

This is a guidance document with sample specification language intended to be inserted into project specifications on this subject as appropriate to the agency's environmental goals. Certain provisions, where indicated, are required for U.S. federal agency projects. Sample specification language is numbered to clearly distinguish it from advisory or discussion material. Each sample is preceded by identification of the typical location in a specification section where it would appear using the SectionFormat™ of the Construction Specifications Institute; the six digit section number cited is per CSI Masterformat™ 2004 and the five digit section number cited parenthetically is per CSI Masterformat™ 1995..

.....

SECTION 11 30 00 (SECTION 11450) – RESIDENTIAL EQUIPMENT

SPECIFIER NOTE:

resource management: Several green manufacturers produce super-efficient appliances and most mainstream manufacturers now produce energy efficient models. Some manufacturers have developed residential washers on the horizontal axis that require much less water. When used in combination with ionizing washer disks, they can significantly reduced water usage and pollution.

toxicity/IEQ: IAQ impact is comparable for green appliances and standard appliances. However, by virtue of their improved energy efficiency, green appliances contribute far less contaminants to the environment during their lifetime than due standard appliances.

performance: Obviously, energy efficient appliances require less energy to operate. Most perform the task for which they were designed comparably to the standard designs which they replace. Federal Trade Commission (FTC) regulations require appliances to be labeled indicating their energy performance (their bright yellow EnergyGuide label).

Typically, horizontal axis washers are more efficient that top loading; and, top-bottom refrigerator/freezers are more efficient than side-by-side refrigerators.

Recycling systems are available and include under-the-counter containers to separate recyclables. They also include interior composting systems which are generally a variation of the standard garbage disposal. In some designs, the composting chute empties to an externally accessible composting bin.

FEMP maintains product efficiency recommendations for a wide range of residential equipment including appliances and mechanical equipment; refer to http://www1.eere.energy.gov/femp/technologies/eep_purchasingspecs.html

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes:
 - 1. Refrigerators.
 - 2. Clothes Washers.
 - 3. Dishwashers.
 - 4. Freezers

1.2 SUBMITTALS

- A. Product data. Unless otherwise indicated, submit the following for each type of product provided under work of this Section:

SPECIFIER NOTE:

Green building rating systems often include credit for materials of recycled content. USGBC-LEED™ v3, for example, includes credit for materials with recycled content, calculated on the basis of pre-consumer and post-consumer percentage content, and it includes credit for use of salvaged/recovered materials. Green Globes US also provides points for reused building materials and components and for building materials with recycled content.

1. Recycled Content:
 - a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
 - b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
 - c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
 - d. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.

SPECIFIER NOTE:

Specifying local materials may help minimize transportation impacts; however it may not have a significant impact on reducing the overall embodied energy of a building material because of efficiencies of scale in some modes of transportation.

Green building rating systems frequently include credit for local materials. Transportation impacts include: fossil fuel consumption, air pollution, and labor.

USGBC-LEED™ v3 includes credits for materials extracted/harvested and manufactured within a 500 mile radius from the project site. Green Globes US also provides points for materials that are locally manufactured.

2. Local/Regional Materials:
 - a. Sourcing location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
 - b. Manufacturing location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
 - c. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
 - d. Product Component(s) Value: Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

SPECIFIER NOTE:

USGBC-LEED™ v3 includes credit for water efficient landscaping and for water use reduction. Limiting or eliminating the use of potable water for landscape irrigation can earn LEED credit. Reducing the aggregate water use of the facility by minimum 20 percent from baseline (not including irrigation) calculated as per the Energy Policy Act of 1992 fixture performance requirements contributes to LEED credit.

3. Water efficiency: Indicate water consumption rates in gallons per day (gpd) per unit for the following:
 - a. Clothes washers.
 - b. Dishwashers.

SPECIFIER NOTE:

The EPA has developed minimum energy efficiency standards for Energy Star labeled products. EPA Energy Star categories include: appliances, HVAC, residential equipment, office equipment, and lighting.

4. Energy Efficiency:
 - a. Submit documentation for Energy Star qualifications for equipment provided under work of this Section.

- B. Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under work of this Section.

SPECIFIER NOTE:

Identify special maintenance agreements. Maintenance agreements are standard practice in the building industry. Take-back programs refer to programs in which the product manufacturer “takes-back” scrap material and/or packaging associated with its product. Green leasing is a new, but dramatic shift in the traditional perspective of leased equipment. Under a green lease, the product manufacturer is responsible for the disposition of the product at all times. Thus, when the customer no longer requires the use of the particular product or requires an updated model, the manufacturer is obligated to reclaim it and refurbish it or disassemble it for recycling as appropriate. This approach necessitates a revision of administrative services. It also requires a basic redesign of products in order to allow for future disassembly and upgrade. This has the potential to be cost effective for manufacturers and customers alike. It is also extremely resource efficient.

- C. Documentation of manufacturer’s **[maintenance agreement] [take-back program] [green lease]** for each type of equipment. Include the following:
1. Appropriate contact information.
 2. Overview of procedures.
 - a. Indicate manufacturer’s commitment to reclaim materials for recycling and/or reuse.
 3. Limitations and conditions, if any, applicable to the project.

1.3 MAINTENANCE

- A. Operational Service: Provide manufacturer’s **[maintenance agreement] [take-back program] [green lease]** service for each type of equipment installed in project. Service shall reclaim materials for recycling and/or reuse. Service shall not landfill or burn reclaimed materials.

PART 2 - PRODUCTS

SPECIFIER NOTE:

EO 13423 includes requirements for Federal Agencies to use “sustainable environmental practices, including acquisition of biobased, environmentally preferable, energy-efficient, water-efficient, and recycled-content products”

EO 13423 directs Federal Agencies “... beginning in FY 2008, reduce water consumption intensity, relative to the baseline of ... year 2007 ... by 2 percent annually through the end of fiscal year 2015 or 16 percent by the end of fiscal year 2015”

Specifically, under the Sustainable Building requirements per Guiding Principle #3 Protect and Conserve Water, EO 13423 directs Federal agencies to "Employ strategies that in aggregate use a minimum of 20 percent less potable water than the indoor water use baseline calculated for the building, after meeting the Energy Policy Act of 1992 fixture performance requirements."

EO 13423 includes requirements for Federal Agencies to “... improve energy efficiency and reduce greenhouse gas emissions ... by (i) 3 percent annually through the end of fiscal year 2015, or (ii) 30 percent by the end of fiscal year 2015, relative to the baseline of ... year 2003”

EO 13423 directs Federal Agencies to use electronic products that are “Electronic Product Environmental Assessment Tool (EPEAT)-registered electronic product[s], unless there is no EPEAT standard for such product” and that are Energy Star; additionally, EO 13423 directs Federal Agencies to use “environmentally sound practices with respect to disposition of agency electronic equipment that has reached the end of its useful life.”

Executive Order 13514; *Federal Leadership in Environmental, Energy, and Economic Performance*; was signed on October 5, 2009. <http://www.ofee.gov/execorders.asp> It expands upon the environmental

performance requirements of EO 13423.

http://www1.eere.energy.gov/femp/regulations/printable_versions/eo13423.html

EO 13514 sets numerous federal requirements in several areas, including sustainable buildings and communities. Federal agencies must implement high performance sustainable federal building design, construction, operation and management, maintenance, and deconstruction, including:

- Ensuring all new Federal buildings, entering the design phase in 2020 or later, are designed to achieve zero net energy by 2030.
- Ensuring all new construction, major renovations, or repair or alteration of Federal buildings comply with the Guiding Principles of Federal Leadership in High Performance and Sustainable Buildings <http://www1.eere.energy.gov/femp/pdfs/mouhighperfsustainfedfacs.pdf>
- Ensuring at least 15% of existing agency buildings and leases (above 5,000 gross square feet) meet the Guiding Principles by fiscal year 2015 and that the agency makes annual progress towards 100% compliance across its building inventory.

2.1 EQUIPMENT

A. Refrigerator:

SPECIFIER NOTE:

Refrigerators: ENERGY STAR qualified models use at least 10 percent less energy than required by current federal standards, and 40 percent less energy than the conventional models sold in 2001. ENERGY STAR labeled commercial solid door refrigerators and freezers are up to 45 percent more efficient than standard commercial refrigeration equipment.

The FEMP website states: "when buying refrigerators from commercial sources, select products that are ENERGY STAR-qualified...all of which meet the annual energy use in the *Performance Requirement* table."

1. Energy Efficiency: Provide Energy Star labeled products **[and comply with FEMP performance requirements as indicated below]**.

FEMP Performance Requirement for Federal Purchases		
Refrigerator Type	Total Volume	Annual Energy Use
Single-Door Manual	≤ 2.4 cu. ft.	255 kWh/year or less
Single-Door Manual	2.5 to 4.4 cu. ft.	275 kWh/year or less
Single-Door Manual	4.5 to 6.4 cu. ft.	295 kWh/year or less
Single-Door Manual	≥ 6.5 cu. ft.	315 kWh/year or less
Single-Door Automatic	≤ 2.4 cu. ft.	305 kWh/year or less
Single-Door Automatic	2.5 to 4.4 cu. ft.	325 kWh/year or less
Single-Door Automatic	4.5 to 6.4 cu. ft.	345 kWh/year or less
Single-Door Automatic	≥ 6.5 cu. ft.	365 kWh/year or less
Bottom-Mount Freezer	≤ 18.4 cu. ft.	475 kWh/year or less
Bottom-Mount Freezer	18.5 to 20.4 cu. ft.	485 kWh/year or less
Bottom-Mount Freezer	≥ 20.4 cu. ft.	495 kWh/year or less
Top-Mount Freezer	≤ 10.4 cu. ft.	340 kWh/year or less
Top-Mount Freezer	10.5 to 12.4 cu. ft.	360 kWh/year or less
Top-Mount Freezer	12.5 to 14.4 cu. ft.	380 kWh/year or less
Top-Mount Freezer	14.5 to 16.4 cu. ft.	400 kWh/year or less
Top-Mount Freezer	16.5 to 18.4 cu. ft.	420 kWh/year or less
Top-Mount Freezer	18.5 to 20.4 cu. ft.	440 kWh/year or less
Top-Mount Freezer	20.5 to 22.4 cu. ft.	460 kWh/year or less
Top-Mount Freezer	22.5 to 24.4 cu. ft.	480 kWh/year or less
Top-Mount Freezer	≥ 24.5 cu. ft.	500 kWh/year or less

Side-by-Side Freezer	≤ 20.4 cu. ft.	560 kWh/year or less
Side-by-Side Freezer	20.5 to 22.4 cu. ft.	580 kWh/year or less
Side-by-Side Freezer	22.5 to 24.4 cu. ft.	600 kWh/year or less
Side-by-Side Freezer	≥ 25.5 cu. ft.	620 kWh/year or less

B. Clothes Washer:

SPECIFIER NOTE:

Clothes Washers: ENERGY STAR qualified washers use less water, which means less energy is needed to heat it. Full-sized ENERGY STAR qualified washers use 18-25 gallons of water per load, compared to the 40 gallons used by a standard machine.

The FEMP website states: "When buying residential and family-size commercial clothes washers use the Modified Energy Factor (MEF) instead of the annual energy consumption (kWh/year) shown on the yellow EnergyGuide label. While both measures include the energy used by the washer and water heater, MEF adds that used by the dryer. Since some clothes washers are more effective at spinning moisture from clothing, resulting in less time and energy needed for drying, MEF is a more accurate indicator of performance. Buyers should also look for products with low water factors (WF), a performance metric for comparing clothes washer water consumption independent of capacity. WF is the total water used per cycle divided by the machine's capacity (in cu. ft.) A lower value indicates a more efficient washer."

1. Energy Efficiency: Provide Energy Star labeled products **[and comply with FEMP performance requirements as indicated below]**.
2. Water Efficiency: Provide Energy Star labeled products **[and comply with FEMP performance requirements as indicated below]**.

FEMP Performance Requirement for Federal Purchases		
Washer Capacity	Modified Energy Factor	Water Factor
1.6 to 3.5 cu. ft.	1.72 or more	8.0 or less

C. Dishwasher:

SPECIFIER NOTE:

Dishwashers: ENERGY STAR qualified dishwashers use up to 25 percent less energy than the federal minimum standard for energy consumption.

The FEMP website states: "when buying residential dishwashers directly from commercial sources, select products that are ENERGY STAR-qualified...and also do not exceed the annual energy use shown in the *Performance Requirements* table...Federal agencies are required to purchase products that use one watt of power or less while in standby mode. Features such as soft touch controls and digital displays use power even when the dishwashers are not working. For some products, FEMP sets a separate standby level. However, since the measurement of annual energy use includes both standby and wash-cycle energy, FEMP requires that in addition to being ENERGY STAR-qualified dishwashers have a maximum annual energy use of 380 kWh for standard models and 288 kWh for compact models."

1. Energy Efficiency: Provide Energy Star labeled products **[and comply with FEMP performance requirements as indicated below]**.

FEMP Performance Requirements for Federal Purchases		
Dishwasher Type	Energy Factor	Annual Energy Use
Standard	0.65 or greater	339 kWh or less
Compact	0.88 or greater	252 kWh or less

D. Freezer:

SPECIFIER NOTE:

Freezers: ENERGY STAR qualified models use at least 10 percent less energy than required by current federal standards, and 40 percent less energy than the conventional models sold in 2001. ENERGY STAR labeled commercial solid door refrigerators and freezers are up to 45 percent more efficient than standard commercial refrigeration equipment.

The FEMP website states: “when buying residential freezers directly from commercial sources, select products that are ENERGY STAR-qualified...which meet the annual energy use (kWh/year) in the *Performance Requirement* table.”

1. Energy Efficiency: Provide Energy Star labeled products **[and comply with FEMP performance requirements as indicated below]**.

FEMP Performance Requirement for Federal Purchases		
Freezer Type–Defrost	Total Volume	Annual Energy Use
Chest–Manual	≤ 6.4 cu. ft.	230 kWh/year or less
Chest–Manual	6.5 to 8.4 cu. ft.	260 kWh/year or less
Chest–Manual	8.5 to 10.4 cu. ft.	290 kWh/year or less
Chest–Manual	10.5 to 12.4 cu. ft.	320 kWh/year or less
Chest–Manual	12.5 to 14.4 cu. ft.	350 kWh/year or less
Chest–Manual	14.5 to 16.4 cu. ft.	380 kWh/year or less
Chest–Manual	16.5 to 18.4 cu. ft.	410 kWh/year or less
Chest–Manual	18.5 to 20.4 cu. ft.	440 kWh/year or less
Chest–Manual	≥ 20.5 cu. ft.	470 kWh/year or less
Upright–Manual	≤ 6.4 cu. ft.	305 kWh/year or less
Upright–Manual	6.5 to 8.4 cu. ft.	330 kWh/year or less
Upright–Manual	8.5 to 10 cu. ft.	355 kWh/year or less
Upright–Manual	10.5 to 12.4 cu. ft.	380 kWh/year or less
Upright–Manual	12.5 to 14.4 cu. ft.	405 kWh/year or less
Upright–Manual	14.5 to 16.4 cu. ft.	430 kWh/year or less
Upright–Manual	16.5 to 18.4 cu. ft.	455 kWh/year or less
Upright–Manual	18.5 to 20.4 cu. ft.	480 kWh/year or less
Upright–Manual	≥ 20.5 cu. ft.	505 kWh/year or less
Upright–Automatic	≤ 12.4 cu. ft.	530 kWh/year or less
Upright–Automatic	12.5 to 14.4 cu. ft.	565 kWh/year or less
Upright–Automatic	14.5 to 16.4 cu. ft.	600 kWh/year or less
Upright–Automatic	16.5 to 18.4 cu. ft.	635 kWh/year or less
Upright–Automatic	18.5 to 20.4 cu. ft.	670 kWh/year or less
Upright–Automatic	≥ 20.5 cu. ft.	705 kWh/year or less

E. Room Air Conditioner:

SPECIFIER NOTE:

Room Air Conditioners: ENERGY STAR qualified models use at least 10 percent less energy than required by current federal standards.

The FEMP website states: “When buying room air conditioners directly from commercial sources, choose models that are ENERGY STAR-qualified...all of which meet the Energy Efficiency Ratios (EER) shown in the *Performance Requirement* table.”

1. Energy Efficiency: Provide Energy Star labeled products **[and comply with FEMP performance requirements as indicated below]**.

FEMP Performance Requirement for Federal Purchases	
Air Conditioner Type and Capacity	Required EER
with louvers; < 20,000 Btu/hr	10.7 or more
with louvers; ≥ 20,000 Btu/hr	9.4 or more
without louvers; < 8,000 Btu/hr	9.9 or more
without louvers; ≥ 8,000 Btu/hr	9.4 or more

PART 3 - EXECUTION

3.X SITE ENVIRONMENTAL PROCEDURES

A. Resource Management:

1. Energy Efficiency: Verify equipment is properly installed, connected, and adjusted. Verify that equipment is operating as specified.
2. Coordinate with manufacturer for **[maintenance agreement] [take-back program] [green lease]**.

END OF SECTION