
USACE / NAVFAC / AFCEC / NASA UFGS-09 62 38 (November 2012)

Preparing Activity: USACE Superseding
UFGS-09 65 36 (November 2010)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2014

SECTION TABLE OF CONTENTS

DIVISION 09 - FINISHES

SECTION 09 62 38

STATIC-CONTROL FLOORING

11/12

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 SCHEDULING
- 1.3 SUSTAINABILITY REQUIREMENTS
- 1.4 SUBMITTALS
- 1.5 OTHER SUSTAINABLE REQUIREMENTS
- 1.6 ENVIRONMENTAL DATA
- 1.7 FIRE RESISTANCE TESTING REQUIREMENTS
- 1.8 EXTRA MATERIALS
- 1.9 QUALITY ASSURANCE
- 1.10 DELIVERY, STORAGE, AND HANDLING
 - 1.10.1 Static-Control Resilient Flooring
 - 1.10.2 Static-Control Carpet
- 1.11 ENVIRONMENTAL CONDITIONS
 - 1.11.1 Static-Control Resilient Flooring
 - 1.11.2 Static Control Carpet
- 1.12 WARRANTY
 - 1.12.1 Static-Control Resilient Flooring
 - 1.12.2 Static-Control Carpet

PART 2 PRODUCTS

- 2.1 STATIC-CONTROL FLOORING AND ACCESSORIES
 - 2.1.1 Product Data
 - 2.1.1.1 Static-Control Resilient Flooring
 - 2.1.1.2 Static-Control Carpet
 - 2.1.1.3 Adhesives
 - 2.1.2 Samples
 - 2.1.2.1 Static-Control Resilient Flooring
 - 2.1.2.2 Static-Control Carpet
 - 2.1.2.3 Moldings
 - 2.1.2.4 Special Treatment Materials
 - 2.1.3 Certificates
 - 2.1.4 Manufacturer's Instructions
 - 2.1.5 Operations and Maintenance Data

- 2.2 STATIC-CONTROL RESILIENT FLOORING
 - 2.2.1 Conductive Resilient Flooring
 - 2.2.1.1 Conductive Vinyl Tile
 - 2.2.1.2 Conductive Rubber Tile
 - 2.2.1.3 Conductive Rubber Sheet Flooring
 - 2.2.2 Static-Dissipative Resilient Flooring
 - 2.2.2.1 Static-Dissipative Vinyl Tile
 - 2.2.2.2 Static-Dissipative Rubber Tile
- 2.3 STATIC-CONTROL CARPET
 - 2.3.1 Physical Characteristics
 - 2.3.1.1 Carpet Construction
 - 2.3.1.2 Type
 - 2.3.1.3 Pile Type
 - 2.3.1.4 Pile Fiber
 - 2.3.1.5 Conductive Fiber
 - 2.3.1.6 Gauge
 - 2.3.1.7 Stitches
 - 2.3.1.8 Surface Pile Weight
 - 2.3.1.9 Pile Thickness
 - 2.3.1.10 Pile Density
 - 2.3.1.11 Dye Method
 - 2.3.1.12 Backing System
 - 2.3.2 Static-Control Carpet Performance Requirements
 - 2.3.2.1 Electrical Resistance
 - 2.3.2.2 Tuft Bind
 - 2.3.2.3 Colorfastness to Crocking
 - 2.3.2.4 Colorfastness to Light
 - 2.3.2.5 Colorfastness to Water
 - 2.3.2.6 Delamination Strength
- 2.4 WALL BASE
 - 2.4.1 Resilient Base
 - 2.4.2 Self-Coving
- 2.5 ADHESIVES
- 2.6 MOLDINGS
- 2.7 ACCESSORIES
- 2.8 ELECTRICAL GROUND CONNECTION
- 2.9 MANUFACTURER'S COLOR, PATTERN AND TEXTURE

PART 3 EXECUTION

- 3.1 SURFACE PREPARATION
- 3.2 MOISTURE, ALKALINITY AND BOND TESTS
- 3.3 INSTALLATION OF STATIC-CONTROL RESILIENT TILE FLOORING
- 3.4 INSTALLATION OF STATIC-CONTROL RESILIENT SHEET FLOORING
- 3.5 INSTALLATION OF STATIC-CONTROL CARPET
- 3.6 INSTALLATION OF WALL BASE
 - 3.6.1 Resilient Base
 - 3.6.2 Self-Coving
- 3.7 CLEANING AND PROTECTION
- 3.8 TESTING

-- End of Section Table of Contents --

USACE / NAVFAC / AFCEC / NASA UFGS-09 62 38 (November 2012)

Preparing Activity: USACE Superseding
UFGS-09 65 36 (November 2010)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated January 2014

SECTION 09 62 38

STATIC-CONTROL FLOORING

11/12

NOTE: This guide specification covers the requirements for static-control resilient flooring over a concrete surface and static-control carpet over concrete or access flooring.

Adhere to UFC 1-300-02 Unified Facilities Guide Specifications (UFGS) Format Standard when editing this guide specification or preparing new project specification sections. Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).

PART 1 GENERAL

1.1 REFERENCES

NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update

the issue dates.

References not used in the text will automatically
be deleted from this section of the project
specification when you choose to reconcile
references in the publish print process.

The publications listed below form a part of this specification to the
extent referenced. The publications are referred to within the text by the
basic designation only.

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

| | |
|-----------|--|
| AATCC 107 | (2009; E 2010) Colorfastness to Water |
| AATCC 16 | (2004; E 2010) Colorfastness to Light |
| AATCC 165 | (2008; E 2011) Colorfastness to Crocking: Textile Floor Coverings - Crockmeter Method |

ASTM INTERNATIONAL (ASTM)

| | |
|------------|--|
| ASTM D5793 | (2013) Binding Sites Per Unit Length or Width of Pile Yarn Floor Coverings |
| ASTM D5848 | (2010; E 2010) Mass Per Unit Area of Pile Yarn Floor Coverings |
| ASTM D6859 | (2011) Standard Test Method for Pile Thickness of Finished Level Pile Yarn Floor Coverings |
| ASTM E2129 | (2010) Standard Practice for Data Collection for Sustainability Assessment of Building Products |
| ASTM E648 | (2010; E 2011) Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source |
| ASTM F1344 | (2012; E 2013) Rubber Floor Tile |
| ASTM F150 | (2006; R 2013) Electrical Resistance of Conductive and Static Dissipative Resilient Flooring |
| ASTM F1700 | (2013a) Solid Vinyl Floor Tile |
| ASTM F1859 | (2012) Rubber Sheet Floor Covering Without Backing |
| ASTM F1861 | (2008; E 2012; R 2012) Resilient Wall Base |
| ASTM F1869 | (2011) Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride |
| ASTM F2170 | (2011) Determining Relative Humidity in |

Concrete Floor Slabs in situ Probes

CARPET AND RUG INSTITUTE (CRI)

CRI CIS (2011) Carpet Installation Standard

ELECTROSTATIC DISCHARGE ASSOCIATION (ESD)

ESD S6.1 (2009) Grounding

ESD S7.1 (2012) Resistive Characterization of Floor Materials

GREEN SEAL (GS)

GS-36 (2011) Commercial Adhesives

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 2551 (1981) Machine-made Textile Floor Coverings - Determination of Dimensional Changes Due to the Effects of Varied Water and Heat Conditions

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 99 (2012; TIA 11-1; TIA 11-2; Errata 12-1; TIA 12-3; TIA 13-4; TIA 13-5) Health Care Facilities Code

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)

SCAQMD Rule 1168 (1989; R 2005) Adhesive and Sealant Applications

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC (2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

1.2 SCHEDULING

Schedule static-control flooring work after any other work which would damage the finished surface of the flooring.

1.3 SUSTAINABILITY REQUIREMENTS

NOTE: The bracketed items are representative of
LEED material documentation and requirements that
may apply to this project. These items should be
edited to reflect the project requirements.

Materials in this technical specification may contribute towards contract compliance with sustainability requirements. See Section 01 33 29 LEED DOCUMENTATION for project LEED NC [local/regional materials,][low-emitting materials,][recycled content,][_____ ,][and][rapidly

renewable materials] requirements.

1.4 SUBMITTALS

NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project.

The Guide Specification technical editors have designated those items that require Government approval, due to their complexity or criticality, with a "G." Generally, other submittal items can be reviewed by the Contractor's Quality Control System. Only add a "G" to an item, if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.] [information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Static-Control Flooring[; G][; G, [____]]
Accessories[; G][; G, [____]]
Environmental Data[; G][; G, [____]]
Adhesives[; G][; G, [____]]
Warranty

SD-04 Samples

Static-Control Flooring[; G][; G, [____]]
Accessories[; G][; G, [____]]

SD-06 Test Reports

Fire Resistance
Moisture, Alkalinity and Bond
Testing

SD-07 Certificates

Static-Control Flooring
Accessories
Adhesives
Qualifications of Applicator

SD-08 Manufacturer's Instructions

Static-Control Flooring[; G][; G, [____]]
Accessories[; G][; G, [____]]

SD-10 Operation and Maintenance Data

Static-Control Flooring[; G][; G, [____]]
Accessories[; G][; G, [____]]

SD-11 Closeout Submittals

LEED Documentation
Other Sustainable Requirements

1.5 OTHER SUSTAINABLE REQUIREMENTS

The following shall be submitted in accordance with LEED NC:

- a. Documentation indicating percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar value of products included in project.
- b. Documentation indicating distance between manufacturing facility and the project site. Indicate distance of raw material origin from the project site. Indicate relative dollar value of local/regional materials to total dollar value of products included in project.

1.6 ENVIRONMENTAL DATA

Submit Table 1 of ASTM E2129 for the following products: [____].

1.7 FIRE RESISTANCE TESTING REQUIREMENTS

NOTE: Choice of critical radiant flux level as it applies to building type and area of application will be made in accordance with the latest edition of UFC 3-600-01 and NFPA 101. Wherever the use of Class II (0.22) watts finish is required, Class I (0.45) watts will be permitted. Critical radiant flux will be a minimum average of 0.45 watts when used in corridors in bachelor enlisted quarters, bachelor officer quarters, hospital, child care centers, temporary lodging facilities, and new construction detention and correctional facilities. Generally the critical radiant flux will be a

minimum of 0.22 for corridors of other type facilities. Where an approved automatic sprinkler system is installed, Class II interior floor finish may be used where Class I floor finish is required, and where Class II is required, no critical radiant flux rating is required.

Provide a minimum average critical radiant flux of [0.22] [0.45] watts per square centimeter for flooring in corridors and exits when tested in accordance with ASTM E648.

1.8 EXTRA MATERIALS

Provide extra material from same dye lot for future maintenance. Provide a minimum of [_____] percent of total square meters square yards of each flooring and base type, pattern, and color.

1.9 QUALITY ASSURANCE

The flooring manufacturer will approve the Qualifications of Applicator and certify that he/she has a minimum of 3 years experience in the application of the materials to be used.

1.10 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the building site in original unopened containers bearing the manufacturer's name, style name, pattern color name and number, size, production run, project identification, handling instructions and related information. Observe ventilation and safety procedures specified in the MSDS. Do not store flooring near materials that may offgas or emit harmful fumes, such as kerosene heaters, fresh paint, or adhesives.

1.10.1 Static-Control Resilient Flooring

Store materials in a clean, dry, secure, and well-ventilated area free from strong contaminant sources and residues with ambient air temperature range as recommended by the manufacturer but not less than 20 degrees C 68 degrees F or more than 30 degrees C 85 degrees F. Stack materials according to manufacturer's recommendations. Protect materials from the direct flow of heat from hot-air registers, radiators and other heating fixtures and appliances.

1.10.2 Static-Control Carpet

Remove materials from packaging and store them in a clean, dry, well ventilated area protected from damage, soiling, and moisture, and maintain at a temperature range as recommended by the manufacturer but not less than 16 degrees C 60 degrees F or more than 32 degrees C 90 degrees F for 2 days prior to installation.

1.11 ENVIRONMENTAL CONDITIONS

Provide temporary ventilation during work of this section.

1.11.1 Static-Control Resilient Flooring

Maintain areas in which resilient flooring is to be installed at a temperature range as recommended by the manufacturer but not less than 20

degrees C 68 degrees F or more than 30 degrees C 85 degrees F for 3 days before application, during application and 2 days after application, unless otherwise directed by the flooring manufacturer for the flooring being installed. Maintain a minimum temperature range as recommended by the manufacturer but not less than 13 degrees C 55 degrees F thereafter for the duration of the contract. Provide adequate ventilation to remove moisture from area and to comply with regulations limiting concentrations of hazardous vapors.

1.11.2 Static Control Carpet

Maintain areas in which carpeting is to be installed at a temperature range as recommended by the manufacturer but not less than 16 degrees C 60 degrees F or more than 32 degrees C 90 degrees F for 2 days before installation, during installation, and for 2 days after installation. Maintain a minimum temperature range as recommended by the manufacturer but not less than 13 degrees C 55 degrees F thereafter for the duration of the contract. Do not permit traffic or movement of furniture or equipment in carpeted area for 24 hours after installation.

1.12 WARRANTY

1.12.1 Static-Control Resilient Flooring

Provide manufacturer's standard performance guarantees or warranties including a five year wear warranty and ten year conductivity warranty.

1.12.2 Static-Control Carpet

Provide manufacturer's standard performance guarantees or warranties including a minimum two years for material and workmanship and ten years for wear, static control, tuft bind and delamination.

PART 2 PRODUCTS

2.1 STATIC-CONTROL FLOORING AND ACCESSORIES

2.1.1 Product Data

2.1.1.1 Static-Control Resilient Flooring

Submit manufacturer's descriptive data for flooring and moldings, and documentation stating physical characteristics for each type of flooring material and installation accessory.

2.1.1.2 Static-Control Carpet

Submit manufacturer's descriptive data and documentation for carpet and moldings, and documentation stating physical characteristics and performance requirements for each type of carpet material and installation accessory.

2.1.1.3 Adhesives

Submit manufacturer's descriptive data, documentation stating physical characteristics, and mildew and germicidal characteristics. Provide Material Safety Data Sheets (MSDS) for all primers and adhesives to the Contracting Officer.

2.1.2 Samples

2.1.2.1 Static-Control Resilient Flooring

Submit [three] [_____] samples of each indicated color and type of flooring, base, moldings, and accessories sized a minimum 60 by 100 mm 2-1/2 by 4 inch.

2.1.2.2 Static-Control Carpet

Submit [three] [_____] "Production Quality" samples 450 by 450 mm 18 by 18 inches of each carpet proposed for use, showing quality, pattern, and color specified.

2.1.2.3 Moldings

Submit [three] [_____] pieces of each type at least 300 mm 12 inches long.

2.1.2.4 Special Treatment Materials

Submit [three] [_____] samples showing system and installation method.

2.1.3 Certificates

Submit certificates attesting that products to be provided meet specification requirements.

2.1.4 Manufacturer's Instructions

Submit manufacturer's printed installation instructions for all flooring materials and accessories, including preparation of substrate, seaming techniques, grounding and recommended adhesives.

2.1.5 Operations and Maintenance Data

- a. Submit Data Package 1 in accordance with Section 01 78 23 OPERATION AND MAINTENANCE DATA.
- b. Submit [three] [_____] copies of manufacturer's maintenance instructions for each type of flooring material describing recommended type of cleaning equipment and materials, spotting and cleaning methods, and cleaning cycles.

2.2 STATIC-CONTROL RESILIENT FLOORING

NOTE: Consider the function of the room, User requirements and consult with the project electrical engineer when determining the type of flooring that is appropriate.

Street shoes generate static electricity with all finish flooring types. Dependent on the function of the room and flooring material specified, special footwear may be required. The special footwear and flooring should be tested as a whole system. Verify with the user if and what type of special footwear will be used (such as ESD shoes or conductive heel straps). If the proper special footwear will not be worn on the static-control floor, a type of

static-control flooring that provides very low static generation without special footwear should be specified. This type of flooring, such as static-control carpet, may be appropriate for mission critical areas such as 911 centers, call centers and air traffic control areas. Rooms requiring special handling considerations for electronic devices (for handling, repair, manufacturing and assembly) due to extreme device sensitivity (sometimes called Class 0) may require an alternative static-control flooring and footwear system that is also very low charging; additional research to determine appropriate flooring type is required. In this instance, extreme device sensitivity (or Class 0) is defined as having a HBM (Human Body Model) or CDM (Charged-Device Model) threshold less than 250 volts.

This specification does not address testing of flooring and footwear together. This is testing which is not the responsibility of the Contractor. User is encouraged to test flooring and footwear together in method as referenced in ESD S20.20.

Heat welding adds cost to a project and is often reserved for clean rooms and wet lab type applications. Tile 12" x 12" in size is not normally heat welded, 24" x 24" tile is occasionally heat welded and 36" x 36" tile is more typically used for heat weld applications.

This specification does not address applications requiring static-control during explosives handling. For this application, the designer is encouraged to research DOD 4145.26-M to determine the specific requirement of explosive handling versus static mitigation for electronic parts handling.

2.2.1 Conductive Resilient Flooring

2.2.1.1 Conductive Vinyl Tile

Conductive vinyl tile shall be a homogeneous vinyl product and conform to **ASTM F1700**. Provide electrical resistance from surface to surface and surface to ground between 25,000 ohms (2.5 x 10 to the 4th) and 1,000,000 ohms (1.0 x 10 to the 6th) when tested in accordance with **[ASTM F150]** [or] **[ESD S7.1]**. Tile shall be **[300]** **[600]** **[900]** **[_____]** mm **[12]** **[24]** **[36]** **[_____]** inches square and **3.2 mm** 1/8 inch thick. [Tile shall be pregrooved for heat welding of seams. As required, provide welding rods as recommended by the manufacturer.]

2.2.1.2 Conductive Rubber Tile

NOTE: Some rubber flooring is not resistant to oil and grease and can perform poorly against certain reagents and stain spills. Determine project needs,

research available product and add verbiage to paragraph if rubber flooring needs to be resistant to oil and grease and perform against certain reagents and stain spills.

Research available sizes and thicknesses since not all manufacturers offer all sizes and thicknesses. The following thicknesses of rubber flooring are recommended for the traffic type shown: 2.0 mm (0.080 inch) thickness - low traffic; 2.5 mm (0.100 inch) thickness - medium traffic; 3 mm (0.118 inch) thickness or greater - heavy traffic.

Ingredients in rubber flooring may include either natural rubber or synthetic materials. Natural rubber is a renewable raw material that is extracted from the sap of the tropical rubber plant without harming the plant.

Provide conductive rubber tile conforming to ASTM F1344 Class 1 homogeneous, Type B (through mottled) with a [smooth] [or] [hammered] surface. Provide electrical resistance from surface to surface and surface to ground between 25,000 ohms (2.5 x 10 to the 4th) and 1,000,000 ohms (1.0 x 10 to the 6th) when tested in accordance with [ASTM F150] [or] [ESD S7.1]. Provide tile [300] [] mm [24] [] inches square and [2.0] [] mm thick.

2.2.1.3 Conductive Rubber Sheet Flooring

NOTE: Some rubber flooring is not resistant to oil and grease and can perform poorly against certain reagents and stain spills. Determine project needs, research available product and add verbiage to paragraph if rubber flooring needs to be resistant to oil and grease and perform against certain reagents and stain spills.

The following thicknesses of rubber flooring are recommended for the traffic type shown: 2.0 mm (0.080 inch) thickness - low traffic; 2.5 mm (0.100 inch) thickness - medium traffic; 3 mm (0.118 inch) thickness or greater - heavy traffic.

Research available widths. Manufacturer's widths vary and not all manufacturers offer all sizes.

Provide conductive rubber sheet flooring conforming to ASTM F1859 (flooring without backing), Type I homogeneous. Provide electrical resistance from surface to surface and surface to ground between 25,000 ohms (2.5 x 10 to the 4th) and 1,000,000 ohms (1.0 x 10 to the 6th) when tested in accordance with [ASTM F150] [or] [ESD S7.1]. Provide tile [1200] [] mm [4] [] feet wide and [2.0] [] mm thick.

2.2.2 Static-Dissipative Resilient Flooring

2.2.2.1 Static-Dissipative Vinyl Tile

Static-dissipative vinyl tile shall be a homogeneous vinyl product and conform to **ASTM F1700**. Provide electrical resistance from surface to surface and surface to ground between 1,000,000 ohms (1.0 x 10 to the 6th) and 1,000,000,000 ohms (1.0 x 10 to the 9th) when tested in accordance with **[ASTM F150]** [or] **[ESD S7.1]**. Tile shall be **[300] [600] [900] [_____]** mm **[12] [24] [36] [_____]** inches square and **3.2 mm 1/8 inch** thick. [Tile shall be pregrooved for heat welding of seams. As required, provide welding rods as recommended by the manufacturer.]

2.2.2.2 Static-Dissipative Rubber Tile

Static-dissipative rubber tile conforming to **ASTM F1344** Class 1 homogeneous, [Type A (solid color)] [Type B (through mottled)]. Provide a [smooth] [hammered] surface. Provide electrical resistance from surface to surface and surface to ground between 1,000,000 ohms (1.0 x 10 to the 6th) and 1,000,000,000 ohms (1.0 x 10 to the 9th) when tested in accordance with **[ASTM F150]** [or] **[ESD S7.1]**. Provide tile **[300] [600] [900] [_____]** mm **[18] [24] [36] [_____]** inches square and **[2.0] [3.5] [_____]** mm thick.

2.3 STATIC-CONTROL CARPET

NOTE: Consider the function of the room, User requirements and consult with the project electrical engineer when determining the type of flooring that is appropriate.

Street shoes generate static electricity with all finish flooring types. Dependent on the function of the room and flooring material specified, special footwear may be required. The special footwear and flooring should be tested as a whole system. Verify with the user if and what type of special footwear will be used (such as ESD shoes or conductive heel straps). If the proper special footwear will not be worn on the static-control floor, a type of static-control flooring that provides very low static generation without special footwear should be specified. This type of flooring, such as static-control carpet, may be appropriate for mission critical areas such as 911 centers, call centers and air traffic control areas. Rooms requiring special handling considerations for electronic devices (for handling, repair, manufacturing and assembly) due to extreme device sensitivity (sometimes called Class 0) may require an alternative static-control flooring and footwear system that is also very low charging; additional research to determine appropriate flooring type is required. In this instance, extreme device sensitivity (or Class 0) is defined as having a HBM (Human Body Model) or CDM (Charged-Device Model) threshold less than 250 volts.

This specification does not address testing of

flooring and footwear together. This is testing which is not the responsibility of the Contractor. User is encouraged to test flooring and footwear together in method as referenced in ESD S20.20.

If more than one carpet type is required for a project, a separate paragraph will be used for each carpet type. Each carpet type will be designated with a letter or number symbol. Use the same designations to key carpets to locations on the drawings and in Section 09 06 90 COLOR SCHEDULE.

ADA Requirements: Carpet must be securely attached; have a firm backing; and have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum thickness should be 13 mm (1/2 in). Fasten exposed edges of carpet to floor surfaces and have trim along the entire length of the exposed edge.

Nylon fiber is typically abrasion resistant and durable in all pile configurations using filament fiber, has good stain removal characteristics, and is recommended for commercial installations.

Furnish first quality carpet; free of visual blemishes, streaks, poorly dyed areas, fuzzing of pile yarn, spots or stains, and other physical and manufacturing defects. Provide carpet materials and treatments as reasonably nonallergenic and free of other recognized health hazards. Provide a static control construction on all grade carpets which gives adequate durability and performance.

2.3.1 Physical Characteristics

2.3.1.1 Carpet Construction

Tufted

2.3.1.2 Type

Modular tile [600 by 600] [_____] mm square [24 by 24] [_____] inch square with 0.15 percent growth/shrink rate in accordance with ISO 2551.

2.3.1.3 Pile Type

[Level-loop] [Multilevel loop] [_____]

2.3.1.4 Pile Fiber

Commercial 100 percent branded (federally registered trademark) nylon continuous filament

2.3.1.5 Conductive Fiber

Provide a continuous conductive fiber as recommended by the manufacturer in every tuft.

2.3.1.6 Gauge

Minimum [_____] mm inch in accordance with ASTM D5793.

2.3.1.7 Stitches

Minimum [_____] per square meter square inch

2.3.1.8 Surface Pile Weight

Minimum [_____] kg/square meter ounces per square yard. This does not include weight of backings. Determine weight in accordance with ASTM D5848.

2.3.1.9 Pile Thickness

Minimum [_____] mm inch in accordance with ASTM D6859.

2.3.1.10 Pile Density

NOTE: Pile Density = $36 \times \text{Pile Weight} / \text{Pile Thickness}$.

Minimum [_____]

2.3.1.11 Dye Method

[Solution dyed] [_____]

2.3.1.12 Backing System

Provide conductive backing system of synthetic material as recommended by the carpet manufacturer.

2.3.2 Static-Control Carpet Performance Requirements

2.3.2.1 Electrical Resistance

NOTE: Coordinate acceptable measurement ranges for project with the project Electrical Engineer.

Provide electrical resistance from surface to surface and surface to ground between [25,000 ohms (2.5 x 10 to the 4th) and 100,000,000 ohms (1.0 x 10 to the 8th) ohms] [_____] when tested in accordance with ESD S7.1 and NFPA 99.

2.3.2.2 Tuft Bind

Provide tuft bind force required to pull a tuft or loop free from carpet backing with a minimum 40 N 10 pound average force for loop pile.

2.3.2.3 Colorfastness to Crocking

Comply dry and wet crocking with AATCC 165 and with a Class 4 minimum rating on the AATCC Color Transference Chart for all colors.

2.3.2.4 Colorfastness to Light

Comply colorfastness to light with AATCC 16, Test Option E "Water-Cooled Xenon-Arc Lamp, Continuous Light" and with a minimum 4 grey scale rating after 40 hours.

2.3.2.5 Colorfastness to Water

NOTE: Include the following test when specifying
carpet constructed of yarn dyed fibers.

Comply colorfastness to water with AATCC 107 and with a minimum 4.0 gray scale rating and a minimum 4.0 transfer scale rating.

2.3.2.6 Delamination Strength

Provide delamination strength for tufted carpet with a secondary back of minimum 440 N/m 2.5 lbs/inch.

2.4 WALL BASE

2.4.1 Resilient Base

NOTE: Delete this paragraph if Section 09 65 00
RESILIENT FLOORING is used, it also specifies
resilient base.

Job formed corners are recommended. The return on preformed corners is not always long enough to hold the piece in place and the corners can be knocked off during vacuuming and other cleaning operations.

Base is available in different lengths ranging from 1220 mm (4 feet) pieces to 30480 mm (100 feet) or 36576 mm (120 feet) rolls. Availability and roll lengths vary dependent on manufacturer. Identify required length if it impacts design intent. Some manufacturers of Type TS (vulcanized thermoset rubber) base offer only 1220 mm (4 feet) lengths and not roll goods.

Resilient base shall conform to ASTM F1861, [[Type TS (vulcanized thermoset rubber)][,][or][Type TP (thermoplastic rubber)][, or][Type TV (thermoplastic vinyl)], [Style A (straight - installed with carpet)][,][and][Style B (coved - installed with resilient flooring)]. Provide [100] [150] mm [4] [6] inch high and a minimum 3 mm 1/8 inch thick wall base. Provide [preformed][job formed] corners in matching height, shape, and color.

2.4.2 Self-Coving

Self-coving shall consist of static-control resilient flooring over a cove stick and shall have [cove cap][and metal corner] as recommended by the manufacturer of the flooring. Self-coving base material shall be same as floor material.

2.5 ADHESIVES

Provide conductive adhesive as recommended by the manufacturer of the static-control flooring[and self-coving base]. Provide conductive adhesive for carpet tile that is also releasable as recommended by the manufacturer. Adhesive for [vinyl][or][rubber] wall base shall be as recommended by the wall base manufacturer. [VOC content shall be less than [50 grams/L] [the current VOC content limits of [GS-36][and][SCAQMD Rule 1168]].]

2.6 MOLDINGS

Provide heavy duty tapered moldings of [[vinyl][or][rubber]] [[____]-colored anodized aluminum][clear anodized aluminum] and types as recommended by flooring manufacturer for both edges and transitions of flooring materials specified. Provide vertical lip on molding of maximum 6 mm 1/4 inch. Provide bevel change in level between 6 and 13 mm 1/4 and 1/2 inch with a slope no greater than 1:2. Provide [____] color to match [resilient base][____].

2.7 ACCESSORIES

Use accessories recommended by the manufacturer of the flooring.

2.8 ELECTRICAL GROUND CONNECTION

NOTE: The static-control resilient flooring is installed in a conductive adhesive. The floor system is grounded to an external ground by a short grounding strip, usually on a room-by-room basis. Designer must provide for connection to an external ground and should coordinate with static-control flooring manufacturers during design stage regarding connections to external ground. Designer will show ground connection to the external ground on the drawings.

Provide an electrical ground connection that meets the requirements of ESD S6.1. Connection between the static-control floor system and the external grounding system shall be provided. Contact with the static-control floor system shall be with conductive grounding strip and shall have the greater of the following: a minimum contact area of 5800 square mm 9 square inch or the dimensions recommended by the manufacturer. Provide the grounding conductor recommended by the manufacturer of the flooring. Connect and install the grounding conductor as recommend by the flooring manufacturer.

2.9 MANUFACTURER'S COLOR, PATTERN AND TEXTURE

NOTE: Editing of color reference sentence(s) shall be coordinated with the Government. Generally the Section 09 06 90 COLOR SCHEDULE or drawings are used when the project is designed by an Architect or Interior designer. Color shall be selected from manufacturer's standard colors or identified in this

specification only when the project has minimal finishes.

When the government directs that color be located in the drawings, a note will be added that states: "Where color is shown as being specific to one manufacturer, an equivalent color by another manufacturer may be submitted for approval. Manufacturers and materials specified are not intended to limit the selection of equal colors from other manufacturers. The word "color" as used herein includes surface color and pattern."

When more than one type, pattern or color is specified identify location.

When a manufacturer's name, stock number, pattern, and color is specified for color, be certain that the product conforms to the specification, as edited.

Provide color, pattern and texture [in accordance with Section 09 06 90 COLOR SCHEDULE] [as indicated] [_____]. Provide flooring in any one continuous area or replacement of damaged flooring in continuous area from same production run with same shade and pattern.

PART 3 EXECUTION

3.1 SURFACE PREPARATION

NOTE: Curing and sealing compounds should not be used on concrete surfaces to receive static-control resilient flooring. If a curing compound is required, it must be coordinated for compatibility with the flooring adhesive and approved by the flooring manufacturer.

Before any work under this section is begun, defects such as rough or scaling concrete, low spots, high spots, and uneven surfaces shall have been corrected, and damaged portions of concrete slabs shall have been repaired in accordance with flooring manufacturer's recommended instructions. Floor shall be in a level plane with a maximum variation of 3 mm 1/8 inch every 3 m 10 feet, except where indicated as sloped. Repair cracks and irregularities and prepare the subfloor in accordance with flooring manufacturer's recommended instructions. Curing and sealing compounds should not be used on concrete surfaces to receive flooring unless they have been tested and approved by the flooring manufacturer. In addition, remove paint, varnish, oils, release agents, sealers, waxes, and adhesives, as required by the flooring product in accordance with manufacturer's printed installation instructions. If a curing compound is required, it must be coordinated for compatibility with the flooring adhesive.

3.2 MOISTURE, ALKALINITY AND BOND TESTS

Determine the suitability of the concrete subfloor for receiving the flooring with regard to moisture content and pH level by moisture and

alkalinity tests. Conduct moisture testing in accordance with ASTM F1869 or ASTM F2170, unless otherwise recommended by the flooring manufacturer. Conduct alkalinity testing as recommended by the flooring manufacturer. Determine the compatibility of the flooring adhesives to the concrete floors by a bond test in accordance with the flooring manufacturer's recommendations.

3.3 INSTALLATION OF STATIC-CONTROL RESILIENT TILE FLOORING

Install static-control resilient flooring, ground connections[, heat welded joints,] and accessories in accordance with the approved manufacturer's installation instructions. Tile lines and joints shall be kept square, symmetrical, tight, and even. Tile at the perimeter of the area to be finished shall vary as necessary to maintain full-size tiles in the field, but no perimeter tile shall be less than one-half the field tile size, except where irregular shaped rooms make it impossible. Tile shall be cut, fitted, and scribed to walls, partitions, and projections after field flooring has been applied. Grounding strips shall be installed in accordance with manufacturer's installation instructions. Protect edges of flooring material meeting hard surface flooring with molding and install in accordance with the molding manufacturer's printed instructions.

3.4 INSTALLATION OF STATIC-CONTROL RESILIENT SHEET FLOORING

Install static-control resilient sheet flooring, ground connections[, heat welded joints] and accessories in accordance with manufacturer's printed installation instructions. Prepare and apply adhesives in accordance with manufacturer's printed directions. Provide square, symmetrical, tight, and even flooring lines and joints. Keep each floor in true, level plane, except where slope is indicated. Cut flooring to fit around all permanent fixtures, built-in furniture and cabinets, pipes, and outlets. Lay out sheets to minimize waste. Cut, fit, and scribe flooring to walls and partitions after field flooring has been applied. Finish joints flush, free from voids, recesses, and raised areas. Grounding strips shall be installed in accordance with manufacturer's installation instructions. Protect edges of flooring material meeting hard surface flooring with molding and install in accordance with the molding manufacturer's printed instructions.[Install flooring with an integral coved base.]

3.5 INSTALLATION OF STATIC-CONTROL CARPET

NOTE: When applicable to the project, coordinate
method of installation of static-control carpet tile
on raised access flooring with access flooring
specification.

Static-control carpet, ground connections and accessories shall be installed in accordance with the approved manufacturer's installation instructions and CRI CIS. Protect edges of carpet meeting hard surface flooring with molding and install in accordance with the molding manufacturer's printed instructions. Follow ventilation, personal protection, and other safety precautions recommended by the adhesive manufacturer. Continue ventilation during installation and for at least 72 hours following installation. Install modular tiles with [release][_____] adhesive and join together snugly. Lay tiles in [the same direction] [an alternating pattern] with accessibility to the subfloor where required. Grounding strips shall be installed in accordance with manufacturer's

installation instructions.

3.6 INSTALLATION OF WALL BASE

3.6.1 Resilient Base

**NOTE: Delete this paragraph if Section 09 65 00
RESILIENT FLOORING specifies resilient base.**

Install wall base in accordance with manufacturer's printed installation instructions. Prepare and apply adhesives in accordance with manufacturer's printed directions. Tighten base joints and make even with adjacent resilient flooring. Fill voids along the top edge of base at masonry walls with caulk. Roll entire vertical surface of base with hand roller, and press toe of base with a straight piece of wood to ensure proper alignment. Avoid excess adhesive in corners.

3.6.2 Self-Coving

The static-control resilient flooring shall have a self-coving base and shall be installed in accordance with the flooring manufacturer's printed installation instructions. Extend the self-cove up the walls, columns and pilasters [100][150] mm [4][6] inches. Terminate the coving with a cove cap. Place a cove stick at the floor-wall junction to support the coving at the bend. Provide self-cove [at room perimeter and at fixed vertical interruptions to the flooring][as indicated]. [Provide protective metal corners at outside and inside corners.]

3.7 CLEANING AND PROTECTION

The flooring shall be cleaned in accordance with the manufacturer's recommendations. Flooring shall be protected by a covering of heavy-duty building paper before foot traffic is permitted. Lap and secure edges of kraft paper protection to provide a continuous cover. Boardwalks shall be placed over flooring in areas where subsequent building operations might damage the floor. Remove and replace flooring that becomes loose, broken, or curled prior to acceptance, or flooring that does not conform to resistance requirements of [ASTM F150][or][ESD S7.1].

3.8 TESTING

Test the flooring in accordance with and conform to the requirements of ESD S6.1 and ESD S7.1.

-- End of Section --