms throughout the healthcare facility.

### Symbio Architectural Recessed

- EB Recessed Mounting for T-grid, sheet rock ceiling and 9/16" slot T-grid.
- EB Can be mounted end-to-end and side-to-side
- EB 20 gauge steel housing
- EB 24 gauge steel reflector
- EB Baked on low gloss, white, powder coated acrylic finish
- EB 2' x 2', 2' x 4' fixture configurations
- EB Louver shielding options: perforated, frosted acrylic or tannenbaum cross blades
- EB T5, T5HO lamps (not by NEO-RAY)
- EB Consult factory for dimming and emergency options
- EB UL Listed, cUL Listed

**Construction**  
20-gauge steel housing.

**Shielding**  
Louver shielding options: white perforated metal, frosted acrylic or tannenbaum cross blades.

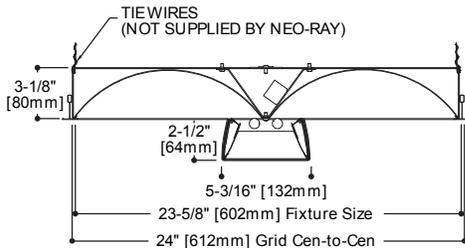
**Electrical**  
120, 277, 347 or Universal Voltage electronic ballast. Fixtures and electrical components certified to UL and cUL standards.

**Finish**  
Durable, low gloss, white, powder coated acrylic finish.

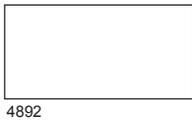
**Mounting**  
Recessed.



Tannenbaum Reflector

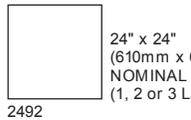


STANDARD LUMINAIRE PLAN - VIEW - VIEW



24" x 48"  
(610mm x 1219mm)  
NOMINAL  
(1, 2 or 3 Lamps)

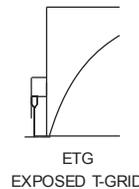
4892



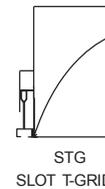
24" x 24"  
(610mm x 610mm)  
NOMINAL  
(1, 2 or 3 Lamps)

2492

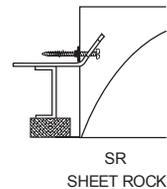
#### MOUNTING INFORMATION



ETG  
EXPOSED T-GRID



STG  
SLOT T-GRID



SR  
SHEET ROCK

### Ordering Information

SAMPLE NUMBER: 2492R-2T5HO-SR-2EB-SI-S17G

<b>Series</b> 2492=Symbio 2X2 4892=Symbio 2X4	<b>Mounting</b> R=Recessed	<b>Ceiling Type</b> ETG=Exposed T-Grid STG=Slot T-Grid SR=Sheet Rock	<b>Ballast</b> EB=Electronic Ballast (Standard) DB=Dimming Ballast	<b>Standard EM Pack</b> EM=Emergency Pack (Consult Factory)
<b>Options</b> A=Air Return C=Chicago Plenum T=Tannenbaum Reflector	<b>Number of Lamps</b> (per cross section) (not included) 2=2 Lamps	<b>Voltage</b> 1=120V 2=277V 3=347V U=Universal	<b>Switching</b> SI=Single Switching DU=Dual Switching	<b>Shielding Option</b> S17=White Louver Perforated Metal Blades S17A=White Louver with Perforated Metal Blades and Acrylic Overlay S17B=White Louver with Frosted Acrylic Blades S17C=White Louver with Frosted Acrylic Blades and Acrylic Overlay S17F=1100G Satin Aluminum Louver with Tannenbaum Blades S17G=1100G Satin Aluminum Louver with Tannenbaum Blades and Acrylic Overlay

Notes: <sup>1</sup> Due to various constraints, some options may not be combined with others. For complete product data, refer to the Neo-Ray Specification Binder. Specifications and dimensions subject to change without notice. Products may be modified for use in international markets. Please contact your Cooper Lighting Sales Representative for availability and ordering information.



## Straight & Narrow 22DR Recessed

A return to simplicity, elegance and minimalism. Sender lines of unbroken light set in an architectural environment are what the essence of Straight and Narrow is all about. Accommodates most architectural lighting design applications

- T5 or T5HO lamps
- Straight and Narrow embodies Neo-Ray's critical attention to architectural detail as well as lighting performance
- Continuous and unbroken light
- Extruded aluminum housing offers precise in-line appearance
- Runs are provided to nearest foot

## Straight & Narrow 22DR Recessed

### Construction:

Extruded aluminum housing. Nominal 3', 4', 6' or 8' illuminated sections.

### Shielding:

Trimless, snap-in, white, high transmission, acrylic diffuser. Snap-in high performance semispecular or white parabolic louver.

### Electrical:

120, 277 or Universal Voltage electronic ballast. Fixtures and electrical components certified to UL and cUL standards.

### Finish:

Durable, low gloss, white, powder coated acrylic. Optional custom finish.

### Mounting:

(ETF) Exposed T-grid 15/16" (STG) Screw Slot Grid 9/16" (SR) Sheet Rock

### OPTICAL OPTIONS



High Performance Louver



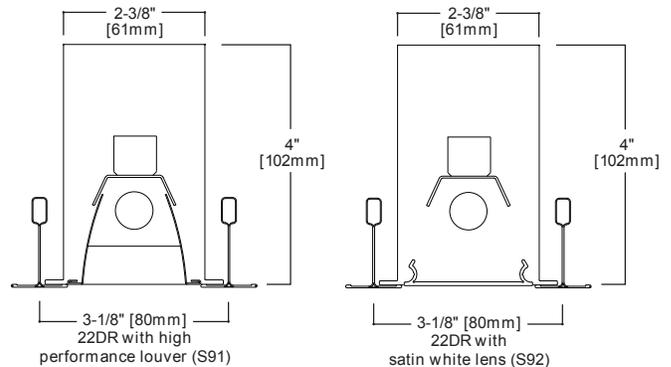
Satin White Lens



Continuous Line



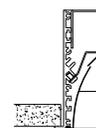
Corner Detail (sheetrock only)



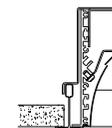
### MOUNTING INFORMATION



STG  
9/16" Screw Slot  
T-Grid Mounting



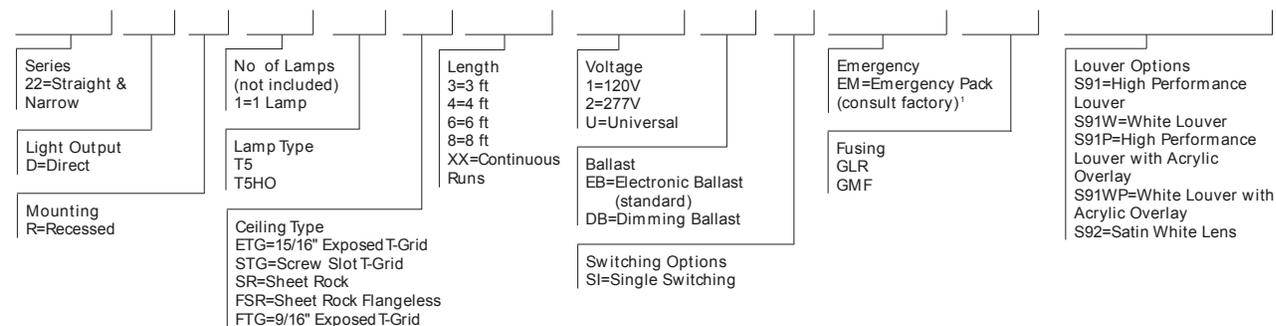
SR  
Sheet Rock  
Mounting



ETF  
15/16" Flat T-Grid  
Mounting

## Ordering Information

SAMPLE NUMBER: 22DR-1T5HO-ETG4D-1EB-SI-EM-GLR-S291



Notes: <sup>1</sup> Required voltage information For some electronic, dimming and EM battery pack ballast combinations, fixture has space limitation (consult factory) Due to various constraints, some options may not be combined with others Please consult your COOPER Lighting representative for additional information For complete product data, refer to the Neo-Ray Specification Binder Specifications and dimensions subject to change without notice Products may be modified for use in international markets Please contact your Cooper Lighting Sales Representative for availability and ordering information



### Straight & Narrow 23DR Recessed

**Construction**  
20 gauge steel housing.

**Shielding**  
Louver shielding options: white perforated metal, frosted acrylic or Tannenbaum cross blades.

**Electrical**  
120, 277, 347 or Universal Voltage electronic ballast. Fixtures and electrical components certified to UL and cUL standards.

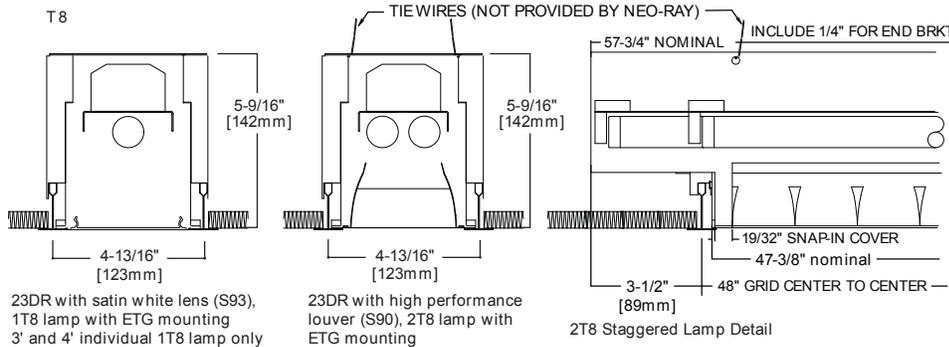
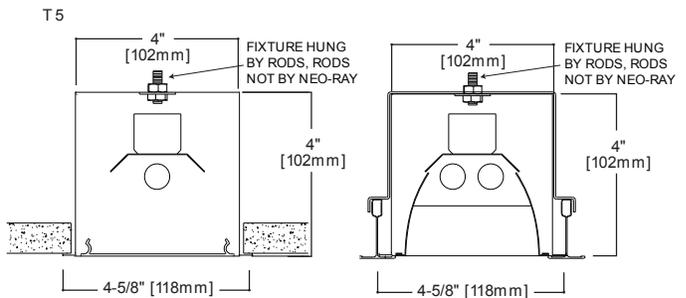
**Finish**  
Durable, low gloss, white, powder coated acrylic finish.

**Mounting**  
Recessed

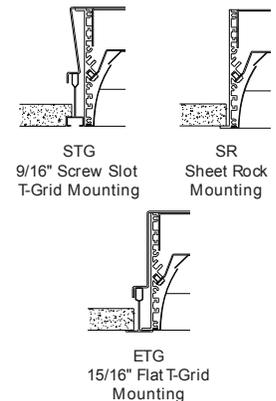
### Straight & Narrow 23DR Recessed

A return to simplicity, elegance and minimalism. Slender lines of unbroken light set in an architectural environment are what the essence of Straight and Narrow is all about. Accommodates most architectural lighting design applications.

- T8, T5 or T5HO lamps
- Straight and Narrow embodies Neo-Ray's critical attention to architectural detail as well as lighting performance
- Continuous and unbroken light
- Extruded aluminum housing offers precise in-line appearance
- Runs are provided to nearest foot



#### MOUNTING INFORMATION



### Ordering Information

SAMPLE NUMBER: 23DR-1T5-ETG4D-1EB-SI-EM-GLR-S22R-2MR16W20F1

Series 23=Straight & Narrow	No of Lamps (not included) 1=1 Lamp 2=2 Lamps	Length 3=3 ft 4=4 ft 6=6 ft 8=8 ft XX=Continuous Runs	Section D=Individual I=Intermediate B=Beginning of Run E=End of Run	Ballast <sup>1</sup> EB=Electronic Ballast (standard) DB=Dimming Ballast	Emergency EM=Emergency Pack (consult factory) <sup>1</sup>	Downlight Options <sup>2</sup> 2MR16W20=Halogen MR16 lamp 20W (fixed) 2MR16W20A=Halogen MR16 lamp 20W (adjustable)
Light Output D=Direct	Lamp Type T5 T5HO T8	Voltage 1=120V 2=277V 3=347V U=Universal	Switching Options SI=Single Switching DU=Dual Switching	Fusing GLR GMF	Louvers Options S91=High Performance Louver S91W=White Louver S91P=High Performance Louver with Acrylic Overlay S91WP=White Louver with Acrylic Overlay S92=Satin White Lens	Optional Accessory (Downlight only) F1=Hex Cell Louver F2=Prismatic Spread Lens F3=Linear Spread Lens F4=Milk White Lens F5=Red Color Filter F6=Blue Color Filter
Mounting R=Recessed RDL=Recessed with Downlight	Ceiling Type ETG=15/16" Exposed T-Grid STG=Screw Slot T-Grid SR=Sheet Rock FSR=Sheet Rock Flangeless FTG=9/16" Exposed T-Grid					

Notes: <sup>1</sup> Required voltage information. For some electronic, dimming and EM battery pack ballast combinations, fixture has space limitation (consult factory). Due to various constraints, some options may not be combined with others. Please consult your COOPER Lighting representative for additional information. For complete product data, refer to the Neo-Ray Specification Binder. Specifications and dimensions subject to change without notice. Products may be modified for use in international markets. Please contact your Cooper Lighting Sales Representative for availability and ordering information.



### line Series 1.5 LED-based Linear Floodlight

io Lighting's line Series 1.5 is approximately 1.5" in diameter. UL listed for wet locations, this LED-based linear floodlight produces functional luminous intensities for lighting bridges and building facades. Ideal for grazing and accent illumination, individual units may be placed end to end to create continuous rows without obvious shadows between fixtures. LEDs are similar to halogen light sources in that they are point sources that can reveal superior definition to textural surfaces and sparkle to reflective surfaces. Series 1.5 is a low voltage linear luminaire that may be ordered in incremental nominal lengths that include: 18", 36". Optional beam spreads along the perpendicular axis of the fixture include 10°, 45° and 65°.

### line Series 1.5 LED-based Linear Floodlight

#### Light Output

line Series 1.5 is available with two lumen outputs for white light only. Red, green and blue are available in high output only. IES format files may be obtained from the factory or downloaded from [www.iolighting.com](http://www.iolighting.com).

Standard Output:  
3000K White: 34 lms/ft  
5000K White: 40 lms/ft

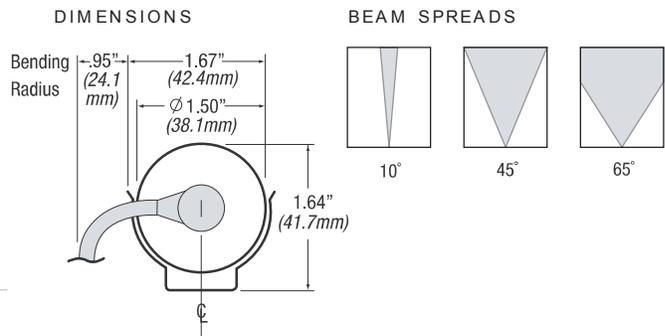
High Output:  
3000K White: 170 lms/ft  
5000K White: 230 lms/ft

#### Power Consumption

Standard Output: 2.1 w/ft

High Output: 7.6 w/ft

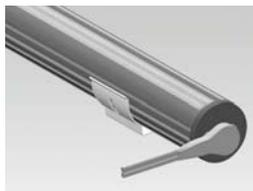
Power consumption does not include power supply losses. Consult io driver specification sheets (at [www.iolighting.com](http://www.iolighting.com)) for losses associated with each driver option.



#### ELECTRICAL FEEDS



2 End Feed



3 Right Side Feed



Interconnector  
(For continuous row mounting)



Interconnect plug connection is used for daisy chaining

### Ordering Information

0	10	E								
io	1	2	3	4	5	6	7	8	9	10

#### 1 LIGHT OUTPUT

10 15 SO or HO

#### 2 LOCATION

E Exterior

#### 3 COLOR

3K White 3000K (Standard)<sup>1</sup>  
 3KH White 3000K (High Output)<sup>1</sup>  
 5K White 5000K (Standard)<sup>1</sup>  
 5KH White 5000K (High Output)<sup>1</sup>  
 R Red<sup>2</sup>  
 G Green<sup>2</sup>  
 B Blue<sup>2</sup>

#### 4 DISTRIBUTION

10 10 Degree  
 45 45 Degree  
 65 65 Degree

#### 5 MOUNTING

100 Surface  
 Note: Universal mounting bracket may be used for all mounting orientations. Set screw locks in aim angle.

#### 6 FINISH

1 Anodized Aluminum  
 2 Anodized Custom Color

#### 7 LENGTH

UNITS (ACTUAL)  
 18 18" (18.25")  
 IP56 Lens face up or down<sup>3</sup>  
 36 36" (35.25")  
 IP55 Lens face down<sup>3</sup>

FOR CONTINUOUS ROW  
 Specify length (e.g., 96'-0")  
 Note: Overall length must be divisible by 18"

#### 8 ELECTRICAL FEED

2 End Feed  
 3 Right Side Feed  
 Note: For straight continuous rows fed by one driver, interconnects will be supplied as required.

#### 9 VOLTAGE/ DIMMING

1 120V  
 2 277V  
 3 120V w/dim  
 4 277V w/dim  
 5 Other

#### 10 SPECIFY DRIVER/ DIMMING

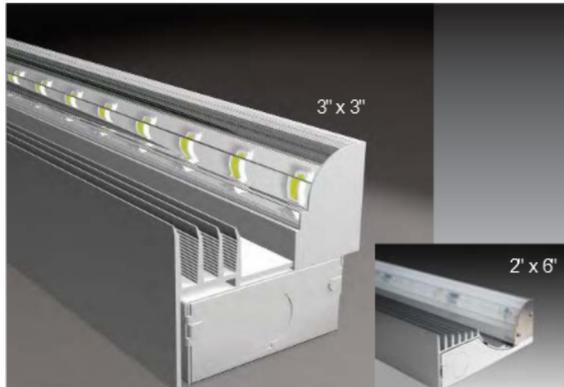
Note: If left blank, io will supply 100 watt drivers. Download Power Supply specification sheet from [www.iolighting.com](http://www.iolighting.com)

#### Footnotes:

- 1 White light variance between LEDs within a single fixture will not exceed +/- 200K
- 2 Refer to conversion table for output High Output only (76 w/ft)
- 3 18" lengths may be installed in face up or face down applications. 36", 54" and 72" lengths may be installed in face down applications only

See website for Line 2.0 Series

For Metric Conversion	1"	1"	1"
	25.4mm	2.54cm	0.3m



### raye LED-based Luminaire

#### Light Output

IES format files may be obtained from the factory or downloaded from [www.iolighting.com](http://www.iolighting.com)

Standard Output:	High Output:
3000K White: 213 lms/ft	3000K White: 320 lms/ft
5000K White: 300 lms/ft	5000K White: 450 lms/ft

#### Power Consumption

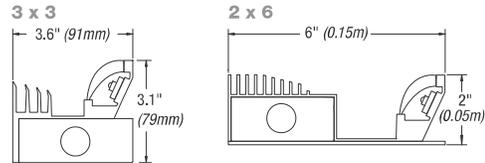
Standard Output: 12 w/ft	High Output: 17.8 w/ft
--------------------------	------------------------

Power consumption does not include power supply losses.

### raye LED-based Luminaire

io Lighting's raye is designed for cove and wall slot applications. Two cross sectional profiles are available: 3" h x 3.6" w and 2" h x 6" w. raye is ideal for applications where spatial conditions are limited but functional light is required. This low voltage LED-based luminaire offers two luminous intensities for a variety of architectural lighting requirements. raye's optical assembly has been designed to uniformly illuminate the interior surfaces of the cove for a clean appearance, while offering a very precise asymmetric beam projection. raye is perfect for delivering light at low angles for shallow cove and wall slot conditions. Individual units may be placed end to end without socket shadows, offering a uniform distribution of light along an architectural reveal. io ensures that each LED is driven with the proper current and voltage, which enables the average rated life to be 50,000 hours at 70% of the lamp lumen output. To ensure proper performance, architectural details should allow for ventilation and air flow around the fixture. Ambient temperature surrounding the fixture shall not exceed 120°F (48.9°C).

#### DIMENSIONS



#### LENGTHS



### Ordering Information

0	08			1		
io	1	2	3	4	5	6

1 SERIES	3 MOUNTING	5 LENGTH	6 VOLTAGE/DIMMING
08 raye	C33 Cove 3" x 3"	UNITS (ACTUAL)	1 120V
2 COLOR	C26 Cove 2" x 6"	18 18" (1702")	2 277V
3K White 3000K (Standard) <sup>1</sup>	W33 Wall Slot 3" x 3"	72 72" (68 02")	3 120V w/dim
3KHO White 3000K (High Output) <sup>1</sup>	W26 Wall Slot 2" x 6"		4 277V w/dim
5K White 5000K (Standard) <sup>1</sup>		CONTINUOUS ROWS	5 Other
5KHO White 5000K (High Output) <sup>1</sup>		For continuous rows specify length	
R Red <sup>2</sup>	4 FINISH	(e.g., 50'-0" must be multiples of 72"	
G Green <sup>2</sup>	1 Anodized Aluminum	and 18" lengths)	
B Blue <sup>2</sup>			

Footnotes:  
 1 White light variance between LEDs within a single fixture will not exceed +/- 200K  
 2 Colors are available in Standard Output only (10w/ft)

See website for Line .75 Series

For Metric Conversion	1"	1"	1"
	25.4mm	2.54cm	0.3m



### plane Marker LED-based Luminaire

#### Light Output

Reference detail section at [www.iolighting.com](http://www.iolighting.com) for more information on luminous distribution for all LED colors of light.

#### Construction

The .66" deep tile frame is anodized extruded aluminum and houses an acrylic lens. Gypsum board recessed housing frame is extruded aluminum and provides a flangeless edge condition. All recessed and surface mounted housings come standard with bar/joist hangers and junction boxes.

#### Electrical

120v or 277v energy saving current limiting Class 2 power supply (driver) is located within 1-1/2" or 2-1/8" deep, 4" octagonal junction box.

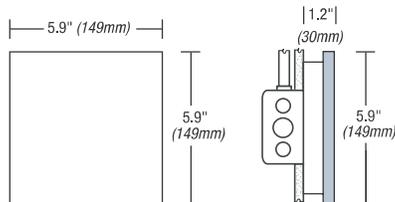
#### Power Consumption

Standard Output: 6.4 w

### plane Marker LED-based Luminaire

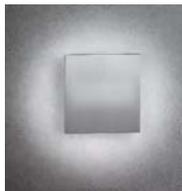
The plane marker is an LED-based luminaire that casts light from the edge of the housing, creating the illusion of a "floating plane." Outdoor applications include building and bridge demarcation. Excellent for interior applications where ambient illumination levels typically do not compete (e.g. restaurants, clubs and some retail). plane mounts directly to a junction box for wall mount applications. UL listed for wet/damp locations.

#### DIMENSIONS



#### COLOR OPTIONS

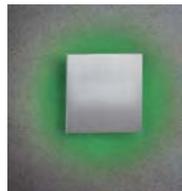
##### Perimeter Color



White



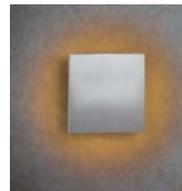
Red



Green



Blue



Amber

### Ordering Information

0	01	M					
io	1	2	3	4	5	6	7

1	PRODUCT FAMILY
01	Plane
2	TYPE
M	Marker

3	PERIMETER COLOR
3K	Warm White
5K	Cool White
R	Red
G	Green
B	Blue
A	Amber
C	Custom

4	MOUNTING
100	J-Box
999	Custom

5	FINISH
METAL CASTING (PAINTED)	
1	Black
2	Bronze
3	Satin Aluminum
4	White

METAL CASTING (PLATED)	
INTERIOR APPLICATIONS ONLY	
5	Satin Nickel
6	Chrome
7	Satin Brass

STAINLESS STEEL	
8	Brushed

CUSTOM COLOR	
9	Custom

6	VOLTAGE/DIMMING
0	120V
1	277V
Note: Dimming not available	

For Metric Conversion	1"	1"	1"
	25.4mm	2.54cm	0.3m

See website for additional models: Luminous Cube, Luminous Pyramid



### plane Custom Signage LED-based Luminaire

#### Light Output

plane signage may be used for interior or exterior applications. Numerals and logos are very legible in both light and dark environments. Samples are available for mock-ups.

#### Construction

Environmentally sealed enclosed and gasketed 5.9" sq. corrosion resistant metal casting (stainless steel optional). Mounts directly to a UV stable, optically clear, high strength polycarbonate housing. Acrylic sign is laser etched for custom sign configuration. LED luminaire module contained within the housing is replaceable. Customer to provide camera ready art. Contact your local io representative for signage order placement.

#### Electrical

120v or 277v energy saving current limiting Class 2 power supply (driver) is located within a 1-1/2" or 2-1/8" deep, 4" octagonal junction box.

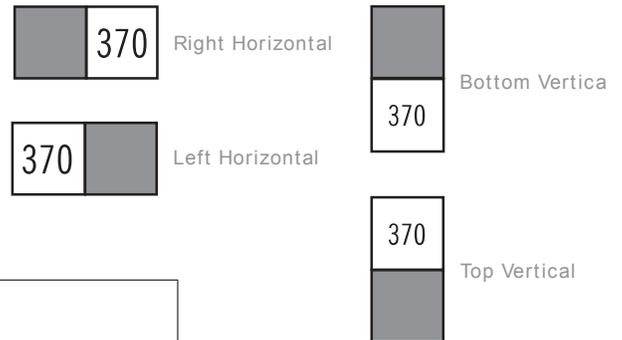
#### Power Consumption

Standard Output: 22 w

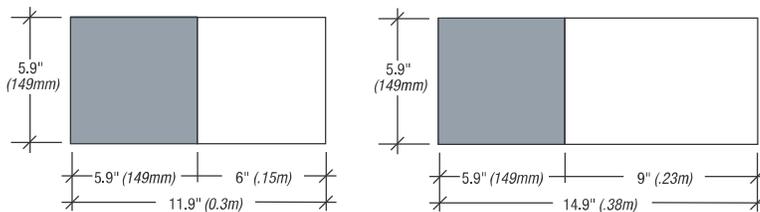
### plane Custom Signage LED-based Luminaire

This configuration of plane is an LED-based luminaire that offers custom signage solutions for exterior and interior architectural applications. Numeric addresses and/or logos are easily created, exploiting the finest details. plane mounts directly to a junction box for wall mount applications. UL listed for wet/damp locations.

#### ORIENTATION OPTIONS



#### DIMENSIONS



### Ordering Information



1	<u>PRODUCT FAMILY</u>	4	<u>EDGELIT COLOR</u>	6	<u>FINISH</u>	7	<u>VOLTAGE</u>
01	Plane	3K	Warm White	METAL CASTING (PAINTED)		0	120V
2	<u>TYPE</u>	5K	Cool White	1	Black	1	277V
SGA	6"	R	Red	2	Bronze	Note: Dimming not available	
SGB	9"	G	Green	3	Satin Aluminum		
		B	Blue	4	White		
3	<u>ORIENTATION</u>	A	Amber	METAL CASTING (PLATED)			
RH	Right Horizontal	C	Custom	INTERIOR APPLICATIONS ONLY			
LF	Left Horizontal	5	<u>MOUNTING</u>	5	Satin Nickel		
BV	Bottom Vertical	100	J-Box	6	Chrome		
TV	Top Vertical	999	Custom	7	Satin Brass		

STAINLESS STEEL  
8 Brushed

CUSTOM COLOR  
9 Custom

For Metric Conversion	1"	1"	1"
	25.4mm	2.54cm	0.3m



### tile 5" and 10" Square Luminous Tiles

#### Light Output

tile is designed to be used as a decorative accent luminaire. While lumen output is negligible, perceived brightness is substantial. io recommends reviewing samples prior to specification. Contact your local io representative to review samples.

#### Construction

The .66" deep tile frame is anodized extruded aluminum and houses an acrylic lens. Gypsum board recessed housing frame is extruded aluminum and provides a flangeless edge condition. All recessed and surface mounted housings come standard with bar/joist hangers and junction boxes.

#### Electrical

120v - 277v energy saving current limiting Class 2 power supply (driver) is provided by io and is located within the junction box.

#### Power Consumption

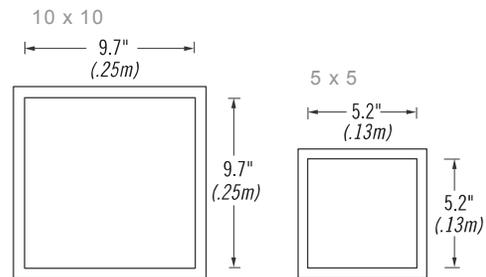
5 x 5: 8 watts

10 x 10: 10 watts

### tile 5" and 10" Square Luminous Tiles

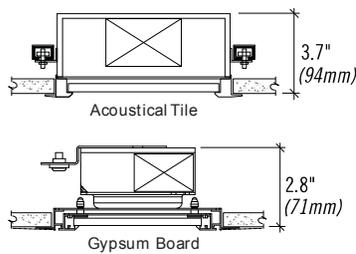
Recessed and surface mounted, 5" and 10" square luminous tiles may be mounted to either gypsum board walls and ceilings or acoustical tile ceilings. Six standard color options along with a plethora of custom colors offer designers a variety of design opportunities for interior applications. tile may also be customized with graphic inserts for a "signage option." tile is ideal for spaces where color is specified to provide visual cues, emphasize brand identity or simply artistic expression. tile may also be used for signage applications. Graphics may be emailed to io for insertion into the tile.

#### DIMENSIONS

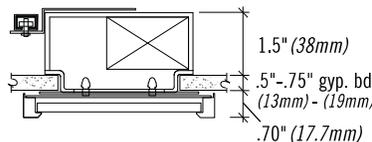


#### MOUNTING OPTIONS

##### Recessed



##### Surface Mount



### Ordering Information

0	02						
io	1	2	3	4	5	6	7

#### 1 PRODUCT FAMILY

02 Tile

#### 2 TYPE

- 5 5" x 5"
- 10 10" x 10"
- C Custom<sup>1</sup>

#### 3 COLOR

- R Red
- G Green
- B Blue
- A Amber
- FB Frost Blue
- FG Frost Green
- CC Custom Color

#### 4 MOUNTING

- 100 Surface Mounted Gyp Board (Ceiling or Wall)
- 101 Surface Mounted Acoustical Tile Ceiling
- 200 Recessed Gyp Board (Ceiling or Wall)
- 201 Recessed Gyp Board (Ceiling or Wall)
- 202 Recessed Acoustical Tile Ceiling
- 203 Recessed Acoustical Tile Ceiling Chicago Plenum Approved

#### 5 FINISH

- 1 Anodized Aluminum
- 2 Anodized Custom Color

#### 6 VOLTAGE/DIMMING

- 0 120V
- 1 277V
- 3 240V
- 4 Other

#### 7 SIGNAGE

- M Men's Room (10x10 only)
- W Women's Room (10x10 only)
- MH Men's Handicap (10x10 only)
- WH Women's Handicap (10x10 only)
- C Custom

#### Footnotes:

1 Custom sizes include 5" x 10", 5" x 14", 5" x 18", 10" x 14", 10" x 18"

For Metric Conversion	1"	1"	1"
	25.4mm	2.54cm	0.3m



### luxrail Indoor/Outdoor LED-based Handrail

#### Light Output

Two luminous intensities are available for white light. IES format files may be obtained from the factory or downloaded from [www.iolighting.com](http://www.iolighting.com).

Standard Output:  
3000K White: 34 lms/ft  
5000K White: 40 lms/ft

High Output:  
3000K White: 170 lms/ft  
5000K White: 230 lms/ft

#### Power Consumption

Standard Output: 2.1 w/ft

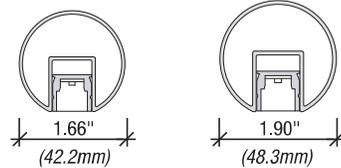
High Output: 7.6 w/ft

Power consumption does not include power supply losses. Consult io driver specification sheets (at [www.iolighting.com](http://www.iolighting.com)) for losses associated with each driver option.

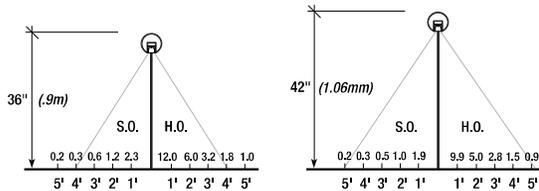
### luxrail Indoor/Outdoor LED-based Handrail

ANSI and ADA compliant, luxrail is an indoor/outdoor LED-based handrail that delivers functional illumination. Two intensities may be specified: standard output and high output. The standard light output version delivers illuminance levels appropriate for exterior applications (2 footcandles at grade) as well as for dark interior environments with low ambient illumination levels.

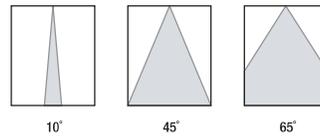
#### DIMENSIONS



#### LIGHT OUTPUT - 65 DEGREE WARM WHITE



#### BEAM SPREADS



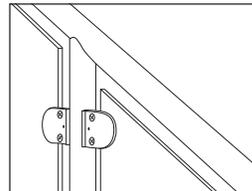
#### MOUNTING / INFILL OPTIONS



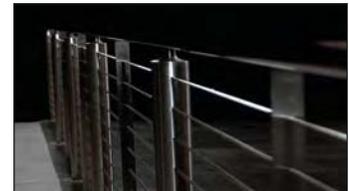
PM (post mounted)



WM (wall mount intermediate)



Glass Infill  
(glass provided by others)



Stainless steel cable infill

### Ordering Information

0	06									
io	1	2	3	4	5	6	7	8	9	10

#### 1 PRODUCT FAMILY

06 Luxrail

#### 2 ALLOY/FINISH

- SSS Stainless Steel Satin
- SSP Stainless Steel Polished
- CAA Clear Anodized Aluminum<sup>7</sup>

#### 3 SIZE

- 1 1.66" OD (1-1/4" pipe size)<sup>7</sup> (available for SS & CAA)
- 2 1.90" OD (1-1/2" pipe size)<sup>7</sup> (available for SS & CAA)

#### 4 MOUNTING

- PM Post Mounted<sup>7</sup>
- WM Wall or Guard Rail Mounted

#### 5 INFILL

- AC Aircraft Cable<sup>5</sup>
- GL Glass (provided by others)
- C Custom
- NR Not Required

#### 6 LIGHT DISTRIBUTION

- 10 10 Degree
- 45 45 Degree
- 65 65 Degree
- NI Handrail only (not illuminated)

#### 7 LIGHT COLOR

- 3K Warm White<sup>3</sup>
- 5K Cool White<sup>3</sup>
- 3KH0 Warm White<sup>3</sup>
- 5KH0 Cool White<sup>3</sup>
- R Red
- G Green
- B Blue

#### 8 LENGTH

Provide overall length of each handrail section Reference Footnote #2<sup>8</sup>

#### 9 VOLTAGE/DIMMING

- 1 120V
- 2 277V
- 3 120V w/dim
- 4 277V w/dim
- 5 Other

#### 10 SPECIFY DRIVER/DIMMING

Note: If left blank, io will supply 100 watt drivers, Download Power Supply specification sheet from [www.iolighting.com](http://www.iolighting.com)

#### Footnotes:

- 1 White light variance between LEDs within a single fixture will not exceed +/- 200K
- 2 Refer to conversion table for output High Output only (76 w/ft)
- 3 18" lengths may be installed in face up or face down applications 36", 54" and 72" lengths may be installed in face down applications only

For Metric Conversion	1"	1"	1"
	25.4mm	2.54cm	0.3m



### C-Scroll Wall

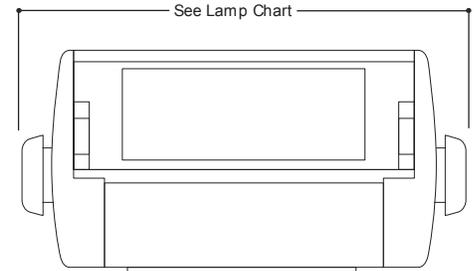
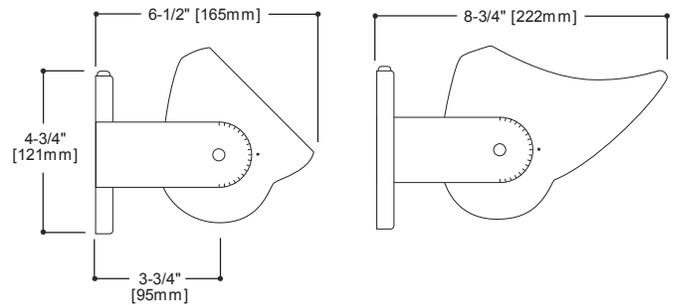
Housing is 6063 aluminum extrusion with die-cast aluminum end caps without exposed fasteners. Hinging doorframe for easy access to gasketed lamp compartment, and stainless steel hardware. Optional integrated extruded aluminum cutoff visor. Die-formed 94% reflective dual-finish anodized aluminum. PointGrab adjustable and lockable aiming system is preset at the factory (25 degrees max. cp. above horizontal). Additional 10-degree indicator marks allow for precise adjustments. Clear tempered glass, micro-prismatic tempered glass or optional U.V. glass (Small only). Use 90-degree supply wire. Tungsten - DC Bayonet (Small), Tungsten - RSC (Large), Standard canopy mounts over recessed junction box (by others). Support structure by others. Luminaire housing is finished using electrostatically applied polyester powder coat paint. Consult factory for custom colors. UL and cUL listed for damp locations.

### C-Scroll Wall

- MRI compliant
- Extruded aluminum housing
- Die-cast aluminum end caps
- Integrated visor option - solid, perf or opal window
- Die-formed 94% reflective dual-finish anodized aluminum reflector
- Electrostatically applied polyester powder coat paint finish
- Gasketed hinging doorframe
- PointGrab™ adjustment

See website for complete product offering

#### C-Scroll Small Wall (SI)



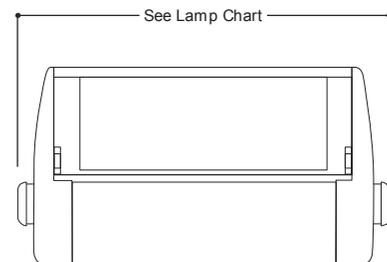
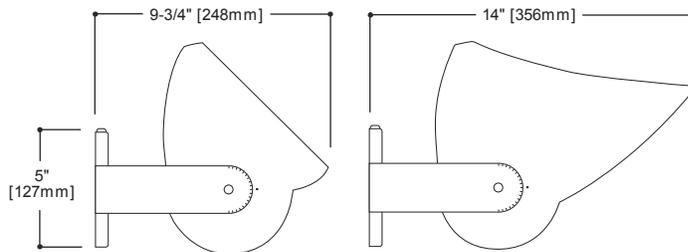
Lamp Chart (C-Scroll Wall Small)

Source	Wattage	Length
Tungsten	100	10-3/4"
	150	12-3/4"
	250	12-3/4"

Lamp Chart (C-Scroll Wall Large)

Source	Wattage	Length
Tungsten	350/500	22-1/2"
	900/1000	30-1/2"

#### C-Scroll Large Wall (LI)



### Ordering Information

SAMPLE NUMBER: SO-SI-P-1-T-250-120-W-YR

<b>Product</b> MRI-SN=C-Scroll No Visor MRI-SS=C-Scroll Solid Visor MRI-SP=C-Scroll Perf Visor MRI-SO=C-Scroll Opal Visor	<b>Lens</b> P=Micro-Prismatic C=Clear U=U V (SI only)	<b>Wattage</b> Small (SI) 100=100W 150=150W 250=250W Large (LI) 350=350W 500=500W 900=900W 01K=1000W	<b>Voltage</b> 120=120V	<b>Finish</b> W=White S=Silver B=Bronze C=Custom	<b>Options</b> L45=45° Cross Blade Louver L25=25° Cross Blade Louver
<b>Size - In/ Outdoor</b> SI=Small Indoor LI=Large Indoor	<b>Number of Lamps</b> 1=1 Lamp			<b>Mounting</b> YR=Yoke / Remote	
	<b>Lamp Type</b> T=Tungston Halogen				

Notes: For additional options, consult your Cooper Lighting Representative Specifications and dimensions subject to change without notice



### C-Scroll Ceiling

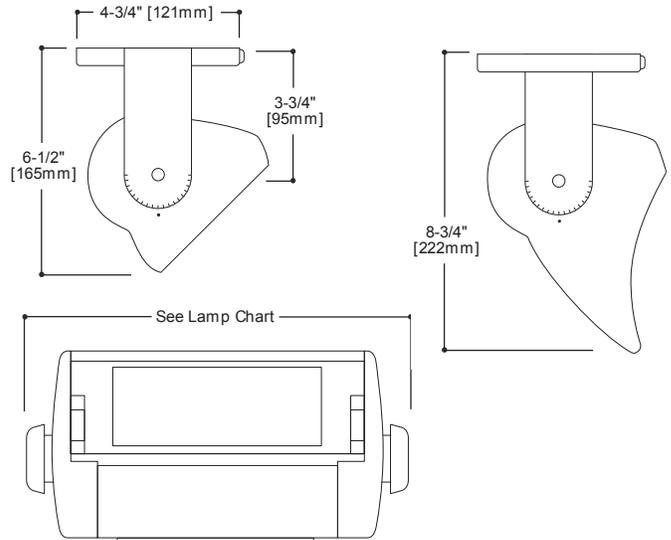
Housing is 6063 aluminum extrusion with die-cast aluminum end caps without exposed fasteners. Hinging doorframe for easy access to gasketed lamp compartment, and stainless steel hardware. Optional integrated extruded aluminum cutoff visor. Die-formed 94% reflective dual-finish anodized aluminum. PointGrab adjustable and lockable aiming system is preset at the factory (25 degrees max. cp. above nadir). Additional 10-degree indicator marks allow for precise adjustments. Clear tempered glass, micro-prismatic tempered glass or optional U.V. glass (Small). Use 90-degree supply wire. Tungsten - DC Bayonet (Small), Tungsten - RSC (Large). Standard canopy mounts over recessed junction box (by others). Support structure by others. Luminaire housing is finished using electrostatically applied polyester powder coat paint. Consult factory for custom colors. UL and cUL listed for damp locations.

### C-Scroll Ceiling

- ☑ MRI compliant
- ☑ Extruded aluminum housing
- ☑ Die-cast aluminum end caps
- ☑ Integrated visor option - solid, perf or opal window
- ☑ Die-formed 94% reflective dual-finish anodized aluminum reflector
- ☑ Electrostatically applied polyester powder coat paint finish
- ☑ Gasketed hinging doorframe
- ☑ PointGrab™ adjustment

See website for complete product offering

#### C-Scroll Small Ceiling (SI)



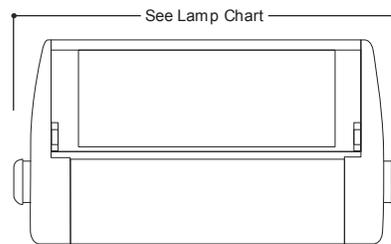
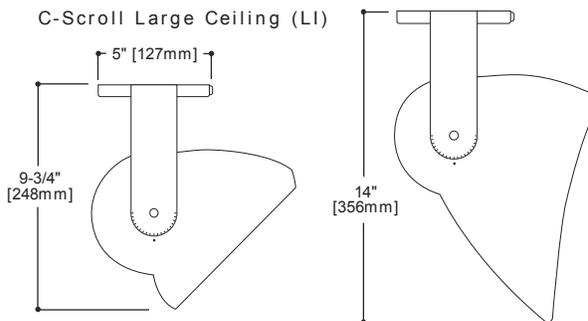
Lamp Chart (C-Scroll Ceiling Small)

Source	Wattage	Length
Tungsten	100	10-3/4"
	150	12-3/4"
	250	12-3/4"

Lamp Chart (C-Scroll Ceiling Large)

Source	Wattage	Length
Tungsten	350/500	22-1/2"
	900/1000	30-1/2"

#### C-Scroll Large Ceiling (LI)

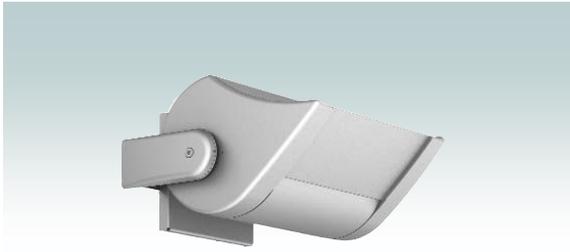


### Ordering Information

SAMPLE NUMBER: SO-SI-P-1-T-100-120-W-YR

<b>Product</b> MRI-SN=C-Scroll No Visor MRI-SS=C-Scroll Solid Visor MRI-SP=C-Scroll Perf Visor MRI-SO=C-Scroll Opal Visor	<b>Lens</b> P=Micro-Prismatic C=Clear U=U V (SI only)	<b>Wattage</b> Small (SI) 100=100W 150=150W 250=250W Large (LI) 350=350W 500=500W 900=900W 01K=1000W	<b>Voltage</b> 120=120V	<b>Finish</b> W=White S=Silver B=Bronze C=Custom	<b>Options</b> L45=45° Cross Blade Louver L25=25° Cross Blade Louver
<b>Size - In/Outdoor</b> SI=Small Indoor LI=Large Indoor	<b>Number of Lamps</b> 1=1 Lamp	<b>Mounting</b> YR=Yoke / Remote			
<b>Lamp Type</b> T=Tungsten Halogen					

Notes: For additional options, consult your Cooper Lighting Representative. Specifications and dimensions subject to change without notice.



## Roundel Wall

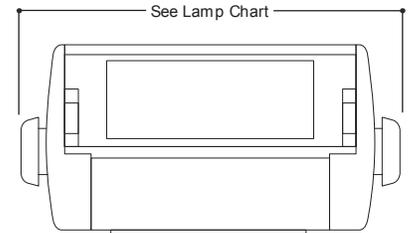
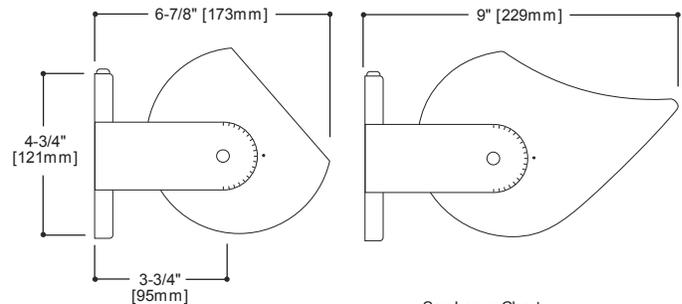
Housing is 6063 aluminum extrusion with die-cast aluminum end caps without exposed fasteners. Hinging doorframe for easy access to gasketed lamp compartment, and stainless steel hardware. Optional integrated extruded aluminum cutoff visor. Die-formed 94% reflective dual-finish anodized aluminum. PointGrab adjustable and lockable aiming system is preset at the factory (25 degrees max. cp. above horizontal). Additional 10-degree indicator marks allow for precise adjustments. Clear tempered glass, micro-prismatic tempered glass or optional U.V. glass. Use 90-degree supply wire. Tungsten - DC Bayonet (Small), Tungsten - RSC (Large). Standard canopy mounts over recessed junction box (by others). Support structure by others. Luminaire housing is finished using electrostatically applied polyester powder coat paint. Consult factory for custom colors. UL and cUL listed for damp locations.

## Roundel Wall

- MRI compliant
- Extruded aluminum housing
- Die-cast aluminum end caps
- Integrated visor option - solid, perf or opal window
- Die-formed 94% reflective dual-finish anodized aluminum reflector
- Electrostatically applied polyester powder coat paint finish
- Gasketed hinging doorframe
- PointGrab™ adjustment

See website for complete product offering

Roundel Small Wall (SI)



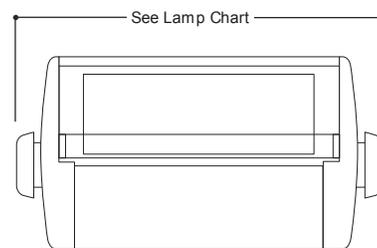
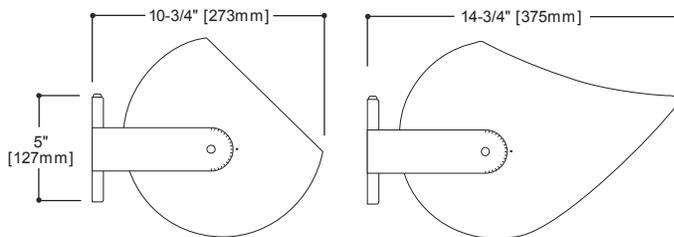
Lamp Chart (Roundel Wall Small)

Source	Wattage	Length
Tungsten	100	10-3/4"
	150	12-3/4"
	250	12-3/4"

Lamp Chart (Roundel Wall Large)

Source	Wattage	Length
Tungsten	350/500	22-1/2"
	900/1000	30-1/2"

Roundel Large Wall (LI)



## Ordering Information

SAMPLE NUMBER: RO-SI-P-1-T-250-120-W-YR

<b>Product</b> MRI-RN=Roundel No Visor MRI-RS=Roundel Solid Visor MRI-RP=Roundel Perf Visor MRI-RO=Roundel Opal Visor	<b>Lens</b> P=Micro-Prismatic C=Clear U=U V (SI only)	<b>Wattage</b> Small (SI) 100=100W 150=150W 250=250W Large (LI) 350=350W 500=500W 900=900W 01K=1000W	<b>Voltage</b> 120=120V	<b>Finish</b> W=White S=Silver B=Bronze C=Custom	<b>Options</b> L45=45° Cross Blade Louver L25=25° Cross Blade Louver
<b>Size - In/ Outdoor</b> SI=Small Indoor LI=Large Indoor	<b>Number of Lamps</b> 1=1 Lamp			<b>Mounting</b> YR=Yoke / Remote	
	<b>Lamp Type</b> T=Tungston Halogen				

Notes: For additional options, consult your Cooper Lighting Representative. Specifications and dimensions subject to change without notice.



## Roundel Ceiling

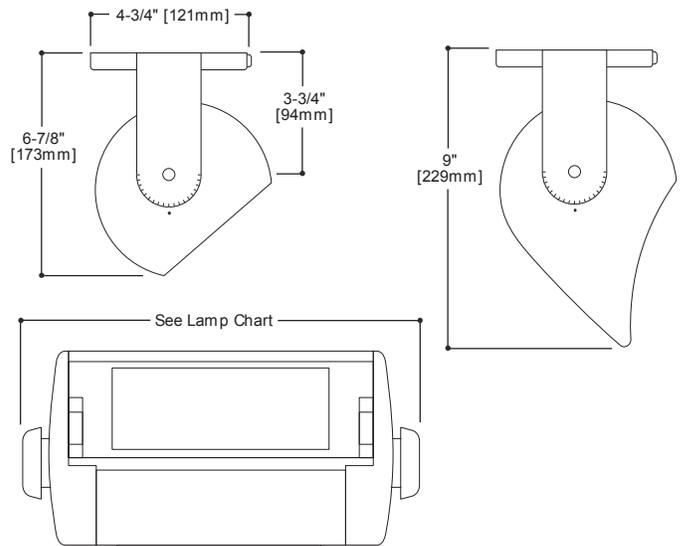
Housing is 6063 aluminum extrusion with die-cast aluminum end caps without exposed fasteners. Hinging doorframe for easy access to gasketed lamp compartment, and stainless steel hardware. Optional integrated extruded aluminum cutoff visor. Die-formed 94% reflective dual-finish anodized aluminum. PointGrab adjustable and lockable aiming system is preset at the factory (25 degrees max. cp. above nadir). Additional 10-degree indicator marks allow for precise adjustments. Clear tempered glass, micro-prismatic tempered glass or optional U.V. glass. Use 90-degree supply wire. Tungsten - DC Bayonet (Small), Tungsten - RSC (Large). Standard canopy mounts over recessed junction box (by others). Support structure by others. Luminaire housing is finished using electrostatically applied polyester powder coat paint. Consult factory for custom colors. UL and cUL listed for damp locations.

## Roundel Ceiling

- MRI compliant
- Extruded aluminum housing
- Die-cast aluminum end caps
- Integrated visor option - solid, perf or opal window
- Die-formed 94% reflective dual-finish anodized aluminum reflector
- Electrostatically applied polyester powder coat paint finish
- Gasketed hinging doorframe
- PointGrab™ adjustment

See website for complete product offering

### Roundel Small Ceiling (SI)



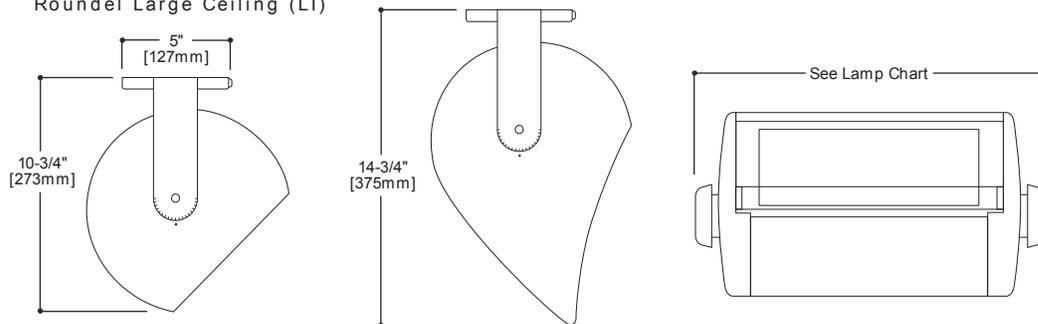
Lamp Chart (Roundel Ceiling Small)

Source	Wattage	Length
Tungsten	100	10-3/4"
	150	12-3/4"
	250	12-3/4"

Lamp Chart (Roundel Ceiling Large)

Source	Wattage	Length
Tungsten	350/500	22-1/2"
	900/1000	30-1/2"

### Roundel Large Ceiling (LI)

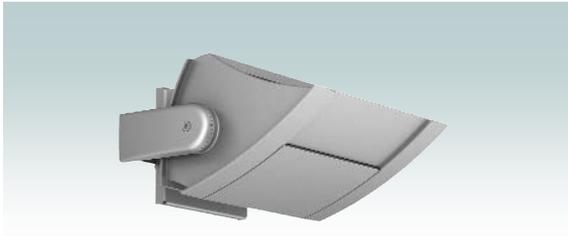


## Ordering Information

SAMPLE NUMBER: RO-SI-P-1-T-100-120-W-YR

<b>Product</b> MRI-RN=Roundel No Visor MRI-RS=Roundel Solid Visor MRI-RP=Roundel Perf Visor MRI-RO=Roundel Opal Visor	<b>Lens</b> P=Micro-Prismatic C=Clear U=U V (SI only)	<b>Wattage</b> Small (SI) 100=100W 150=150W 250=250W Large (LI) 350=350W 500=500W 900=900W 01K=1000W	<b>Voltage</b> 120=120V	<b>Finish</b> W=White S=Silver B=Bronze C=Custom	<b>Options</b> L45=45° Cross Blade Louver L25=25° Cross Blade Louver
<b>Size - In/ Outdoor</b> SI=Small Indoor LI=Large Indoor	<b>Number of Lamps</b> 1=1 Lamp			<b>Mounting</b> YR=Yoke / Remote	
	<b>Lamp Type</b> T=Tungston Halogen				

Notes: For additional options, consult your Cooper Lighting Representative. Specifications and dimensions subject to change without notice.



### Vault Wall

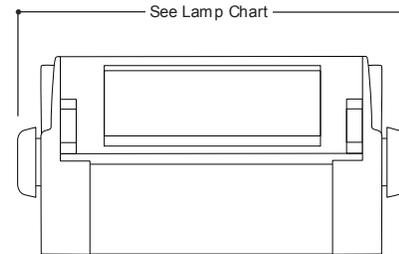
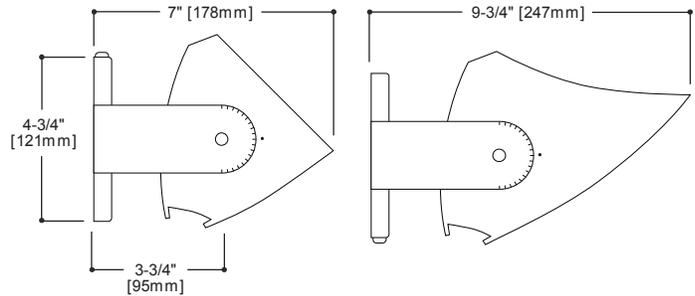
- MRI compliant
- Extruded aluminum housing
- Die-cast aluminum end caps
- Integrated visor option - solid, perf or opal window
- Die-formed 94% reflective dual-finish anodized aluminum reflector
- Electrostatically applied polyester powder coat paint finish
- Gasketed hinging doorframe
- PointGrab™ adjustment

See website for complete product offering

### Vault Wall

Housing is 6063 aluminum extrusion with die-cast aluminum end caps without exposed fasteners. Hinging doorframe for easy access to gasketed lamp compartment, and stainless steel hardware. Optional integrated extruded aluminum cutoff visor. Die-formed 94% reflective dual-finish anodized aluminum. PointGrab adjustable and lockable aiming system is preset at the factory (25 degrees max. cp. above horizontal). Additional 10-degree indicator marks allow for precise adjustments. Clear tempered glass, micro-prismatic tempered glass or optional U.V. glass. Use 90-degree supply wire. Tungsten - DC Bayonet (Small), Tungsten - RSC (Large). Standard canopy mounts over recessed junction box (by others). Support structure by others. Luminaire housing is finished using electrostatically applied polyester powder coat paint. Consult factory for custom colors. UL and cUL listed for damp locations.

Vault Small Wall (SI)



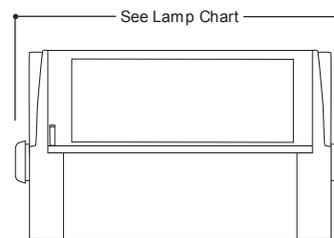
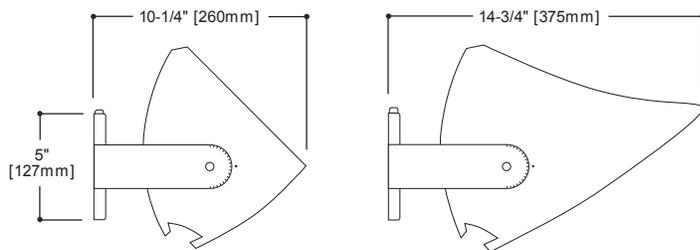
Lamp Chart (Vault Wall Small)

Source	Wattage	Length
Tungsten	100	10-3/4"
	150	12-3/4"
	250	12-3/4"

Lamp Chart (Vault Wall Large)

Source	Wattage	Length
Tungsten	350/500	22-1/2"
	900/1000	30-1/2"

Vault Large Wall (LI)



### Ordering Information

SAMPLE NUMBER: VN-SI-P-1-T-150-120-W-YR

<b>Product</b> MRI-VN=Vault No Visor MRI-VS=Vault Solid Visor MRI-VP=Vault Perf Visor MRI-VO=Vault Opal Visor	<b>Lens</b> P=Micro-Prismatic C=Clear U=U V (SI only)	<b>Wattage</b> Small (SI) 100=100W 150=150W 250=250W Large (LI) 350=350W 500=500W 900=900W 01K=1000W	<b>Voltage</b> 120=120V	<b>Finish</b> W=White S=Silver B=Bronze C=Custom	<b>Options</b> L45=45° Cross Blade Louver L25=25° Cross Blade Louver
<b>Size - In/ Outdoor</b> SI=Small Indoor LI=Large Indoor	<b>Number of Lamps</b> 1=1 Lamp			<b>Mounting</b> YR=Yoke / Remote	
	<b>Lamp Type</b> T=Tungston Halogen				

Notes: For additional options, consult your Cooper Lighting Representative. Specifications and dimensions subject to change without notice.



### Vault Ceiling

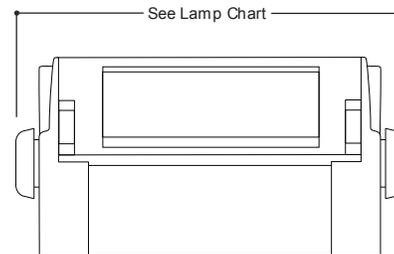
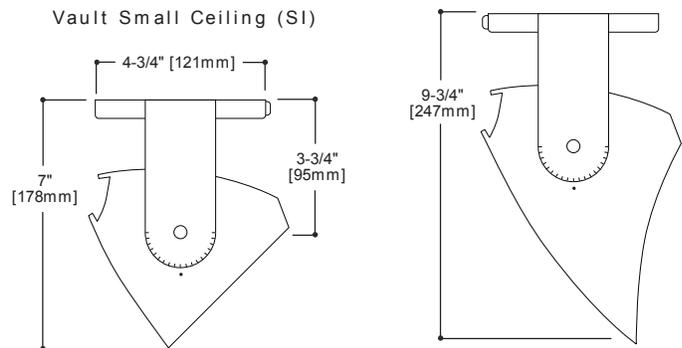
Housing is 6063 aluminum extrusion with die-cast aluminum end caps without exposed fasteners. Hinging doorframe for easy access to gasketed lamp compartment, and stainless steel hardware. Optional integrated extruded aluminum cutoff visor. Die-formed 94% reflective dual-finish anodized aluminum. PointGrab adjustable and lockable aiming system is preset at the factory (25 degrees max. cp. above nadir). Additional 10-degree indicator marks allow for precise adjustments. Clear tempered glass, micro-prismatic tempered glass or optional U.V. glass. Use 90-degree supply wire. Tungsten - DC Bayonet (Small), Tungsten - RSC (Large). Standard canopy mounts over recessed junction box (by others). Support structure by others. Luminaire housing is finished using electrostatically applied polyester powder coat paint. Consult factory for custom colors. UL and cUL listed for damp locations.

### Vault Ceiling

- ☑ MRI compliant
- ☑ Extruded aluminum housing
- ☑ Die-cast aluminum end caps
- ☑ Integrated visor option - solid, perf or opal window
- ☑ Die-formed 94% reflective dual-finish anodized aluminum reflector
- ☑ Electrostatically applied polyester powder coat paint finish
- ☑ Gasketed hinging doorframe
- ☑ PointGrab™ adjustment

See website for complete product offering

Vault Small Ceiling (SI)



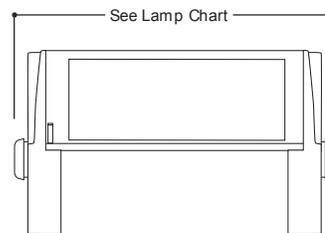
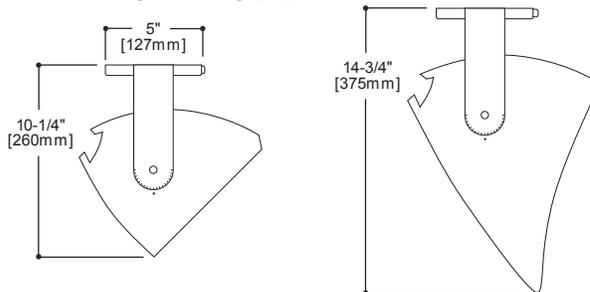
Lamp Chart (Vault Ceiling Small)

Source	Wattage	Length
Tungsten	100	10-3/4"
	150	12-3/4"
	250	12-3/4"

Lamp Chart (Vault Ceiling Large)

Source	Wattage	Length
Tungsten	350/500	22-1/2"
	900/1000	30-1/2"

Vault Large Ceiling (LI)

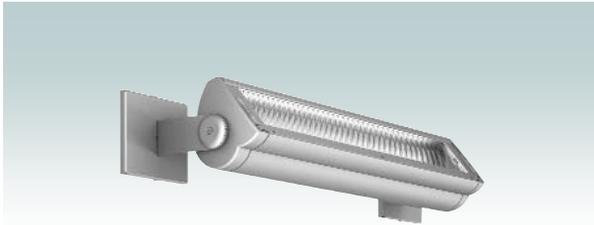


### Ordering Information

SAMPLE NUMBER: VN-SI-P-1-T-250-120-W-YR

<b>Product</b> MRI-VN=Vault No Visor MRI-VS=Vault Solid Visor MRI-VP=Vault Perf Visor MRI-VO=Vault Opal Visor	<b>Lens</b> P=Micro-Prismatic C=Clear U=U V (SI only)	<b>Wattage</b> Small (SI) 100=100W 150=150W 250=250W Large (LI) 350=350W 500=500W 900=900W 01K=1000W	<b>Voltage</b> 120=120V	<b>Finish</b> W=White S=Silver B=Bronze C=Custom	<b>Options</b> L45=45° Cross Blade Louver L25=25° Cross Blade Louver
<b>Size - In/Outdoor</b> SI=Small Indoor LI=Large Indoor	<b>Number of Lamps</b> 1=1 Lamp			<b>Mounting</b> YR=Yoke / Remote	
	<b>Lamp Type</b> T=Tungston Halogen				

Notes: For additional options, consult your Cooper Lighting Representative. Specifications and dimensions subject to change without notice.



### C-Scroll Small Integral Individual Linear Wall

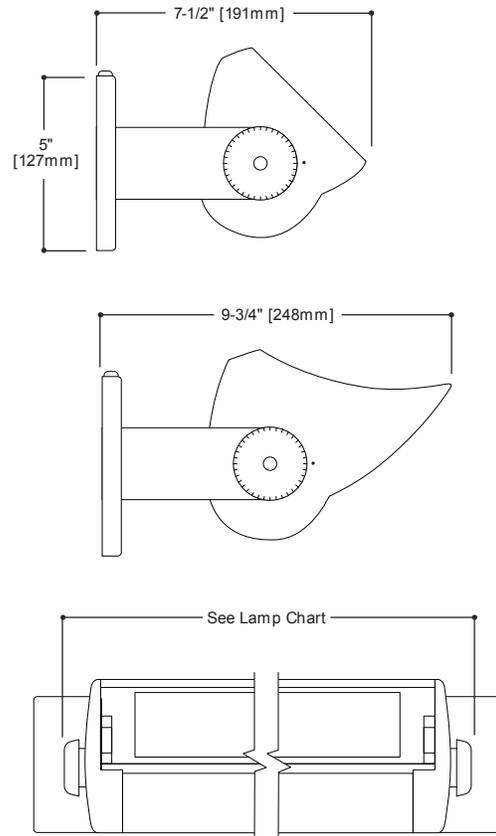
Housing is 6063 aluminum extrusion with die-cast aluminum end caps without exposed fasteners. Hinging doorframe for easy access to gasketed lamp compartment, and stainless steel hardware. Optional integrated extruded aluminum cutoff visor. Die-formed 94% reflective dual-finish anodized aluminum. PointGrab adjustable and lockable aiming system is preset at the factory (25 degrees max. cp. above horizontal). Additional 10-degree indicator marks allow for precise adjustments. Indoor: Clear acrylic lens/door assembly is standard. Aluminum doorframe with no lens, prismatic glass lens, or clear glass lens is optional. Outdoor: Gasketed aluminum doorframe with prismatic glass lens is standard. Gasketed aluminum doorframe with clear glass lens is optional. Use 90 degree supply wire. Linear Fluorescent - Medium Bi-pin and Mini Bi-pin. Ballast is integral to luminaire and includes quick-disconnect to provide a safe, reliable means of disconnecting power to the fixture during service and maintenance. Standard canopy mounts over recessed junction box (by others). Support structure by others. Luminaire housing is finished using electrostatically applied polyester powder coat paint. Consult factory for custom colors. Labels UL and cUL listed for damp locations. Optional wet location listing is available.

### C-Scroll Small Integral Individual Linear Wall

- Extruded aluminum housing
- Die-cast aluminum end caps
- Integrated visor option
- Die-formed 94% reflective dual-finish anodized aluminum reflector
- Electrostatically applied polyester powder coat paint finish
- Hinging doorframe
- PointGrab™ adjustment

See website for complete product offering

C-Scroll Small Integral Individual Linear Wall



Lamp Chart (C-Scroll Small Integral Individual Linear - Wall)

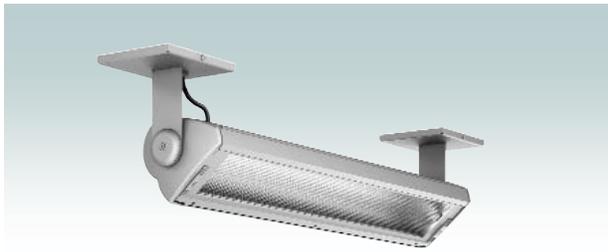
Source	Wattage	Length
T8	17	28-1/2"
	25	40-3/4"
	32	52-3/4"
T5/T5HO	14/24	28-1/2"
	21/39	40-3/4"
	28/54	52-3/4"

### Ordering Information

SAMPLE NUMBER: SN-SI-C-1-F-021-120-W-YI

<b>Product</b> SN=C-Scroll No Visor SS=C-Scroll Solid Visor	<b>Lens</b> A=Acrylic <sup>1</sup> N=None <sup>2</sup> P=Micro-Prismatic <sup>3</sup> C=Clear	<b>Wattage</b> 014=14W (2' T5) 017=17W (2' T8) 021=21W (3' T5) 024=24W (2' T5HO) 025=25W (3' T8) 028=28W (4' T5) 032=32W (4' T8) 039=39W (3' T5HO) 054=54W (4' T5HO)	<b>Voltage</b> 120=120V 277=277V 347=347V UNV=Universal	<b>Finish</b> W=White S=Silver B=Bronze C=Custom	<b>Options</b> L45=45° Cross Blade Louver L25=25° Cross Blade Louver
<b>Size - In/Outdoor</b> SI=Small Indoor SO=Small Outdoor	<b>Number of Lamps</b> 1=1 Lamp			<b>Mounting</b> YI=Yoke / Integral	
	<b>Lamp Type</b> B=Battery Pack (Remote Mount) F=Fluorescent - Electronic				

Notes: <sup>1</sup> Standard for indoor models For use with indoor models only <sup>2</sup> For use with indoor models only <sup>3</sup> Standard for outdoor models For additional options, consult your Cooper Lighting Representative Specifications and dimensions subject to change without notice



### C-Scroll Small Integral Individual Linear Ceiling

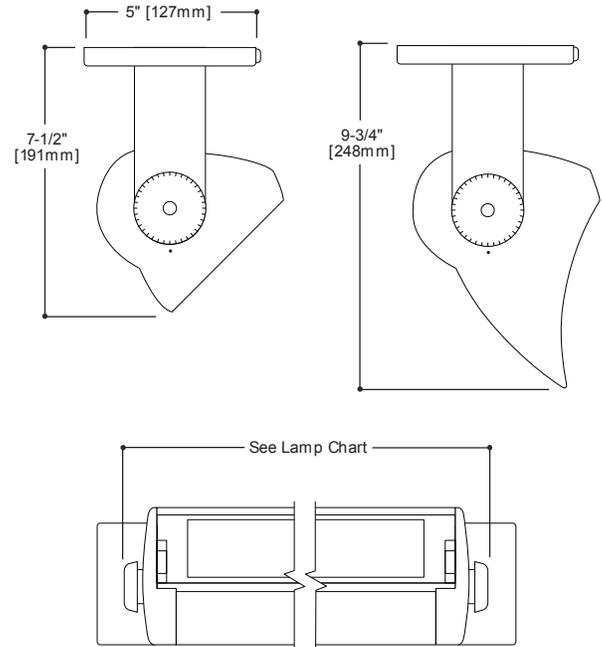
Housing is 6063 aluminum extrusion with die-cast aluminum end caps without exposed fasteners. Hinging doorframe for easy access to gasketed lamp compartment, and stainless steel hardware. Optional integrated extruded aluminum cutoff visor. Die-formed 94% reflective dual-finish anodized aluminum. PointGrab adjustable and lockable aiming system is preset at the factory (25 degrees max. cp. above nadir). Additional 10-degree indicator marks allow for precise adjustments. Indoor: Clear acrylic lens/door assembly is standard. Aluminum doorframe with no lens, prismatic glass lens, or clear glass lens is optional. Outdoor: Gasketed aluminum doorframe with prismatic glass lens is standard. Gasketed aluminum doorframe with clear glass lens is optional. Use 90 degree supply wire. Linear Fluorescent - Medium Bi-pin and Mini Bi-pin. Ballast is integral to luminaire and includes quick-disconnect to provide a safe, reliable means of disconnecting power to the fixture during service and maintenance. Standard canopy mounts over recessed junction box (by others). Support structure by others. Luminaire housing is finished using electrostatically applied polyester powder coat paint. Consult factory for custom colors. Labels UL and cUL listed for damp locations. Optional wet location listing is available.

### C-Scroll Small Integral Individual Linear Ceiling

- Extruded aluminum housing
- Die-cast aluminum end caps
- Integrated visor option
- Die-formed 94% reflective dual-finish anodized aluminum reflector
- Electrostatically applied polyester powder coat paint finish
- Hinging doorframe
- PointGrab™ adjustment

See website for complete product offering

### C-Scroll Small Integral Individual Linear Ceiling



Lamp Chart (C-Scroll Small Integral Individual Linear - Ceiling)

Source	Wattage	Length
T8	17	28-1/2"
	25	40-3/4"
	32	52-3/4"
T5/T5HO	14/24	28-1/2"
	21/39	40-3/4"
	28/54	52-3/4"

### Ordering Information

SAMPLE NUMBER: SN-SI-C-1-F-021-120-W-YI

<b>Product</b> SN=C-Scroll No Visor SS=C-Scroll Solid Visor	<b>Lens</b> A=Acrylic <sup>1</sup> N=None <sup>2</sup> P=Micro-Prismatic <sup>3</sup> C=Clear	<b>Wattage</b> 014=14W (2' T5) 017=17W (2' T8) 021=21W (3' T5) 024=24W (2' T5HO) 025=25W (3' T8) 028=28W (4' T5) 032=32W (4' T8) 039=39W (3' T5HO) 054=54W (4' T5HO)	<b>Voltage</b> 120=120V 277=277V 347=347V UNV=Universal	<b>Finish</b> W=White S=Silver B=Bronze C=Custom	<b>Options</b> L45=45° Cross Blade Louver L25=25° Cross Blade Louver
<b>Size - In/Outdoor</b> SI=Small Indoor SO=Small Outdoor	<b>Number of Lamps</b> 1=1 Lamp	<b>Lamp Type</b> B=Battery Pack (Remote Mount) F=Fluorescent - Electronic	<b>Mounting</b> YI=Yoke / Integral		

Notes: <sup>1</sup> Standard for indoor models For use with indoor models only <sup>2</sup> For use with indoor models only <sup>3</sup> Standard for outdoor models For additional options, consult your Cooper Lighting Representative Specifications and dimensions subject to change without notice



### Roundel Large Integral Ceiling

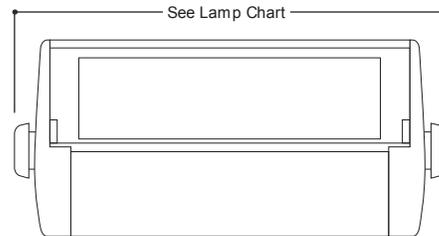
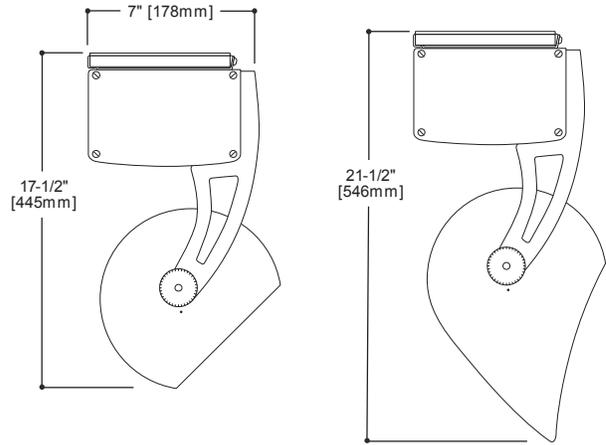
Housing is 6063 aluminum extrusion with die-cast aluminum end caps without exposed fasteners. Hinging doorframe for easy access to gasketed lamp compartment, and stainless steel hardware. Optional integrated extruded aluminum cutoff visor. Die-formed 94% reflective dual-finish anodized aluminum. PointGrab adjustable and lockable aiming system is preset at the factory (25 degrees max. cp. above nadir). Additional 10-degree indicator marks allow for precise adjustments. Clear tempered glass, micro-prismatic tempered glass. Use 90-degree supply wire. Metal Halide - G12, Medium and Mogul, and Fluorescent - GX24Q and 2G11. Ballast is integral to luminaire. Mounting Standard canopy mounts over recessed junction box (by others). Support structure by others. Finish Luminaire housing is finished using electrostatically applied polyester powder coat paint. Consult factory for custom colors. Labels UL and cUL listed for damp locations. Optional wet location listing is available.

### Roundel Large Integral Ceiling

- ☑ Extruded aluminum housing
- ☑ Die-cast aluminum end caps
- ☑ Integrated visor option - solid, perf or opal window
- ☑ Die-formed 94% reflective dual-finish anodized aluminum reflector
- ☑ Electrostatically applied polyester powder coat paint finish
- ☑ Gasketed hinging doorframe
- ☑ PointGrab™ adjustment

See website for complete product offering

Roundel Large Integral Ceiling



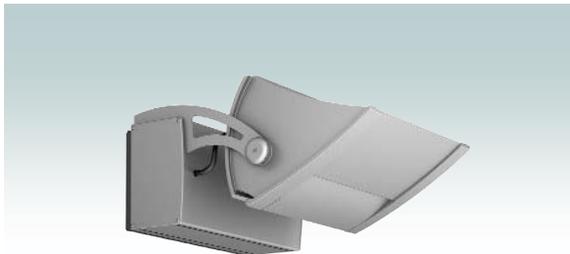
Lamp Chart (Roundel Large Integral - Ceiling)

Source	Wattage	Length
Metal Halide	100/175	16-1/2"
	(2) 150/250/400	22-1/2"
	(2) 400	30-1/2"
Fluorescent	32/42/57	16-1/2"
	(2) 32/42	22-1/2"
	40/50/55	30-1/2"
	(2) 40/50/55	30-1/2"

### Ordering Information

SAMPLE NUMBER: RO-LI-P-1-M-250-120-W-Y101

<b>Product</b> RN=Roundel No Visor RS=Roundel Solid Visor RP=Roundel Perf Visor RO=Roundel Opal Visor	<b>Lens</b> N=None <sup>1</sup> P=Micro-Prismatic C=Clear	<b>Wattage</b> 032=32W <sup>3</sup> 036=36W <sup>3</sup> 040=40W <sup>3</sup> 042=42W <sup>3</sup> 050=50W <sup>3</sup> 055=55W <sup>3</sup> 057=57W 100=100W 150=150W <sup>2</sup> 175=175W 250=250W <sup>3</sup> 400=400W <sup>3</sup>	<b>Voltage</b> 120=120V 277=277V 347=347V	<b>Finish</b> W=White S=Silver B=Bronze C=Custom	<b>Options</b> L45=45° Cross Blade Louver L25=25° Cross Blade Louver
<b>Size - In/Outdoor</b> LI=Large Indoor LO=Large Outdoor	<b>Number of Lamps</b> 1=1 Lamp 2=2 Lamps	<b>Lamp Type</b> E=Metal Halide - Electronic <sup>2</sup> F=Fluorescent - Electronic M=Metal Halide - Magnetic <sup>2</sup> R=Metal Halide - Restrike		<b>Mounting</b> Y101=Yoke Integral Style 01 Y102=Yoke Integral Style 02 Y103=Yoke Integral Style 03 Y104=Yoke Integral Style 04	



## Vault Large Integral Wall

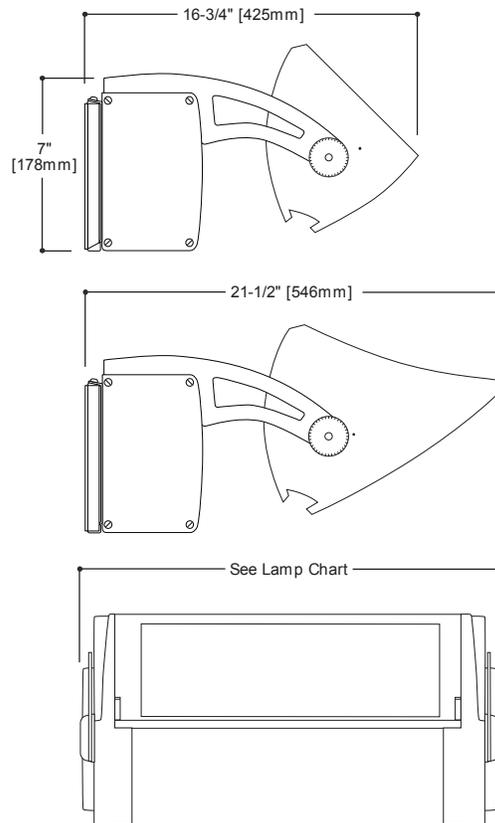
Housing is 6063 aluminum extrusion with die-cast aluminum end caps without exposed fasteners. Hinging doorframe for easy access to gasketed lamp compartment, and stainless steel hardware. Optional integrated extruded aluminum cutoff visor. Die-formed 94% reflective dual-finish anodized aluminum. PointGrab adjustable and lockable aiming system is preset at the factory (25 degrees max. cp. above horizontal). Additional 10-degree indicator marks allow for precise adjustments. Clear tempered glass, micro-prismatic tempered glass. Use 90-degree supply wire. Metal Halide - G12, Medium and Mogul, and Fluorescent - GX24Q and 2G11. Standard canopy mounts over recessed junction box (by others). Support structure by others. Finish Luminaire housing is finished using electrostatically applied polyester powder coat paint. Consult factory for custom colors. Labels UL and cUL listed for damp locations. Optional wet location listing is available.

## Vault Large Integral Wall

- Extruded aluminum housing
- Die-cast aluminum end caps
- Integrated visor option - solid, perf or opal window
- Die-formed 94% reflective dual-finish anodized aluminum reflector
- Electrostatically applied polyester powder coat paint finish
- Gasketed hinging doorframe
- PointGrab™ adjustment

See website for complete product offering

### Vault Large Integral Wall



Lamp Chart (Vault Large Integral Wall)

Source	Wattage	Length
Metal Halide	100/175	16-1/2"
	(2) 150/250/400	22-1/2"
	(2) 400	30-1/2"
Fluorescent	32/42/57	16-1/2"
	(2) 32/42	22-1/2"
	40/50/55	30-1/2"
	(2) 40/50/55	30-1/2"

## Ordering Information

SAMPLE NUMBER: VN-LI-P-1-M-250-120-W-Y101

<b>Product</b> VN=Vault No Visor VS=Vault Solid Visor VP=Vault Perf Visor VO=Vault Opal Visor	<b>Lens</b> N=None <sup>1</sup> P=Micro-Prismatic C=Clear	<b>Wattage</b> 032=32W <sup>3</sup> 036=36W <sup>3</sup> 040=40W <sup>3</sup> 042=42W <sup>3</sup> 050=50W <sup>3</sup> 055=55W <sup>3</sup> 057=57W 100=100W 150=150W <sup>2</sup> 175=175W 250=250W <sup>3</sup> 400=400W <sup>3</sup>	<b>Voltage</b> 120=120V 277=277V 347=347V	<b>Finish</b> W=White S=Silver B=Bronze C=Custom	<b>Options</b> L45=45° Cross Blade Louver L25=25° Cross Blade Louver
<b>Size - In/Outdoor</b> LI=Large Indoor LO=Large Outdoor	<b>Number of Lamps</b> 1=1 Lamp 2=2 Lamps			<b>Mounting</b> Y101=Yoke Integral Style 01 Y102=Yoke Integral Style 02 Y103=Yoke Integral Style 03 Y104=Yoke Integral Style 04	
	<b>Lamp Type</b> E=Metal Halide - Electronic <sup>2</sup> F=Fluorescent - Electronic M=Metal Halide - Magnetic R=Metal Halide - Restrike				

Notes: <sup>1</sup> Fluorescent indoor only <sup>2</sup> 2 lamps only <sup>3</sup> Available with 1 or 2 lamps For additional options, consult your Cooper Lighting Representative Specifications and dimensions subject to change without notice

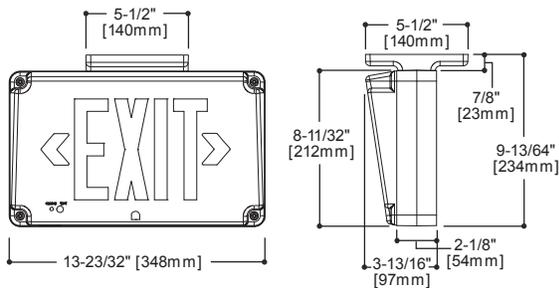


## UX Exit Lighting

The Sure-Lites UX NEMA 4X Exit combines the strength and durability of die cast aluminum with architecturally pleasing aesthetics. Designed for the most severe environments, the UX exit will provide maximum performance against rain, moisture, cold, corrosives and dust. Universal configurations (single and double face) and universal mounting provide the ease of one product specifying for any job. Additional designed-in features such as LED technology provide the customer with a long life, low maintenance, dependable exit sign in those conditions when reliability is crucial. The injection molded, clear, polycarbonate shield not only provides protection against moisture and rain, but vandalism as well. Four Torx® head tamperproof screws with center-pin reject provide additional vandal-proof security. The unique design and features make the UX Exit compatible in most indoor and outdoor environments.

## UX Exit Lighting

- ☑ NEMA 4X listed
- ☑ Operating temperature -45°C (-49°F) to 60°C (+ 140°F)
- ☑ Dual voltage input 120/277 VAC, 60Hz isolation transformer
- ☑ Die cast aluminum housing
- ☑ Powder coat finish
- ☑ LED lamping
- ☑ Exit can be universally mounted ceiling, wall or end
- ☑ Universal pattern knockouts on rear of single face housing for direct mounting to junction box
- ☑ Pendant mount
- ☑ Watchguard EMS Self-Diagnostic system
- ☑ Laser testing
- ☑ Premium nickel cadmium batteries
- ☑ T6 HAZ lamp rating
- ☑ IP66, Ingress Protection from IEC (International Electrical Commission)
- ☑ UL844, Hazardous Locations (Class 1, Division 2, Groups A, B, C, D) with "HAZ" option
- ☑ UL FTBR listed when specified with the "2C" option
- ☑ Suitable for Floor Proximity installation, UL listed, ADA (American Disabilities Act)
- ☑ NSF National Sanitation Foundation/Splash Zone (for food processing)
- ☑ Cleanrooms Class 10,000
- ☑ UL 924, UL 924 Wet Location (Suitable for wet and damp locations), NEC/OSHA, Life Safety NFPA 101, meets most state and local codes
- ☑ Patents pending

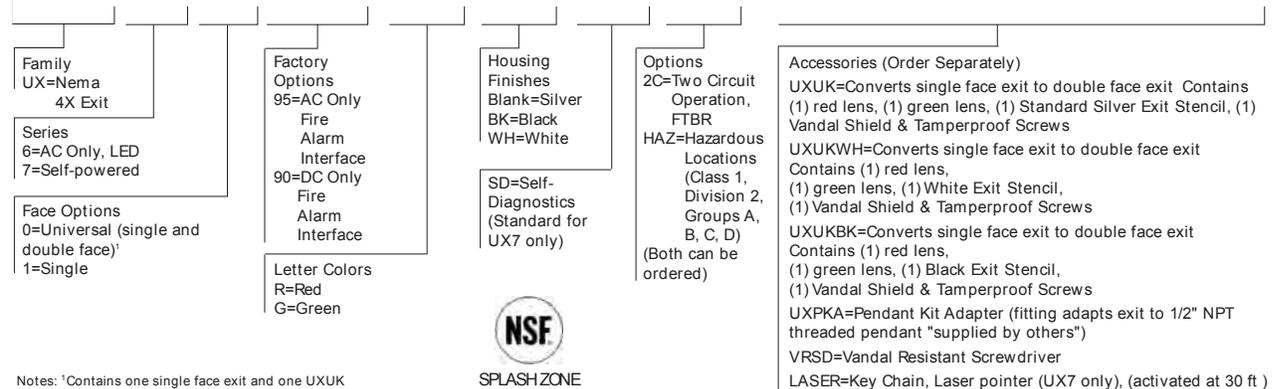


Energy Data — AC Only Exits

	Input Power:		Input Current (Max.):		Power Factor:		T.H.D.:	
	120V	277V	120V	277V	120V	277V	120V	277V
	<b>LED Exits</b>							
LED Exits -Red Letters	2.7W	3.2W	.07A	.04A	> .30	> .39	< 56%	< 69%
LED Exits -Green Letters	2.3W	3.0W	.08A	.03A	> .26	> .36	< 54%	< 67%

## Ordering Information

SAMPLE NUMBER: UX61R



Notes: \*Contains one single face exit and one UXUK



SPLASH ZONE

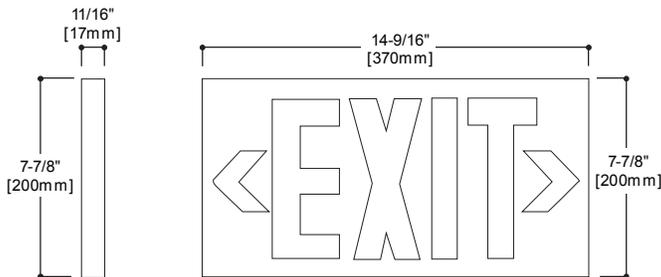


### PHL Photoluminescent Exit

Photoluminescent “glow-in-the-dark” exits are designed to absorb and store energy from existing light sources. The signs do not require electricity and are non-radioactive, non-toxic, and fire-resistant. This energy efficient exit is ideal for areas where electrical wiring is either difficult or unavailable. It is an excellent choice when adding low level exits. The PHL Series exits do not require regular maintenance and have a life expectancy of at least 25 years.

### PHL Photoluminescent Exit

- ☑ Energizes from fluorescent lighting (minimum 5 Ft-Candle of fluorescent illumination required during building occupancy)
- ☑ 90 minutes of illumination with a legible viewing distance of at least 50 feet
- ☑ Heavy duty aluminum housing is impact resistant, corrosion proof and flame retardant
- ☑ High-brightness strontium oxide aluminate photoluminescent pigment is applied directly onto housing
- ☑ Non-Radioactive and Non-Toxic
- ☑ Ceiling, wall or end mounting
- ☑ Field selectable chevrons
- ☑ UL 924 listed, meets Life Safety NFPA 101, ULC listed, most state and local codes, Energy Star listed
- ☑ Rated life: 25+ years



Brushed Aluminum, Red



Brushed Aluminum, Green



Red



Green

### Ordering Information

SAMPLE NUMBER: PHL1RBA

Product Family  
PHL=Photoluminescent Exit

Face Options  
1=Single  
2=Double

Letter Colors (Outline)  
R=Red  
G=Green

Housing Color  
Blank=Same as Letter Color  
BA=Brushed Aluminum

Accessories  
PHLS=Clear Acrylic Shield  
PHLJ=Large Canopy (J-Box)

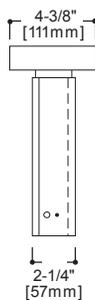
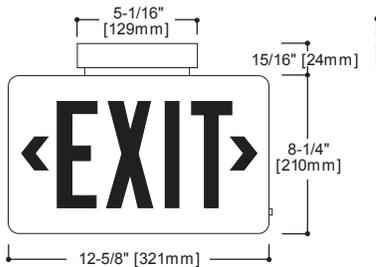


### CX Series Architectural Exit Lighting

The CX Surface Mounted Die Cast Aluminum Exit combines the strength and durability of die casting with the bright even illumination of LED lamp sources. Unlike competitive units that have a pronounced dot effect from protruding diodes, the CX LED offers unequalled uniform illumination and brightness. The CX Self-Powered LED comes standard with the Watchguard EMS self-diagnostic system insuring fixture reliability and reducing maintenance costs.

### CX Series Architectural Exit Lighting

- ☑ Dual-voltage Input 120/277 VAC, 60 Hz, isolation transformer
- ☑ Die cast aluminum housing
- ☑ Die cast canopy included
- ☑ LED lamping
- ☑ Watchguard EMS self-diagnostic system (CX7 Only)
- ☑ Exit can be universally mounted ceiling, wall or end
- ☑ Universal pattern knock-outs on rear of single face housing for direct mounting to junction box
- ☑ NFPA 101 compliant knockout chevrons allow quick conversion to directional signs
- ☑ Self-powered exits feature line-latching, solid-state voltage limited charger, low-voltage disconnect, brownout circuit, overload/short-circuit protection, test switch/power indicator light
- ☑ Lamp Location listed (AC Only), UL 924 listed, CSA Certified, Life Safety NFPA 101, NEC/OSHA, Energy Star listed, AC Only-UL FTBR when specified with the "2C" option, most state and local codes suitable for floor proximity installation.



#### Energy Data — Self-Powered Exits

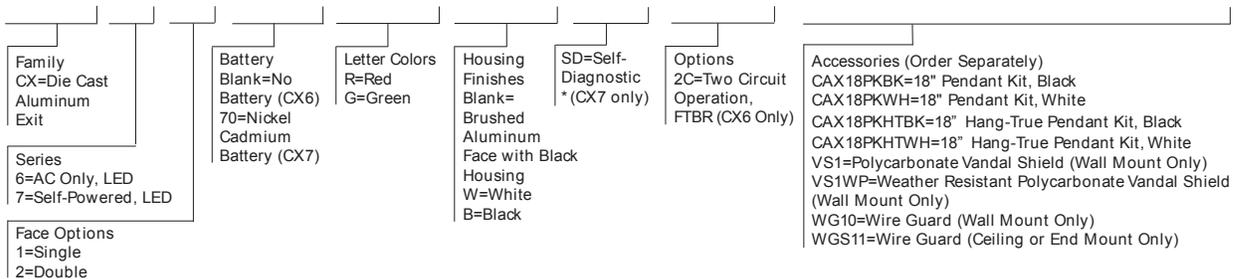
		Sealed Nickel Cadmium Battery							
		Input Power:		Input Current (Max.):		Power Factor:		T.H.D.:	
		120V	277V	120V	277V	120V	277V	120V	277V
		LED Exits							
LED Exits -Red Letters		2.8W	2.9W	.03A	.02A	> .81	> .77	< 32%	< 46%
LED Exits -Green Letters		3.9W	3.6W	.08A	.04A	> .41	> .43	< 48%	< 49%

#### Energy Data — AC Only Exits

		Input Power:		Input Current (Max.):		Power Factor:		T.H.D.:	
		120V	277V	120V	277V	120V	277V	120V	277V
		LED Exits							
LED Exits -Red Letters		2.4W	2.5W	.03A	.02A	> .78	> .73	< 33%	< 48%
LED Exits -Green Letters		3.2W	3.0W	.08A	.03A	> .33	> .35	< 50%	< 52%

### Ordering Information

SAMPLE NUMBER: CX7170RSD



Notes: Please consult your Cooper Lighting Representative for availability. Specifications & dimensions subject to change without notice.

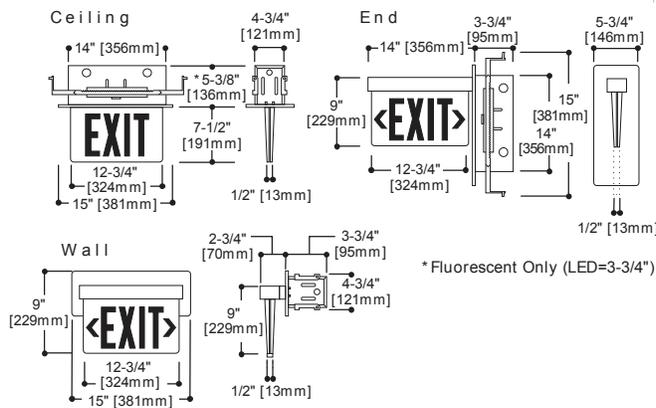


### ELX Series Architectural Exit Lighting

The Sure-Lites ELX Series Recessed Exits are designed for architectural excellence and minimal presence. The crystal clear wedge shaped panel allows architectural details to shine through while providing excellent light distribution and exit visibility. Long life, energy-efficient LED lamps reduce energy costs and eliminate routine lamp maintenance.

### ELX Series Architectural Exit Lighting

- Dual-voltage input 120/277 VAC or 120/347 VAC 60Hz
- 20 gauge steel recessed housing with nine conduit knockouts
- Injection molded high-impact acrylic panel
- LED or Fluorescent lamping
- Fluorescent: two F8T5 lamps wired for separate circuits
- Premium Nickel Cadmium battery
- Watchguard EMS Self-Diagnostic system (standard)
- Mirror background standard on double face exits
- Torsion springs secure trim plate to housing
- UL FTBR listed-standard Fluorescent, LED with 2C option
- Damp location listed
- Line-latching, Solid-State voltage limited charger, Solid-State switching, low-voltage disconnect, brownout circuit, overload/short-circuit protection, test switch/power indicator light.
- UL 924 listed, Life Safety NFPA 101, NEC/OSHA, most state and local codes



#### CHEVRON CONFIGURATION

	FRONT	BACK	FACE
AR	EXIT>	Blank	Single
AL	<EXIT	Blank	Single
DA	<EXIT>	Blank	Single
DA	<EXIT>	<EXIT>	Double
ARL	EXIT>	<EXIT	Double

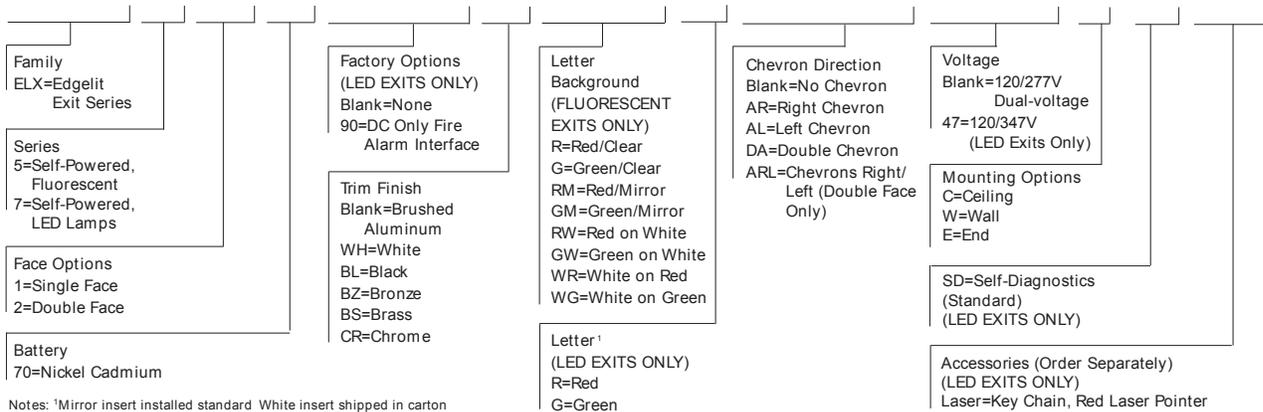
#### Energy Data

	Input Power:			Input Current (Max.):			Power Factor:			T.H.D.:		
	120V	277V	347V	120V	277V	347V	120V	277V	347V	120V	277V	347V
<b>Fluorescent Exits</b>												
Fluorescent Exits -8W Lamps	14W	14W	-	.21A	.09A	-	>.56	>.58	-	<12%	<12%	-
<b>LED Exits with Self-Diagnostics Option</b>												
LED Exits -Red Letters	4.9W	4.8W	-	.05A	.02A	-	>.90	>.87	-	<25%	<24%	-
LED Exits - Green Letters	4.9W	4.7W	-	.05A	.02A	-	>.85	>.82	-	<25%	<24%	-

\*Mirror insert installed standard White insert shipped in carton Consult your Cooper Lighting Representative

### Ordering Information

SAMPLE NUMBER: ELX5170RARE



Notes: \*Mirror insert installed standard White insert shipped in carton Consult your Cooper Lighting Representative

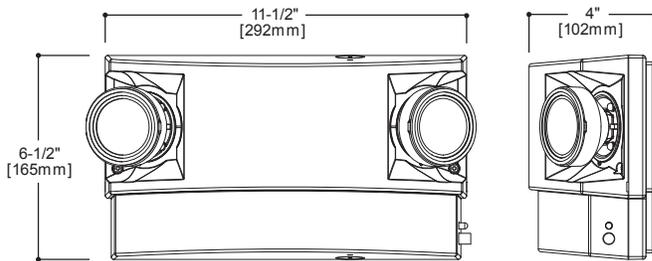


### CHEL Architectural Emergency Lighting

The Sure-Lites CHEL Emergency Light provides a distinct solution to any emergency lighting application. Constructed of die-cast aluminum, the CHEL presents not only a unique shape and design but also provides dependable strength and durability. The two, fully adjustable, high efficiency 12W MR16 lamps provide maximum path of egress performance. The standard Watchguard EMS self-diagnostic system meets NFPA 101 testing requirements providing assurance that the unit is working properly at all times. The Sure-Lites LASER test feature allows remote, 30 second confidence testing of the emergency light upon demand.

### CHEL Architectural Emergency Lighting

- ☑ Dual-voltage Input 120/277 VAC, 60 Hz
- ☑ Die cast aluminum housing with powder coat finish
- ☑ Two fully adjustable heads with 6V 12W MR16 lamps
- ☑ Sealed lead calcium battery maintenance free, long life, full recharge time, 24 hours
- ☑ Watchguard EMS Self-Diagnostic system
- ☑ Remote photocell test switch (requires accessory LASER for activation)
- ☑ Universal pattern knockouts on rear of housing for direct mounting to junction box
- ☑ Snap Fit design
- ☑ Reversible mounting
- ☑ Line-Latching, Solid-state Voltage Limited Charger, Low-Voltage Disconnect, Brownout Circuit, Overload/Short Circuit Protection, Test Switch/Power indicator light
- ☑ UL 924 listed Self-Diagnostics, UL Outdoor Wet Location listed (suitable for wet and damp locations), Life Safety NFPA 101, NEC/OSHA, most state and local codes



#### ENERGY DATA

CHEL1SD  
Input Current (Max.)  
120V = .05A  
277V = .02A



CHEL1BKSD



CHEL1WHSD



CHEL1SD  
(Reverse Mounted)

#### ELECTRICAL RATINGS

Model	Rated Wattage to 87 1/2% of Rated DC Voltage		Lamp Information			
	DC Voltage	1 1/2 Hours	Type	Wattage	Number	Spacing <sup>1</sup>
CHEL1SD	6	24	MR16	12	29-140	50 0'

### Ordering Information

SAMPLE NUMBER: CHEL1SD

#### CHEL1

Family  
CHEL1=Architectural  
Emergency Light

Housing Finishes  
Blank=Silver  
BK=Black  
WH=White

SD=Self  
Diagnostics

Options  
TDM=Time Delay  
Monitor

Accessories<sup>1</sup>  
LASER=Key Chain, Red Laser  
Pointer (activation tested at 30 feet)

Notes: <sup>1</sup>Order separately Please consult your Cooper Lighting Representative for availability Specifications & dimensions subject to change without notice <sup>2</sup>The "Rule of Thumb" spacing guidelines are designed to achieve 1 foot-candle average and 0.1 foot-candle minimum with a 40:1 maximum/minimum ratio The corridor used is 100 feet long, 9 foot ceiling with a 6 foot wide walkway and 3 foot path of egress The reflectances are 80% ceiling, 50% walls and 20% floors The fixture mounting height is 8.5 feet Cooper Lighting assumes no responsibility for local requirements or specific project variables This is a guideline to be used as a design aid, not as guarantee of any code compliance



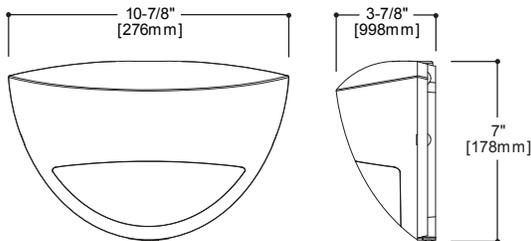
## AEL1 Architectural Emergency Lights

The Sure-Lites Architectural Emergency Light is designed to provide superior illumination while blending into the surrounding space. The housing is constructed of die cast aluminum with an integral refractive polycarbonate lens. The emergency light's advanced optical design in conjunction with high output Xenon lamps provide maximum path of egress lighting performance.

The Sure-Lites Architectural Emergency Light is listed for temperatures between -20°C and 40°C (-4°F and 104°F) and has silicone gaskets that provide protection from rain, moisture, corrosives and dust. [Remote unit temperature range: -40°C and 65°C (-40°F and 149°F)] Standard features include Watchguard EMS self-diagnostic system which meets NFPA 101 testing requirements and a FasTest photocell which enables remote testing of the emergency light.

## AEL1 Architectural Emergency Lights

- ☑ Dual-voltage input 120/277VAC, 60Hz
- ☑ Die cast aluminum housing with powder coat finish
- ☑ Three 6V, 6W high output Xenon lamps
- ☑ Sealed nickel cadmium battery maintenance free, long life, full recharge time, 24 hours
- ☑ Watchguard EMS Self-Diagnostic system
- ☑ Photocell test switch (requires accessory LASER for activation)
- ☑ Universal pattern knockouts on rear of housing for direct mounting to junction box
- ☑ UV stable polycarbonate lens
- ☑ Line-Latching, Solid-state Voltage Limited Charger, Low-Voltage Disconnect, Brownout Circuit, Overload/Short Circuit Protection, Test Switch/Power Indicator light
- ☑ UL 924 listed Self-Diagnostics, UL Outdoor Wet Location listed (suitable for wet and damp locations), Life Safety NFPA 101, NEC/OSHA, most state and local codes



### ENERGY DATA

AEL1SD  
 Input Current (Max.)  
 120V = .10A  
 277V = .07A



AEL1WHSD



AEL1BKSD



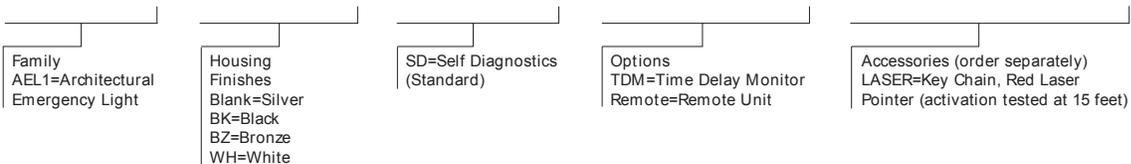
AEL1BZSD

### ELECTRICAL RATINGS

Model	Rated Wattage to 87 1/2% of Rated D C Voltage		Lamp Information			
	DC Voltage	1 1/2 Hours	Type	Wattage	Number	Spacing <sup>1</sup>
AEL1SD	6	18	Xenon	6 each	11549423	30 0'

## Ordering Information

SAMPLE NUMBER: AEL1SD



Notes: <sup>1</sup>The "Rule of Thumb" spacing guidelines are designed to achieve 1 foot-candle average and 0.1 foot-candle minimum with a 40:1 maximum/minimum ratio. The corridor used is 100 feet long, 9 foot ceiling with a 6 foot wide walkway and 3 foot path of egress. The reflectances are 80% ceiling, 50% walls and 20% floors. The fixture mounting height is 8.5 feet. Cooper Lighting assumes no responsibility for local requirements or specific project variables. This is a guideline to be used as a design aid, not as guarantee of any code compliance.

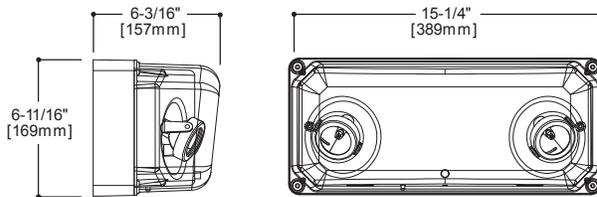


### UEL Emergency Lighting

The Sure-Lites UEL NEMA 4X Emergency Light is designed for those emergency lighting applications where ruggedness and dependability are a must. The UEL's housing is constructed of durable die cast aluminum combined with the strength of a clear polycarbonate shield. Designed for the most severe environments, the UEL Emergency Light will provide maximum performance against rain, moisture, cold, corrosives and dust. The UEL's standard features include a nickel cadmium battery, self-diagnostics, photocell LASER test and MR16 lamps that provide the customer with a long life, low maintenance, dependable, severe environment approved emergency lighting unit in conditions when reliability is crucial. An additional injection molded, polycarbonate shield provides protection against moisture, rain, and vandalism. (4) Torx head tamperproof screws with center-pin reject provide additional vandal-proof security. The unique design and features make the UEL Emergency Light compatible in most indoor and outdoor environments.

### UEL Emergency Lighting

- ☑ NEMA 4X, UL50 listed
- ☑ Dual-voltage input 120/277VAC, 60Hz, isolation transformer
- ☑ Die cast aluminum housing
- ☑ Powder coat finish
- ☑ (2) adjustable MR16 lamps
- ☑ Nickel cadmium battery
- ☑ Fully recharged in 24 hours
- ☑ Vandal proof
- ☑ UV stable, glass-clear polycarbonate, vandal resistant shield (.150" thick) with Torx head tamperproof screws, stainless steel
- ☑ T1 Haz lamp rating
- ☑ Watchguard EMS Self-Diagnostic system
- ☑ Photocell test switch (requires accessory LASER for activation)
- ☑ Push-in AC power connectors facilitate installation
- ☑ UL 924 listed Self-Diagnostics, UL 924 Outdoor Wet Location listed (suitable for wet and damp locations)
- ☑ NSF, National Sanitation Foundation/Splash Zone (for food processing)
- ☑ IP66, Ingress Protection from IEC (International Electrical Commission)
- ☑ Cleanroom Class 10,000
- ☑ Patent pending



#### Energy Data

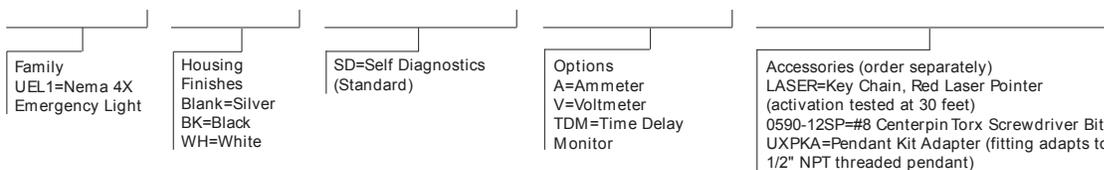
Model No.	Input Current (Max.):	
	120V	277V
UEL1SD	.09A	.03A

#### ELECTRICAL RATINGS

Model	Rated Wattage to 87 1/2% of Rated D C Voltage		Lamp Information			
	DC Voltage	1 1/2 Hours	Type	Wattage	Number	Spacing <sup>1</sup>
UEL1SD	12	24	MR16	12	29-141	50 0'

### Ordering Information

SAMPLE NUMBER: UEL1SDC



SPLASH ZONE

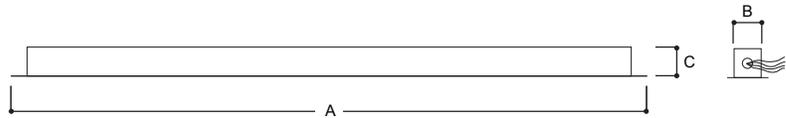
Notes:<sup>1</sup>The "Rule of Thumb" spacing guidelines are designed to achieve 1 foot-candle average and 0.1 foot-candle minimum with a 40:1 maximum/minimum ratio. The corridor used is 100 feet long, 9 feet ceiling with a 6 feet wide walkway and 3 feet path of egress. The reflectances are 80% ceiling, 50% walls and 20% floors. The fixture mounting height is 70 feet with a lamp head angle of 45 degrees. Cooper Lighting assumes no responsibility for local requirements or specific project variables. This is a guideline to be used as a design aid, not as guarantee of any code compliance.



### FBP Emergency Lighting

When AC power fails, the Sure-Lites Fluorescent Battery Pack (FBP) automatically switches to emergency mode. The FBP maintains illumination of one or two lamps for a minimum of 90 minutes. The product line is UL924 Listed for field retrofit installation.

Model	Dimensions		
	A	B	C
FBP140X	9.4"	2.4"	1.5"
FBP240U	9.4"	2.4"	1.5"
FBP240M	9.4"	2.4"	1.5"
FBP240H	13.3"	2.4"	1.5"
FBP240HU	13.3"	2.4"	1.5"
FBP240HSD	13.3"	2.4"	1.5"
FBP240C	9.4"	2.4"	1.5" (Flex=28"L)
FBP240D	9.4"	2.4"	1.5" (Flex=28"L)
FBP3500	16.3"	5.5"	1.7" (Flex=28"L)
FBP450LP	14.1"	1.5"	1.0"



### FBP Emergency Lighting

- ☑ Dual-voltage input 120/277VAC, 60Hz
- ☑ Universal voltage 120 to 277 VAC, 50/60 Hz (FBP240HU)
- ☑ Sealed nickel cadmium batteries
- ☑ Solid-State charger, overload/short-circuit protection, test switch/power indicator light
- ☑ Can be installed inside or on top of fixture
- ☑ May be used with switched or unswitched fixtures
- ☑ Compatible with many different lamp types
- ☑ Compatible with many ballast types including standard, rapid-start, slimline, instant-start, energy saving, dimming and electronic AC ballasts - consult your Cooper Lighting Representative regarding specific applications
- ☑ Self Diagnostic (FBP240HSD)
- ☑ Low Profile (FBP450LP)
- ☑ UL 924 listed, UL listed for Retrofit/ Field Installation, Chicago Approved, Life Safety NFPA 101, NEC/OSHA, most state and local codes

#### Energy Data

Model No.	Input Power 120V
FBP140X	4.5W
FBP240U	5.3W
FBP240M	5.3W
FBP240H	5.8W
FBP240HSD	4.0W
FBP240HU	6.0W
FBP240C	5.3W
FBP240D	3.5W
FBP3500	8.0W
FBP450LP	1.5W

#### ELECTRICAL RATINGS AND ORDERING INFORMATION

Model	Lamp Type	Number of Lamps Operated in Emergency Mode	Initial Lumens
FBP140X	20W-40W, 2-4, T8-T12 U-shaped, circleline, 2D, energy saving, rapid start (4-pin, 2G11) long compact fluorescent	One	350-450
FBP240U	17W-215W, 2-8, T8-T12 HO, VHO, U-shaped, circleline, 2D, energy saving, rapid start (4-pin, 2G11) long compact fluorescent	One	600-700
FBP240M	17W-215W, 2-8, T8-T12 HO, VHO, U-shaped, circleline, 2D, energy saving, rapid start (4 pin, 2G11) long compact fluorescent	One-20W to 215W (2-8) One-20W to 39W long compact fluorescent One or Two-20W to 40W (2'-4')	600-700
FBP240H	17W-215W, 2-8, T8-T12 HO, VHO, U-shaped, circleline, energy saving, rapid start (4-pin, 2G11 or G24q) long compact fluorescent	One or Two - 17W to 24W One or Two - 32W to 40W (2'-4') One - 40W to 215W (5'-8') One or Two - 18W to 39W long compact fluorescent One or Two - 18W to 32W 4-Pin compact fluorescent	1100-1400 (700-1000 for long compact fluorescent)
FBP240HSD	17W-215W, 2-8, T8-T12 HO, VHO, U-shaped, circleline, energy saving, rapid start (4-pin, 2G11, G24q, or GX24q) twin, quad and triple twin-tube compacts	One or Two-17W to 40W (2-4) One-40W to 215W (5'-8') One or Two-18W to 39W long compact fluorescent One-40W to 55W long compact fluorescent One or Two-18W to 42W 4-pin compact fluorescent	1100-1400 (700-1000 for long compact fluorescent)
FBP240HU	17W-215W, 2-8, T8-T12 HO, VHO, U-shaped, circleline, energy saving, rapid start (4-pin, 2G11, G24q, or GX24q) twin, quad and triple twin-tube compacts	One or Two-17W to 40W (2-4) One-40W to 215W (5'-8') One or Two-18W to 39W long compact fluorescent One-40W to 55W long compact fluorescent One or Two-18W to 42W 4-pin compact fluorescent	1100-1400 (700-1000 for long compact fluorescent)
FBP240C	6W-28W tubular without integral starter, 13W-42W 4-pin twin, quad, or triple twin-tube compact fluorescent without integral starters	One or Two-6W to 40W tubular One or Two-13W to 39W or One-42W 4-pin compact fluorescent	300-750
FBP240D	18W-26W quad tube with integral starter in two pin base	One-18W to 26W compact fluorescent	300-650
FBP450LP	32W, 4', T8	One	450
FBP3500	17W-215W, 2'-8', T8-T12 HO, VHO, U-shaped circleline, energy saving and (4-pin, 2G11, G24Q, or GX240) twin, quad and triple twin-tube compacts	One or Two-17W to 40W (2"-4") One-40W to 215W (5'-8') One or Two-18W to 39W long compact fluorescent One-40W to 55W long compact fluorescent One or Two-18W to 42W 4-pin compact fluorescent	1450-3500

### Ordering Information

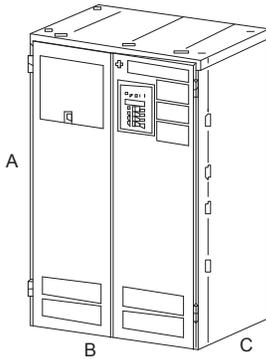
SAMPLE NUMBER: FBP140X

FBP140X FBP240U FBP240M FBP240H FBP240HSD FBP240HU FBP240C FBP240D FBP3500 FBP450LP	Accessories (Order separately)  FBP1WBC=Wire Bundle Cover for external mount applications (2 required)
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### Lifeway II Single Phase C Series Inverter

The Sure-Lites Lifeway II C Series is a single phase inverter that provides uninterrupted power. This pulse width modulated inverter utilizes IGBT technology and has a 2 millisecond transfer time. The unit's operating efficiency is 98%, well above a typical fast transfer inverter. The C Series inverter is UL 924 Listed and meets NFPA 101 requirements by providing 90 minutes of illumination for emergency egress lighting. Other run times and voltages are available. Please consult your Cooper Lighting Representative.



Height	Width	Depth
A	B	C
47"	30"	25"

### Lifeway II Single Phase C Series Inverter

- ☑ Input 120 or 277VAC 1 phase 2 wire
- ☑ Custom voltages available
- ☑ Electronic and magnetic ballast compatible
- ☑ Generator compatibility
- ☑ Forced air cooling only during emergency operation, no filters required
- ☑ 90 minute runtime standard; other runtimes available upon request
- ☑ 98% efficient PWM/IGBT technology with micro-processor control
- ☑ User programmable with password protection
- ☑ Self-Testing and Self-Diagnostic with Event, Test and Alarm Logs
- ☑ RS232 communications port
- ☑ UL 924 listed

#### SPECIFICATION DATA

Input Voltage	120 or 277VAC 1-phase 2 wire +10%-15% Contact factory for all other voltages
Input Frequency	60Hz, ±3%
Input Protection	Input Circuit Breaker
Input Harmonic Distortion	< 10%
Input Power Factor	0.5 lag/lead
Output Voltage	120 or 277VAC 1-phase 2 wire Contact factory for all other voltages
Static Voltage	Load current change ±2%, battery discharge ±12.5%
Dynamic Voltage	± 2% for ±25% load step change, ±3% for a 50% load step change, recovery within 3 cycles
Output Harmonic Distortion	< 3% THD for linear load
Output Frequency	60 Hz ±0.05Hz during emergency mode
Load Power Factor	0.5 lag to 0.5 lead
Inverter Overload	125% for 5 minutes
Output Protection	Optional Distribution Circuit Breakers
Battery	10 Year Valve-regulated Sealed Lead/Calcium (standard)
Environmental	
Altitude	< 10,000 feet without derating
Operating Temp	System operates safely from 0° to 40°C (32° to 104°F) up to 95% humidity UL rating, 20° to 30°C (68° to 86°F), includes battery performance which can be affect- ed by temperature Contact factory for details
Storage Temp	-20° to 70°C (Electronics Only)
Humidity	< 95% (non-condensing)

#### LIFEWAY II SINGLE PHASE C SYSTEM PART NUMBER / RATING / MECHANICAL SPECIFICATIONS

Part Number	Pwr Rtg KVA	Pwr Rtg kW	Effic @ full load %	Audible Noise db@1m	Heat Loss BTU	UPS Cabinet Dimensions			UPS Weight lb/kg	Battery Voltage VDC	Battery Current Amperes	Battery Run Minutes	Battery Cabinet Dimensions			No of Battery Cabinets	Total No of Cabinets	Total System Weight (lb/kg)
						Width in/cm	Height in/cm	Depth in/cm					Width in/cm	Height in/cm	Depth in/cm			
ISC015	1.5	1.5	98	45	75	30/77	47/120	25/64	250/114	48	39	90	na <sup>2</sup>	na <sup>2</sup>	na <sup>2</sup>	na <sup>2</sup>	1	546/249
ISC022	2.25	2.25	98	45	100	30/77	47/120	25/64	265/121	72	38	90	na <sup>2</sup>	na <sup>2</sup>	na <sup>2</sup>	na <sup>2</sup>	1	709/323
ISC030	3.0	3.0	98	45	160	30/77	47/120	25/64	295/134	96	38	90	na <sup>2</sup>	na <sup>2</sup>	na <sup>2</sup>	na <sup>2</sup>	1	887/403
ISC037	3.75	3.75	98	45	200	30/77	47/120	25/64	305/139	120	37	90	na <sup>2</sup>	na <sup>2</sup>	na <sup>2</sup>	na <sup>2</sup>	1	1045/475
ISC048	4.8	4.8	98	45	245	30/77	47/120	25/64	315/143	144	40	90	na <sup>2</sup>	na <sup>2</sup>	na <sup>2</sup>	na <sup>2</sup>	1	1203/546
ISC060	6.0	6.0	98	45	300	30/77	47/120	25/64	350/159	180	40	90	30/77	47/120	25/64	1	2	1670/759
ISC080	8.0	8.0	98	45	400	30/77	47/120	25/64	375/171	240	39	90	30/77	47/120	25/64	1	2	2087/949
ISC100	10.0	10.0	98	45	500	30/77	47/120	25/64	435/198	144	82	90	30/77	47/120	25/64	2	3	2631/1195
ISC125	12.5	12.5	98	45	660	30/77	47/120	25/64	465/211	180	82	90	30/77	47/120	25/64	2	3	3105/1409
ISC167	16.7	16.7	98	45	840	30/77	47/120	25/64	530/241	240	80	90	30/77	47/120	25/64	2	3	3954/1795

### Ordering Information

SAMPLE NUMBER: ISC037120120

Series ISC=Single Phase C	KVA Rating 015=1.5    060=6.0 022=2.25    080=8.0 030=3.0    100=10.0 037=3.75    125=12.5 048=4.8    167=16.7	Voltage Input 120 277	Voltage Output 120 277	Options See page Cooper Lighting Buyer's Guide for options
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Notes: Please consult your Cooper Lighting Representative for availability. Specifications & dimensions subject to change without notice.

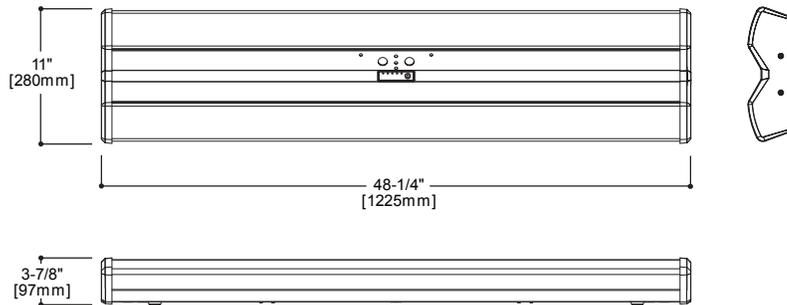


### Stair Lite 2 Stairwell Lighting System

The Stair Lite 2 System is designed to satisfy all stairwell lighting requirements in one easy to install package. Stair Lite 2 consists of a surface mounted, two lamp fluorescent lighting fixture that incorporates an integrally mounted ultrasonic motion detector, a system display panel, and an optional full battery backup. The Stair Lite 2 includes an energy efficient bi-level lamp operation so that one lamp remains on constantly while the motion detector activates the second lamp when needed to significantly reduce the operating costs. The Stair Lite 2 System is designed for use in stairwells or any other area of a building where the occupancy level or usage factor would be considered minimal.

### Stair Lite 2 Stairwell Lighting System

- ☐ Dual-voltage Input 120/277 VAC, 60Hz
- ☐ Formed 20 gauge steel housing and cover plate construction
- ☐ Durable white powder coat finish
- ☐ T8 32W fluorescent lamps (Lamps not included)
- ☐ Single-lamp electronic ballast that is "0" degree rated
- ☐ Sealed, maintenance-free nickel cadmium battery
- ☐ Fully automatic, energy efficient ultrasonic motion detector
- ☐ Solid-state Status Indicator Display system with an AC power indicator
- ☐ Variety of electrical and mounting knockouts for a easy installation
- ☐ UL 924, Life Safety NFPA 101, NEC/OSHA, most state and local codes



### Ordering Information

SAMPLE NUMBER: STL24F032T87

Family STL2=StairLite 2	Operation 4=AC Only 5=Self Powered	Lamp Type & Size (2) 4' Lamps F032T8	Voltage Blank=120 VAC 7=277 VAC
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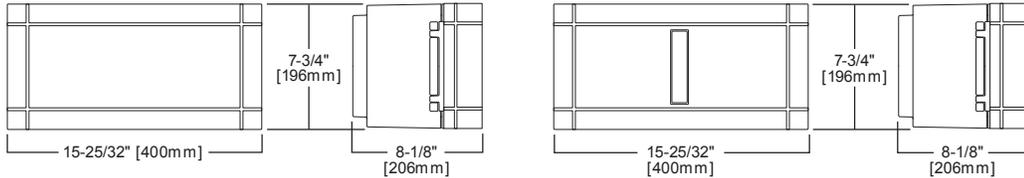


### ENTRI Series Architectural Wall Luminaire

Entri Series' family of modular faceplate designs provide a tasteful architectural statement equally suitable for indoor and outdoor environments. Available luminous faceplate window adds a signature look, while affording custom color capability.

### ENTRI Series Architectural Wall Luminaire

- One piece die-cast aluminum construction. Accommodates either up or down mounting configurations with no modifications
- One piece die-cast aluminum faceplate utilizes a continuous silicone gasket to seal securely to housing
- Side hinged faceplate swings open via release of one (1) flush mount die-cast aluminum latch on housing side panel
- Choice of ten (10) high efficiency optical systems
- Ballast and related electrical componentry are heat sunk to the housing
- Optional die-cast aluminum adapter box to allow for surface conduit wiring, quartz lamp options, and emergency battery pack capability
- Approximate net weight: 13 lbs. (6 kgs.)



### Ordering Information

SAMPLE NUMBER: ENV-150-MH-120-EB-3S-BK-LG-L<sup>1</sup>

<b>Product Family</b> ENV=ENTRI Round Reveals	<b>Lamp</b> Wattage HID <sup>1</sup> 39=39W 70=70W 100=100W 150=150W Compact Fluorescent <sup>2</sup> 26=26W 32=32W 42=42W 52=52W <sup>3</sup> 57=57W <sup>4</sup> 64=64W <sup>3</sup> 84=84W <sup>3</sup> Halogen <sup>5</sup> 100=100W 150=150W 250=250W	<b>Lamp Type</b> MH=Metal Halide WS=White SON High Pressure Sodium <sup>6</sup> CF=Compact Fluorescent <sup>7</sup> HL=Quartz Halogen	<b>Voltage<sup>8</sup></b> 120=120V 208=208V 240=240V 277=277V 347=347V 480=480V DT=Dual-Tap Wired 277V <sup>9</sup> MT=Multi-Tap Wired 277V <sup>10</sup> TT=Triple-Tap Wired 347V <sup>11</sup> UNV=120-277V Universal Electronic Ballast	<b>Ballast</b> MB=Magnetic EB=Electronic Ballast <sup>12</sup> X=None (for Halogen Lamp)	<b>Optical System</b> Downlight or Uplight (HID or Halogen) 3S=Type III FT=Forward Throw FX=Wall Grazing Optic TS=Tight Spot Downlight and Uplight (HID and Halogen) 3SG=Type III, 90% Main/10% Secondary Glow 3SP=Type III with Pencil Secondary FTG=Forward Throw, 90% Main/10% Secondary Glow FTP=Forward Throw with Pencil Secondary FXF=Wall Grazing Optic, 50% up/50% Down TSF=Tight Spot, 50% up/50% Down Compact Fluorescent CFG=90% Main + 10% Secondary Glow CFM=100% Main, Up or Downlighting	<b>Colors (add as                  suffix/must specify)<sup>13</sup></b> BK=Black AP=Grey BZ=Bronze WH=White DP=Dark Platinum GM=Graphite Metallic	<b>Options &amp;                  Accessories                  (See Below)</b>														
<b>Optional Luminous Faceplate Insert<sup>14</sup></b> LG=Luminous Glass Insert LGO=Luminous Glass Insert with Warm Orange Gel LGR=Luminous Glass Insert with Red Gel LGB=Luminous Glass Insert with Bright Blue Gel LGG=Luminous Glass Insert with Deep Green Gel	<b>Options<sup>14</sup></b> F=Single Fuse (120, 277 or 347V) Specify Voltage FF=Double Fuse (208, 240 or 480V) Specify Voltage DSAB=Dual Fluorescent Switching Control Adapter Box <sup>15</sup> QAB=Quartz Restrike Adapter Box EMAB=Quartz Restrike with Delay Adapter Box (Also Strikes at Cold Start) EM/SCAB=Quartz Emergency Separate Circuit Adapter Box CF/EMAB=Emergency Battery Backup Adapter Box (Specify 120 or 277V) <sup>16</sup> PC=Button Type Photocontrol (specify voltage) WG=Wire Guard <sup>17</sup> FRM=Frosted Main Flat Glass FRS=Frosted Secondary Flat Glass <sup>18</sup> L=Lamp Included (Standard for all Halogen lamps)	<table border="1"> <thead> <tr> <th>WATTAGE TABLE</th> <th>ENV</th> </tr> </thead> <tbody> <tr> <td>Metal Halide</td> <td>39, 70, 100, 150W</td> </tr> <tr> <td>White Son HPS</td> <td>100W</td> </tr> <tr> <td>Compact Fluorescent</td> <td>26, 32, 42, 57W</td> </tr> <tr> <td>Dual Compact Fluorescent</td> <td>(2) 26, (2) 32, (2) 42W</td> </tr> <tr> <td>Quartz Halogen</td> <td>100, 150, 250W</td> </tr> </tbody> </table>	WATTAGE TABLE	ENV	Metal Halide	39, 70, 100, 150W	White Son HPS	100W	Compact Fluorescent	26, 32, 42, 57W	Dual Compact Fluorescent	(2) 26, (2) 32, (2) 42W	Quartz Halogen	100, 150, 250W	<b>Certifications</b> <table border="1"> <tr> <td>IP66 Rated</td> <td>U.L. 1598</td> <td rowspan="2"> </td> </tr> <tr> <td>CSA Listed</td> <td>40°C Ambient</td> <td>ISO 9001</td> </tr> </table>	IP66 Rated	U.L. 1598		CSA Listed	40°C Ambient	ISO 9001
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Notes: 1 All MH lamps are T6 envelope with G12 lamp base. All HPS lamps are T6 envelope with GX12 lamp base. 2 All 26/32/42/57W CF lamps feature a 4-pin lamp base. Available in CFM and CFG distributions only. 3 Dual compact fluorescent lamps. 4 Nominal M O L lamp length of 57W CFL not to exceed 7". 5 All Halogen lamps are T4 envelope with mini-can base, 120V lamp. 250W Quartz requires thru-way mounting box. 150W requires magnetic ballast. 6 WhiteSON HPS lamp available in 100W only. Requires electronic ballast. 120/277V only. Includes use of VA2001 accessory Thru-way Box. 7 Compact Fluorescent ballasts contain internal fusing. No supplemental fusing is necessary. CF ballasts are 120 through 277V. Specify with UNV voltage designation. 8 Products also available in non-US voltages and 50Hz for international markets. Consult factory for availability and ordering information. 9 Dual-tap is 120/277V wired 277V. 10 Multi-tap is 120/208/240/277V wired 277V. 11 Triple-tap is 120/277/347V wired 347V. 12 120 through 277V only. Electronic ballasts contain internal fusing, no supplemental fusing is necessary. Electronic ballast available with all CF lamps, and 39/70/100W MH lamps. Available with 150W MH lamp. Includes VA2001 accessory Thru-way Box. Not available with QAB or EMAB options. 13 Custom and RAL color matching available upon request. Consult your INVUE Lighting Systems Representative for further information. 14 Add as suffix in the order shown. 15 Dual switching requires dual 26, 32 or 42W Compact Fluorescent lamps. Allows independent switching control of each lamp through use of two (2) electronic ballasts. Allows 50% power reduction when dual ballasts are independently wired and controlled. 16 CF lamps only. Battery backup operates 90 minutes at minimum 32°F (0°C), 42W maximum. 17 For use in down lighting applications only. 18 Frosted secondary lens provided standard on 3SG, FTG, and CFG distributions. 19 Order separately, replace XX with color suffix. 20 Specifications and dimensions subject to change without notice.



### Vision Wall Architectural Wall Luminaire

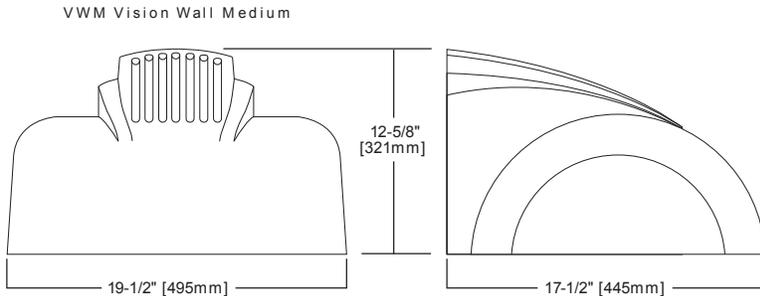
The classic lines and sophisticated construction of the Vision Wall luminaire make it an ideal complement to architectural site design. IP65 ingress Rating standard. UL listed and CSA Certified for wet locations in up or down mounting applications with no necessary modifications to the door or housing.

### Vision Wall Medium Architectural Wall Luminaire

- ☑ One piece die-cast aluminum housing
- ☑ One piece die-cast aluminum door with continuous silicone gasket accommodates either up or down mounting configurations
- ☑ Lens is impact-resistant 1/8" thick tempered clear or optional frosted flat glass
- ☑ Door frame is hinged and secured to the housing via four (4) captive stainless steel Allen head fasteners
- ☑ Standard zinc plated attachment plate fits directly to 4" JBox
- ☑ Choice of five (5) high efficiency optical systems. Type II, III, IV, and FX optical systems constructed of premium 95% reflective anodized aluminum sheet
- ☑ Mogul-base porcelain socket for HID lamp sources
- ☑ Approximate net weight: VWM Vision Wall Medium 45 lbs (20.5 kgs), VWS Vision Wall Small 25 lbs (11 kgs)



In downlighting configurations only



### Ordering Information

SAMPLE NUMBER: VWM-400-MH-MT-3S-BK-L

<b>Product Family</b> VWM=Vision Wall Medium  VFS VISION Wall Small also available. See Cooper Lighting Buyers Guide 5th Edition pg 1122	<b>Lamp Wattage</b> HID <sup>1</sup> 150=150W 175=175W 250=250W 320=320W <sup>2</sup> 350=350W <sup>2</sup> 400=400W <sup>3,4</sup> Compact Fluorescent 114=(2) 57W <sup>5</sup> 140=(2) 70W <sup>5</sup>	<b>Lamp Type</b> MH=Metal Halide MP=Pulse Start Metal Halide HPS=High Pressure Sodium CF=Compact Fluorescent <sup>6</sup>	<b>Voltage</b> <sup>7</sup> 120=120V 208=208V 240=240V 277=277V 347=347V 480=480V DT=Dual-Tap Wired 277V <sup>8</sup> MT=Multi-Tap Wired 277V <sup>9</sup> TT=Triple-Tap Wired 347V <sup>10</sup> UNV=120-277V Universal Electronic Ballast	<b>Optical System</b> 2S=Type II 3S=Type III 4S=Type IV FX=Wall Grazing Optic TS=Tight Spot	<b>Colors</b> (add as suffix/must specify) <sup>11</sup> BK=Black AP=Grey BZ=Bronze WH=White DP=Dark Platinum GM=Graphite Metallic	<b>Options &amp; Accessories</b> (See Below)
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#### Options <sup>12</sup>

F=Single Fuse (120, 277 or 347V) Specify Voltage  
 FF=Double Fuse (208, 240 or 480V) Specify Voltage  
 Q=Quartz Restrike <sup>13</sup>  
 EM=Quartz Restrike with Delay (Also Strikes at Cold Start) <sup>13</sup>  
 EM/SC=Quartz Emergency Separate Circuit <sup>13</sup>  
 PC=Button Type Photocontrol (Specify Voltage)  
 DS=Dual Fluorescent Switching Control <sup>14</sup>  
 HS=House Side Shield <sup>15</sup>  
 VS=Polycarbonate Vandal Shield  
 FR=Frosted Flat Glass Lens  
 L=Lamp Included

#### Accessories <sup>16</sup>

VWM/EM=Embedded Mount  
 VWM/TB-XX=Thru-way Box <sup>17</sup>  
 VWM/WG-XX=Wire Guard

WATTAGE TABLE	VWM
Metal Halide	175, 250, 400W
Pulse Start Metal Halide	250, 320, 350, 400W
High Pressure Sodium	150, 250, 400W
Compact Fluorescent	(2) 57W, (2) 70W

#### Certifications

IP66 Rated	UL 1598		
CSA Listed	40°C Ambient	ISO 9001	

Notes: 1 All HID lamps are mogul-base 2 320W and 350W Pulse Start Metal Halide lamps only 3 400W MH requires reduced envelope ED28 lamp 4 400W rated for 25°C ambient environments 5 Dual Compact Fluorescent lamp options available in Type 4S distribution only 6 Compact Fluorescent ballasts contain internal fusing. No supplemental fusing is necessary. CF ballasts are 120 through 277V. Specify with UNV voltage designation 7 Products also available in non-US voltages and 50Hz for international markets. Consult factory for availability and ordering information 8 Dual-tap is 120/277V wired 277V 9 Multi-tap is 120/208/240/277V wired 277V 10 Triple-tap is 120/277/347V wired 347V 11 Custom and RAL color matching available upon request. Consult your INVUE Lighting Systems Representative for further information 12 Add as suffix in the order shown 13 Quartz options not available with FX or TS distributions 14 Dual switching requires dual 57W or dual 70W Compact Fluorescent lamps. Allows independent switching control of each lamp through use of two (2) electronic ballasts. Allows 50% power reduction when dual ballasts are independently wired and controlled 15 House side shield not available with FX and TS optics 16 Order separately, replace XX with color suffix 17 For use in down lighting applications only 18 Specifications and dimensions subject to change without notice



### Solas Series Round Wall Luminaire

The SOLAS™ Series family of modular faceplate designs provide a tasteful architectural statement equally suitable for indoor and outdoor environments. SOLAS™ Series luminaires are for recessed wall mounted applications only.

### Solas Series Round Wall Luminaire

- ☑ One piece die-cast aluminum construction
- ☑ One piece die-cast aluminum faceplate utilizes a continuous silicone gasket to seal securely to housing. Faceplate is mounted with two (2) point screws. ADA compliant
- ☑ 95% reflective anodized aluminum sheet. Optical segments are rigidly mounted inside a heavy wall aluminum housing for superior protection
- ☑ Removable power tray for ease of maintenance. Conduit splice box provides six (6) 3/4" NPS hubs for supply connection
- ☑ Available for indoor and outdoor applications utilizing drywall, OSB, concrete pour and brick/masonry. Maximum depth back housing protrudes into wall is 5-3/4"
- ☑ Approximate net weight: 20 lbs. (9.99 kgs)

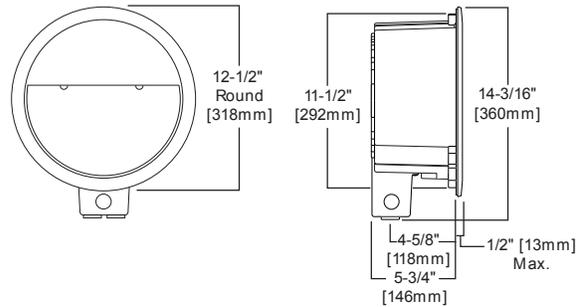


In downlighting configurations only

**Certifications**

IP66 Rated	UL 1598	ADA Compliant	∞ Cutoff
CSA Listed	25°C Rated	ISO 9001	

Recessed wall mount only



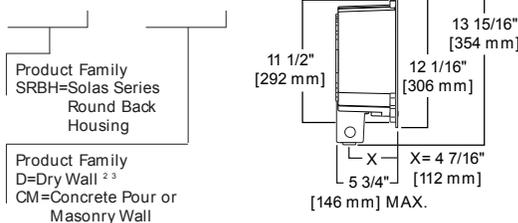
### Ordering Information

SAMPLE NUMBER: SRS-M-39-MHT6-MT-MB-PC-BK

<p><b>Product Family</b> SRS=Solas Series Round Scoop<sup>1</sup></p> <p><b>Wall Type</b> D=Dry Wall<sup>2,3</sup> C=Concrete Pour M=Masonry Wall</p> <p><b>Other SOLAS products available</b> See Cooper Lighting Buyers Guide 5th Edition pgs 1124-1127</p>	<p><b>Lamp Wattage</b> HID<sup>4</sup> 35=35W<sup>5</sup> 50=50W 70=70W 100=100W<sup>6</sup> <b>HID T6 Lamps</b> 39=39W 70=70W <b>Compact Fluorescent</b><sup>7</sup> 26=26W 32=32W 42=42W 52=52W 57=57W<sup>8</sup> 64=(2) 32W <b>LED H.O.</b> 18=18W</p>	<p><b>Lamp Type</b> MH=Metal Halide HPS=High Pressure Sodium MHT6=Metal Halide T6 CF=Compact Fluorescent<sup>7</sup> LEDRD=LED Red Lamps<sup>9</sup> LEDBL=LED Blue Lamps<sup>9</sup> LEDGN=LED Green Lamps<sup>9</sup> LEDOR=LED Orange Lamps<sup>9</sup> LEDCY=LED Cyan Lamps<sup>9</sup> LEDWH=LED White Lamps<sup>9</sup></p>	<p><b>Voltage</b><sup>10</sup> 120=120V 208=208V 240=240V 277=277V 347=347V 480=480V DT=Dual-Tap Wired 277V<sup>11,12</sup> MT=Multi-Tap Wired 277V<sup>13</sup> TT=Triple-Tap Wired 347V<sup>14</sup> UNV=120/277V Universal Electronic Ballast</p>	<p><b>Ballast Type</b> MB=Magnetic Ballast EB=Electronic Ballast<sup>15</sup></p> <p><b>Lens Type</b> FR=Frosted Flat Glass</p>	<p><b>Colors</b><sup>16</sup> BK=Black AP=Grey BZ=Bronze WH=White DP=Dark Platinum GM=Graphite Metallic</p> <p><b>Options</b><sup>17</sup> F=Single Fuse (120, 277 or 347V) Specify Voltage<sup>18</sup> FF=Double Fuse (208, 240 or 480V) Specify Voltage<sup>18</sup> TP=Tamper Proof Hardware (TORX™ Center Pin Reject) CF/EM=Emergency Battery Pack<sup>19</sup> EM/SC=Quartz Emergency Separate Circuit<sup>20</sup> L=Lamp included</p> <p><b>Accessories</b><sup>21</sup> LED RD/RK=Red LED Lamp Replacement Kit LED BL/RK=Blue LED Lamp Replacement Kit LED GN/RK=Green LED Lamp Replacement Kit LED OR/RK=Orange LED Lamp Replacement Kit LED CN/RK=Cyan LED Lamp Replacement Kit LED WH/RK=White LED Lamp Replacement Kit</p>	<p><b>Options &amp; Accessories</b> (See Below)</p>
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### Ordering Information (Back Housing. Must be order separately)

SAMPLE NUMBER: SRBH-D



WATTAGE TABLE	SRS
Metal Halide ED-17	50, 70, 100W
High Pressure Sodium	35, 50, 70W
Metal Halide T6	39, 70W
Compact Fluorescent	26, 32, 42, 57W
Dual Compact Fluorescent	(2) 26, (2) 32W
LED High Output	18W

Notes: 1 Inverted (uplight) mount units available in scoop faceplate only, 70W or less with Magnetic Ballast "MB" only 2 If insulation material is used, it must be kept minimum 3" away from luminaire on all sides 3 All HID units for drywall or combustible applications will require a dual- or multi-tap magnetic ballast allowing use of insulation detector as required by Code CF units have built in thermal protection; insulation detector will be taken out of circuit 4 All HID ED-17 lamps are medium-base 5 35W HPS available in 120V only 6 100W MH available only in "C" Concrete Pour and "M" Masonry Wall units 7 CF lamps use electronic ballast 120-277V (UNV) only 8 Nominal M O L lamp length of 57W CFL not to exceed 7" 9 Available with electronic ballast, 120V only 10 Products also available in non-US voltages and 50Hz for international markets Consult factory for availability and ordering information 11 Dual-tap is 120/277V wired 277V 12 Not available in 70W MH medium-base M98 lamp 13 Multi-tap is 120/208/240/277V wired 277V 14 Triple-tap is 120/277/347V wired 347V 15 Available in 50W MH or less, 120-277V universal voltage, not available with HID units in Dry Wall (D) applications "EB" standard on all Compact Fluorescent 16 Custom and RAL color matching available upon request Consult your INVUE Lighting Systems Representative for further information 17 Add as suffix in the order shown 18 Available on 50W or less only Not available with CF/EM 19 CF lamps only Battery backup operates 90 minutes at minimum 32°F (0°C), 42W maximum 20 For use only with 39W T4 MH lamp Backup lamp is Halogen 120V T4, G9 base 40W maximum 21 Order separately 22 Specifications and dimensions subject to change without notice

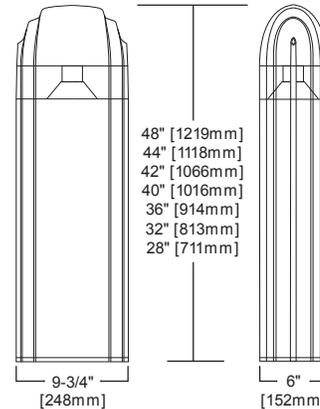


### VXB Vision Bollard Low Level Luminaires

The Vision Bollard from INVUE brings architectural style to the pedestrian level. The Vision Bollard can be used along with Vision Series' Area, Flood, and Wall luminaires to provide a coordinated look sure to enhance any architectural setting. Concealed lamp and reflector system eliminates all visible glare while providing high levels of pavement illumination. UL listed and CSA certified for wet locations.

### VXB Vision Bollard Low Level Luminaires

- ☑ Vandal resistant low copper, die-cast aluminum top
- ☑ Heavy wall seamless extruded aluminum shaft. Optional button photocontrol mounts to extrusion
- ☑ Standard impact and UV resistant injection molded acrylic lens
- ☑ Continuous silicone gasketing provided between extruded housing and lens to forbid entry of contaminants
- ☑ Glare-free, fully concealed reflector system features a high efficiency fluted hydroformed reflector for superior light output and uniform pavement illumination
- ☑ Quick-disconnect ballast assembly located at base of housing for cooler operation and ease of maintenance
- ☑ Medium-base porcelain socket for HID lamp sources
- ☑ Rugged cast aluminum base features two (2) factory installed leveling vials
- ☑ Approximate net weight: 32 lbs. (14.5 kgs)



### Ordering Information

SAMPLE NUMBER: VXB-40-70-MH-MT-BK

<b>Product Family</b> VXB=Vision Bollard	<b>Fixture Height</b> 28=28" 32=32" 36=36" 40=40" 42=42" 44=44" 48=48"	<b>Lamp Wattage</b> <sup>1</sup> <b>HID</b> 35=35W <sup>2</sup> 50=50W 70=70W 100=100W <b>Compact Fluorescent</b> <sup>3</sup> 26=26W 32=32W 42=42W	<b>Lamp Type</b> MH=Metal Halide HPS=High Pressure Sodium CF=Compact Fluorescent <sup>3</sup>	<b>Voltage</b> <sup>4</sup> 120=120V 208=208V 240=240V 277=277V DT=Dual-Tap Wired 277V <sup>5</sup> MT=Multi-Tap Wired 277V <sup>6</sup> TT=Triple-Tap Wired 347V <sup>7</sup> UNV=120-277V Universal Electronic Ballast	<b>Colors</b> (add as suffix/must specify) <sup>8</sup> BK=Black AP=Grey BZ=Bronze WH=White DP=Dark Platinum GM=Graphite Metallic	<b>Options &amp; Accessories</b> (See Below)
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<b>Options</b> <sup>9</sup> F=Single Fuse (120, 277 or 347V) Specify Voltage FF=Double Fuse (208 or 240V) Specify Voltage PL=Polycarbonate Lens PC=Button Type Photocontrol (Specify Voltage) CF/EM=Compact Fluorescent <sup>10</sup> Emergency Battery Pack L=Lamp Included <sup>11</sup>	<b>Accessories</b> <sup>12</sup> VXBABKIT=Anchor Bolt Kit
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WATTAGE TABLE		VXB
Metal Halide		50, 70, 100W
High Pressure Sodium		35, 50, 70, 100W
Compact Fluorescent		26, 32, 42W

Certifications		
IP44 Rated	U.L. 1598 Listed	
CSA Listed	25C Ambient	ISO 9001
		 Outoff

Notes: 1 All lamps are medium-base 2 35W HPS available in 120V only 3 CF lamps use electronic ballast 120-277V (UNV) only 4 Products also available in non-US voltages and 50Hz for international markets Consult factory for availability and ordering information 5 Dual-Tap is 120/277V wired 277V 6 Multi-Tap ballast is 120/208/240/277V wired 277V 7 Triple-Tap ballast is 120/277/347V wired 347V 8 RAL and custom color matches available Consult your INVUE Lighting Systems Representative for more information 9 Add suffix in the order shown 10 CF lamps only Battery backup operates 90 minutes at minimum 32°F (0°C), 42W maximum 11 Coated lamp recommended 12 Order separately, replace XX with color suffix 13 Specifications and dimensions subject to change without notice

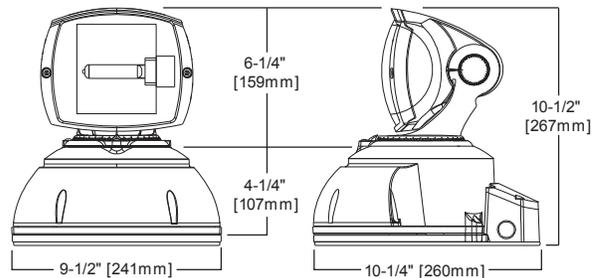


### PHH Phocus Architectural Flood Luminaire

PHOCUS defines the ultimate floodlighting solution; powerful performance, easily concealable size and a stunningly beautiful shape. Available in wattages up to 150 watt T-6 Metal Halide and 150 watt T-4 Quartz Halogen. PHOCUS is versatile in application. Ground, wall, ceiling, burial and remote mounting configurations offer a wide variety of application alternatives to accomplish specific design requirements. Offering seven (7) uniquely shaped optical distributions, plus an array of HID and Quartz Halogen PAR lamps, PHOCUS is unrivaled in its optical versatility. An available family of light control accessories provides custom cutoff solutions to meet specific distribution requirements.

### PHH Phocus Architectural Flood Luminaire

- ☑ One-piece, die-cast aluminum housing with cast indicator mark on backside of housing references 5° integral aiming marks on yoke arm for precise vertical aiming control
- ☑ Die-cast aluminum door is secured with two (2) tamper resistant recessed stainless steel fasteners
- ☑ Lens is impact resistant .20" tempered clear or optional frosted contoured glass, sealed to the door with a one-piece molded silicone gasket
- ☑ Heavy-duty die-cast aluminum yoke arms utilize a positive-lock adjustment mechanism for both solid attachment and infinite aiming
- ☑ Choice of seven (7) high efficiency optical systems
- ☑ Die-cast aluminum ballast enclosure. Wiring compartment features a removable access cover and is completely sealed from electrical components to prevent water or vapor entry into the fixture
- ☑ Approximate net weight: 10 lbs. (4.5 kgs.)



### Ordering Information

SAMPLE NUMBER: PHH-39-MH-120-EB-FL30-GIB-DP

<p><b>Product Family</b> PHH=PHOCUS HID</p> <p>PHQ Quartz version available also See Cooper Lighting Buyers Guide 5th Edition pg 1111</p>	<p><b>Lamp Type</b> MH=Metal Halide</p>	<p><b>Voltage</b> <sup>5</sup> 120=120V 208=208V 240=240V 277=277V 347=347V DT=Dual-Tap Wired 277V <sup>6 7</sup> MT=Multi-Tap Wired 277V <sup>6 8</sup> TT=Triple-Tap Wired 347V <sup>6 9</sup> UNV=120-277V Universal Electronic Ballast</p>	<p><b>Ballast</b> MB=Magnetic EB=Electronic <sup>10</sup></p>	<p><b>Optical Systems</b> HID T6 Lamps NS=Narrow Spot Axial HNF=Horizontal Narrow Flood HMF=Horizontal Medium Flood HWF=Horizontal Wide Flood VNF=Vertical Narrow Flood VMF=Vertical Medium Flood VWF=Vertical Wide Flood</p> <p>HID PAR Lamps <sup>11</sup> SP10=10" Spot FL30=30" Flood</p>	<p><b>Mounting Options</b> <u>Ground Mount</u> GBB=Direct Burial Mount (supplied with burial ballast) <sup>12</sup> GIB=Integral Ballast Box GRB=Remote Mount (supplied with remote burial ballast) <sup>12</sup> GRNB=Remote Mount (requires remote potted ballast by others) <sup>13</sup> GSR=Spike Mount (supplied with remote burial ballast) <sup>12</sup></p> <p><u>Wall/Ceiling Mount</u> WIB=Integral Ballast Box WRNB=Remote Mount (requires remote potted ballast by others)</p>	<p><b>Colors (add as suffix/must specify)</b> <sup>14</sup> BK=Black AP=Grey BZ=Bronze WH=White DP=Dark Platinum GM=Graphite Metallic VR=Verde Green</p> <p><b>Options &amp; Accessories</b> (See Below)</p>													
<p><b>Lamp Wattage</b> HID T6 Lamps <sup>1</sup> 39=39W <sup>2</sup> 70=70W <sup>3</sup> 100=100W 150=150W HID PAR Lamps <sup>4</sup> 39=39W <sup>2</sup></p>	<p><b>Options</b> <sup>15</sup> F=Single Fuse (120, 277 or 347V) Specify Voltage <sup>16</sup> FF=Double Fuse (208, 240 or 480V) Specify Voltage <sup>16</sup> FR=Frosted Flat Glass Lens L=Lamp Included</p>	<p><b>Accessories</b> <sup>17</sup> VA3003-XX=Color Filter Adapter with Red Gel VA3004-XX=Color Filter Adapter with Bright Blue Gel VA3005-XX=Color Filter Adapter with Deep Green Gel VA3006-XX=Color Filter Adapter with Warm Orange Gel VA3001-XX=Top Visor VA3002-XX=Four Sided Shield VA3007-XX=Wire Guard</p>	<p><b>Certifications</b></p> <table border="1"> <tr> <td>IP65 Rated</td> <td>U.L. 1598</td> <td>2GVibration Tested</td> </tr> <tr> <td>CSA Listed</td> <td>25°C Ambient</td> <td>ISO 9001</td> </tr> </table>	IP65 Rated	U.L. 1598	2GVibration Tested	CSA Listed	25°C Ambient	ISO 9001	<table border="1"> <tr> <td colspan="2"><b>WATTAGE TABLE</b></td> <td><b>PHH</b></td> </tr> <tr> <td>Metal Halide T6</td> <td></td> <td>39, 70, 100, 150W</td> </tr> <tr> <td>Metal Halide PAR20</td> <td></td> <td>39W</td> </tr> </table>	<b>WATTAGE TABLE</b>		<b>PHH</b>	Metal Halide T6		39, 70, 100, 150W	Metal Halide PAR20		39W
IP65 Rated	U.L. 1598	2GVibration Tested																	
CSA Listed	25°C Ambient	ISO 9001																	
<b>WATTAGE TABLE</b>		<b>PHH</b>																	
Metal Halide T6		39, 70, 100, 150W																	
Metal Halide PAR20		39W																	

Notes: 1 T6 lamps use G12 base 2 Available in Dual-tap, 120 and 277V only 3 70W magnetic ballast limited to Dual-tap 120/277V or 120/347V 4 39W PAR20 lamps use medium screw base 5 Products also available in non-US voltages and 50Hz for international markets Consult factory for availability and ordering information 6 Magnetic ballasts only 7 Dual-tap is 120/277V wired 277V 8 Multi-tap is 120/208/240/277V wired 277V 9 Triple-tap is 120/277/347V wired 347V 10 120 through 277V only Not available with 150 MH lamp, or GBB, GRB, GSR ground mount options 11 PAR 20 MH lamps available in 39W only 12 GBB, GRB, GSR mounting options include a magnetic potted burial ballast enclosure Not available in 150W MH Maximum 50' removing distance from fixture head 13 For use when ground mounting in non-earth or interior surface environments 14 Custom and RAL color matching available upon request Consult your INVUE Lighting Systems Representative for further information 15 Add as suffix in the order shown 16 Fusing available on GIB and WIB mounting options only 17 Order separately, replace XX with color suffix 18 Specifications and dimensions subject to change without notice



### FLS Flite Architectural Area Luminaire

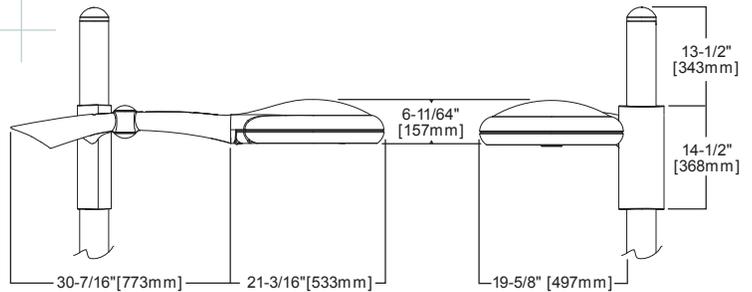
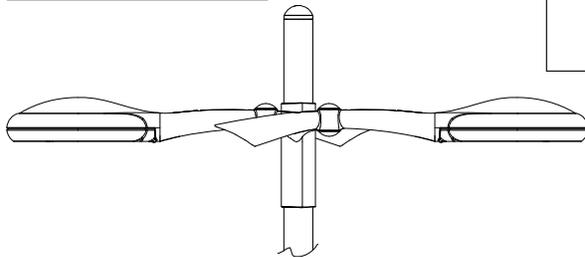
Dramatic styling launches FLITE in to its own stratosphere. The 90° design of the cast arm assembly in conjunction with the flowing lines from pole to luminaire provide statement that both daring form and spectacular performance can coexist harmoniously in application. Dual mount capability by simply specifying (2) FLS Flite luminaires.

### FLS Flite Architectural Area Luminaire

- ☑ Heavy-wall, die-cast aluminum housing
- ☑ Continuous silicone gasketing provides IP65 fixture rating
- ☑ Impact resistant 1/8" thick tempered clear or optional frosted flat glass
- ☑ Toolless entry to housing provided via two (2) push release recessed latches
- ☑ Heavy wall, cast aluminum arm fits 4" O.D. 10" long tenon
- ☑ Ballast and related electrical componentry are mounted to a reinforced one piece tray with integral handle
- ☑ Choice of five (5) high efficiency segmented optical systems constructed of premium 95% reflective anodized aluminum sheet
- ☑ Medium-base porcelain socket for HID lamp sources
- ☑ Approximate net weight: 86 lbs. (39 kgs.)



DUAL CONFIGURATION



### Ordering Information

SAMPLE NUMBER: FLS-175-MH-MT-3S-BK-L

<b>Product Family</b> FLS=FLITE Site Small <sup>1</sup>	<b>Lamp Wattage</b> HID <sup>2</sup> 70=70W 100=100W 150=150W 175=175W Compact Fluorescent <sup>3</sup> 42=42W 57=57W <sup>4</sup>	<b>Lamp Type</b> MH=Metal Halide HPS=High Pressure Sodium CF=Compact Fluorescent <sup>5</sup>	<b>Voltage</b> <sup>6</sup> 120=120V 208=208V 240=240V 277=277V 347=347V 480=480V DT=Dual-Tap wired 277V <sup>7</sup> MT=Multi-Tap wired 277V <sup>8</sup> TT=Triple-Tap wired 347V <sup>9</sup> UNV=120-277V Universal Electronic Ballast	<b>Optical System</b> 2S=Type II 3S=Type III 4S=Type IV 5S=Type V SL=Spill Light Eliminator	<b>Colors</b> <sup>10</sup> (add as suffix/must specify) BK=Black AP=Grey BZ=Bronze WH=White DP=Dark Platinum GM=Graphite Metallic	<b>Options &amp; Accessories</b> (See Below)
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WATTAGE TABLE		FLS
Metal Halide		70, 100, 175W
High Pressure Sodium		70, 100, 150W
Compact Fluorescent		42, 57W

Certifications			
IP65 Rated	U.L. 1598	2G Vibration Tested	<b>FCO</b> Full Cutoff
CSA Listed	25°C Ambient	ISO 9001	

Options <sup>11</sup>  
 F=Single Fuse (120, 277 or 347V) Specify Voltage  
 FF=Double Fuse (208, 240 or 480V) Specify Voltage  
 Q=Quartz Restrike <sup>12</sup>  
 EM=Quartz Restrike with Time Delay (Also Strikes at Cold Start) <sup>12</sup>  
 EM/SC=Quartz Emergency Separate Circuit <sup>12</sup>  
 42CF/EM=Emergency Battery Backup <sup>13</sup>  
 R=NEMA Twistlock Photocell Receptacle  
 PC=Button Type Photocontrol (Specify Voltage)  
 HS=House Side Shield <sup>14</sup>  
 VS=Polycarbonate Vandal Shield  
 FR=Frosted Flat Glass Lens  
 L=Lamp Included

Accessories <sup>15</sup>  
 OA/RA1016=NEMA Photocontrol Multi-Tap  
 OA/RA1027=NEMA Photocontrol 480V  
 OA/RA1201=NEMA Photocontrol 347V

Notes: 1 Fixture includes decorative arm assembly 2 All HID lamps are medium-base 3 Available in Type 3S, 4S, and 5S distributions only 4 Nominal M.O.L lamp length of 57W CFL not to exceed 7" 5 Compact Fluorescent ballasts contain internal fusing No supplemental fusing is necessary CF ballasts are 120 through 277V Specify with UNV voltage designation 6 Products also available in non-US voltages and 50Hz for international markets Consult factory for availability and ordering information 7 Dual-tap is 120/277V wired 277V 8 Multi-tap is 120/208/240/277V wired 277V 9 Triple-tap is 120/277/347V wired 347V 10 Custom and RAL color matching available upon request Consult your INVUE Lighting Systems Representative for further information 11 Add as suffix in the order shown 12 Quartz options not available with SL optic 13 Battery backup operates 90 minutes at minimum 32°F (0°C), 42W maximum Type 3S, 4S, 5S optics only 14 House side shield not available on 5S and SL optics 15 Order separately 16 Specifications and dimensions subject to change without notice



### Ascent Architectural Area Luminaire

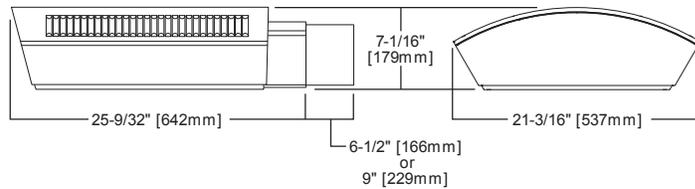
ASCENT enhances the rectilinear form with a housing that blends effortlessly to traditional or ambitious architectural environments. ASCENT brings two (2) housing sizes and a fluid form to match the culture in which it resides.

### Ascent Architectural Area Luminaire

- ☑ Two-piece heavy-wall, die-cast aluminum housing
- ☑ Continuous silicone gasketing provides IP66 fixture rating
- ☑ Impact resistant 1/8" thick tempered clear or optional frosted flat glass
- ☑ Toolless entry to housing is provided via two (2) flush mounted quick release latches
- ☑ Ballast and related electrical components are mounted to a reinforced one-piece die-cast aluminum power tray
- ☑ Choice of five (5) high efficiency segmented optical systems constructed of premium 95% reflective anodized aluminum sheet
- ☑ Mogul-base porcelain socket for HID lamp sources
- ☑ Housing and arm finished in a 5 stage premium TGIC polyester powder coat paint
- ☑ Approximate net weight: AEM Ascent Site Medium 51 lbs. (23 kgs), EPA: 1.35, AES Ascent Site Small 35 lbs. (16 kgs), EPA: .85



AEM Ascent Site Medium



### Ordering Information

SAMPLE NUMBER: AEM-400-MH-MT-3S-BK-L

<b>Product Family</b> AEM=ASCENT Site Medium  AES ASCENT Site Small also available See Cooper Lighting Buyers Guide 5th Edition pg 1088	<b>Lamp Wattage</b> HID <sup>2</sup> 150=150W 175=175W 250=250W 320=320W <sup>3</sup> 350=350W <sup>3</sup> 400=400W <sup>4</sup> Compact Fluorescent 114=(2) 57W <sup>5</sup> 140=(2) 70W <sup>5</sup>	<b>Lamp Type</b> MH=Metal Halide MP=Pulse Start Metal Halide HPS=High Pressure Sodium CF=Compact Fluorescent <sup>6</sup>	<b>Voltage</b> <sup>7</sup> 120=120V 208=208V 240=240V 277=277V 347=347V 480=480V DT=Dual-Tap Wired 277V <sup>8</sup> MT=Multi-Tap Wired 277V <sup>9</sup> TT=Triple-Tap Wired 347V <sup>10</sup> UNV=120-277V Universal Electronic Ballast	<b>Optical System</b> 2S=Type II 3S=Type III 4S=Type IV 5S=Type V SL=Spill Light Eliminator	<b>Colors</b> <sup>11</sup> (add as suffix/must specify) BK=Black AP=Grey BZ=Bronze WH=White DP=Dark Platinum GM=Graphite Metallic	<b>Options &amp; Accessories</b> (See Below)
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Certifications		
IP66 Rated	U.L. 1598	3G Vibration Tested
CSA Listed	40°C Ambient	ISO 9001

WATTAGE TABLE	
	AEM
Metal Halide	175, 250, 400W
Pulse Start Metal Halide	250, 320, 350, 400W
High Pressure Sodium	150, 250, 400W
Compact Fluorescent	(2) 57, (2) 70

- Options**<sup>12</sup>
- F=Single Fuse (120, 277 or 347V) Specify Voltage
  - FF=Double Fuse (208, 240 or 480V) Specify Voltage
  - Q=Quartz Restrike<sup>13</sup>
  - EM=Quartz Restrike with Time Delay (Also Strikes at Cold Start)<sup>13</sup>
  - EM/SC=Quartz Emergency Separate Circuit<sup>13</sup>
  - R=NEMA Twistlock Photocell Receptacle
  - PC=Button Type Photocontrol (Specify Voltage)
  - DS=Dual Fluorescent Switching Control<sup>14</sup>
  - HS=House Side Shield<sup>15</sup>
  - FR=Frosted Flat Glass Lens
  - L=Lamp Included

- Accessories**<sup>16</sup>
- OA/RA1016=NEMA Photocontrol Multi-Tap
  - OA/RA1027=NEMA Photocontrol 480V
  - OA/RA1201=NEMA Photocontrol 347V
  - VA1049-XX=Direct Wall Mount Kit<sup>17</sup>
  - VA1050-XX=Wall Mount Kit with 6 1/2" Arm<sup>17</sup>
  - VA1055-XX=6 1/2" Arm for Square Pole
  - VA1056-XX=9" Arm for Square Pole<sup>18</sup>
  - VA1057-XX=6 1/2" Arm for Round Pole
  - VA1059-XX=9" Arm for Round Pole<sup>18</sup>
  - VA1018-XX=Mast Arm Adapter Kit
  - VA1033-XX=Single Arm Tenon Adapter for 2 3/8" O D Tenon
  - VA1034-XX=2 @ 180° Tenon Adapter for 2 3/8" O D Tenon
  - VA1035-XX=3 @ 120° Tenon Adapter for 2 3/8" O D Tenon
  - VA1036-XX=4 @ 90° Tenon Adapter for 2 3/8" O D Tenon
  - VA1037-XX=2 @ 90° Tenon Adapter for 2 3/8" O D Tenon
  - VA1038-XX=3 @ 90° Tenon Adapter for 2 3/8" O D Tenon
  - VA1039-XX=2 @ 120° Tenon Adapter for 2 3/8" O D Tenon
  - VA1040-XX=Single Arm Tenon Adapter for 3 1/2" O D Tenon
  - VA1041-XX=2 @ 180° Tenon Adapter for 3 1/2" O D Tenon
  - VA1042-XX=3 @ 120° Tenon Adapter for 3 1/2" O D Tenon
  - VA1043-XX=4 @ 90° Tenon Adapter for 3 1/2" O D Tenon
  - VA1044-XX=2 @ 90° Tenon Adapter for 3 1/2" O D Tenon
  - VA1045-XX=3 @ 90° Tenon Adapter for 3 1/2" O D Tenon
  - VA1046-XX=2 @ 120° Tenon Adapter for 3 1/2" O D Tenon

Notes: 1 Arm not included. See accessories. 2 All HID lamps are mogul-base. 3 320/350W Pulse Start Metal Halide lamp only. 4 400W Metal Halide requires reduced envelope ED28 lamp. 5 Dual Compact Fluorescent lamp options available in Type 4S distribution only. 6 Compact Fluorescent ballasts contain internal fusing. No supplemental fusing is necessary. CF ballasts are 120 through 277V. Specify with UNV voltage designation. 7 Products also available in non-US voltages and 50Hz for international markets. Consult factory for availability and ordering information. 8 Dual-tap is 120/277V wired 277V. 9 Multi-tap is 120/208/240/277V wired 277V. 10 Triple-tap is 120/277/347V wired 347V. 11 Custom and RAL color matching available upon request. Consult your INVUE Lighting Systems Representative for further information. 12 Add as suffix in the order shown. 13 Quartz options not available with SL optic. 14 Dual switching requires dual 57W or dual 70W Compact Fluorescent lamps. Allows independent switching control of each lamp through use of two (2) electronic ballasts. Allows 50% power reduction when dual ballasts are independently wired and controlled. 15 House side shield not available on 5S and SL optics. 16 Order separately, replace XX with color suffix. 17 For use in down lighting applications only. 18 Use when mounting fixture heads at 90° increments. 19 Specifications and dimensions subject to change without notice.



### Strut Architectural Area Luminaire

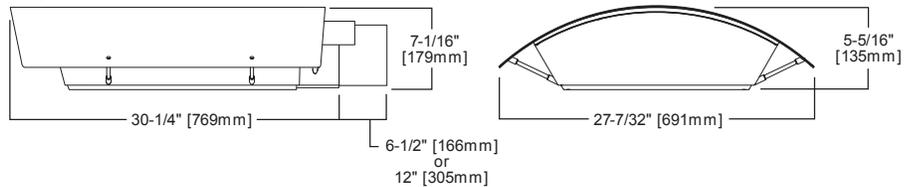
STRUT enhances the rectilinear form with a housing that blends effortlessly to traditional or ambitious architectural environments. STRUT brings two (2) housing sizes and a fluid form to match the culture in which it resides.

### Strut Architectural Area Luminaire

- ☑ Two-piece heavy-wall, die-cast aluminum housing
- ☑ Continuous silicone gasketing provides IP66 fixture rating
- ☑ Impact resistant 1/8" thick tempered clear or optional frosted flat glass
- ☑ Toolless entry to housing is provided via two (2) flush mounted quick release latches
- ☑ Ballast and related electrical components are mounted to a reinforced one-piece die-cast aluminum power tray
- ☑ Choice of five (5) high efficiency segmented optical systems constructed of premium 95% reflective anodized aluminum sheet
- ☑ Mogul-base porcelain socket for HID lamp sources
- ☑ Housing and arm finished in a 5 stage premium TGIC polyester powder coat paint
- ☑ Approximate net weight: STM Strut Site Medium 51 lbs. (23 kgs.)  
EPA: 1.64, STS Strut Site Small 35 lbs. (16 kgs.), EPA: 1.03



STM Strut Site Medium



### Ordering Information

SAMPLE NUMBER: STM-400-MH-MT-3S-BK-STR-L

<b>Product Family</b> STM=STRUT Site Medium  STS STRUT Site Small also available See Cooper Lighting Buyers Guide 5th Edition pg 1090	<b>Lamp Wattage</b> HID <sup>2</sup> 150=150W 175=175W 250=250W 320=320W <sup>3</sup> 350=350W <sup>3</sup> 400=400W <sup>4</sup> Compact Fluorescent 114=(2) 57W <sup>5</sup> 140=(2) 70W <sup>5</sup>	<b>Lamp Type</b> MH=Metal Halide MP=Pulse Start Metal Halide HPS=High Pressure Sodium CF=Compact Fluorescent <sup>6</sup>	<b>Voltage</b> <sup>7</sup> 120=120V 208=208V 240=240V 277=277V 347=347V 480=480V DT=Dual-Tap Wired 277V <sup>8</sup> MT=Multi-Tap Wired 277V <sup>9</sup> TT=Triple-Tap Wired 347V <sup>10</sup> UNV=120-277V Universal Electronic Ballast	<b>Optical System</b> 2S=Type II 3S=Type III 4S=Type IV 5S=Type V SL=Spill Light Eliminator	<b>Colors</b> <sup>11</sup> (add as suffix/must specify) BK=Black AP=Grey BZ=Bronze WH=White DP=Dark Platinum GM=Graphite Metallic	<b>Structural Option</b> (add as suffix) STR=Strut Rod Supports (Painted to match fixture)	<b>Options &amp; Accessories</b> (See Below)
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**Certifications**

IP66 Rated	U.L. 1598 Listed	3G Vibration Tested	FCO Full Cutoff
CSA Listed	40°C Ambient	ISO 9001	

WATTAGE TABLE	STM
Metal Halide	175, 250, 400W
Pulse Start Metal Halide	250, 320, 350, 400W
High Pressure Sodium	150, 250, 400W
Compact Fluorescent	(2) 57, (2) 70

**Options**<sup>12</sup>

- F=Single Fuse (120, 277 or 347V)  
Specify Voltage
  - FF=Double Fuse (208, 240 or 480V)  
Specify Voltage
  - Q=Quartz Restrike<sup>13</sup>
  - EM=Quartz Restrike with Time Delay  
(Also Strikes at Cold Start)<sup>13</sup>
  - EM/SC=Quartz Emergency Separate  
Circuit<sup>13</sup>
  - R=NEMA Twistlock Photocell Receptacle
  - PC=Button Type Photocontrol  
(Specify Voltage)
  - DS=Dual Fluorescent Switching Control<sup>14</sup>
  - HS=House Side Shield<sup>15</sup>
  - FR=Frosted Flat Glass Lens
  - L=Lamp Included
- Accessories**<sup>16</sup>
- OA/ RA 1016=NEMA Photocontrol Multi-Tap
  - OA/ RA 1027=NEMA Photocontrol 480V
  - OA/ RA 1201=NEMA Photocontrol 347V
  - VA 1050-XX=STM Wall Mount Kit with 6 1/2" Arm<sup>17</sup>
  - VA 1055-XX=6 1/2" Arm for Square Pole
  - VA 1069-XX=12" Arm for Square Pole<sup>18</sup>
  - VA 1057-XX=6 1/2" Arm for Round Pole
  - VA 1072-XX=12" Arm for Round Pole<sup>18</sup>
  - VA 1018-XX=Mast Arm Adapter Kit
  - VA 1033-XX=Single Arm Tenon Adapter for 2 3/8" O D Tenon
  - VA 1034-XX=2 @ 180° Tenon Adapter for 2 3/8" O D Tenon
  - VA 1035-XX=3 @ 120° Tenon Adapter for 2 3/8" O D Tenon
  - VA 1036-XX=4 @ 90° Tenon Adapter for 2 3/8" O D Tenon
  - VA 1037-XX=2 @ 90° Tenon Adapter for 2 3/8" O D Tenon
  - VA 1038-XX=3 @ 90° Tenon Adapter for 2 3/8" O D Tenon
  - VA 1039-XX=2 @ 120° Tenon Adapter for 2 3/8" O D Tenon
  - VA 1040-XX=Single Arm Tenon Adapter for 3 1/2" O D Tenon
  - VA 1041-XX=2 @ 180° Tenon Adapter for 3 1/2" O D Tenon
  - VA 1042-XX=3 @ 120° Tenon Adapter for 3 1/2" O D Tenon
  - VA 1043-XX=4 @ 90° Tenon Adapter for 3 1/2" O D Tenon
  - VA 1044-XX=2 @ 90° Tenon Adapter for 3 1/2" O D Tenon
  - VA 1045-XX=3 @ 90° Tenon Adapter for 3 1/2" O D Tenon
  - VA 1046-XX=2 @ 120° Tenon Adapter for 3 1/2" O D Tenon

Notes: 1 Arm not included See accessories 2 All HID lamps are mogul-base 3 320/350W Pulse Start Metal Halide lamps only 4 400W Metal Halide requires reduced envelope ED28 lamp 5 Dual Compact Fluorescent lamp options available in Type 4S distribution only 6 Compact Fluorescent ballasts contain internal fusing No supplemental fusing is necessary CF ballasts are 120 through 277V Specify with UNV voltage designation 7 Products also available in non-US voltages and 50Hz for international markets Consult factory for availability and ordering information 8 Dual-tap is 120/277V wired 277V 9 Multi-tap is 120/208/240/277V wired 277V 10 Triple-tap is 120/277/347V wired 347V 11 Custom and RAL color matching available upon request Consult your INVUE Lighting Systems Representative for further information 12 Add as suffix in the order shown 13 Quartz options not available with SL optic 14 Dual switching requires dual 57W or dual 70W Compact Fluorescent lamps Allows independent switching control of each lamp through use of two (2) electronic ballasts Allows 50% power reduction when dual ballasts are independently wired and controlled 15 House side shield not available on 5S and SL optics 16 Order separately, replace XX with color suffix 17 For use in down lighting applications only 18 Use when mounting fixture heads at 90° increments 19 Specifications and dimensions subject to change without notice



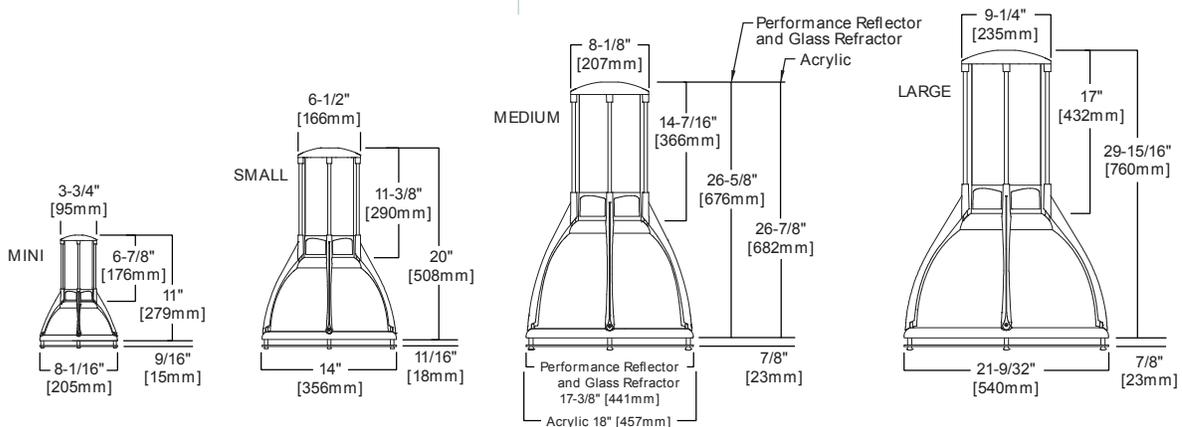
also available in Medium and Large sizes

## AVID Decorative High-Bay Luminaire

- Available in four scaled sizes, ideal for many different applications
- Cast aluminum construction makes the AVID series durable
- Complete optical offering delivers high efficiencies up to 96%
- Variety of optical choices including borosilicate glass lens, prismatic acrylic lens, high performance aluminum reflector and an optional shroud
- Lamping options include 20-400 watt metal halide, single and multi-lamp compact fluorescent, quartz halogen and incandescent
- Lens options include Clear Glass lens, Decorative Frosted Ring and Frosted Glass Lens
- Mounting includes Pendant for all sizes and Cable Mount for Mini and Small

## AVID Decorative High-Bay Luminaire

Impact Flood's cylindrical form blends effortlessly to architectural and landscape environments. Available in wattages up to 175W Metal Halide and High Pressure Sodium, and up to 42W Compact Fluorescent. Impact Flood offers properly scaled solutions for any floodlighting application.



## Ordering Information

SAMPLE NUMBER FOR SMALL: AIS-100-MH-120-A12-M-I-SC-GM

<b>Product Family</b> AIS=AVID Series Small	<b>Lamp Wattage</b> HID 39=39W T6 G12 50=50W Medium Base 70=70W Medium Base 100=100W Medium Base Compact Fluorescent X=Number of Lamps X26=(1 or 2) 26W X32=(1 or 2) 32W X42=(1 or 2) 42W Quartz <sup>1</sup> 250=250W Incandescent <sup>1</sup> 200=200W	<b>Voltage</b> 120=120V 208=208V 240=240V 277=277V UNV=120-277V MT=(standard 120/208/240/277)	<b>Distribution</b> N=Narrow M=Medium W=Wide	<b>Mounting Options</b> Pendant <sup>4</sup> P36=36" Pendant Kit P60=60" Pendant Kit P120=120" Pendant Kit Cable SC=Cable Mount with Straight Power Cord <sup>3</sup> (Standard Length 120") CC=Cable Mount with Coiled Power Cord <sup>3</sup> (Standard Length 4'-10")	<b>Finish</b> BK=Black AP=Grey BZ=Bronze WH=White DP=Dark Platinum GM=Graphite Metallic	<b>Options</b> F1=Single Fuse F2=Double Fuse LL=Lamp Included FGS=Frosted Glass Lens OGL=Clear Glass Lens DFR=Decorative Frosted Ring OR=Open Rated Socket
	<b>Lamp Type</b> MH=Metal Halide CF=Compact Fluorescent IN=Incandescent QZ=Quartz Halogen	<b>Optical System</b> Borosilicate Glass G12=12" Glass Refractor SG12=12" Shroud with Glass Refractor Aluminum A12=12" Performance Reflector <sup>2</sup> Acrylic AC12=12" Clear Acrylic SAC12=12" Shroud with Clear Acrylic	<b>Ballast Housing</b> I=Integral			

Notes: 1 Cannot be used with AC12 Optic 2 Shroud comes standard with Performance Reflector 3 Specify W for white cord, example: SCW 4 Pendant dimension refers to the distance from the mounting plane to the bottom of the fixture 5 Specifications and dimensions subject to change without notice

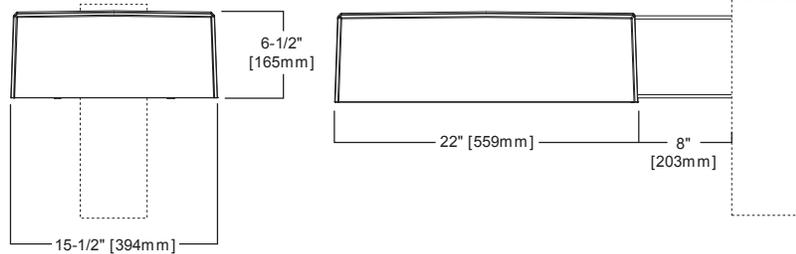


### Tribute Area Luminaire

The Lumark Tribute is the most versatile, functionally designed, universally adaptable outdoor luminaire available. The Tribute brings outstanding performance to walkways, parking lots, roadways, loading docks, building areas, and any security lighting application. UL listed and CSA certified for wet locations. IP55 Rating.

### Tribute Area Luminaire

- ☑ Rugged die-cast construction and classic form
- ☑ Contractor-friendly features such as toolless entry and an optional electrical power tray
- ☑ Available with nine (9) uniquely shaped optical distributions
- ☑ Whether selecting a high efficiency hydroformed optic or a premium 95% reflective segmented reflector, Tribute's optical versatility provides custom tailored lighting solutions for exacting site requirements
- ☑ Cooper's-exclusive SLE Spill Light Eliminator optic which provides outstanding cutoff behind the pole and maximum street-side reach.
- ☑ Offered in five (5) distinct mounting configurations, providing unrivaled versatility in mounting
- ☑ Housing and arm finished in a 5 stage premium TGIC bronze polyester powder coat paint
- ☑ Optional colors include black, grey, white, dark platinum and graphite metallic. RAL and custom color matches available
- ☑ UL listed for wet locations. CSA certified



### Ordering Information

SAMPLE NUMBER: MHTR-SL-400-MT-LL

<b>Lamp Type</b> HP=High Pressure Sodium MH=Metal Halide MP=Pulse Start MH (CWA)	<b>Distribution</b> 2F=Type II Formed Segmented 3F=Type III Formed Segmented 4F=Type IV Formed Segmented 4S=Type IV Segmented 5F=Type V Formed Segmented 5S=Type V Segmented SL=Spill Light Eliminator	<b>Voltage<sup>5</sup></b> 120V=120V 208V=208V 240V=240V 277V=277V 347V=347V 480V=480V DT=Dual-Tap <sup>6</sup> MT=Multi-Tap, <sup>6</sup> wired 277V TT=Triple-Tap, <sup>6</sup> wired 347V 5T=5 Tap, <sup>6</sup> wired 480V	<b>Options<sup>8</sup></b> F1=Single Fuse (120, 277 or 347V only) <sup>9</sup> F2=Double Fuse (208, 240 or 480V only) <sup>9</sup> Q=Quartz Restrike (Hot Strike Only) <sup>9</sup> EM=Quartz Restrike with "Delay Relay" (Quartz lamp strikes at both hot and cold starts) <sup>9</sup> EM/SC=Emergency Separate Circuit <sup>10</sup> LL=Lamp Included S=1-1/4" - 2-3/8" Internal Mast Arm Mount TM=Trunnion Mount PT=Electrical Power Tray HS=House Side Cutoff <sup>11</sup> LA=Less Arm (Order Mounting Separately) PER=NEMA Twistlock Photocontrol Receptacle PC=Button Type Photocontrol WH=White BK=Black AP=AP Grey DP=Dark Platinum GM=Graphite Metallic	<b>Accessories<sup>12</sup></b> MA1201-XX=Direct Wall Mount Kit1 MA1218-XX=Direct Mount for Pole1 MA1219-XX=Wall Mounting Plate OA1090-XX=Adjustable slipfitter Arm for Tenon Mount 2 3/8" O D 1 MA1221-XX=External House Side Shield Kit (EPA= 0 38) MA1222=External House Side Shield Kit for 2S/3S MA1223=Internal House Side Shield Kit 4S MA1224=Internal House Side Shield Kit for 2F/3F MA1225=Internal House Side Shield Kit for 4F MA1010-XX=Single Tenon Adapter for 3 1/2" O D Tenon MA1011-XX=2 @ 180 degrees Tenon Adapter for 3 1/2" O D Tenon MA1012-XX=3 @ 120 degrees Tenon Adapter for 3 1/2" O D Tenon MA1013-XX=4 @ 90 degrees Tenon Adapter for 3 1/2" O D Tenon MA1014-XX=2 @ 90 degrees Tenon Adapter for 3 1/2" O D Tenon MA1015-XX=2 @ 120 degrees Tenon Adapter for 3 1/2" O D Tenon MA1016-XX=3 @ 90 degrees Tenon Adapter for 3 1/2" O D Tenon MA1017-XX=Single Tenon Adapter for 2 3/8" O D Tenon MA1018-XX=2 @ 180 degrees Tenon Adapter for 2 3/8" O D Tenon MA1019-XX=3 @ 120 degrees Tenon Adapter for 2 3/8" O D Tenon MA1045-XX=4 @ 90 degrees Tenon Adapter for 2 3/8" O D Tenon MA1048-XX=2 @ 90 degrees Tenon Adapter for 2 3/8" O D Tenon MA1049-XX=3 @ 90 degrees Tenon Adapter for 2 3/8" O D Tenon OARA1016=Photoelectric Control 105-285V NEMA Type OARA1027=Photoelectric Control 480V NEMA Type OA/RA1021=Photoelectric Control 347V NEMA Type OARA1013=Shorting Cap TR/VS=Field Installed Vandal Shield13
<b>Series<sup>7</sup></b> TR=Tribute (Arm Included)	<b>Lamp Wattage<sup>2</sup></b> 70=70W 100=100W 150=150W 175=175W 250=250W 320=320W 400=400W			

Notes: 1 8 Inch Arm and pole adapter included with fixture. Specify Less Arm "LA" option when mounting accessory is ordered separately. 2 Standard with mogul-base socket for 150-400W and medium-base socket 100W and below. 3 320W Pulse Start Metal Halide lamps only. 4 Requires reduced envelope lamp. 5 Products also available in non-US voltages and 50HZ for international markets. Consult factory for availability and ordering information. 6 Dual-Tap is 120/277V wired 277V. Multi-Tap is 120/208/240/277V wired 277V. Triple-Tap ballast is 120/277/347V wired 347V. 5-Tap is 120/208/240/277/480V wired 480V. 7 Custom and RAL color matching available upon request. Consult Cooper Lighting Representative for further information. 8 Add as a suffix. 9 Must specify voltage. 10 Quartz options not available with SL optics. 11 House side shield not available on 5S, 5F, or SL optics. 12 Order separately/replace XX with color specification. 13 Not available with SLE or House Side Shield.

LAMP TYPE	WATTAGE
Metal Halide	70, 100, 175, 250, 400W
High Pressure Sodium	70, 100, 175, 250, 400W
Pulse Start Metal Halide	150, 175, 250, 320, 400W



### IP Impact Trapezoid Wall Mount Luminaire

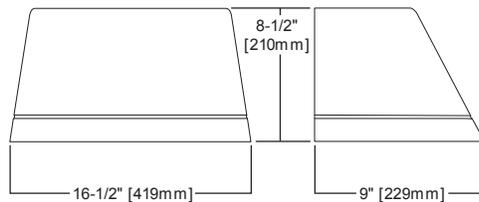
The IMPACT Trapezoid full cutoff wall luminaire makes an ideal complement to site design. UL Listed and CSA Certified for wet locations in down mount applications and damp locations in up mounted applications. Rugged construction and full cutoff classified optics provide facade and security lighting for light restricted zones surrounding the healthcare facility.

### IP Impact Trapezoid Wall Mount Luminaire

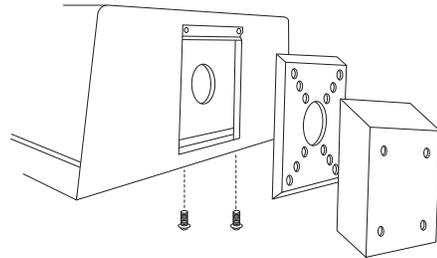
- Two-piece die-cast aluminum housing
- Rigid steel mounting attachment fits directly to 4" J-Box or wall with "Hook-N-Lock" mechanism for quick installation
- HID luminaires supplied with high power factor ballast with Class H insulation. Minimum starting temperatures are -40°C (-40°F) for HPS and -30°C (-22°F) for MH. Compact Fluorescent luminaires feature program start, high efficient multi-voltage 50/60Hz ballast with -18°C (0°F) minimum starting
- Die-cast door features 1/8" heat- and impact-resistant clear tempered glass lens. Hinged door secured in place via two (2) captive fasteners
- Durable polyester powder coat finish. Standard color is bronze. Other finish colors available
- UL listed for wet locations. CSA certified
- Approximate net weight: 18 lbs. (8 kgs.)



NOTE: In down light applications only



HOOK-N-LOCK MOUNTING  
(Mounting attachment included J-Box not included)



### Ordering Information

SAMPLE NUMBER: MHIP-T-150-MT-LL

<p><b>Lamp Type</b> MH=Metal Halide HP=High Pressure Sodium FL=Compact Fluorescent</p> <p>Also available in Medium size See Cooper Lighting Buyers Guide 5th Edition pg 567</p>	<p><b>Fixture Type</b> IP=IMPACT</p>	<p><b>Fixture Shape</b> T=Trapezoid</p>	<p><b>Lamp Wattage</b> HID<sup>1</sup> 50=50W<sup>2</sup> 70=70W<sup>3</sup> 100=100W 150=150W 175=175W<sup>4</sup> Compact Fluorescent<sup>5</sup> 26/32/42=26, 32, or 42W 52=(2) 26W<sup>6</sup> 64=(2) 32W<sup>6</sup> 84=(2) 42W<sup>6</sup></p>	<p><b>Voltage<sup>7</sup></b> 120V 208V 240V 277V 347V 480V DT=Dual-Tap<sup>8</sup> MT=Multi-Tap<sup>9</sup> TT=Triple-Tap<sup>10</sup> E=Electronic Ballast<sup>11</sup></p>	<p><b>Options &amp; Accessories</b> (See Below)</p>
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LAMP TYPE	WATTAGE
Metal Halide	50, 70, 100, 175W
High Pressure Sodium	50, 70, 100, 150W
Compact Fluorescent	26, 32, 42, 52, 64, 84W

- Options<sup>13</sup>  
 F1=Single Fuse (120, 277 or 347V) Must Specify Voltage  
 F2=Double Fused (208 or 240V) Must Specify Voltage  
 TR=Tamper Resistant Screw (Door and Mounting Plate)  
 PE=Button Photocontrol (Must Specify Voltage)  
 UPL10=10% Uplight  
 LL=Lamp Included (Must Specify Wattage on PL)<sup>14</sup>  
 BK=Black  
 WH=White  
 Q=Quartz Restrike T4 Lamp<sup>6 17 18 21 22</sup>  
 EM=Emergency Quartz Restrike T4 Lamp With Time Delay Relay<sup>6 15 16 17 18</sup>  
 EM140-XXX=CFL Cold Weather Emergency Battery Pack (Must Specify 120 or 277V)<sup>6 19 20</sup>  
 CF/EM-XXX=Emergency Battery Pack (Must Specify 120 or 277V)<sup>6 19 21</sup>  
 QMR=Quartz Restrike MR16 Lamp<sup>6 17 18 22</sup>  
 EMMR=Emergency Quartz Restrike MR16 Lamp With Time Delay Relay<sup>6 17 18 22</sup>  
 EM/SC=Emergency Separate Circuit T4 Lamp<sup>16 18 23</sup>  
 EM/SC/MR=Emergency Separate Circuit MR16 Lamp<sup>22 23</sup>  
 EM/SC/12V=Emergency Separate Circuit (12V)<sup>24</sup>  
 2QMR=(2) Quartz Restrike MR16 Lamps<sup>6 17 18 22</sup>  
 2EMMR=(2) Emergency Quartz Restrike MR16 Lamps With Time Delay Relay<sup>6 17 18 22</sup>  
 2EM/SC/MR=(2) Emergency Separate Circuit MR16 Lamps<sup>22 23</sup>  
 2EM/SC/12V=(2) Emergency Separate Circuit MR16 Lamps (12V)<sup>24</sup>  
 2QMR/SC=(1) Quartz Restrike MR16 Lamp and (1) Emergency Separate Circuit MR16 Lamp<sup>6 17 18 22 23</sup>  
 2EMMR/SC=(1) Emergency Quartz Restrike MR16 Lamp with Time Delay Relay and (1) Emergency Separate Circuit MR16 Lamp<sup>6 17 18 22 23</sup>

Notes: 1 All HID lamps are medium-base 2 Available only in 120 or 277V and Dual-Tap 3 Not available in 480V 4 Metal Halide only 5 52W is (2) 26W quad tube lamps 32, 42, 64, 84W use compact triple tube CFL lamps 6 Not available with upright option 7 Products also available in non-US voltages and 50Hz for international markets. Consult your Cooper Lighting Representative for availability and ordering information 8 Dual-Tap ballast are 120/277V wired 277V 9 Multi-Tap ballast are 120/208/240/277V wired 277V 10 Triple-Tap ballast are 120/277/347V wired 347V 11 Supplied with 120V through 277V 50/60Hz for Compact Fluorescent 12 Painted bronze Supplied with lamp and Multi-Tap HPF ballast wired 277V 13 Add as suffix in the order shown 14 Lamp is Cooper Lighting designated product based on luminaire requirements Specified lamps must be ordered as a separate line item 15 The power might need to cycle and allow HID lamp to cool in warm climates Available up to 175W HID 16 For use with T4 double contact DC bayonet base, 100W maximum, 120V halogen lamp by others 17 Lamps wired to quartz restrike relay 18 Not available with CFL 19 Battery pack will operate up to 42W CFL lamp for 90 minutes 20 CFL lamps only, rated for minimum temperature of 0°F (-18°C), available with 52W CFL maximum, heater rated for 300W with thermostat control 21 CFL lamps only, rated for minimum temperature of 32°F (0°C), available with 52W CFL maximum 22 For use with MR16, GU10 base, 50W maximum, 120V halogen lamp by others 23 Leads run out back for connection to auxiliary 120V circuit 24 Supplied with 12V Bi-pin socket for connection to emergency battery pack (supplied by others) For use with MR16, GU5.3 base, 35W maximum, 12V halogen lamp by others 25 (1) Lamp wired quartz restrike, (1) lamp wired emergency separate circuit, leads run separate out back 26 Consult your Cooper Lighting Representative for availability and ordering information 27 Specifications and dimensions subject to change without notice



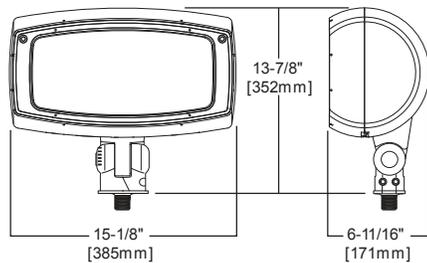
### MS Impact Flood Flood Luminaire

Impact Flood's cylindrical form blends effortlessly to architectural and landscape environments. Available in wattages up to 175W Metal Halide and High Pressure Sodium, and up to 42W Compact Fluorescent. Impact Flood offers properly scaled solutions for any floodlighting application.

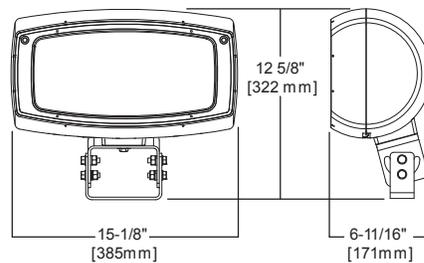
### MS Impact Flood Flood Luminaire

- ☑ Rugged one-piece die-cast aluminum housing. One-piece extruded silicone gasket seals the optical and electrical compartment from external contaminants. IP65 rated
- ☑ Die-cast aluminum door is secured via two (2) tamper resistant stainless steel allen head fasteners
- ☑ Impact resistant, clear flat tempered glass sealed to door with a one-piece silicone gasket
- ☑ Available in horizontal or vertical lamp orientation. Optics feature medium-base lamp holders for HID
- ☑ High power factor ballast is heat sunk to housing for cooler operation and longer life
- ☑ Heavy-duty die-cast aluminum knuckle mount utilizes tooth-lock adjustment mechanism for solid engagement and ease of aiming. Optional heavy-gauge adjustable steel trunnion mount provides additional durability when required
- ☑ Approximate net weight: 25 lbs. (11.36 kgs)

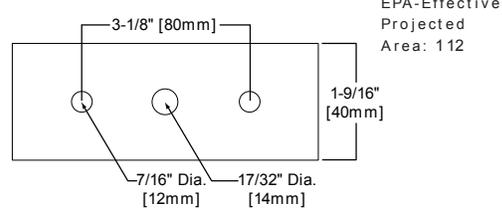
Knuckle Mount



Trunnion Mount



TRUNNION DRILL PATTERN



### Ordering Information

SAMPLE NUMBER: MHMS-K-HF-175-MT-LL

<b>Lamp Type</b> MH=Metal Halide HP=High Pressure Sodium CF=Compact Fluorescent	<b>Fixture Type</b> MS=Impact Flood Small	<b>Mounting Type</b> K=Knuckle T=Trunnion	<b>Distribution</b> HF=Horizontal Flood VF=Vertical Flood	<b>Lamp Wattage</b> HID <sup>1</sup> 50=50W 70=70W 100=100W 150=150W 175=175W Compact Fluorescent <sup>2</sup> 26/32/42=26, 32, 42W	<b>Voltage</b> <sup>3</sup> 120V 208V 240V 277V 347V 480V	<b>Options &amp; Accessories</b> (See Below)
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Also available in Medium size. See Cooper Lighting Buyers Guide 5th Edition pg 557

- Options**<sup>4</sup>
- Q=Quartz Relay (DC Bayonet Base)
  - EM=Quartz Emergency Cold Start Time Delay Relay
  - EM/SC=Quartz Emergency Separate Circuit
  - F=Single Fuse (120, 277 or 347V Specify Voltage)
  - FF=Double Fuse (208, 240 or 480V Specify Voltage)
  - PE=Button Photocontrol (Specify Voltage)
  - WH=White<sup>9</sup>
  - BK=Black<sup>9</sup>
  - AP=Grey<sup>9</sup>
  - LL=Lamp Included
- (Must Specify Single Wattage with Fluorescent)

- Accessories**<sup>10</sup>
- MS/BD-XX=Barn Doors (EPA 103)
  - MS/TV-XX=Top Visor (EPA 51)
  - MS/4V-XX=Four Sided Shield (EPA 87)
  - MS/VS=Vandal Shield
  - MS/WG=Wire Guard
  - MS/JB-XX=Architectural J-Box
  - MS/SF-XX=Slipfitter
  - MS/TMA-XX=Twin Mount Arm (EPA 35)
  - MS/WMA-XX=Wall Mount Arm (EPA 22)
  - MS/WM-XX=Wall Mount

- MT=Multi-Tap<sup>4</sup>
- TT=Triple-Tap<sup>5</sup>
- DT=Dual-Tap<sup>5</sup>
- UNV=120-277V Electronic Ballast<sup>7</sup>

LAMP TYPE	WATTAGE
Metal Halide	50, 70, 100, 175W
High Pressure Sodium	50, 70, 100, 150W
Compact Fluorescent	26, 32, 42W

Notes: 1 All lamps are medium-base 2 4-pin fluorescent sockets standard for PL lamps 3 Products also available in non-US voltages and 50Hz for international markets Consult factory for availability and ordering information 4 Multi-Tap is 120/208/240/277V wired 277V 5 Triple-Tap ballast is 120/277/347V wired 347V 6 Dual-Tap is 120/277V wired 277V 7 Compact Fluorescent lamps only, 120-277V with internal fusing 8 Add as suffix in the order shown 9 Other finish colors available Consult your Cooper Lighting representative 10 Order separately, replace XX with color suffix 11 Specifications and dimensions subject to change without notice



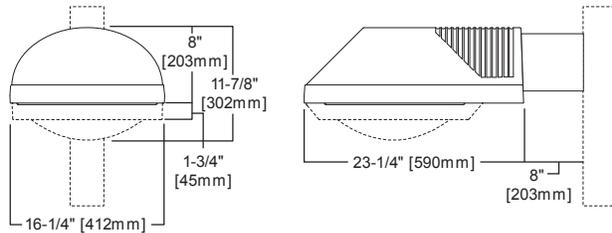
### Talon Architectural Area Luminaire

The McGraw-Edison Talon is the most versatile, functionally designed, universally adaptable outdoor luminaire available. The Talon brings outstanding performance to walkways, parking lots, roadways, loading docks, building areas, and any security lighting application. U.L. listed and CSA certified for wet locations. IP65 Rated.

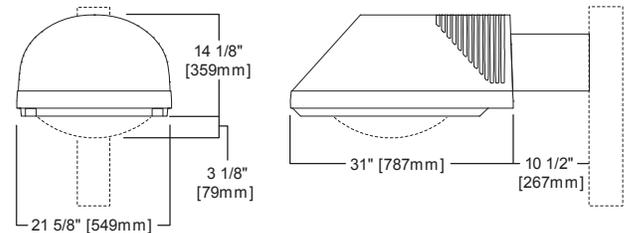
### Talon Architectural Area Luminaire

- █ Seek, architectural design available in two (2) housing sizes up to 1000W HID
- █ Thick wall die-cast aluminum construction
- █ Channel set silicone gasketing that forms an impenetrable IP65 barrier optimizing electrical component operation and fixture longevity
- █ Choice of fourteen (14) high efficiency, field rotatable optical systems
- █ Unrivaled Spill Light Eliminator optic for areas mandating strict light trespass control
- █ Proprietary Hi-Low dimming option provides up to 50% energy savings
- █ Compliance solutions for spill light control, emergency egress, energy efficiency and curfew codes

DIMENSIONS – Medium



DIMENSIONS – Large



### Ordering Information

SAMPLE NUMBER: TLM-400-MH-MT-3F-FG-BK-HS

<p><b>Product Family</b><sup>1</sup> TLM=Talon Site Medium</p> <p><b>Lamp Wattage</b><sup>2</sup> 70=70W 100=100W 150=150W 175=175W 200=200W<sup>3,4</sup> 250=250W 320=320W<sup>3,4</sup> 350=350W<sup>3,4</sup> 400=400W<sup>4</sup></p> <p><b>Lamp Type</b> MH=Metal Halide MP=Pulse Start Metal Halide HPS=High Pressure Sodium</p> <p><b>Voltage</b><sup>5</sup> 120=120V 208=208V 240=240V 277=277V 347=347V 480=480V DT=Dual-Tap<sup>6</sup> MT=Multi-Tap<sup>6</sup> TT=Triple-Tap<sup>6</sup> 5T=5-Tap<sup>6,7</sup></p>	<p><b>Distribution</b> <b>Horizontal Lamp</b> 2F=Type II Formed 2S=Type II Segmented 3F=Type III Formed 3S=Type III Segmented 4F=Type IV Formed 4S=Type IV Segmented 5F=Type V Formed 5S=Type V Segmented SL=Spill Light Eliminator AF=Automotive Front Row <b>Vertical Lamp</b> 3V=Type III Vertical<sup>8</sup> 4V=Type IV Automotive Perimeter<sup>8</sup> AR=Area Round<sup>8</sup> AS=Area Square<sup>8</sup></p> <p><b>Lens Type</b> FG=Flat Glass SG=Sag Glass</p> <p><b>Colors (add as suffix/must specify)</b><sup>9</sup> BK=Black AP=Grey BZ=Bronze WH=White DP=Dark Platinum GM=Graphite Metallic</p>	<p><b>Options (add as suffix)</b> F=Single Fuse (120, 277 or 347V)<sup>10</sup> FF=Double Fuse (208, 240 or 480V)<sup>10</sup> Q=Quartz Restrike<sup>11</sup> EM=Quartz Restrike w/Delay (Also Strikes at Cold Start)<sup>11</sup> EM/SC=Quartz Emergency Separate Circuit<sup>11</sup> PT=Electrical Power Tray P=Button Type Photocontrol (120, 208, 240 or 277V)<sup>10</sup> R=NEMA Twistlock Photocontrol Receptacle HS=Internal House-side Shield<sup>12</sup> VS=Polycarbonate Vandal Shield DD=Deep Door WM=Wall Mount with 8" Arm DM=Direct Mount for Round or Square Pole DW=Direct Wall Mount MS=External Mast Arm Adapter HL=Hi/Low Dimming<sup>13</sup> L=Lamp Included</p>	<p><b>Accessories</b> (order separately/replace XX with color designation) OA/RA1016=NEMA Photocontrol (105-285V) OA/RA1027=NEMA Photocontrol (480V) OA/RA1201=NEMA Photocontrol (347V) OA/RA1013=Shorting Cap MA1010-XX=Single Tenon Adapter for 3 1/2" O D Tenon MA1011-XX=2 @ 180° Tenon Adapter for 3 1/2" O D Tenon MA1012-XX=3 @ 120° Tenon Adapter for 3 1/2" O D Tenon MA1013-XX=4 @ 90° Tenon Adapter for 3 1/2" O D Tenon MA1014-XX=2 @ 90° Tenon Adapter for 3 1/2" O D Tenon MA1015-XX=2 @ 120° Tenon Adapter for 3 1/2" O D Tenon MA1016-XX=3 @ 90° Tenon Adapter for 3 1/2" O D Tenon MA1017-XX=Single Tenon Adapter for 2 3/8" O D Tenon MA1018-XX=2 @ 180° Tenon Adapter for 2 3/8" O D Tenon MA1019-XX=3 @ 120° Tenon Adapter for 2 3/8" O D Tenon MA1045-XX=4 @ 90° Tenon Adapter for 2 3/8" O D Tenon MA1048-XX=2 @ 90° Tenon Adapter for 2 3/8" O D Tenon MA1049-XX=3 @ 90° Tenon Adapter for 2 3/8" O D Tenon MA1213-XX=External House-side Shield Kit [EPA=0 38]</p>
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Notes: 1 8" arm and round pole adapter included with fixture 2 Standard with mogul-base socket for HPS, MH and 250-400W MP Standard with medium-base socket for 200W MP and below 3 200/320/350W Pulse Start Metal Halide lamps only 4 Requires reduced envelope lamp 5 Products also available in non-US voltages and 50Hz for international markets Consult factory for availability and ordering information 6 Dual-Tap is 120/277V wired 277V Multi-Tap is 120/208/240/277V wired 277V Triple-Tap ballast is 120/277/347V wired 347V 5-Tap is 120/208/240/277/480V wired 480V 7 Available for 250-400W only 8 Vertical lamp optics ship standard with deep door 250-400W not available with flat glass 9 Custom and RAL color matching available upon request Consult Cooper Lighting Representative for further information 10 Must specify voltage 11 Quartz options not available with SL and AF optics 12 House-side shield not available on 5S, 5F, AS, AR, and SL optics 13 Requires vertical lamp orientation Provides 24V low voltage leads used in dimming control 14 Specifications and dimensions subject to change without notice

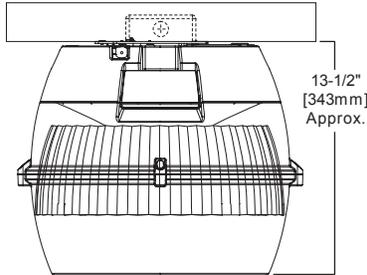


## EPL Envoy Parking Garage Luminaire

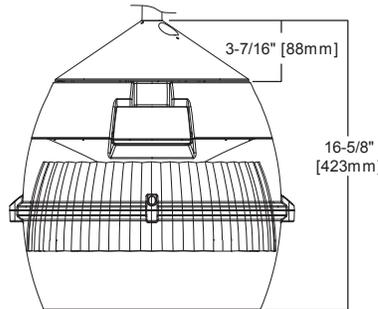
- ☑ Universal J-box Mounting plate
- ☑ Hook 'n' Hang System for hands free wiring
- ☑ Side 'n' Lock Engagement
- ☑ Toolless access to lamp and electrical
- ☑ Toolless fixture release and removal
- ☑ IP 66 Rated
- ☑ Multiple shield options including house side shield and drive lane shield
- ☑ 6 different mounting configurations including a Wall Mount Arm Accessory
- ☑ 26 different emergency "path of egress" solutions

## EPL Envoy Parking Garage Luminaire

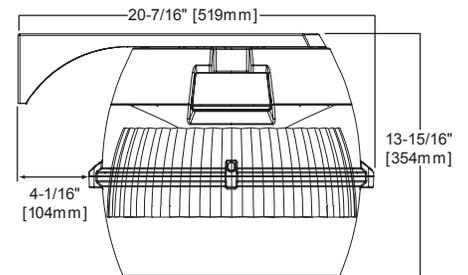
The McGraw Edison Envoy (EPL) is a unique presentation of form, function and unmatched versatility, making it the right choice for complex garage lighting applications. A toolless accessible housing, lens and electrical access is standard. Envoy offers solutions addressing primary and egress lighting needs for garages, canopies and other installations where maintenance, performance and longevity are required. UL and C-UL US listed for wet locations under UL1598. IP66 Rated.



**Standard J-Box Mount [Recessed]**  
The J-Box is recessed/cast into ceiling. Envoy is attached using the quick mount release bracket system.



**Pendant BOX/Bird Guard [PBG]**  
The pendant box accessory also acts as a bird guard and may be used with a free swinging or rigid pendant system, allowing the fixture to level and hang straight. Envoy is attached using the same quick mount release bracket similar to J-Box installation.



**Wall Mount [WM]**  
The wall mount arm allows you to match path or perimeter lighting within or outside the garage. Envoy is attached using the same quick mount release bracket similar to J-Box installation. Power is routed in wall and through access hole within arm to fixture.

### Standard Colors

AP Grey	BK Black
WH White	BZ Bronze

## Ordering Information

SAMPLE NUMBER: EPL-175-MP-MB-MT-TG-AP-L-EM/SC

Product Family EPL=Envoy Parking Luminaire	Lamp Wattage MH 175=175W HPS 70=70W CF 84= (2) 42W MP 100=100W 114= (2) 57W 70=70W 150=150W 100=100W 150=150W 175=175W 200=200W Induction 126= (3) 42W 140= (2) 70W 85= 85W 168= (4) 42W	Lamp Type MH=Metal Halide MP=Pulse Start Metal Halide HPS=High Pressure Sodium CF=Compact Fluorescent QL=Induction	Ballast MB=Magnetic Ballast EB=Electronic Ballast	Voltage 120=120V 208=208V 240=240V 277=277V 480=480V DT=Dual-Tap w/277V MT=Multi-Tap w/277V TT=Triple-Tap w/347V	Distribution RD=Round SQ=Square TG=Rectangular	Color [add as suffix/must specify] AP=Grey BK=Black BZ=Bronze WH=White	Options + Accessories
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## Rio™ 1235-RD Architectural Step Lights

Rio architectural step lights provide beauty, performance and durability. Transitional styling, low profile design and no visible fasteners provide seamless integration with architectural styles of all kinds. Logical, modular design elements facilitate fast and foolproof installation in all types of wall surfaces including drywall, concrete pour or brick/masonry. All models include IP68 rated outdoor protection, but are also suitable for indoor wall-mounted applications. All models are ADA compliant.

## Rio™ 1235-RD Architectural Step Lights

### Construction

Back box and painted fascia are die-cast from corrosion-resistant Type 383 aluminum alloy. Back box is painted white. Natural metal fascia is precision-machined from solid brass or stainless steel.

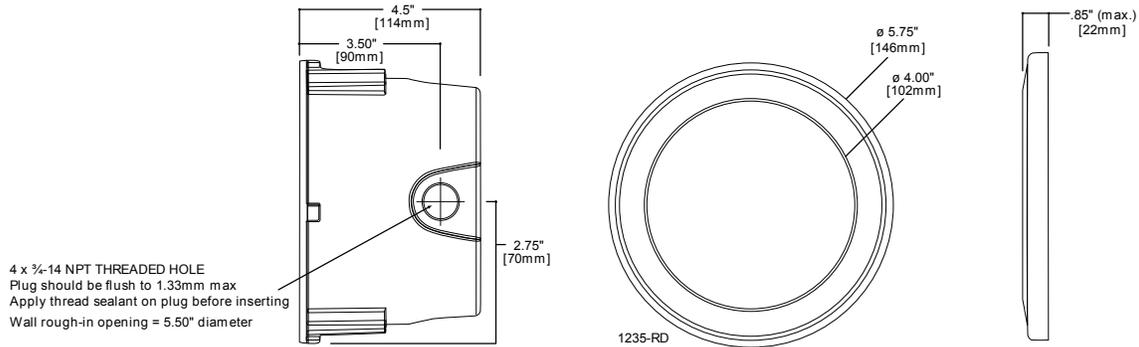
### Finish

Back box and fascia are double protected by a chromate conversion undercoating and polyester powdercoat paint finish. Machined, natural finish brass or stainless steel fascia is unpainted to reveal the natural beauty of the material. Brass will patina naturally over time in outdoor environments.

### Electrical

Fixture includes integral, electronic ballast, transformer or LED driver mounted to Lumière's factory-assembled POWER-TRAY(TM) optical/electrical module. The POWER-TRAY™ module plugs directly into the back box providing fast, easy installation.

- Integral electronic gear
- Factory assembled Power-Tray™
- Fascia adjusts 20° for proper alignment
- ADA compliant
- IP68 rated outdoor protection
- UL/cUL listed
- Three (3) year warranty
- Available in other configurations (see Cooper Lighting 5th Edition Buyer's Guide, pgs. 1048-1049)



## Ordering Information

SAMPLE NUMBER: 1235C-RD-C-20T3-120/12-BZ-LBB

MODEL	WALL TYPE	SOURCE	VOLTS	FINISH	OPTIONS
1235-RD	5" round, open fascia	C Concrete pour	12V Halogen	Painted	Advance Ship Back Box (select LBB option and order back box separately) LBB Less back box
1235C-RD	5" round, cross fascia	D Drywall	20T3 20W / T3 / G4	BK Black	
1235E-RD	5" round, eyelid fascia	M Masonry	LED	BZ Bronze	1235-BB-C Back Box & cover for poured concrete 1235-BB-D Back Box & cover for drywall 1235-BB-M Back Box & cover for masonry
1235L-RD	5" round, louver fascia		4LED 4W / LED	CS Qty silver VE Verde WT White	
				Natural Metal NBR Brass NSS Stainless steel	

Fixture includes integral electronic gear  
Lamp not included except for LED sources



### Zuma 1203 Series Architectural Step Lights

The Zuma 1203 is a rugged and attractive ADA-compliant step light for use with a low voltage, 13W incandescent lamp (provided). It mounts directly to any non-combustible surface, yet projects only 1-3/4" from the mounting surface. The adjustable 'eyelid' style faceplate rotates 360° and shields the lamp source to provide soft, comfortable illumination.

### Zuma 1203 Series Architectural Step Lights

#### Material

Mounting base is machined from corrosion-resistant 6060-T6 aluminum billet. Faceplate/housing is cast from corrosion-resistant silicone aluminum.

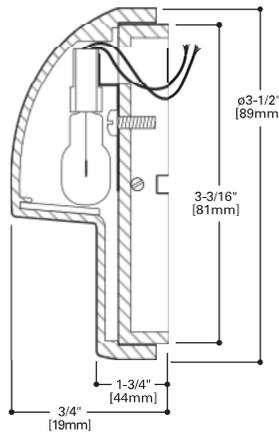
#### Finish

Fixtures are double protected by a chromate conversion undercoating and polyester powdercoat paint finish, surpassing the rigorous demands of the outdoor environment. A variety of standard colors are available.

#### Electrical

Remote 12V transformer required (not included). Available from Lumière as an accessory

-  Cast aluminum "eyelid" rotates 360°
-  Surface-mounted machined alum. base
-  Stainless steel hardware
-  ADA compliant
-  UL/cUL listed
-  Three (3) year warranty



### Ordering Information

SAMPLE NUMBER: 1203-INC13-12-BK

MODEL	SOURCE	VOLTS	FINISH
1203 Aluminum/ rotates 360° / surface mount	Incandescent INC13 13W / T5 / wedge 12V remote transformer required - not included Lamp included	12	Painted BK Black BZ Bronze CS City silver VE Verde WT White



### Zuma 1201 Series Architectural Step Lights

The Zuma 1201 series is a rugged ADA-compliant recessed mounted step light for use with a low voltage, T4 halogen lamp (provided). The housing and faceplate are die-cast from corrosion-resistant silicone aluminum alloy. Model 1201-LA includes a louvered faceplate; model 1201-OA features an open faceplate. Both can be mounted in non-combustible surfaces such as brick, concrete or stone.

### Zuma 1201 Series Architectural Step Lights

#### Material

Face plate and recessed mounted housing are corrosion-resistant die-cast silicone aluminum. Housing includes two 1/2" NPS threaded holes for easy through wiring. Recessed housing is available to ship in advance of complete fixture for rough-in purposes (specify option - LBB and order recessed housing separately).

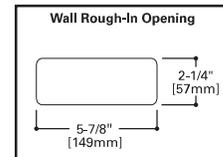
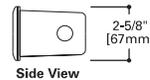
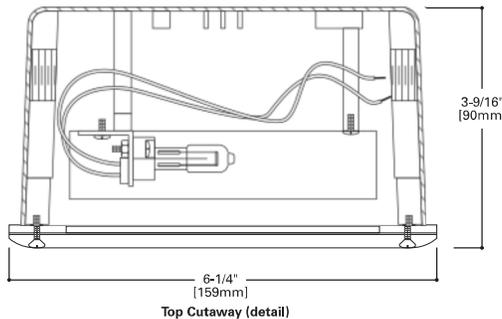
#### Finish

Fixtures are double protected by a chromate conversion undercoating and polyester powdercoat paint finish, surpassing the rigorous demands of the outdoor environment. A variety of standard colors are available.

#### Electrical

Remote 12V transformer required (not included). Available from Lumière as an accessory - see the Accessories & Technical Data section of this catalog for details.

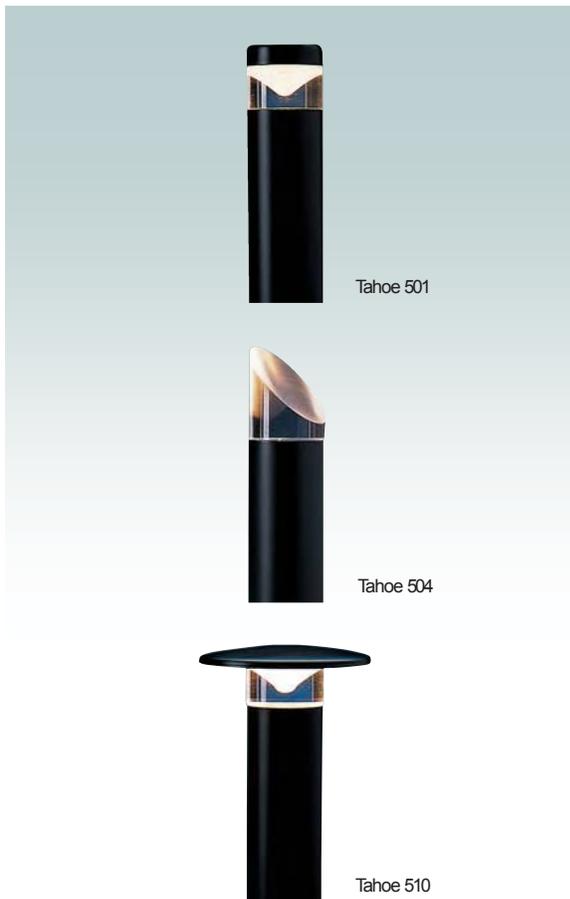
- Louvered die-cast aluminum face plate
- Recess-mounted die-cast alum. housing
- Specular pebblestone aluminum reflector
- Stainless steel hardware
- ADA compliant
- UL/cUL listed
- Three (3) year warranty



### Ordering Information

SAMPLE NUMBER: 1201-LA-35T4-12-BK

MODEL	SOURCE	VOLTS	FINISH	OPTIONS
1201-LA	Halogen 35T4 35W / T4 / GY6.35 12V remote transformer required - not included	12	Painted BK Black BZ Bronze CS Qty silver VE Verde WT White	CL Diode connection for increased lamp life MB Mounting brackets for metal or concrete
1201-OA	Open aluminum face / recess mount Lamp included			



## Tahoe 501/504/510 Mini-Bollards

### Material

Precision-machined from corrosion-resistant 6061-T6 aluminum extrusion.

### Finish

Double protected by a chromate conversion undercoating and polyester powdercoat paint finish.

### Electrical

Remote 12V step-down transformer required (not included). See Accessories & Technical Data section for ordering information.

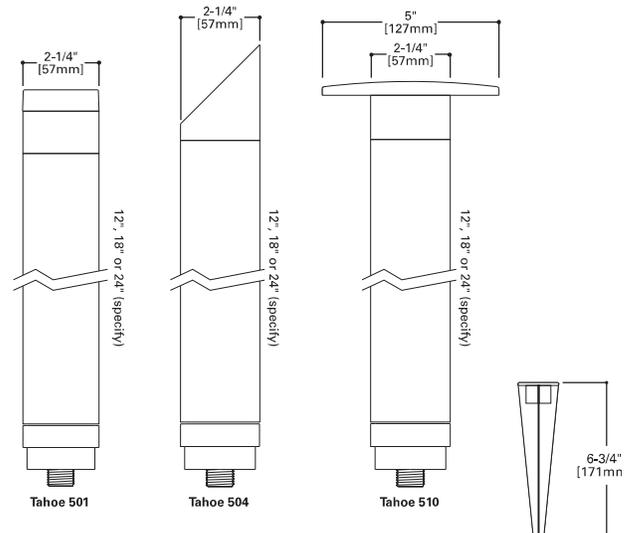
### Labels & Approvals

UL and cUL listed, standard wet label. Manufactured to ISO 9001-2000 Quality Systems Standard. IBEW union made.

-  Includes cast zinc mounting spike
-  Machined aluminum construction
-  Machined clear acrylic lens
-  Stainless steel hardware
-  UL/cUL listed
-  Three (3) year warranty

## Tahoe 501/504/510 Mini-Bollards

Tahoe mini-bollards are petite, yet rugged low voltage beacons in three distinct styles. They utilize a 20-watt MR16 lamp source and are ideal for a variety of commercial and residential applications. Each model is available in three sizes and includes a cast zinc ground spike for fast, easy installation. Lumière's exclusive Siphon Protection System (SPS) prevents water from siphoning into the fixture through its own lead wires.



## Ordering Information

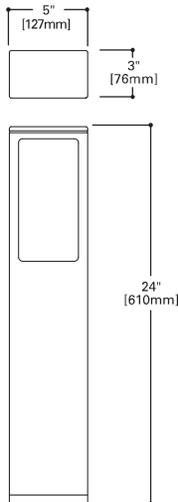
SAMPLE NUMBER: 501-12-20MR16-12-BK

MODEL	SIZE	SOURCE	VOLTS	FINISH
501 Mini-bollard with 6-3/4" mounting spike	12	Halogen 20MR16 20W / MR16 / GU5.3	12	Painted
504 Mini-bollard with 6-3/4" mounting spike	18	12V remote transformer required - not included		BK Black
510 Mini-bollard with 6-3/4" mounting spike	24	Lamp included 6-3/4" ground spike included		BZ Bronze
				CS Qty silver
				VE Verde
				WT White



### Sedona 1800-24 Bollard

Sedona is a bollard unlike any other. It utilizes a decorative, edge lit glass block lens. This unique and patented concept provides a functional, low-glare source of light in an attractive, sculptural form. Model 1800-24 lamp source selections include compact fluorescent, incandescent PAR lamps or low voltage MR16 halogen. Our patented LumaLevel™ leveling system provides quick installation, easy adjustment, secure mounting and protection from vibration.



### Sedona 1800-24 Bollard

**Material**

Precision-machined from corrosion-resistant 6061-T6 aluminum extrusion. Mounting base is cast from silicone aluminum alloy.

**Finish**

Double protected by a chromate conversion undercoating and polyester powdercoat paint finish.

**Electrical**

CF42: Includes integral electronic ballast (120/277V). Universal GX24q socket accepts 26W, 32W and 42W 4-pin lamps. 50PAR20: Operates with line voltage (120V). 50MR16: step-down transformer required (not included). Specify option IT for integral transformer. See Accessories & Technical Data section for remote transformers.

**Labels & Approvals**

UL and cUL listed, standard wet label. Manufactured to ISO 9001-2000 Quality Systems Standard. IBEW union made.

- Includes anchor bolts & template
- Decorative edge-lit glass block lens
- Patented LumaLevel™ mounting/leveling system
- Stainless steel hardware
- UL/cUL listed
- Three (3) year warranty
- Available in other configurations see 5th Edition Buyer's Guide pg. 1045.

### Ordering Information

SAMPLE NUMBER: 1800-24-CF42-120-BK

MODEL	SIZE	SOURCE	VOLTS	FINISH	OPTIONS
1800 24" x 5" x 3" bollard	24	Compact Fluorescent CF42 26W, 32W, or 42W / triple tube / universal GX24q Includes integral universal electronic ballast (120-277V) Lamp not included	120 277	Painted BK Black BZ Bronze CS Qty silver VE Verde WT White	IT Integral transformer for 12V MR16 source See "Accessories & Technical Data" section of catalog for remote transformers
		Incandescent 50PAR20 50W / PAR20 / medium Lamp not included	120		To ship anchor bolt/template kit in advance LAB Less anchor bolts & template (order kit separately - 7581-01)
		Halogen 50MR16 50W / MR16 / GU5.3 12V remote or integral transformer required - not included Lamp not included	120/12 277/12		



### Monaco 2003 Accent/Flood: Low Voltage

Monaco 2003 is an extremely compact and attractive MR16 low voltage fixture. The fully adjustable mounting stem provides 200° tilt and 360° rotation for easy aiming. Vertical and horizontal aim-locking mechanisms are standard. Various lenses, louvers and color or dichroic filters can be combined up to three at once to create multiple lighting effects. Lumière's exclusive Sphon Protection System (SPS) prevents water from siphoning into the fixture through its own lead wires.

### Monaco 2003 Accent/Flood: Low Voltage

#### Material

Precision-machined from corrosion-resistant 6061-T6 aluminum or solid brass, bronze, copper or stainless steel.

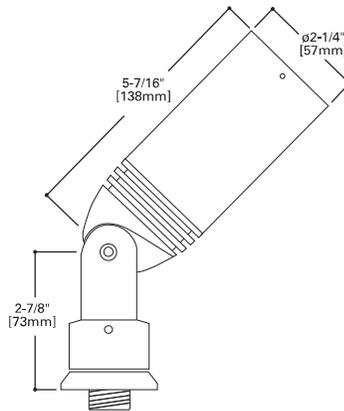
#### Finish

6061-T6 aluminum is double protected by a chromate conversion undercoating and polyester powdercoat paint finish. Brass, bronze, copper and stainless steel is unpainted to reveal the natural beauty of the material. Brass, bronze and copper will patina naturally over time.

#### Electrical

Remote 12V step-down transformer required (not included). See Accessories & Technical Data section for ordering information.

-  200° tilt, 360° rotation
-  Precision machined materials
-  Stainless steel hardware
-  SPS Sphon Protection System
-  Holds up to 3 optical accessories
-  UL/cUL listed
-  Three (3) year warranty



### Ordering Information

SAMPLE NUMBER: 2003-50MR16-12-BK

MODEL	SOURCE	VOLTS	FINISH
2003	1/2" NPS adjustable rotational stem	50MR16 50W / MR16 / GU5.3	12
			12
	Halogen		Painted
	12V remote transformer required - not included		BK Black
	Lamp not included		BZ Bronze
			CS City silver
			VE Verde
			WT White
			Metal
			NBR Brass
			NBZ Bronze
			NCP Copper
			NSS Stainless steel



### Cambria 203 Accent/Flood: Low Voltage

Cambria 203 is an ultra-compact MR16 low voltage halogen and LED fixture. It is available with a fully adjustable side swivel stem (203, 203-FL), an adjustable center rear swivel (203-CRS) or stationary rear flush mount (203-FM). Various lenses, louvers and color or dichroic filters can be combined - up to three at once - to create multiple lighting effects. Lumière's exclusive Sphon Protection System (SPS) prevents water from siphoning into the fixture through its own lead wires.

### Cambria 203 Accent/Flood: Low Voltage

#### Material

Housing hood and mounting stem are precision-machined from corrosion-resistant 6061-T6 aluminum billet, brass, bronze, copper or stainless steel.

#### Finish

Fixtures constructed from 6061-T6 aluminum are double protected by a chromate conversion undercoating and polyester powdercoat paint finish, surpassing the rigorous demands of the outdoor environment. A variety of standard colors are available.

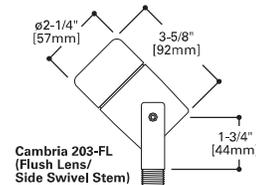
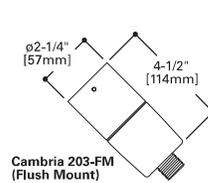
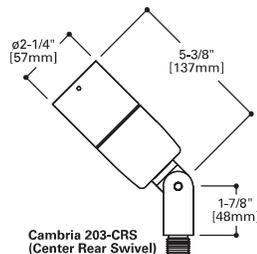
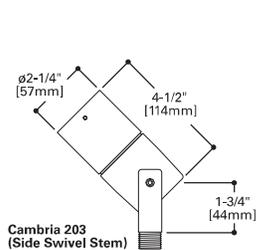
#### Electrical

Remote 12V transformer required (not included). Available from Lumière as an accessory.

#### Labels & Approvals

UL and cUL listed, standard wet label. IP65 rated. Manufactured to ISO 9001-2000 Quality Systems Standard. IBEW union made. Approved by New York City Dept. of Buildings, Bureau of Electrical Control for use in NYC, NY.

- 340° tilt, 360° rotation
- Precision machined materials
- Stainless steel hardware
- SPS Sphon Protection System
- Holds up to 3 optical accessories
- LED modules are included and are available in three color temperatures (warm, neutral, and cool) and three distributions (spot, narrow, and flood).
- UL/cUL listed
- Three (3) year warranty



### Ordering Information

SAMPLE NUMBER: 203-50MR16-12-BK

MODEL	SOURCE	VOLTS	FINISH
203 1/2" NPS side swivel stem	Halogen	12	Painted BK Black BZ Bronze CS City silver VE Verde WT White
203-CRS 1/2" NPS center rear swivel	50MR16 50W / MR16 / GU5.3		
203-FM 1/2" NPS rear flush mount	12V remote transformer required - not included		
203-FL 1/2" NPS side swivel stem/flush lens	Lamp not included		
			Metal NBR Brass NBZ Bronze NCP Copper NSS Stainless steel



## Cambria 201 Accent/Flood: Low Voltage

Cambria 201 is an ultra-compact MR11 low voltage halogen fixture. It is available with a fully adjustable side swivel stem (201, 201-FL), an adjustable center rear swivel (201-CRS) or stationary rear flush mount (201-FM). Various lenses, louvers and color or dichroic filters can be combined up to three at once to create multiple lighting effects. Lumière's exclusive Siphon Protection System (SPS) prevents water from siphoning into the fixture through its own lead wires.

## Cambria 201 Accent/Flood: Low Voltage

### Material

Precision-machined from corrosion-resistant 6061-T6 aluminum or solid brass, bronze, copper or stainless steel.

### Finish

6061-T6 aluminum is double protected by a chromate conversion undercoating and polyester powdercoat paint finish. Brass, bronze, copper and stainless steel is unpainted to reveal the natural beauty of the material. Brass, bronze and copper will patina naturally over time.

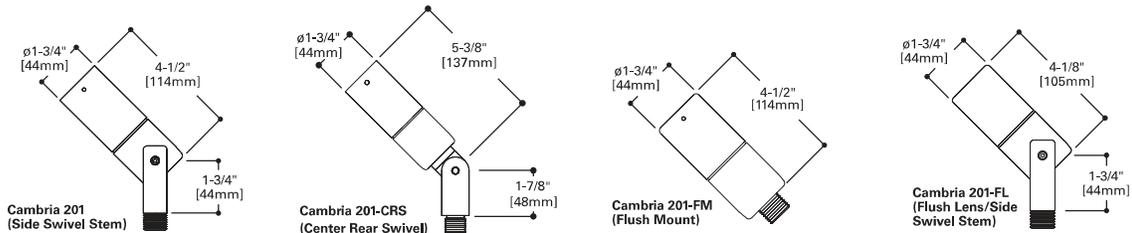
### Electrical

Remote 12V step-down transformer required (not included). See Accessories & Technical Data section for ordering information.

### Labels & Approvals

UL and cUL listed, standard wet label. Also suitable for indoor use. Manufactured to ISO 9001-2000 Quality Systems Standard. IBEW union made. Approved by New York City Dept. of Buildings, Bureau of Electrical Control for use in New York City, N.Y.

-  340° tilt, 360° rotation
-  Precision machined materials
-  Stainless steel hardware
-  SPS Siphon Protection System
-  Holds up to 3 optical accessories
-  UL/cUL listed
-  Three (3) year warranty



## Ordering Information

SAMPLE NUMBER: 201-35MR11-12-BK

MODEL	SOURCE	VOLTS	FINISH	OPTIONS
201	Halogen	12	Painted	DC D.C. Bayonet base in lieu of GU4 bi-pin
201-CRS	35MR11 35W / MR11 / GU4		BK Black	
201-FM	12V remote transformer required - not included		BZ Bronze	
201-FL	Lamp not included		CS City silver	
			VE Verde	
			WT White	
			Metal	
			NBR Brass	
			NBZ Bronze	
			NCP Copper	
			NSS Stainless steel	



### Maui 1502 Pathway

Maui 1502 is a compact, low voltage pathway fixture. Its rugged construction and pleasing aesthetic make it ideal for a wide variety of applications. Comfortable, low glare illumination is provided through and below the slotted light reveals.

### Maui 1502 Pathway

#### Material

Housing is die-cast from silicone aluminum alloy. Mounting post is precision-machined from corrosion-resistant 6061-T6 aluminum.

#### Finish

Double protected by a chromate conversion undercoating and polyester powdercoat paint finish.

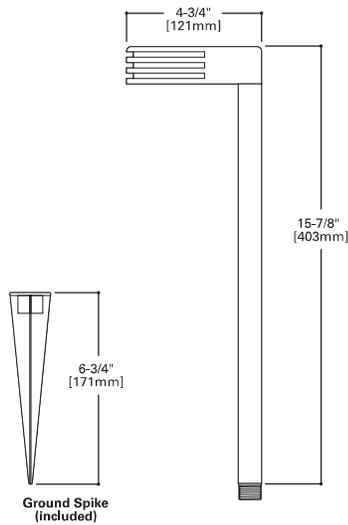
#### Electrical

CF5: Includes integral 120V ballast. INC18 and 50T4: Remote 12V step-down transformer required (not included). See Accessories & Technical Data section for ordering information.

#### Labels & Approvals

UL and cUL listed, standard wet label. Manufactured to ISO 9001-2000 Quality Systems Standard. IBEW union made.

-  Includes cast zinc mounting spike
-  Slotted light reveals w/ white diffuser
-  Die-cast & machined aluminum
-  Stainless steel hardware
-  UL/cUL listed
-  Three (3) year warranty



### Ordering Information

SAMPLE NUMBER: 1502-INC18-12-BK

MODEL	SOURCE	VOLTS	FINISH
1502 Slotted housing with 1/2" NPS post	Incandescent INC18 18W / S8 / D.C. bayonet 12V remote transformer required - not included Lamp included 6-3/4" ground spike included	12	Painted BK Black BZ Bronze CS City silver VE Verde WT White



### Westwood 714 Wall Mount

Westwood 714 and 714-2 are ultra-compact wall fixtures for use with PAR20 metal halide lamps. Both models are provided with a remote ballast/housing assembly and are suitable for use with 120, 208, 240, 277 or 347V line voltage (specify). Model 714 provides downlight or uplight by way of the 180° rotational fixture head. Model 714-2 provides combination uplight and downlight. Various lenses, louvers and color or dichroic filters can be combined up to three at once to create multiple lighting effects. Lumière's exclusive Sphon Protection System (SPS) prevents water from siphoning into the fixture through its own lead wires.

### Westwood 714 Wall Mount

#### Material

Housing and hood are precision-machined from corrosion-resistant 6061-T6 aluminum billet. Mounting canopy is constructed from corrosion-resistant silicone aluminum.

#### Finish

Fixtures are double protected by a chromate conversion undercoating and polyester powdercoat paint finish, surpassing the rigorous demands of the outdoor environment. A variety of standard colors are available.

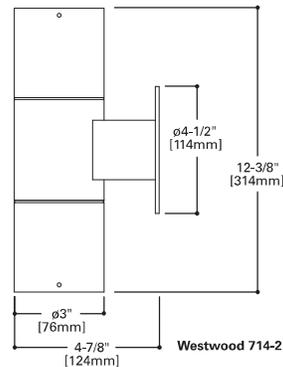
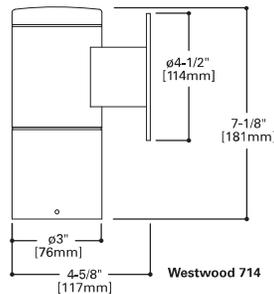
#### Electrical

Remote core & coil ballast/housing assembly is standard (120/208/240/277/347V). Maximum remote mounting distance is 50'. Rated for -20°C starting temperature.

#### Labels & Approvals

UL and cUL listed, standard wet label. Manufactured to ISO 9001-2000 Quality Systems Standard. IBEW union made.

- Includes remote core & coil ballast/housing
- Machined housing & hood, fabricated canopy
- Holds up to 3 optical accessories
- UL/cUL listed
- Three (3) year warranty



### Ordering Information

SAMPLE NUMBER: 714-MH39PAR20-277-BK

MODEL	SOURCE	VOLTS	FINISH
714 Up or downlight	Metal Halide MH39PAR20 39W / PAR20 / medium	120	Painted
714-2 Combination up/down light	Includes remote core & coil ballast / housing Lamp not included	208	BK Black
		240	BZ Bronze
		277	CS City silver
		347	VE Verde
			WT White



### Atlantis 1407 Underwater Fixtures

#### Material

Precision-machined from corrosion-resistant solid bronze or stainless steel.

#### Finish

The natural beauty and durability of solid bronze or stainless steel.

#### Electrical

Remote 12V transformer required (not included). Use Lumière model T300 or equivalent only. See Accessories & Technical Data section for ordering information.

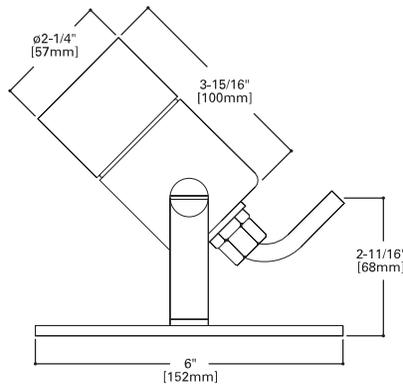
#### Labels & Approvals

UL and cUL listed, standard wet label. Fixture and cord entry to fixture require complete underwater submersion. Manufactured to ISO 9001-2000 Quality Systems Standard. IBEW union made. Approved by New York City Dept. of Buildings, Bureau of Electrical Control for use in New York City, NY.

### Atlantis 1407 Underwater Fixtures

The Atlantis 1407 is an ultra compact underwater fixture for use with a low voltage MR16 lamp. Its heavy-duty, adjustable mounting plate provides easy and secure aiming. A standard quick-release mechanism enables easy re-lamping out of the water. Various lenses, louvers and color or dichroic filters can be combined up to three at once to create multiple underwater lighting effects.

-  Includes adjustable mounting base
-  Includes 15' of low voltage S/D cord
-  Precision machined materials
-  Stainless steel hardware
-  Holds up to 3 optical accessories
-  UL/cUL listed
-  Three (3) year warranty



### Ordering Information

SAMPLE NUMBER: 1407-75MR16-12-NBZ

MODEL	SOURCE	VOLTS	FINISH
1407 Adjustable underwater light	Halogen 75MR16 75W / MR16 / GU5.3 Lumière Model T300 12V remote transformer required - not included Lamp not included  Note: Fixture and cord entry to fixture require complete underwater submersion	12	Metal NBZ Bronze NSS Stainless steel



### Monaco 6000A Inground

A small-scale, adjustable inground illuminator for use with metal halide point sources. Fixture includes lamp, factory-installed in a waterproof lamp module. Our Venterra™ heat and water management system keeps outer lens temperatures in check while protecting inner components from the effects of ground water. Our exclusive Beam-Driver™ aiming system provides up to 15° tilt and 360° rotation of the lamp module. It operates with a conventional cordless drill or screwdriver to provide easy, precision aiming without disturbing the sealed lamp module or looking into the energized lamp source. Corrosion-proof housing design is suitable for walk-over and drive-over applications to 5000 lbs. A complete line of accessories is available.

### Monaco 6000A Inground

**Material**

Housing and side mounted wiring compartment are constructed from corrosion-proof black polycarbonate. Hardware and internal components are stainless steel. Lens is minimum 1/2" thick clear tempered glass.

**Finish**

**Painted Brass**

Painted trim rings are constructed from solid cast brass and double protected by a chromate conversion undercoating and polyester powdercoat paint finish. Natural Brass or Stainless Steel

Machined natural brass or stainless steel trim rings are unpainted to reveal the natural beauty of the material. Brass will patina naturally over time.

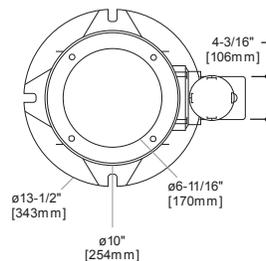
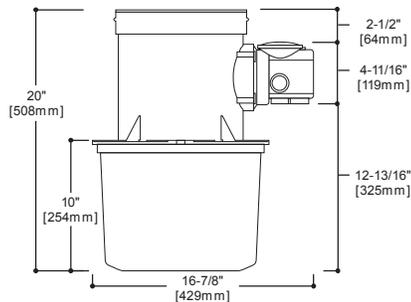
**Electrical**

Fixture includes an integral core & coil ballast assembly (120/208/240/277/347V). Rated for minimum -30° C starting temperature. Ballast is encapsulated in UL-approved, waterproof potting material.

**Labels & Approvals**

UL and cUL listed, standard wet label. Manufactured to ISO 9001-2000 Quality Systems Standard. IBEW union made.

- 15° tilt, 360° rotation
- Beam-Driver™ aiming
- Factory-installed lamp
- UL/cUL listed
- Three (3) year warranty



### Ordering Information

SAMPLE NUMBER: 6000N-MH150-277-MFL-NSS-CP

MODEL	SOURCE	VOLTS	DISTRIBUTION	FINISH	OPTIONS
6000A w/ Beam-Driver™, 15° tilt / 360° pan	Metal Halide			Painted	
	MH39T4 39W / T4.5 / G3.5	120	SP Spot	BK Black	CP Concrete pour collar
	MH39T6 39W / T6 / G12	208	NFL Narrow Flood	BZ Bronze	DSB 5000# drive-over structural bracket kit
	MH70T6 70W / T6 / G12	240	MFL Medium Flood	CS City silver	EL Electronic HID ballast
	MH150T6 150W / T6 / G12	277	WFL Wide Flood	VE Verde	NSL Non-slip textured lens
	MH50 50W / ED17 / medium	347	WW Wall Wash	WT White	TRL Temperature reduction lens
	MH70 70W / ED17 / medium				Advance Ship Back Box (select LBB option and order back box separately)
	MH100 100W / ED17 / medium				LBB Less back box
	MH150 150W / ED17 / medium				6000A-BB Back Box
	MH175 175W / ED17 / medium				
	High Pressure Sodium				
	HPS35 35W/E17/medium				
	HPS50 50W/E17/medium				
	HPS70 70W/E17/medium				
	HPS100 100W/E17/medium				
HPS150 150W/E17/medium					
Compact Fluorescent					
CF26 26W/TTT/GX24q-3	120				
CF32 32W/TTT/GX24q-3	277				
CF42 42W/TTT/GX24q-4					
CF57 57W/TTT/GX24q-5					
Includes integral core & coil ballast Lamp included					

## Cooper Wiring

Unparalleled reliability distinguishes our line of hospital grade wiring devices. Quality materials, manufacturing, attention to detail and design innovation is what you'll find in every product. We then enhance our hospital grade devices with quality features such as solid brass mounting straps, one-piece grounding systems and our exclusive 5-leaf line contacts found on our duplex receptacles. Add in our exclusive screw terminal guards that protect against short circuits after installation, and you'll see why Cooper Wiring Devices comes out ahead. For additional information visit [www.cooperwiringdevices.com](http://www.cooperwiringdevices.com).



## Cooper Industries

Cooper Industries is a world leader in the manufacturing and marketing of electrical construction products. The power behind Cooper's brands can be traced back over a century. Heritage and pedigree are supported by state-of-the-art engineering, production, new product development and distribution facilities. We manufacture thousands of well-known products that are used around the world. Our high quality product platform has earned a leadership position in the markets that we serve. For additional information visit [www.cooperindustries.com](http://www.cooperindustries.com).

### Lighting Solutions and Beyond

The family of Cooper companies can truly provide construction and building solutions beyond just lighting. Lighting may make a building come to life, but today's modern buildings require miles of cable, conduit and a variety of additional electrical construction materials.

As a diversified company, Cooper has the unique ability to evaluate and understand end user needs, align those needs with our affiliated divisions and provide comprehensive solutions for customers.

Healthcare buildings and hospitals are complex projects. If your organization is planning a healthcare project, chances are the bill of materials will require wiring devices, power distribution cable trays, fuses and, of course, lighting. Please look to Cooper Industries as your connection for building and construction electrical materials. Globally, Cooper Industries has a customer service and sales network with the expertise and specialties to provide the right solution.

### COOPER Safety



**Cooper Safety, the right message, to the right people at the right time.**

Cooper Safety is a leading manufacturer of emergency lighting, security systems, fire detection systems, lighting fixtures, and electrical installation materials.

Our well-known brands and products can be found in a whole variety of settings, industrial, commercial, and domestic, illuminating these facilities, as well as providing protection to both life and property by offering fire and security detection, and escape route illumination.

### COOPER Bussmann



**Since 1914, Cooper Bussmann has been a leader in developing new products and creating leading-edge technology to provide excellence in circuit protection.**

Cooper Bussmann provides the industry standard with its comprehensive portfolio of fuses, fuse holders, terminal blocks, voltage surge protectors, inductors and miniature transformers to provide quality power. From the main electrical supply in multi-story buildings and industrial complexes to printed circuit boards in electronic products, Cooper Bussmann develops complete solutions for the global marketplace.

### COOPER Power Systems



**Cooper Power Systems' products have been exceeding utility and electrical distribution customers' needs for decades.**

Cooper Power Systems' technology leadership has influenced the development of modern electrical distribution systems through advances in overcurrent and overvoltage protection products, switchgear and underground distribution equipment. Products from Cooper Power Systems have set benchmarks for reliability and innovation in today's energy distribution systems.

### COOPER B-Line



**Cooper B-Line is a leading manufacturer of support systems and enclosures for the electrical, mechanical and telecommunication industries.**

Cooper B-Line's 46 years of dedication to product quality and customer service has established its industry-wide reputation of value and reliability. By providing our customers with the most complete line of cable support systems and related products available in the industry, Cooper B-Line stands out as the market's source for one stop shopping.

### COOPER Crouse-Hinds



**Cooper Crouse-Hinds makes electrical products which provide safety and protect electrical systems in hazardous, commercial and industrial environments.**

For over 100 years Cooper Crouse-Hinds has been the worldwide leader in product innovation, technical support and sales assistance. Today our products meet standards and codes on every continent, having created the broadest product line for applications around the globe.

### COOPER Wiring Devices



**Cooper Wiring Devices offers a complete line of wiring devices and accessories for the distribution and control of power.**

Cooper Wiring Devices has the broadest offering available today of wiring devices and accessories for the industrial, commercial and residential construction and renovation markets. With over 10,000 products to choose from, Cooper Wiring Devices provides wide-ranging solutions for complex electrical challenges.





Cooper Lighting, LLC.  
Customer First Center  
1121 Highway 74 South  
Peachtree City, GA 30269

P: 770-486-4800  
F: 770-486-4801

[www.cooperlighting.com](http://www.cooperlighting.com)

International Sales, USA  
Cooper Lighting, LLC.  
1121 Highway 74 South  
Peachtree City, GA 30269

P: 770-486-4800  
F: 770-486-4801

Canada  
Cooper Lighting, LLC.  
5925 McLaughlin Road  
Mississauga, Ontario L5R 1B8

P: 905-507-4000  
F: 905-568-7049

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Cooper Industries, Ltd.  
600 Travis, Ste. 5800  
Houston, TX 77002-1001  
P: 713-209-8400  
[www.cooperindustries.com](http://www.cooperindustries.com)



# Lighting that transforms the patient experience

Philips Healthcare Lighting

**PHILIPS**

sense and simplicity

# Content

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## Who is Philips?

As a leader in healthcare and consumer lifestyles and the global leader in lighting, Philips is spearheading innovative and environmentally progressive solutions for today's healthcare facilities.

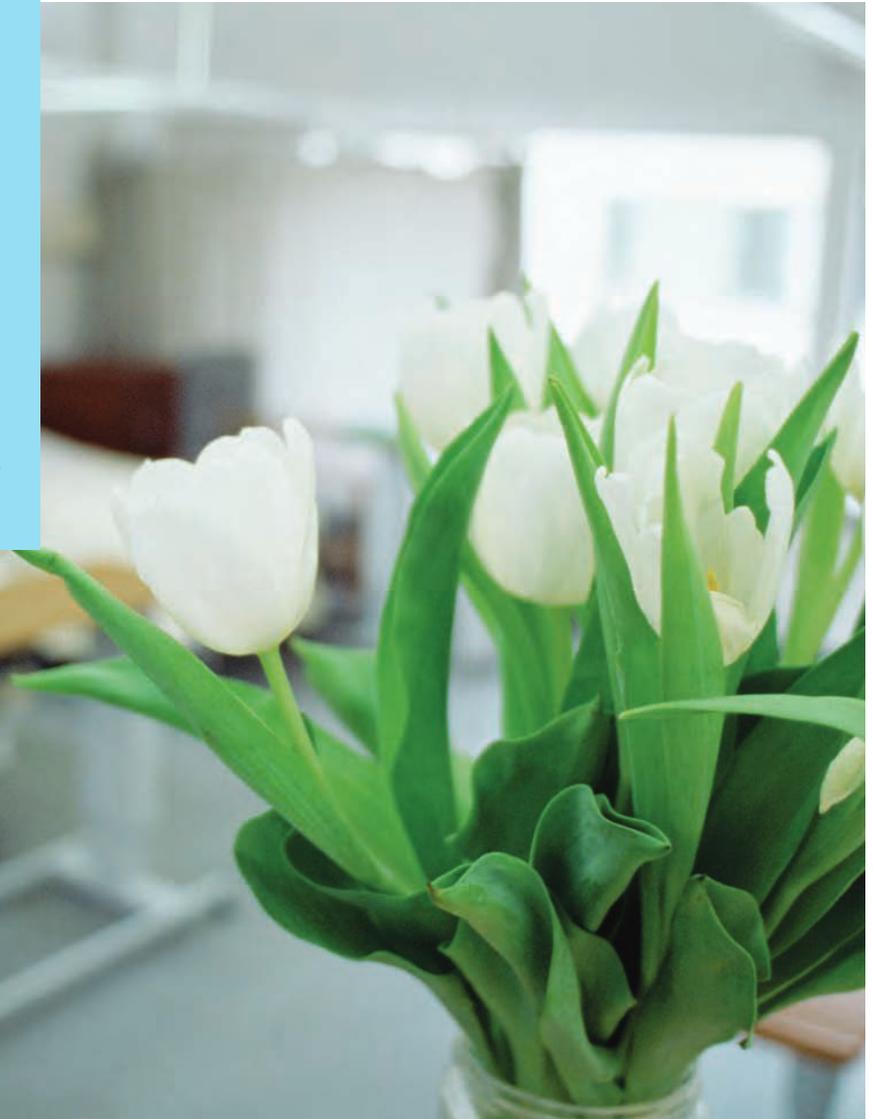
For a century and counting, Philips has been the foremost innovator and provider of lighting technologies, enabling new and more efficient uses of light that can transform our world both visually and practically.

We're proud to be a global leader in sustainability, too—we strive toward the ideal of meeting the needs of the present generation without compromising the ability of future generations to meet their own needs. We believe that every entity, from a local clinic to a national healthcare system, can benefit by being greener, too. Sustainability contributes to better everyday care and better long-range planning.

Like you, Philips takes patient needs as the starting point for healthcare equipment and lighting solutions. Our longstanding commitment to the mission of better care means providing flexibility to meet the specific needs of the user.

The Philips family of products delivers complete lighting solutions—from components and modules, to lamps, luminaires, and integrated systems—bringing you the utmost in quality, simplicity and innovations.

# Shedding your heal



At Philips Lighting, we work with you to create welcoming, efficient healthcare spaces that bring you better facility operations—and better patient experiences.

# new light on healthcare spaces



Patients are changing, and with them the character of hospitals is changing too. Rising costs of care, the role of insurers, and more patient options for treatment—all these factors are forcing healthcare organizations to become more competitive. What once seemed like small differences between medical buildings are now the reasons that patients—and medical professionals—will favor one facility over another.

To compete in the high-stakes, high-stress reality of today's healthcare market, facilities must be designed around the needs of patients, visitors, healthcare providers and administrators.

Central to this equation is lighting. When healthcare facilities invest in better lighting, patients and staff not only see better, they feel better, too. One study showed that lighting can do far more than just improve visibility—it can actually accelerate the healing process, and improve caregiver performance.<sup>1</sup> Installing the proper lighting products can help patients relax, nurses become more efficient, and doctors focus more easily on the tasks at hand. And Philips lighting products can be part of the solution.

For more than 100 years, Philips has been providing products uniquely suited to improving the healthcare environment, from CT scanners to energy-efficient TV sets and energy efficient lighting solutions. Let our expertise in healthcare shed new light on the right choices for your facility.

1) Excerpt from: Anjali Joseph, Ph.D., Director of Research, The Center for Health Design. "The Impact of Light on Outcomes in Healthcare Settings", August 2006. Nov. 24, 2008. <[www.healthdesign.org/research/reports/light.php](http://www.healthdesign.org/research/reports/light.php)>

# The path to a heal

To be a leader in today's competitive environment, healthcare facilities need to improve in terms of ambiance, well-being and sustainability to help address the critical issues of patient experience, staff motivation, brand image and their financial goals. Lighting can support these key factors and help you transform your facility in meaningful and innovative ways.

**Ambiance:** Welcoming, efficient facilities can provide physical and emotional comfort, putting patients and visitors at ease, and creating an optimal work environment for caregivers. Utilizing Philips lighting solutions, you can customize diagnostic areas, patient rooms, and lobbies, creating unique experiences for each occupant.

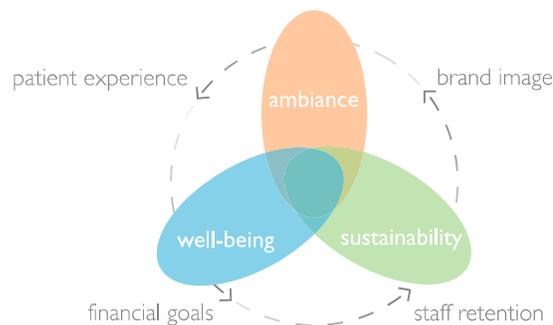
**Well-Being:** Comfortable spaces can impact patient wellness. Implementing good lighting design and use of innovative lighting solutions can help put patients at ease and inspire confidence while promoting staff effectiveness.

**Sustainability:** Employing systems that reduce a facility's environmental impact builds a positive image and saves dollars on energy use and maintenance. Our lighting products offer some of the highest efficiencies and longest life of any available today. Philips is committed to innovative solutions for reducing a facility's environmental "footprint" and cutting energy use—while remaining cost-effective.



Few environments are as challenging to illuminate as a hospital. A properly illuminated space is essential to drive the critical issues facing healthcare management.

- **Patient Experience:** Create appealing, emotionally uplifting environments
- **Staff Retention:** Improve staff well-being and motivation
- **Brand Image:** Create a distinctive corporate image
- **Financial goals:** Control facility operational costs



**Choosing the right lighting solution can help you achieve the desired mix of ambiance, well-being and sustainability.**



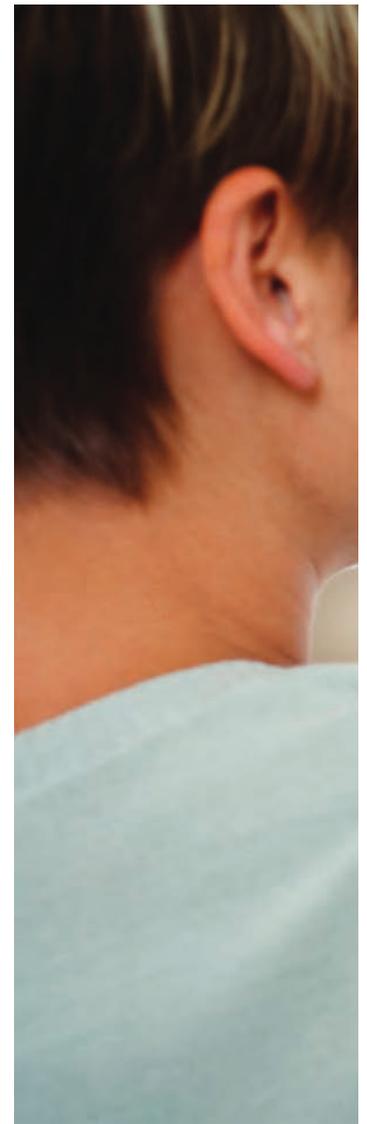
thier future



# Comfort, care and quality

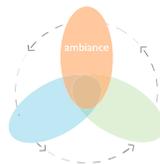
# Improving the patient experience

As patients assume greater responsibility for their own health, they demand higher levels of care. Sophisticated consumers now understand that patient comfort is part of the wellness equation, and they expect hospitals to be inviting and supportive during some of the most stressful moments of their lives. Philips lighting solutions for healthcare help you meet those expectations, putting patients at ease and adapting easily to their myriad of needs.



## What is Color Rendering?

Color rendering (CRI) is the ability of a light source to represent colors in objects, and is a relative measurement which rates light sources on a scale of 0–100. The higher the CRI, the more true colors appear (Good = 70–80 CRI, Excellent = 80+ CRI). High CRI is essential in settings where it is important that people appear natural and where visual clarity is important.



**Ambiance:** Lighting needs for patients and their families vary widely during a single hospital visit or stay. Bright general lighting can help highlight the reception desk, café and elevator banks. It can make public areas appear relaxed and welcoming, and create an environment for better examination by doctors and nurses. Warm, pleasant light in patient recovery rooms helps put patients at ease.



**Philips T8 Fluorescent lamps with ALTO II™ Technology** and a CRI of 80 provide a high quality of light well-suited for patient comfort and examination.



**Well-being:** Our bodies are finely tuned to react to the ebb and flow of sunlight that occurs over the course of a day, but a hospital environment often interrupts this biological rhythm. Designing rooms around patient needs can help make hospitals less intimidating, reduce anxiety, encourage loved ones to spend more time with patients and allow staff to work more efficiently.

Philips lighting solutions can recreate the dynamic nature of natural light in interior spaces, and help improve the patient's sense of well-being in the process.

Likewise, providing dark environments at night to promote healthy sleep patterns allows patients to maintain their daily rhythms and routines that create peace of mind. And as a 24-7 operation, hospitals need to provide adequate light for staff to perform their jobs at all hours of the day and to maintain alertness.



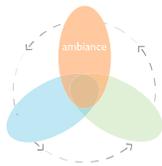
The innovative wayfinding system, **Philips CareGlow™ LED Device**, automatically illuminates indoor pathways with soft white light when the patient steps out of bed at night. No fumbling for a light switch, and no buzzing the staff. Instead, patients experience comfort and convenience to safely find their way at night.

## Making a difference

# Retaining motivated care

Few professionals are as dependent on lighting as healthcare workers. The ability to see properly can literally be a lifesaver. Around-the-clock operations require environments that help your staff cope with the demands of their jobs.

Philips Lighting products bring the very best color rendering and clarity available to operating rooms, diagnostic centers, and doctors' offices.



**Ambiance:** Healthcare provider staff must be able to perform under stress at all times of the day and night. Nurse's stations, doctors' offices and patient rooms are busy areas where proper lighting is needed to accurately diagnose patients and perform demanding tasks. Lamps with a high color rendering index (CRI 80) promote clarity.



**Philips eW® Profile Powercore** LED lighting fixture delivers high-quality white light that lasts for years and can be easily installed under cabinets.



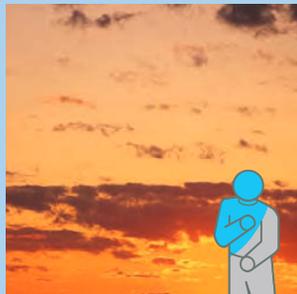
**Well-being:** The natural rhythms of light and darkness—day and night—synchronize our biological clocks, affecting alertness and perception levels. The intensity and color of light—cool vs. warm—can help establish those rhythms and improve comfort levels. Because natural lighting doesn't reach many hospital workspaces, Philips provides lighting solutions that can not only be dimmed, but can also be changed in color to help recreate the tones of natural daylight, such as morning and evening levels.



### Trend: How working environments influence motivation and well-being

Choice of tones of white light affects people's mood and activity levels.<sup>1</sup>

#### Warm white light



Relaxation

#### Cool white light



Activity

<sup>1</sup>) ETH Institute for Hygiene and working psychology, Zurich

givers



Brightening the brand

# Creating a distin

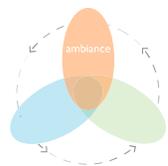


# ctive and positive image



Healthcare consumers and caregivers have more choice today than ever before. So in today's competitive healthcare market, first impressions count. Facilities that attract patients and medical professionals in a cost-effective way stand above their competitors.

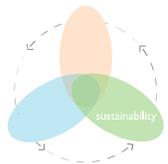
You can set the tone with good general lighting and with unique accent architectural lighting. It's a simple yet valuable way to communicate your healthcare mission to the outside world—and present your brand image as a warm and caring entity.



**Ambiance:** Lighting that communicates the right mood and that improves visitor wayfinding helps send these messages. Highlighting a building's best architectural features such as atriums and artful façades is yet another way to boost awareness—and market share. In these ways, Philips lighting solutions can set you apart, and communicate your healthcare mission to the public.



**Well-being:** A thoughtful visual image does more than boost your brand image. It contributes to patient confidence in the provider's care. Those positive attitudes may mean more positive outcomes.



**Sustainability:** Similarly, choosing environmentally friendly lighting solutions throughout your facilities sends a clear, healthy message all the while saving investors' dollars. Choosing products that have a small environmental footprint lets patients know the organization values sustainable choices. For hospitals following the *Green Guide for Healthcare*, seeking U.S. Green Building Council LEED® certification, or following H<sub>2</sub>E—*Hospitals for a Healthy Environment*, Philips offers lamps with low-mercury and extra-long life technology—earth-friendly choices that reduce waste.

## Boosting the bottom line

# Controlling operations an

In today's economy, healthcare facilities need to do everything they can to protect their bottom lines. Simplification, along with energy-efficient, long-lasting lighting solutions, means savings.

Because healthcare organizations operate 24–7, even small gains in efficiency can lead to significant savings. Replacing outdated lighting systems with more efficient, environmentally-friendly solutions will reduce energy consumption and maintenance requirements, saving funds for the core mission: healthcare delivery. Working with fewer lamp types and standardizing wattages can reduce complexity, making maintenance more manageable and less costly.

Philips has a strong commitment to sustainability and is continuously finding innovative ways to provide more environmentally sound and energy efficient choices for you. We are convinced that those facilities that combine the principles of economic growth and environmental stewardship will be the winners in the future.

To access your potential savings, our team of lighting experts can perform a Lighting Audit to help you maximize your profits without sacrificing your staff and patients' experience.

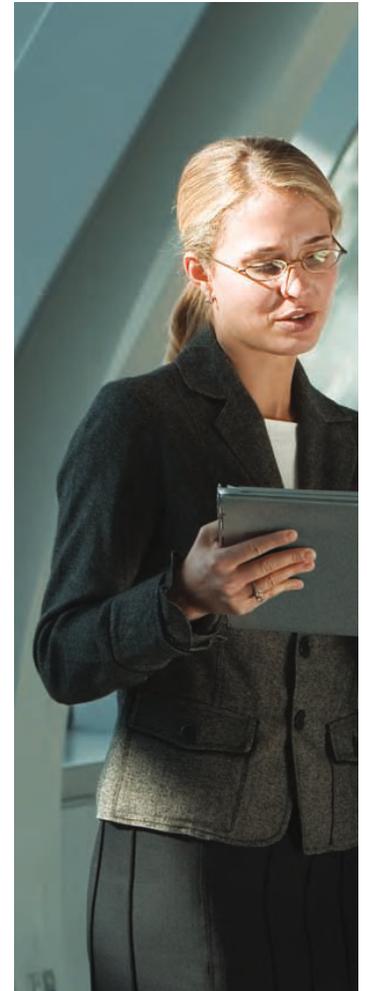
### Healthcare T.C.O.O.: The Total Cost of (Lighting) Ownership

Understanding how various lighting choices impact the bottom line is essential. These elements will affect a property's payback, cash outlays and return on investment. Taken together, it's the total cost of ownership, or T.C.O.O.

#### Four factors drive the total cost of lighting ownership:

<b>1. Product</b>	The initial purchase cost for the lighting system.	Beyond first cost, compare performance: service life, lumen maintenance, and color rendering and stability.
<b>2. Energy</b>	Annual operating hours multiplied by electrical cost (kWh).	Consider product wattages as well as light output and lamp performance.
<b>3. Maintenance</b>	Includes labor and relamping costs.	Longer-life lamps that maintain color stability and lumen output can reduce maintenance.
<b>4. Disposal</b>	The end-of-life cost, including disposal and recycling of lamps, ballasts and fixtures.	Another area where longer-life lamps benefit the healthcare facilities, by reducing waste and cost.

1) MasterColor CDMi 25W PAR38 offers 12,000 hours rated average life as compared to standard 75W PAR38 halogen with 3000 rated average life. The rated average life is the life obtained, on average, from large representative groups of lamps in laboratory tests under controlled conditions at 10 or more operating hours per start. It is based on survival of at least 50% of the lamps and allows for individual lamps or groups of lamps to vary considerably from the average.



**Philips MasterColor® Integrated 25W PAR38 Ceramic Metal Halide lamps** consume 3 times less energy and last up to 4 times longer than standard 75W PAR38 halogen lamps.<sup>1</sup> This cuts cost—but not light output.

# and meeting financial goals

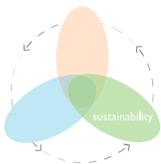


**Philips: A “LEEDer” in Greening Healthcare** Regardless of what industry standards guide your sustainability program, lighting plays a key role. Four key points to consider when creating a lighting system for a healthcare facility:

- Improving the quality of the light produced
- Reducing mercury levels
- Maximizing energy efficiency
- Extending the life of the bulb—for less waste and lower maintenance costs

Philips has reduced the amount of mercury in our fluorescent T8 lamps significantly. An industry leader when it comes to environmentally friendly, energy-efficient products, our lighting systems can help you reach your environmental and financial goals more quickly.

Philips sustainable lighting solutions can help contribute points toward the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) certifications.



**Sustainability:** Going green doesn't have to cost more. You can save money by refitting older T12 lighting systems with new, high-performance long-life T8 lamps and electronic ballasts. Or replace high-wattage T8s with today's lower wattage, energy-efficient T8 lamps—without even changing the ballast. You can further reduce costs by adding long-life lamps to your fixtures, a move that extends the relamping cycle, reducing hassles and inventory levels.



For optimized system performance, **Philips Energy Advantage T8 25W Fluorescent lamps featuring ALTO II™ Technology and the high-efficiency Optanium® electronic ballast** has the lowest mercury content and is one of the lowest energy-consuming 4-foot T8 systems on the market.

# Philips healthcare lighting

Lamps	Factors			Applications
	Ambiance	Well-Being	Sustainability	
<p><b>Energy Advantage T8 25W Linear Fluorescent</b></p> <ul style="list-style-type: none"> <li>• Features ALTO II™ Technology with only 1.7mg of mercury</li> <li>• Operates on any Instant Start and Programmed Start Ballast†</li> <li>• High energy savings and long life to reduce relamping cycle</li> </ul> 		EO 01	EO 01	<ul style="list-style-type: none"> <li>• Patient room</li> <li>• Treatment areas</li> <li>• Staff areas/offices</li> </ul>
<p><b>SILHOUETTE® Series T5 High Output Fluorescent</b></p> <ul style="list-style-type: none"> <li>• Slim profile lamp for design flexibility with outstanding lumen performance</li> <li>• Operates on any Programmed Start Ballast†</li> <li>• Features ALTO® Lamp Technology with only 1.4mg of mercury</li> <li>• Energy efficient and long life</li> </ul> 		EO 01	EO 01	<ul style="list-style-type: none"> <li>• Patient room</li> <li>• Treatment areas</li> <li>• Staff areas/offices</li> </ul>
<p><b>Energy Advantage T8 25W U-Bent Fluorescent</b></p> <ul style="list-style-type: none"> <li>• Features ALTO® Lamp Technology with only 2.0mg of mercury</li> <li>• Operates on any Instant Start and Programmed Start Ballasts</li> <li>• High energy savings and extra long life to reduce relamping cycle</li> </ul> 		EO 01	EO 01	<ul style="list-style-type: none"> <li>• Patient room</li> <li>• Treatment areas</li> <li>• Staff areas/offices</li> </ul>
<p><b>Energy Advantage PL-T Non-integrated Compact Fluorescent</b></p> <ul style="list-style-type: none"> <li>• 27W and 33W are direct replacements for 32W and 42W standard PL-T lamps with comparable light output</li> <li>• No ballast change required</li> <li>• Features ALTO® Lamp Technology</li> </ul> 	EO 01	EO 01	EO 01	<ul style="list-style-type: none"> <li>• Corridors</li> <li>• Entrance area</li> <li>• Lobby</li> </ul>
<p><b>MasterColor® CDM 25W Integrated PAR38</b></p> <ul style="list-style-type: none"> <li>• Easy retrofit upgrade from halogen PAR38</li> <li>• Energy efficient—uses up to 3 times less energy than a 75W PAR38 halogen lamp with comparable light output</li> </ul> 	EO 01		EO 01	<ul style="list-style-type: none"> <li>• Lobby</li> </ul>
Ballasts				
<p><b>Optanium® Electronic Ballast</b></p> <ul style="list-style-type: none"> <li>• For T8 Fluorescents, extends the service cycle, which lowers labor and material costs</li> <li>• Energy efficient, long life system solution</li> </ul> 		EO 01	EO 01	<ul style="list-style-type: none"> <li>• Patient room</li> <li>• Treatment areas</li> <li>• Staff areas/offices</li> </ul>
<p><b>Centium® Electronic Ballast</b></p> <ul style="list-style-type: none"> <li>• For T5 Fluorescents, ideal for use with occupancy sensors</li> <li>• Programmed start for maximizing lamp life</li> <li>• Smaller footprint than traditional ballasts enabling sleek fixture designs</li> </ul> 		EO 01	EO 01	<ul style="list-style-type: none"> <li>• Patient room</li> <li>• Treatment areas</li> <li>• Staff areas/offices</li> </ul>

# solutions

LEDs	Factors			Applications
	Ambiance	Well-Being	Sustainability	
<p><b>CareGlow™ LED Device</b></p> <ul style="list-style-type: none"> <li>• Motion activated low ambient wayfinding lighting provides confidence at night</li> <li>• LED technology uses only 2 watts of energy</li> <li>• Easily installed in any location, requires no maintenance</li> </ul> 				<ul style="list-style-type: none"> <li>• Patient room</li> </ul>
<p><b>eW® Profile Powercore</b></p> <ul style="list-style-type: none"> <li>• Low profile linear line-voltage under cabinet light fixture</li> <li>• End-to-end connections</li> <li>• Low power consumption—up to 50 fixture-feet per run</li> <li>• Fully dimmable</li> </ul> 				<ul style="list-style-type: none"> <li>• Offices</li> <li>• Nurses station</li> <li>• Gift shop</li> </ul>
<p><b>eW® Cove Powercore</b></p> <ul style="list-style-type: none"> <li>• LED cove fixture delivers white light with simple line-power installation</li> <li>• Flexible adaptable mounting, works with commercial dimmers</li> <li>• Mounts directly to flat surfaces in runs of up to 100 linear feet on a single circuit</li> </ul> 				<ul style="list-style-type: none"> <li>• Restaurant</li> <li>• Lobby</li> <li>• Elevators</li> </ul>
<b>More Products from the Philips Family</b>				
<p><b>Lightolier OBL Fixture</b></p> <ul style="list-style-type: none"> <li>• Over-bed wall mounted fixture with separate lamp compartments for controlled uplight and downlight</li> <li>• .125 thick DR acrylic linear prismatic impact resistant refractor</li> <li>• Four-way pull switch (120V)</li> </ul> 				<ul style="list-style-type: none"> <li>• Patient room</li> </ul>
<p><b>Lightolier MD Coffer</b></p> <ul style="list-style-type: none"> <li>• Four integral lighting functions: indirect ambient, direct reading, examination and optional night light</li> <li>• Precise glare-free light control</li> <li>• Installs as one-piece unit for recessed or surface mount</li> </ul> 				<ul style="list-style-type: none"> <li>• Patient room</li> <li>• Treatment areas</li> </ul>
<p><b>ColorBlast® I2 Powercore</b></p> <ul style="list-style-type: none"> <li>• Rich, saturated wall-washing color and color changing effect light fixture</li> <li>• Simplified installation for easier, more consistent positioning</li> <li>• Enhances architectural lighting effects in stores</li> </ul> 				<ul style="list-style-type: none"> <li>• Exterior</li> </ul>

1) Starting voltage should be equal to or greater than 550V. These lamps are not recommended for use where the temperature in fixture is below 70°F. Striations may occur where air movement is present in fixture. For best operation, use ballast with anti-striation circuitry.

# Why Philips

At Philips, we pride ourselves on producing tomorrow's products today. Just like you, we value lighting solutions that are flexible enough to fit the needs of each unique user, while sustaining our environment.

## Customized Solutions

We are committed to working together with you to create effective and efficient environments. Whether you're planning an entirely new lighting design or just need an audit of your existing property, our team of applications lighting experts will work with you to create a solution that is tailored to your unique needs.

## Always in Touch

Whether your properties are scattered across the country or represent a single location, a Philips representative nearby can answer questions about lighting. That representative will help you design and implement solutions to meet your most pressing needs.

A visit to a Philips Lighting Application Center can bring those solutions to life. Each Center hosts demonstrations and workshops where customers can acquaint themselves with the latest in healthcare lighting technologies.

Our network of national distributors can address all your re-lamping and re-ballasting needs while our national accounts team ensures that your facility receives premium services.

## One Partner, Many Solutions

Philips leads the global lighting market as a pace setter in the industry, as well as the best partner to do business with, and as a responsible corporate citizen contributing to the sustainability of society at large. We can offer integrated solutions that draw upon capabilities from across the entire Philips group—from defibrillators and coffee-makers, to the most advanced televisions and set-top boxes. All are part of our drive to help build world-class, cost-effective healthcare properties.

**Only Philips delivers a full portfolio of solutions, providing our customers the luxury and the flexibility that comes with choice, and the confidence that comes from partnering with an industry innovator.**

## Philips—delivering your lighting solutions



**Luminaires**  
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**Lamps and Ballasts**  
featuring Philips Lighting Company and  
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## Science News

from research organizations



# Using light to image and potentially to treat PTSD

**Date:** September 6, 2016

**Source:** University of Texas at Arlington

**Summary:** After years of studying the effects of near-infrared light on veterans with post-traumatic stress disorder or traumatic brain injuries, a team of bioengineers has published research that could result in an effective, long-term treatment for brain disorders.

**Share:**

### FULL STORY

After years of studying the effects of near-infrared light on veterans with post-traumatic stress disorder or traumatic brain injuries, a team led by a University of Texas at Arlington bioengineer has published groundbreaking research in Nature's *Scientific Reports* that could result in an effective, long-term treatment for brain disorders.

Professor Hanli Liu was the primary investigator on the project. Her team of graduate students and a research associate, Fenghua Tian, worked with co-investigators Alexa Smith-Osborne, a UTA social work associate professor; Francisco Gonzalez-Lima, a psychology professor at UT Austin; and Fu Lye Martin Woon, a former assistant professor of psychiatry at UT Southwestern; to show potential intervention using light in brain disorders including post-traumatic stress disorder.

Their research is funded in part by a UT System BRAIN or Brain Research through Advancing Innovative Neurotechnologies seed grant titled, "Transcranial light therapy and imaging of prefrontal cognition in PTSD."

With the UT System's support, Liu's interdisciplinary collaborative team has not only investigated the brain imaging capability of light but also revealed

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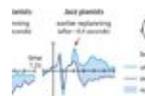


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the therapeutic rationale for potentially improving cognitive functions of patients with PTSD. The first paper resulting from the seed funding is published online and titled, "Interplay between up-regulation of cytochrome-c-oxidase and hemoglobin oxygenation induced by near-infrared laser."

As in the first study, the team used a human forearm as a biological model instead of the human brain to avoid confounding factors due to such anatomical structures as the scalp and skull. The paper outlines their discovery that shining near-infrared light on the subject's forearm increases production of cytochrome-c-oxidase, a protein inside the neurons that stimulates blood flow. This discovery shows great potential that NIR or infrared light also will work within the brain.

"This is the first time that effects of light stimulation have been quantified on living human tissue," Liu said. "The next challenge is to apply what was learned in a simpler system to the brain, where the light must pass through the scalp and the skull, as well as the brain. In the past several years, we have used the knowledge gained in the NIR field to detect, monitor and understand certain brain disorders, such as PTSD. But we have never utilized NIR light for treatment."

Now the team is moving to report and publish its findings of transcranial NIR stimulation on the human brain by quantifying production of cytochrome-c-oxidase and increase of blood flow. It would support a novel, non-invasive treatment with imaging ability, especially for memory, which could really help veterans who suffer from PTSD.

The UT BRAIN initiative was approved by the UT System Board of Regents in 2014 and supports a virtual UT System Neuroscience and Neurotechnology Research Institute that promotes trans-disciplinary, multi-institutional research projects focused on neuroscience and neurotechnology. It has provided a total of \$5 million with a \$100,000 per grant in a 2-year period of Sept.1, 2015 to Aug. 31, 2017.

Eight days prior to that paper, Liu and her team published another paper in Scientific Reports, titled, "Prefrontal responses to Stroop tasks in subjects with post-traumatic stress disorder assessed by functional near infrared spectroscopy." That paper outlined Liu's work to understand how the brains of people suffering from PTSD are different from a healthy group of non-PTSD sufferers using a Stroop test.

**Stroop tests are attention tests that are commonly used in psychology.**

Liu measured blood flow in the left side of the dorsal lateral prefrontal cortex of subjects' brains and found that those suffering from PTSD don't have the ability to pay attention and also have insufficient blood flow in that area of the brain. Michael Cho, chair of UTA's Bioengineering Department, says that Liu's continuing focus on using NIR light to detect, monitor and potentially treat brain injuries underscores the UTA's focus on health and the human condition contained within the Strategic Plan 2020: Bold Solutions | Global Impact.

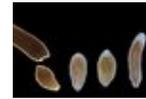
"Dr. Liu and her collaborators have made incredible strides in identifying how the brain is affected by trauma, as well as how to treat disorders such as



## Strange & Offbeat

### HEALTH & MEDICINE

Lyosomes and Mitochondria Chat Each Other Up in Cell



First Complete Genome Assembly of Planarian Flatworm Reveals Treasure Trove on Function and Evolution of Genes

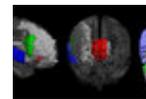
Trove on Function and Evolution of Genes



Eating Insects Might Seem Yucky, but They Are Nutritious and There Is No Reason

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### LIVING & WELL



Fat Cat? Here's How Much to Feed to Lose Weight



Don't Hold Your Nose and Close Your Mouth When You Sneeze, Doctors Warn



Print a 200-Million-Year-Old Dinosaur 'Fossil' in Your Own Home

PTSD noninvasively with light," Cho said. "This is truly innovative, ground-breaking research, and the results are a testament to Hanli and the input of her collaborators."

Liu, a Fellow of the American Institute for Medical and Biological Engineering and a member of the UTA Academy of Distinguished Scholars, joined UTA's College of Engineering in 1996 and has secured more than \$11 million as principal investigator or co-PI in research funding during her career. Her work is focused on medical instrumentation and imaging, minimally invasive and noninvasive spectroscopy and imaging of tissue, optical diffuse imaging for cancer prognosis, and brain activities.

She has studied PTSD extensively with Smith-Osborne and Tian, and they have applied a portable brain-mapping device that allows them to "see" where memory fails student veterans with PTSD. That research led the team to connect with Gonzalez-Limam and further discovered that shining low-level light on the brain by placing the light source on the forehead can stimulate and energize neurons to function more effectively. When cells are stimulated with light, they remain stimulated for a lengthy period of time even after the light is removed. The approach differs from other therapies that use magnets or electric shocks and has the potential to yield effective, longer-lasting treatments.

#### Story Source:

Materials provided by **University of Texas at Arlington**. Original written by Jeremy Agor. *Note: Content may be edited for style and length.*

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#### Journal Reference:

1. Amarnath Yennu, Fenghua Tian, Alexa Smith-Osborne, Robert J. Gatchel, Fu Lye Woon, Hanli Liu. **Prefrontal responses to Stroop tasks in subjects with post-traumatic stress disorder assessed by functional near infrared spectroscopy**. *Scientific Reports*, 2016; 6: 30157 DOI: 10.1038/srep30157

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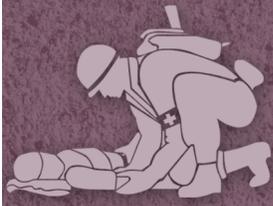
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## **5.** **Telemedicine**

## FGI lays out telemedicine guidelines



Telemedicine is included as part of the common elements for both hospitals and outpatient facilities in the 2018 Guidelines.

Image courtesy of Arizona telemedicine program



Telemedicine use rose from 54 percent in 2014 to 71 percent in 2017, according to a survey conducted by the Healthcare Information and Management Systems Society's HIMSS Analytics, and a February 2018 post by the Patient Safety & Quality Healthcare journal indicates that as of 2017, all 50 states have adopted some form of telemedicine reimbursement coverage.

Nonetheless, many questions and inconsistencies still arise in discussions of telemedicine, including how to define the term. The Health Resources & Services Administration (HRSA) defines telehealth as “the use of electronic information and telecommunication technologies to support and promote long-distance clinical health care, patient and professional health-related education, public health and health administration.”

The Centers for Medicare & Medicaid Services uses the HRSA definition and the terms “telehealth” and “telemedicine” interchangeably. However, in announcing the HIMSS 2017 survey results, KPMG LLP suggested a differentiation. Telehealth connects clinicians with patients in their home or via mobile devices, while telemedicine connects primary care or emergency department clinicians to medical specialists via technology.

While there is no shortage of technology — from two-way videos to smartphones — the distinction that telemedicine is more than a home visit via mobile device is important when it comes to designing environments to support these services. There is an inherent difference between connecting via FaceTime with a primary care provider when a patient has a cold versus coordinating patient care with specialists in another location for patients located in underserved areas or where it might be better to avoid unnecessary patient transfers.

## **A proactive approach**

The Facility Guidelines Institute (FGI) Health Guidelines Revision Committee (HGRC) took a proactive approach to design for telemedicine in the 2018 Guidelines for Design and Construction documents for hospitals and outpatient facilities, establishing a few minimum requirements for telemedicine spaces and offering additional recommendations supported by research and best practices. FGI began by establishing a glossary definition for what the Guidelines means by telemedicine: “The use of electronic information and communications technologies to provide and support health care when distance separates the patient and medical provider.”

A note appended to the glossary definition further delineates this simple definition: “Clinical applications of telemedicine may encompass diagnostic, therapeutic and forensic modalities. Common applications include pre-hospitalization assessment and post-hospital follow-up care, scheduled and urgent outpatient visits, medication management, psychotherapy and consultation. Patient and provider consultations, medical imaging, remote monitoring and education are all services that can be provided via telemedicine.

A variety of technologies, including videoconferencing systems, internet-based websites, digital phones and secure email can be used to deliver telemedicine services. Telemedicine facilitates the exchange of health information, services and education between providers and providers or patients through electronic means.”

Multiple sources were used as a foundation for the proposals that became the basic requirements and recommended appendix language for telemedicine spaces in the 2018 Guidelines, including:

- Papers about telemedicine workspaces from Janet Major (2005) and Elizabeth Krupinski (2014), both of the Arizona Telemedicine Program;
- California Telemedicine and eHealth Center’s “Telemedicine Room Design: Program Guide” (2011);
- Guidelines for telehealth rooms used by the Provincial Health Services Authority in Canada;
- American Telemedicine Association’s telemental health standards and guidelines (2009);
- A consensus report published in the Journal of Digital Imaging on consistency and standardization of color in medical imaging (2015).

FGI requirements for telemedicine spaces are not intended to apply to virtual visits that do not require a physical examination of the patient or visits that originate from a physician’s or patient’s home. Appendix language recognizes the patient experience, understanding that remote communications via electronic equipment can be a necessary supplement to in-person care. A reminder is also included that design of telemedicine spaces should facilitate natural communication for the widest range of participants, including elderly patients, those unaccustomed to electronic communication and those with vision, hearing or cognitive impairments.

## **Common requirements**

Telemedicine requirements are included as part of the common elements for both hospitals and outpatient facilities in the 2018 Guidelines. Where an organization provides clinical telemedicine services, a bay, cubicle or room must be provided to accommodate those services. Requirements are given for the size of telemedicine spaces, privacy, acoustics, lighting, interior surfaces, site identification and storage for equipment. Where low patient

volume makes provision of a dedicated telemedicine room impractical, the space also can serve other functions such as a physician's office, exam room or conference room.

In the appendix, the Guidelines indicates that telemedicine services may include one-on-one interactions, consultations with a patient and family members (e.g., pediatric or elderly patients), examinations supported by a telemedicine presenter located with the patient, or specialty services such as dermatology or orthopedics. Throughout the section on telemedicine, recommendations accompany the minimum requirements for designers to consider when designing telemedicine spaces. For example, each type of service provided may have specific needs for lighting and space to support the clinical function. Thus, it is important to know what services will be provided in the telemedicine space to achieve a functional design.

**Space requirements.** Where a telemedicine bay, cubicle or room is used for patient examination, the space must be sized so that an exam table can be situated within view of the camera and the following can be accommodated: fixed or mobile telemedicine equipment, peripheral devices, an on-site caregiver or patient presenter, a hand-washing station where hands-on exams are provided and a documentation area. For privacy, the space must also permit arrangement of monitors, screens or other image or data projections so that they are not visible from outside the telemedicine space.

Further considerations for sizing a telemedicine space are described in the appendix. One of these is the proximity of the camera and microphone to the patient. The camera and exam table should be positioned so that a presenter using and manipulating telemedicine peripherals can see both the patient and the monitor, with images being transmitted to the remote clinician's site. Space for microphones should be available in front of and close to the individuals speaking in the videoconference, ideally at least 4 feet from the telemedicine workstation to prevent audio feedback.

The room should be large enough for the patient and the patient presenter (if one is present) to move around comfortably for the type of clinical service being provided. For example, when an examination includes gait evaluation, the telemedicine space should be large enough for this activity to be captured by the camera.

**Acoustics.** A telemedicine room must have an acoustic environment that facilitates speech intelligibility and communication. Appendix recommendations suggest that the room be in a quiet location to minimize exposure to background noise that can be picked up by microphones. Therefore, locations near open office areas, busy corridors, stairwells, parking lots, waiting rooms/areas, HVAC systems and toilet rooms are unsuitable.

A telemedicine room also must be designed for the sound isolation rating appropriate for its clinical function. In designing to achieve this minimum sound transmission class rating, consideration of all portions of the room envelope is recommended, including walls, floor/ceiling assemblies, doors and glazing as well as field conditions that may affect the performance of those elements. As well, background noise levels in telemedicine bays, cubicles and rooms must be suitable for the clinical functions performed in the space.

These requirements for speech intelligibility, sound isolation and background noise are all based on the acoustic design requirements in Part 1 of the Guidelines.

**Lighting.** All spaces intended for telemedicine services must allow direct frontal lighting. However, it is recommended that both direct and indirect lighting be provided to support creation of images with even lighting and accurately reproduced colors. According to the sources on which the new Guidelines requirements were based, full-spectrum or warm,

white light (3200-4000 K) with a minimum light level of 150 foot-candles is appropriate.

Means of controlling glare from natural and artificial light sources also are required. For example, shades or blinds can reduce light and glare in rooms with windows. In these spaces, it also should be possible for clinicians and patients to avoid sitting in front of a window unless backlighting can be adequately addressed. Diffused light shining diagonally toward the patient is recommended to reduce shadows on the face caused by overhead lighting or a light source behind the patient.

**Interior surfaces.** The finishes and colors selected for a telemedicine bay, cubicle or room must be able to support natural rendition of color and pattern. As indicated in the Guidelines appendix, the sources referenced in development of the text were consistent in finding that light to medium blue or light gray matte finishes are best for proper rendering of color and facilitating picture clarity. These shades are preferred because they offer minimal light absorption and reflectivity. If a space is used for other functions, screens or curtains may be used to provide the appropriate background color or to hide clutter (e.g., bookshelves and framed pictures with glass).

The Guidelines requires the backdrop wall color to have a light reflectance value of 30 to 40 percent. In the appendix, a surface finish gloss rating of Level 1 or 2 (flat finish) is recommended rather than a gloss rating of Level 5 (semi-gloss) or 6 (gloss finish) to avoid glare and reflections. Also in the appendix are recommendations to avoid glare and contrast by specifying these light reflectance values for surfaces: 80 to 90 percent for ceilings, 25 to 45 percent for furniture and 20 to 40 percent for flooring.

**Site identification.** Facility identification must be provided at the telemedicine site so that it appears in the transmitted image unless such identification is embedded in the electronic telemedicine platform. This signage is sometimes required for reimbursement, but is also helpful for reminding clinicians and patients where the person with whom they are speaking is based when telemedicine services are offered between multiple locations.

**Equipment-associated issues.** Secure storage is required for telemedicine spaces where portable equipment and peripheral devices (e.g., digital cameras, task lighting and electrocardiogram devices) are used. Additional guidance for equipment used for telemedicine services includes camera placement so that participants in the telemedicine communication perceive the exchange as happening eye-to-eye, and provision of temperature controls based on the heat the electronic equipment may generate. Depending on the complexity of equipment used, multiple outlets may be required. Finally, a reminder is given to select and install telemedicine equipment to facilitate cleaning and support infection-prevention practices.

## Continuous evolution

Telemedicine and telehealth have evolved quickly over the past few years, suggesting that they will continue to develop at a rapid pace. As technology advances and organizations become more familiar with platforms and service options, minimum built-environment standards to support these practices may need to be refined.

Although HGRC members debated whether advanced technology could make up for shortcomings in the physical environment, robust discussions suggested that many organizations will not invest in the highest-quality technology. Moreover, even some of the most prestigious health care systems in the country acknowledge that they learn from their mistakes and make necessary corrections to the physical environment or communications

equipment — an approach not all organizations may be able to afford.

In the end, as language for the 2018 Guidelines was established, the HGRC focused on balancing a small amount of verbiage as required minimum standards with more extensive recommendations in the appendix. The goal was to allow enough flexibility for organizations to ascertain their own level of need based on services rendered.

Spaces for telemedicine communications should strive to maintain the level of safety, privacy, quality of care and patient experience that would be expected for communication when it takes place in person. As more evidence becomes available, telemedicine requirements in the Guidelines will adapt, through revised language for minimum standards and updates from the field in FGI's "Beyond Fundamentals" platform.

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***Ellen Taylor, Ph.D., AIA, EDAC, is vice president for research, The Center for Health Design, and a member of the steering committee of the FGI Health Guidelines Revision Committee. She can be reached at [etaylor@healthdesign.org](mailto:etaylor@healthdesign.org).***

## ► Telemedicine room design

Janet Major

Arizona Telemedicine Program, University of Arizona, USA

### Summary

Proper design of rooms for telemedicine store-and-forward and realtime interactive consultations is critical. The challenge is to incorporate communication technology into medical practice to facilitate efficient communication and effective patient care. If this is done properly, the technology becomes unnoticeable to those involved in the telemedicine interaction. This article describes some of the steps that can be taken in a telemedicine room design to achieve this goal. Room location, treatments, background, lighting, power and telecommunications aspects are reviewed. Although every room design will have its own unique challenges, adhering to these basic principles will provide an excellent foundation to begin with.

### Introduction

This article provides some basic guidelines for designing and setting up a room for the practice of telemedicine. The design principles apply for both prerecorded (i.e. store-and-forward) and realtime (i.e. interactive) applications. Telemedicine facility design basically involves building small television studios in a clinical setting. The aim is to create a functional, yet comfortable, space for both the clinician and patient. Professional TV work uses special effects to create a mood or communicate information, whereas telemedicine uses these techniques to communicate medically accurate information.

There are several factors that influence the design of the space used for telemedicine. The location of the room can be critical, but its size and furnishing can be more important. Bigger is definitely better and a large room is necessary when providing both clinical and educational applications. The types of clinical services being offered can dictate the size of the space as well as its location within the health-care facility, so it is important to let the function help guide the design. Several room treatments should be performed before

any telemedicine equipment is installed in order to prevent possible problems when using microphones (e.g. echo) and cameras (e.g. glare and reflections) in a clinical setting.

### Location

Location is everything in real estate. This is also true in telemedicine. The location of the room can be the key to success for the clinical services being offered. One of the most successful telemedicine sites in the Arizona Telemedicine Program (ATP) is the Tuba City Regional Health Care Corporation in Tuba City, Arizona. The telemedicine room here is located in a walk-in clinic that is centrally located for all patients and clinicians, making it easy to walk there from any office or central check-in desk. There are other ATP sites that have the telemedicine equipment located in their only conference room, which is situated away from the main patient visitation areas and examination rooms. Such rooms are not easy to get to for either the clinician or the patient, and are often not available because of meetings being held there. This means that the equipment is not accessible or used very often. Any room identified as a telemedicine clinic needs to be in a suitable location and to be accessible for both the patient and the health-care provider.<sup>1</sup> Ideally, it should be designated specifically for telemedicine so that it will always be available when needed.

Correspondence: Janet Major, Arizona Telemedicine Program, Department of Biomedical Communications, Arizona Health Sciences Center, University of Arizona, 1501 N. Campbell, Tucson, AZ 85724, USA  
(Fax: +1 520 626 2145; Email: majorj@biocom.arizona.edu)

## Clinical applications

It is important to decide what specialty consultations or services will be provided when determining how the space will be designated for telemedicine use. In other words, how many computers and how much telemedicine equipment will fit into one small clinic room? Telemedicine clinic rooms need to be versatile enough to be set up and re-set for specific clinics. For example, if only store-and-forward teledermatology services are going to be offered, the patient room does not have to be very large. However, in a paediatric orthopaedic videoconference to fit a child with a new prosthesis, it may be necessary to empty the patient telemedicine room except for the trolley and a chair or two for family members. Since it is an orthopaedic clinic, it will probably be necessary to perform gait studies and therefore enough space is needed for the patient to take 8–10 steps. Thus, the telemedicine room must have about 5 m of unimpeded walking space. If the telemedicine room is only 3 m × 4 m, then a gait study may need to be done by walking up and down the hall outside the telemedicine clinic room. Long camera and microphone cables help with this, but clearing the hallway of other pedestrian traffic may present a problem. All distractions need to be eliminated in order to communicate clearly with the specialist. The key is to understand the space and location requirements *before* starting clinical services, rather than realizing halfway through a consultation that there is not enough room to carry out the required parts of the examination.

Clinic rooms for telemedicine applications can be used for both sending and receiving information. The videoconferencing display equipment can be the same to accomplish both tasks. Specialists interviewing patients in a videoconference session may want a large 81 cm monitor to improve their view of the patient. The clinician who is presenting the patient may need or want a smaller monitor if space is severely limited, although it should still be big enough to be seen clearly from about 2 m away.

There are no standards regarding display requirements for realtime interactive telemedicine. The ordinary cathode ray tube (CRT) display will suffice, but liquid crystal displays (LCDs) save space, although they are more expensive at present. Most commercially available monitors will have sufficient spatial resolution (1600 × 2100 pixels; 32-bit), contrast resolution (many monitors exceed 1000:1) and colour fidelity to be used in most settings.<sup>2</sup> Monitors should be calibrated regularly. The GretagMacbeth ColorChecker Chart is available as a jpeg image file for installation on the computer driving the display. For realtime

videoconferencing, the originating site should point the camera at the chart. The persons at the receiving site can tune their monitor by comparing the displayed image with a physical copy of the chart. This is a simple and effective technique that does not require technical skills or knowledge.<sup>2</sup>

In terms of the videoconferencing unit, there are usually several video inputs that can be used to connect almost any medical device that has a video output. It is preferable to connect devices using S-video leads rather than composite video leads, if possible.<sup>3</sup> The crux is whether or not the specialist at the consulting end considers the quality of the image to be diagnostic.

In many cases, telemedicine rooms take over space that was once used for something else. For example, at the St Elizabeth's of Hungary Clinic in Tucson, Arizona, a relatively small biohazard waste closet was turned into a telemedicine room (see Figure 1 a and b). Physicians, nutrition counsellors (see Figure 2) and nurses all come here to videoconference with their patients. It has made a rather cosy telemedicine suite, but they look good on video to their patients and that is what matters most.

Ideally, when a clinic room is designated as a telemedicine suite, there will be room to expand. Success means more specialty services, which therefore require more space for equipment. If resources are available, a second room can be designated for telemedicine or educational applications. Ideally, one would want to keep separate the spaces used for clinical versus educational applications and administrative meetings. The ATP offers a wide variety of interactive educational opportunities for clinicians via video-conference. Often, these are offered at lunchtime with topics relevant to the clinic that afternoon. Space is needed for clinicians to relax, eat and enjoy the educational programme during their lunch hour. A telemedicine room with sufficient space for educational programme viewing, from Douglas, Arizona, is shown in Figure 3. The room is approximately 4 m wide × 5 m deep. The front one-third of the space is used for clinical consultations and the rest of the room provides space for rows of chairs for the educational programmes. Combining clinical services with education in the same room works very well at this location.

## Room treatments

Regardless of the space which is available, it can usually be improved for telemedicine purposes, with relatively inexpensive room treatments. There are some basic production elements that can make or break



**Figure 1** (a) The room chosen for telemedicine at the St Elizabeth's of Hungary Clinic in Tucson, Arizona, prior to renovation was a biohazard waste room. (b) After the renovation, signs of its previous use were still evident



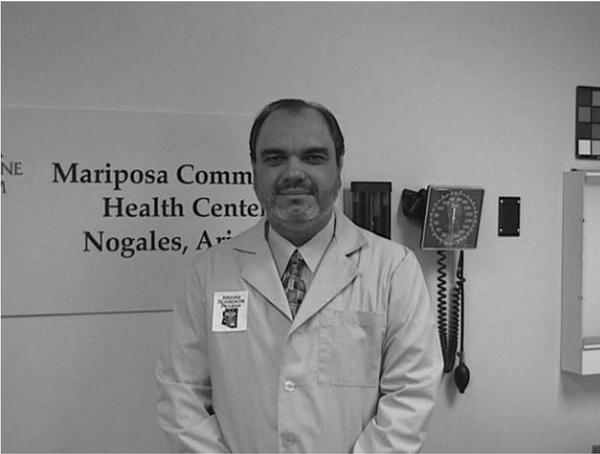
**Figure 2** The nutrition specialist at the St Elizabeth's of Hungary Clinic in Tucson, Arizona, giving a lecture from the telemedicine room. Note the relatively small workspace she has available



**Figure 3** A typical telemedicine room used for clinical videoconferencing, store-and-forward applications, educational broadcasts and administrative meetings

conversations and consultations via videoconference. One is the colour of the room. The first telemedicine equipment installed by the ATP in Tuba City, Arizona, was in a room that had been painted a striking shade of pumpkin-orange. This did not photograph well and typically distorted the skin colour of those being

photographed with it as the backdrop. Room colour can make a dramatic difference to the quality of the video or digital images. Light blue looks excellent on video and can provide the perfect background for taking digital images for store-and-forward applications such as teledermatology. The ATP has successfully



**Figure 4** A typical telemedicine room showing a clinician with the site identification sign behind him

convinced the relevant authorities that a light blue colour should be used for the walls in their telemedicine rooms. The biggest challenge in fulfilling our request has been to obtain a matt paint. Institutions prefer semi-gloss paint because of its shine and ease of cleaning, but cameras do not, because of the inherent glare.

## Background

The background in a telemedicine room can potentially make or break the conversation and interaction between a clinician and a patient. Imagine that you are a patient in a gown talking to a specialist via video. You notice that there is a door behind the specialist. Who is going to walk through that door? Maybe no one, but as you sit there half-naked you may find it difficult to stop thinking about it and it could detract significantly from the interaction and trust between you and the specialist. The job of telemedicine staff is to use technology to facilitate a productive conversation between a clinician and a patient. This means paying particular attention to video production details like the background. The ATP protocol is to include a sign with the name of the site in the background of all patient and consulting sites (see Figure 4). This helps keep everyone oriented since a specialist may see patients at several sites within a single scheduled clinic. It is also very helpful for the patients and the clinicians, and assists the conversation flow.

## Audio

Audio is very important in telemedicine,<sup>4</sup> particularly with regard to patient confidentiality. Proper

placement and use of the microphone requires continuing staff training. It is useful to have the ability to turn the microphone on or off. Paying particular attention to audio will prevent any unintentional broadcasting of personal phone calls or patient information. The quality of the audio can make or break the conversation. One can eliminate a lot of echo and increase the quality of the audio simply by carpeting the clinic room. However, you need to consider what the camera will potentially see with regard to the colour and pattern of the carpet. Light blue or grey without an ornate pattern is best. If the walls are bare and made of a hard material (e.g. bare concrete or plaster), it is advisable to cover them with a sound-dampening material such as acoustic material, corkboard or even a thick curtain material. Note that any wall coverings or curtains will need to comply with local fire regulations.

## Lights

Another critical component of successful telemedicine is the lighting.<sup>5</sup> It is important that the lighting be even and consistent in terms of colour temperature. It is easy to colour-correct any existing light fittings to warm, white light (3200–4000 K). To ensure the light is evenly distributed throughout the room, the existing lighting should be supplemented with standard fluorescent fixtures if possible. This is most important for dermatology and other specialties where colour information is likely to affect diagnostic accuracy. It is important not to create unwanted special effects with the colour or angle of the lighting fixtures.

## Power and telecommunications

Any room designed for telemedicine must have sufficient electrical power, including emergency back-up power for services involving videoconferencing. Computer network connections will be required to both the telemedicine network and the in-house network and patient database. There also needs to be an in-house telephone line that may be part of the internal PBX (n.b. it is often helpful to have a telephone with a silent ring, e.g. a lamp, to announce incoming calls). A telemedicine clinical room also requires at least one direct telephone line to the room for technical support, and a fax machine to support telemedicine telecommunications. These services enhance the efficient flow of information within a

health-care facility as well as among providers in multiple locations.

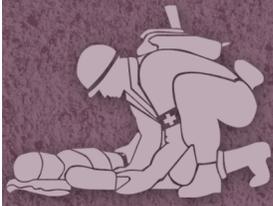
## Conclusion

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In telemedicine room design, the challenge is to incorporate communication technology into medical practice to facilitate efficient communication. If this is done properly, the technology becomes unnoticeable to those involved in the telemedicine interaction.

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## 6. Wall Finishes

# Antimicrobial Coatings

July 31, 2007

*Darrell Snyder, Lisa Barrett,  
and Emerentiana Sianawati*

Can they be effective against bacteria?

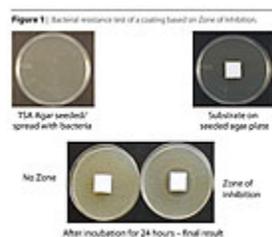


Figure 1

A study conducted by the Battelle organization forecasts that antibacterial surfaces and germ-resistant coatings will be an important technological breakthrough in household products. Homeowners are looking for new cleansers that provide lasting protection on kitchen and bathroom surfaces. This protection from disease-causing micro-organisms might be built into surfaces with disinfectant treatment and materials.<sup>1</sup> It also anticipates that young people will insist on safe and healthy products and be prepared to pay more for products and services that offer health benefits.<sup>2</sup>

Recent food poisoning outbreaks and high rates of hospital-acquired infections<sup>3</sup> have also heightened people's awareness on how easily diseases can be transmitted. Antibacterial coatings will provide an extra line of defense and a complementary strategy for maintaining hygiene standards and public health. Antibacterial coatings will also reduce the risk of infected surfaces acting as a reservoir for transmission to food and humans. Other advantages in economical and environmental aspects are less frequency of repainting, labor and chemical cost reductions.

Biocides are commonly added to paint formulations to maintain the product's integrity from microbial attack and to provide protection in the dry film against any fungal and algal growth. Most paint consumers expect the aesthetic look of their painted surface to last for a long time. Microbial growth often stains paints and deteriorates paint properties. Biocides for dry film protection play a large role in maintaining paint's physical beauty and keep any microbial growth away from the coated surface. The most common commercial dry film biocides are based on the following actives: zinc pyrithione (ZPT), 3-iodopropargyl-

n-butylcarbamate (IPBC), 2-n-octyl-4-isothiazolin-3-one (OIT), 4,5-dichloro-2-(n-octyl)-4-isothiazolin-3-one (DCOIT), carbendazim (CBZ) and chlorothalonil (CTL). The above biocides are mostly known to be effective against fungi and sometimes algae, but their effectiveness against bacteria is not fully known. Only the first four biocides were chosen for the antibacterial testing study because of restrictions imposed by the European Biocidal Product Directive (BPD) on carbendazim and chlorothalonil. Carbendazim has stringent reclassification: paints containing more than 1000 ppm of this active have to be labeled “Toxic R46 (may cause heritable genetic damage), carry a “skull and crossbones” symbol, and a phrase “restricted to professional users”. The paint MSDS must state “mutagen Category 2”.<sup>4</sup> Chlorothalonil carries an R40 label (limited evidence of a carcinogenic effect).

Silver-based biocides are another widely known active for providing antibacterial properties in many articles such as medical devices and other polymers.<sup>5,6</sup> Its usage in paints however is not as fully known. Because of its antibacterial activities, the silver-based biocide used in the study serves as a benchmark. A new U.S.-registered isothiazolin-based biocide, n-butyl-1,2-benzisothiazolin-3-one, was also included.

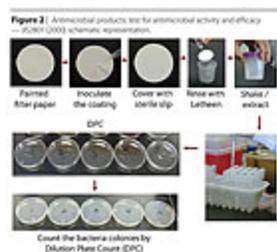


Figure 2

## Regulatory

A recent article written by P.D. Askew is a very good overview defining the terms of hygienic surfaces and supporting the claims.<sup>7</sup> There is no regulatory structure fully developed to govern coating registration intended to provide antimicrobial properties. In the United States, the word “antibacterial paint” only can be used for paints that make any health claims such as “kills 99.9% bacteria on the surface” or “effective against specific organism (MRSA, E. coli, etc)”. These antibacterial paints are regulated by the EPA. The EPA has to approve and register the paint before it can be sold to consumers. This process is both costly and timely. EPA registration however, is not necessary if the antimicrobial properties are intended to protect the article and follow the EPA’s treated article exemption guidelines. In this case only the biocide used to protect the article has to be registered by the EPA.

The most common statements found in the market place regarding “treated article” are: “provides continuous protection against odor- and staining-causing bacteria, mold and mildew on the dried paint film” or “provide continuous protection to fight the growth of bacteria, mold and mildew that can cause stains, odors and deterioration of the coating”. Regulation restriction has made it harder for coatings manufacturers to fully maximize the antibacterial attributes of an antibacterial coating. Only publications and indirect messages through marketing, advertisements or branding were used to get the messages

across and reach the end consumer. For these reasons, commercial paints that had treated article exemption statements or paints with a “branding” logo, such as Microban, were evaluated to reveal whether these paints had antibacterial properties. In the European Union, antibacterial paints are regulated by the European Biocidal Product Directive (BPD). Basically this government body offers a similar guidance as EPA for the treated article. Antibacterial paints are considered to be biocidal products within Product Type 2 and the active ingredient used to provide antibacterial properties has to also be registered for Product Type 2.

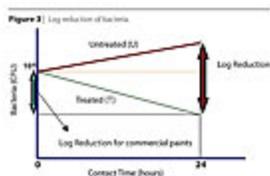


Figure 3

## Antibacterial Efficacy Testing

There is no standard method published by either the EPA or BPD to determine the efficacy of antibacterial paint. Many industry groups, such as ASTM, ISO, JIS, etc., publish their own standard methods that are primarily designed to determine the activity of antimicrobial agents in non-porous materials. Many of these methods are adopted to test the antibacterial efficacy of a paint film. There are qualitative antibacterial tests used commercially based on zone diffusion assay to determine the ability of the treated article to prevent microbial growth. The antibacterial effectiveness is assessed by the formation of zones of inhibition in nutrient agar, which had its surface seeded or streaked with bacteria. This method is commonly employed to look at the effectiveness of antibiotics.<sup>8</sup> Figure 1 illustrates the zone of inhibition method.

For quantitative evaluation, Japanese Industrial Standard (JIS) Z2801:2000<sup>9</sup> and ASTM E 2180-01<sup>10</sup> are the most widely used. In the JIS Z2801 method, the coated surface is inoculated with a bacterial cell suspension and held in intimate contact with the help of a sterile polypropylene film or sterile glass microscope cover slip for a set contact time, usually 24 hours. Only two bacterial strains were required (but not limited to) to be tested: *Staphylococcus aureus* (ATCC # 6538) and *Escherichia coli* (ATCC# 11229). The value of antimicrobial activity was determined by the difference in the logarithmic value of viable cell counts between antimicrobial products and untreated products after 24 hours contact time. To pass the test, the bacterial log reduction value obtained should not be less than 2.0. Figure 2 illustrates the JIS method.

ASTM E 2180-01 is a method that was designed more for hydrophobic or hard surfaces. It is another standard, quantitative method that is embraced to evaluate the efficacy of an antibacterial coating and is similar to the JIS method. In the ASTM method, however, the bacterial suspension is made in an agar slurry and applied onto the test surface to form a pseudo-biofilm, providing a uniform intimate contact. The antibacterial effectiveness is determined by the percent reduction of bacteria from treated versus untreated

samples.

## Experimental

The antibacterial properties of six commercial antimicrobial paints and six antimicrobial agents were evaluated using zone of inhibition and JIS 2801 against *Staphylococcus aureus* (S.a.), *Escherichia coli* (E.c.), *Pseudomona aeruginosa* (Ps.a.), *Salmonella choleraesuis* (S.c.) and *Klebsiella pneumoniae* (K.p.). The commercial paints consisted of three store brand paints that have “treated article” messages and three that have “branding logo.” The antimicrobial agents tested were zinc pyrithione (ZPT), dichloro-n-octylisothioxolin-one (DCOIT), n-octylisothiazolin-one (OIT), 3-iodo-2-propargyl-n-butyl carbamate (IPBC), n-butyl-1,2-benzisothiazolin-3-one (BBIT), and silver. The efficacy of these antimicrobial agents was tested in typical architectural paints.

## Sample Preparation

The commercial paints were used as is. With the exception of ZPT chemistry, other antimicrobial agents were tested at the lowest and highest concentrations recommended by its manufacturer. Each sample was two-coated on Whatman 934-AH filter paper and allowed to dry for 24 hours between coatings. The coated filter papers were cut to 2-inch -diameter. A set of each sample was leached for 24 hours in running water and dried for at least 24 hours before antibacterial testing was performed. The tests were performed in triplicate.

## Zone of Inhibition Testing

A 0.1 ml bacterial suspension was spread over a petri-dish containing solidified trypticase soy agar (TSA). Each coated sample was placed in the center of the plate and incubated for 24 hours at 30 °C. During incubation the bacteria grow and reproduce creating a mat of colonies completely covering the media’s surface except for the vicinity of the painted sample where the biocide leaches out into the media and inhibits bacterial growth. This creates a “halo” or “zone of inhibition” (Z). Both the distance (measured in millimeters) from the edge of the sample to the outer edge of the Z and the clarity of the Z give an indication of the effectiveness of the biocide to prevent bacterial growth. A sample without a Z would indicate either no biostatic effect or the inability of the biocide to leach into the media. After incubation, the samples with zones of inhibition were measured and the clarity of these Z was recorded.

Table 1 | Effect of substrates using zone of inhibition (ZOI) testing

Sample Description	Zone of Inhibition (mm) Against	
	<i>E. coli</i>	<i>S. aureus</i>
<b>Filter paper</b>		
• RT-24 Biocide Free	0, no growth under	0
• Biocide 1	0, no growth under	0
• Biocide 2	4	0
<b>Glass slide</b>		
• RT-24 Biocide Free	0, no growth under	0
• Biocide 1	0, no growth under	0
• Biocide 2	3	0
<b>Wood chip</b>		
• RT-24 Biocide Free	0, no growth under	0
• Biocide 1	0, no growth under	0
• Biocide 2	4	0

Table 1

# JIS 2801 Testing

A 0.1ml of a 24-hour suspension of each bacterium was placed onto the surface of each painted test piece. For the “0-hour contact time” the inoculum was rinsed with 9-ml sterile Lethen broth as soon as it was applied to the surface. For the “24-hour contact time” a sterile glass cover-slip was placed onto the inoculated painted test sample and incubated for 24 hours at 30 °C then rinsed with 9-ml sterile Lethen broth. The surviving bacteria in the rinse solution were determined using a serial dilution counting technique on TSA. The criteria for passing this test is based on a minimum of 2 log reduction. The logarithmic bacterial reduction was calculated based on the calculation illustrated in Figure 3.

## Antibacterial Testing of Painted Wall

Per our request, the University of São Paulo – Institute de Medicina De São-Paulo investigated the effectiveness of ZPT to inhibit bacteria growth in various paints coated on an interior dry wall. Paints tested in Group One are acrylic satin, acrylic and epoxy while Group Two consists of a semi-gloss. Each paint was coated on an 80 x 80 cm<sup>2</sup> wall and inoculated with various bacteria and fungi. The concentration of microbes used is equivalent to the Mc Farland Scale of 1. Weekly, the wall was swabbed and the bacteria/fungi were counted. The following microorganisms were tested:

- Bacillus subtilis (B.s)
- Salmonella choleraesius (S.c)
- Staphylococcus aureus (S.a)
- Escherichia coli (E.c.)
- Enterobacter aerogenes (E.a)
- Mycobacterium smegmatis (M.s)
- Pseudomonas aeruginosa (P.a.)
- Alcaligenes faecalis (A.f)
- Trichophyton mentagrophytes (T.m)
- Penicillium pinophilum (P.p)
- Pool of mixed bacteria
- Pool of mixed fungi
- Pool of fungi and bacteria

Table 2 | Effect of substrates using JIS 2801 testing

Sample Description	Antibacterial Reduction (log)			
	ZPT		ZS	
	Biofilm	Biofilm	Biofilm	Biofilm
<b>Filter paper</b>				
BT124-04 Bioactive Free	4.1	4.9	1.2	2.8
Bioactive 1	4.1	4.9	0.1	0.5
Bioactive 2	4.1	4.9	2.6	2.7
<b>Non-stick</b>				
BT124-04 Bioactive Free	4.0	4.0	0.1	0.5
Bioactive 1	4.0	4.0	0.6	0.9
Bioactive 2	4.0	4.0	1.9	1.3
<b>Wood chip</b>				
BT124-04 Bioactive Free	4.1	4.0	4.2	3.9
Bioactive 1	4.1	4.0	2.8	4.5
Bioactive 2	4.1	4.0	2.8	3.9

Table 2

# Results and Discussion

## Factors that Affect the Antibacterial Testing Substrate

The antibacterial evaluations performed in this study were based on the zone of inhibition and JIS 2801 tests. We found that there were several variables that needed to be considered to assure that the methods were applicable in evaluating the antibacterial properties of a coating. The first variable to be considered was the coating substrate. JIS 2801 requires a non-porous substrate. Microscopic glass slides are commonly used and are practical until they are leached and immersed in the water. Difficulties arise because the applied coating can peel off. Ideally, both antibacterial tests should use the same substrate for the evaluation. To choose an ideal substrate, the applicability of pine wood, Whatman 934-AH filter paper and microscopic glass slide were evaluated. Pine wood and Whatman filter paper are common substrates used in fungal resistance tests. The coating efficacy in these various substrates was evaluated against a gram-positive *St. aureus* and gram-negative *E. coli*. The results, summarized in Tables 1 and 2, show that both the glass slides and filter paper produced similar results and had better reproducibility than the pine wood. Coated wood chips generated a higher bacterial log reduction than the other two substrates, which means that the bacteria adhered well to the coated wood surface and did not efficiently release in the Letheen solution during the rinsing process. For practicality, Whatman filter paper was used in the rest of the study.

Table 3 Effect of in-can preservatives using zone of inhibition testing

Preservative	Substrate	200 colonies after 24 hrs Contact Time				
		St. aureus	S. flex	E. coli	S. flex	E. coli
Formaldehyde	Unleached	0	0	0	0	0
	Leached	0	0	0	0	0
Sodium Chlorate	Unleached	0	0	0	0	0
	Leached	0	0	0	0	0
Sodium Dichromate	Unleached	0	0	0	0	0
	Leached	0	0	0	0	0
Sodium Permanganate	Unleached	0	0	0	0	0
	Leached	0	0	0	0	0

Table 3

## Biocide Neutralizer

In this part of the experiment, the effect of biocide neutralizer used in JIS 2801 was also investigated. If indeed a neutralizer has a very important role in JIS testing, a higher solubility antimicrobial agent will have a more striking effect than the less soluble antimicrobial agent. BBIT has a water solubility of ~400 ppm and ZPT of ~6 ppm. BBIT was neutralized with sodium thiosulfate and ZPT with a mixture of sodium thiosulfate and sodium thioglycolic acid. The results, summarized in Table 2, showed that the effect of neutralizer was minimal. The bacterial extraction in JIS could be carried out without neutralizer. Subsequently, neutralizer was not used in this study.

Figure 4 Effect of in-can preservatives on antibacterial testing - JIS 2801

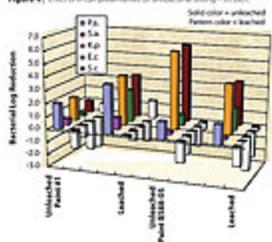


Figure 4

## In-Can Preservatives

Many of the preserved paints we tested developed a zone of inhibition and reduced the bacteria count. This finding complicated the validity of the test, for the role of the dry film antimicrobial agent became irrelevant. To ensure the “true effects” of these dry film antibacterial properties, a few paints were selected and leached for 24 hours. The antibacterial efficacy between the leached and unleached paints from each test was compared in Table 3 and Figure 4. The results showed that leaching reduced the interference caused by in-can preservatives. Leaching washed away any organic soluble materials in the paints that exhibited initial “pseudo-antibacterial effect”.

Table 4 | Effect of film thickness on the zone of inhibition testing.

Paint	# of Coating	ZOI (mm) after 24 hrs Contact Time				
		P.A.	S.A	E.p	E.L	S.L
Paint #1	1	0	0	0	0	0
unpreserved	2	0	0	0	0	0
Paint #580-05	1	0	0	0	0	0
Preserved	2	0	0	0	0	0

Table 4  
Film Thickness

A typical generic architectural paint and several commercial paints were coated on Whatman filter papers with varying film thickness. No film thickness measurement was conducted. Instead, the number of coatings applied (one or two coats) was used to differentiate the film thickness. Based on two paints evaluated, the outcome of zone of inhibition testing was not affected much by coating thickness, Table 4. Similar results were found in JIS 2801 test, Figure 5. The number of bacterial log reduction were not exact but in the proximity and both coatings exhibited a similar antibacterial efficacy trend.

Figure 5 | Effect of film thickness on antibacterial activity - JIS 2801

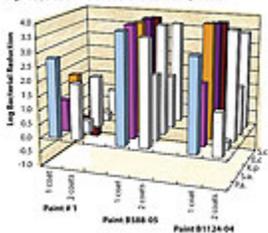


Figure 5

Understanding variables that may affect the outcome of antibacterial testing is very important. This study showed that in-can preservatives and any organic soluble materials in a paint could diffuse into the agar media or become soluble in Letheen solution and give pseudo-antibacterial results. This effect could be minimized, and leaching was one factor that should be considered to validate the antibacterial efficacy of a coating. A preservative-free paint should be used as a “negative control” paint as well. Finally, a non-porous substrate was a better substrate to be used in these two methods. Whatman Filter paper is our choice in our study since we can use the same substrate for fungal resistance testing. Since the effect of film thickness was minimal, two coats were utilized to ensure uniformity of the coating.

**Table 5** | The bacterial resistance properties of various commercial paints, tested according to zone of inhibition.

Sample Description	Condition	After 24 Hours Contact Time					
		E. coli	S. aureus	E. coli	S. aureus	E. coli	S. aureus
Paint A	Unleached	20	24	20	20	20	20
Paint A	Leached	20	24	20	20	20	20
Paint B	Unleached	28	28	29	23	29	29
Paint B	Leached	21	26	26	20	26	26
Paint C	Unleached	23	28	24	20	22	22
Paint C	Leached	20	23	20	20	20	20
Paint D	Unleached	23	28	24	20	22	22
Paint D	Leached	20	23	20	20	20	20
Paint E	Unleached	28	28	29	23	29	29
Paint E	Leached	20	20	20	20	20	20
Paint F	Unleached	28	28	29	23	29	29
Paint F	Leached	23	23	24	20	20	20

Table 5

## Antibacterial Evaluation of Commercial Paints

The antibacterial properties of six commercial paints were evaluated. The results of the zone of inhibition test are summarized in Table 5. It was obvious that leaching reduced the effect of soluble organic materials in the paints tested and resulted in smaller zones of inhibition. No bacterial growth was noted for all surfaces that had direct contact with bacteria. Based on the formation of a zone of inhibition, all paints, except Paint E, exhibited a strong inherent bacterial resistance against *St. aureus*. Only Paint B from the stored brand category and Paint F from paint with ‘branding logo’ provided a broad spectrum of bacterial resistance.

The JIS 2801 test results were also consistent with the zone of inhibition test results, Table 6. The number of bacterial log reduction was lower when the paints were leached. Paints B and F continued to provide the broadest antibacterial properties against the bacteria tested. More paints however, had bacterial log reduction around 2 or higher against specific organisms tested.

**Table 6** | Antibacterial properties of commercial paint samples tested according to JIS 2801.

Sample Description	Condition	Log Reduction of Bacterial Count After 24 Hours Contact Time					
		E. coli	S. aureus	E. coli	S. aureus	E. coli	S. aureus
Sample A*	Unleached	4.74	4.93	4.93	4.40	4.40	5.36
Sample A*	Leached	2.72	3.54	3.30	3.67	3.36	3.36
Sample B	Unleached	4.94	4.93	4.93	4.40	4.40	5.36
Sample B	Leached	3.97	4.93	4.00	2.23	2.83	2.83
Sample C*	Unleached	3.68	4.41	4.17	3.76	4.05	4.05
Sample C*	Leached	0.78	1.98	1.47	1.70	1.56	1.56
Sample D	Unleached	3.45	3.73	4.41	3.72	4.45	4.45
Sample D	Leached	2.11	3.04	3.00	1.87	1.90	1.90
Sample E	Unleached	2.30	1.70	1.58	1.60	1.62	1.62
Sample E	Leached	1.04	1.05	1.05	1.06	1.07	1.07
Sample F*	Unleached	4.10	3.10	4.60	3.70	3.22	4.60
Sample F*	Leached	3.48	3.40	4.42	3.40	4.40	4.40

\* Paint with ‘branding logo’

Table 6

Both antibacterial test results showed that paint could have bacterial log reduction without the formation of a zone of inhibition or vice versa. The results appear contradictory. A simple explanation is that interior paints without a zone of inhibition might not have as durable biocidal (kill bacteria) properties while paints without measurable bacterial log reductions might only have biostatic (prevent bacterial growth) properties.

**Table 7** | Antibacterial properties of various biocides in paint after leaching, tested according to JIS 2801.

Biocides	Conc. (ppm)	Bacterial Log Reduction After 24 Hours Contact Time			
		E. coli	S. aureus	E. coli	S. aureus
Silver	250	4.9	3.2	4.0	3.4
	400	5.07	3.9	3.3	4.8
ECOPH	140	4.1	3.0	4.4	3.7
	700	4.7	2.8	4.0	3.4
G1	400	3.2	1.1	1.6	1.8
	1700	3.5	2.7	4.0	3.7
ZPT	360	3.8	2.9	3.0	4.0
	700	4.9	3.1	4.0	3.8
BMC	1200	3.5	2.8	3.4	3.7
	2400	4.1	3.3	3.7	4.0
BMC	400	3.5	2.7	4.8	3.8
	2000	2.5	2.2	4.9	4.2

\* Reported and giving 2.5 log reduction

Table 7

## Antibacterial Evaluation of Antimicrobial Agents

In this study, with the exception of ZPT, all other antimicrobial agents were added in a generic acrylic satin paint at the lowest and highest concentration recommended by its manufacturer in interior paint. ZPT was tested at a mid-concentration range of 760 and 1520 ppm. Only the leached samples evaluated by JIS 2801 were reported in Table 7. The results showed that, with the exception of IPBC, all other antimicrobial agents exhibited efficacy against the test bacteria. The isothiazolin-based antimicrobial agents, especially OIT and BBIT, provided similar degrees of antibacterial protection and the highest concentrations were required to give broader biocidal spectrum. ZPT and silver were effective at the lowest concentrations tested.

Table 8: Bacterial resistance properties of antimicrobial agents in paints tested according to zone of inhibition.

Biocide	Zone (mm)	Condition	ZPT (mg/L after 24 hrs. Leached) Zone				
			S.a	K.p	E.c	S.g	B.l
Silver	400	Untreated	0	0	0	0	0
	Leached	0	0	0	0	0	
DCOIT	1140	Untreated	0	2	0	0	0
	Leached	0	0	0	0	0	
OIT	1090	Untreated	0	5	0	0	0
	Leached	0	2	0	0	0	
ZPT	760	Untreated	0	1	0	7	0
	Leached	0	2	0	7	0	
1520	Untreated	1	1	0	0	10	
	Leached	0	0	0	0	0	
IPBC	2400	Untreated	0	0	0	0	0
	Leached	0	0	0	0	0	
BBIT	2000	Untreated	0	0	0	0	0
	Leached	0	0	0	0	0	

Table 8

Zone of inhibition tests summarized in Table 8 confirmed that IPBC did not provide a broad-spectrum efficacy to prevent bacterial growth. Bacterial growth was seen in paint tested against S.a, K.p and E.c. Other antimicrobial agents such as OIT and BBIT provided similar degrees of bacterial resistance behavior. ZPT formed a zone of inhibition against four of the five bacteria tested and silver did not form any zone of inhibition.

Correlating both antibacterial test results, only ZPT showed to be a strong and lasting antibacterial agent against the five bacteria tested. Silver is another antimicrobial agent proven to provide antibacterial properties though its biostatic property was not as robust.

Table 9: Antibacterial properties of Group 1 Paints after four weeks.

Paints	Microorganisms											
	S.a	K.p	E.c	E.f	S.g	B.l	A.f	C.a	P.a	T1	T2	
Acrylic Satin												
1000 ppm												
ZPT												
1000 ppm												
Acrylic Satin												
1000 ppm												
ZPT												
1000 ppm												
Epoxy												
1000 ppm												
ZPT												

Table 9

## Antibacterial Testing of Painted Walls

Further testing was conducted to reaffirm the effectiveness of ZPT. Various paints containing ZPT were painted on an interior wall providing a simulated real life condition, and inoculated with various microorganisms. Since neither the zone of inhibition or JIS 2801 could be adopted, bacterial activities were monitored weekly up to four weeks by transferring any viable bacteria from the painted wall to the nutrient agar. The results of this study are summarized in Tables 9 and 10. All biocide-free paints from group one

did not exhibit any antibacterial properties; all microorganisms tested and environmental contaminants grew on these surfaces. In contrast, only fungal contaminants collected from the environment were detected in a few of Group One paints treated with ZPT but none of the microorganisms tested grew. In flat to satin paints, ZPT at 1900 ppm was effective against various bacteria and fungi. In Group Two, the semigloss paint was found to be less susceptible to bacterial growth. Only *Staphylococcus aureus* (S.a) and *Mycobacterium smegmatis* (M.s) grew on the biocide free paints. An additional ZPT at a concentration 950 ppm improved the antimicrobial properties of this paint.

Table 10 | Antibacterial properties of Group II Paints after four weeks

Paints	Microorganisms							
	B.a	S.a	E.c	P.a	K.f	M.s	A.t	F.g
Semigloss	+	+	+	+	+	+	+	+
Blank	+	+	+	+	+	+	+	+
950 ppm ZPT	-	-	-	-	-	-	-	-
1900 ppm ZPT	-	-	-	-	-	-	-	-

Table 10

## Conclusion

The term and the methods to support the antibacterial paints are still being debated. This study however, supports the idea that with the right addition of antimicrobial agent, an antibacterial coating can be formulated to be effective in preventing or reducing bacterial growth. Zinc pyrithione (ZPT) was found to be the best and broadest spectrum antimicrobial agent. The effectiveness of ZPT against fungi and algae is also already known. Silver was another effective antimicrobial agent though its performance was not as robust as ZPT and its effectiveness against fungi still needs confirmation. Other isothiazolin biocides were found to have limited antibacterial properties. Paint formulations also played a role in determining the quantity of antimicrobial agent needed. A semi-gloss paint seems to be less susceptible to bacterial growth compared to paints with higher pigment volume concentration.

This paper was presented at the Asia Pacific Coatings Show in Bangkok, June 2007.

Darrell Snyder | Arch Chemicals Inc., New Castle, DE

Lisa Barrett | Arch Chemicals Inc., New Castle, DE

Emerentiana Sianawati works for Arch Chemicals Inc. in New Castle, DE

# New Sherwin-Williams paint kills infection-causing bacteria

Nathan Bomey, USA TODAY

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(Photo: Sherwin-Williams)

Future hospital patients may have walls to thank for saving their lives.

Paint giant Sherwin-Williams is slated to announce Wednesday that it has developed a new paint that kills infection-causing bacteria.

The product, dubbed Paint Shield, earned certification from the U.S. Environmental Protection Agency for killing more than 99.9% of bacteria such as Staph, E. coli, and MRSA, Steve Revnew, senior vice president of product innovation for Sherwin-Williams said in an interview.

Applications for the paint could include medical complexes, locker rooms, schools, daycare centers, hotels, homes and cruise ships, says Revnew.

The patented product contains proprietary technology developed by researchers at the retailer and paint maker's Cleveland headquarters.

Revnew the product successfully completed third-party lab tests to validate its health claims and certify safety.

Completion of those tests allows companies to use the term "antibacterial paint" under EPA guidelines, [according to the Paint & Coatings Industry trade journal \(http://www.pcimag.com/articles/87237-antimicrobial-coatings\)](http://www.pcimag.com/articles/87237-antimicrobial-coatings).

Other manufacturers put additives into paints to prevent bacteria from spreading and call it antimicrobial paint. A number of university scientists have made claims about antibacterial paint breakthroughs in the lab.

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Revnew said Sherwin-Williams' product is differentiated kills bacteria on the surface after two hours, instead of simply preventing the organisms from corroding the paint as antimicrobial products do.

Sherwin-Williams CEO Chris Connor, in a statement, called Paint Shield "one of the most significant technological breakthroughs in our nearly 150-year history of innovation."

For paint — a product that people from many centuries ago would recognize — any innovation is significant and can disrupt the market.

Sherwin-Williams, the largest U.S. chain devoted primarily to paint sales, has 11.3% market share in paint manufacturing, according to research firm

IBISWorld. That makes the company the second largest paint maker in the U.S., behind PPG Industries at 21.3% and ahead of Valspar at 8.6%.

ADVERTISING



Paint Shield will come at a premium. A gallon of Paint Shield, which will be available in 590 colors, will cost \$84.99. By comparison, an average gallon of interior paint costs at Sherwin-Williams ranges from \$29.99 to \$79.59.

Revnew, who declined to offer sales projections, says that commercial painters and consumers alike will embrace the product.

"As you can well imagine, there's quite a bit of need in this market," he says.

Paint Shield, which was developed after consulting with infectious disease experts, can be applied with a brush or roller, like other paint products. It will be available in the first quarter of 2016 at Sherwin-Williams' more than 4,000 U.S. stores.

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