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USACE / NAVFAC / AFCEA UFGS-09660 (August 2002)  
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Preparing Activity: USACE Superseding  
UFGS-09660A (January 1998)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated 23 June 2005

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SECTION TABLE OF CONTENTS

DIVISION 09 - FINISHES

SECTION 09660

CONDUCTIVE VINYL FLOORING

08/02

PART 1 GENERAL

- 1.1 REFERENCES
- 1.2 SUBMITTALS
- 1.3 QUALIFICATION OF APPLICATOR
- 1.4 DELIVERY AND STORAGE
- 1.5 ENVIRONMENTAL REQUIREMENTS
- 1.6 SCHEDULING
- 1.7 WARRANTY

PART 2 PRODUCTS

- 2.1 CONDUCTIVE VINYL TILE
- 2.2 ADHESIVE
- 2.3 WALL BASE
  - 2.3.1 Resilient Base
  - 2.3.2 Self-Coving
- 2.4 ACCESSORIES
- 2.5 ELECTRICAL GROUND CONNECTION
- 2.6 COLOR

PART 3 EXECUTION

- 3.1 SURFACE CONDITIONS
- 3.2 INSTALLATION OF CONDUCTIVE VINYL TILE
- 3.3 INSTALLATION OF WALL BASE
  - 3.3.1 Topset Cove Base
  - 3.3.2 Self-Coving
- 3.4 CLEANING AND PROTECTING
- 3.5 TESTING
- 3.6 TESTING FOR EXPLOSIVE AND AMMUNITION FACILITIES

-- End of Section Table of Contents --

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### SECTION 09660

#### CONDUCTIVE VINYL FLOORING 08/02

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NOTE: This guide specification covers the requirements for conductive vinyl tile over a concrete surface.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

This guide specification includes tailoring options for resilient base, and self-coving base. Selection or deselection of a tailoring option will include or exclude that option in the section, but editing the resulting section to fit project is still required.

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## PART 1 GENERAL

### 1.1 REFERENCES

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NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest guide specification. Use of SpecsIntact automated reference checking is recommended for projects based on older guide specifications.

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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.

ASTM INTERNATIONAL (ASTM)

ASTM D 2240 (2004) Rubber Property - Durometer Hardness

ASTM F 1066 (2004) Vinyl Composition Floor Tile

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 99 (2005) Health Care Facilities

UNDERWRITERS LABORATORIES (UL)

UL 779 (1995; Rev thru Jan 1997) Electrically  
Conductive Floorings

1.2 SUBMITTALS

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NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" 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 projects.

Submittal items not designated with a "G" are considered as being for information only for Army projects and for Contractor Quality Control approval for Navy projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.][for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for

the Government.] The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-03 Product Data

Conductive Vinyl Tile

Manufacturer's data composed of catalog cuts, brochures and product information.

Installation of Conductive Vinyl Tile

Manufacturer's preprinted material describing product installation. Cleaning and maintenance instructions shall be included.

SD-04 Samples

Conductive Vinyl Tile

Three samples of each color and type of flooring and base. Sample size shall be minimum 75 x 75 mm 3 x 3 inch.

SD-06 Test Reports

Testing

Reports of tests, including analysis and interpretation of test results. Each report shall be properly identified. The test methods used shall be identified and the test results shall be recorded.

SD-07 Certificates

Conductive Vinyl Tile  
Adhesive  
Qualification of Applicator

Certificate attesting that the tile and adhesive meet the requirements specified. Certificate indicating approval of the flooring applicator by the flooring manufacturer.

1.3 QUALIFICATION OF APPLICATOR

Applicator shall be approved by the flooring manufacturer and shall have a minimum of 3 years experience in the application of the materials to be used.

1.4 DELIVERY AND STORAGE

Materials shall be delivered to the building site in original unopened containers. Materials shall be stored in a clean dry area with temperature maintained above 21 degrees C 70 degrees F for two days prior to installation.

1.5 ENVIRONMENTAL REQUIREMENTS

Areas to receive conductive vinyl flooring shall be maintained at a temperature above 21 degrees C 70 degrees F for two days before, during,

and after application. A minimum temperature of 13 degrees C 55 degrees F shall be maintained thereafter.

#### 1.6 SCHEDULING

Conductive vinyl flooring work shall be scheduled after any other work which would damage the finished surface of the flooring.

#### 1.7 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a one year period shall be provided.

### PART 2 PRODUCTS

#### 2.1 CONDUCTIVE VINYL TILE

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NOTE: Insert tiles will be installed in visible areas as required, and drawings will indicate locations.

Conductive tiles are not recommended for use in areas where contamination can be caused by explosive dust.

Conductive floors will be used at operations where explosives having an electrostatic sensitivity of 0.1 joule or less such as primer, detonator, igniter, and incendiary mixtures are exposed. Conductive floors are also required where the following are performed:

- a. Loose unpacked ammo with electric primers.
- b. Exposed electro-explosive devices.
- c. Electrically initiated items with exposed electric circuitry.
- d. Hazardous materials that could be ignited by static discharge from humans.

The specification may be modified to provide for seamless installation. If seamless installation is specified, the tile shall be routed at the seams and heat welded. Manufacturer's instructions should be reviewed when revising the specification to provide for seamless installation.

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Conductive vinyl tile shall conform to ASTM F 1066. Tile shall meet the test requirements of UL 779. Tile shall be [300 x 300 mm, 12 x 12 inch,] [600 x 600 mm, 24 x 24 inch,] [900 x 900 mm, 36 x 36 inch, with heat welded seams,] 3 mm 1/8 inch thick. Insert tiles shall be conductive tiles with lettering in contrasting color reading "Conductive Floor, Do not Wax."

#### 2.2 ADHESIVE

Adhesive shall be a conductive adhesive specifically recommended by the manufacturer of the flooring.

## 2.3 WALL BASE

### 2.3.1 Resilient Base

Base shall be [Type I (rubber)] [or] [Type II (vinyl)] Style B, (coved).  
Base shall be [100] [150] mm [4] [6] inch high and a minimum 3 mm 1/8 inch  
thick. [Preformed outside] [Job formed] corners shall be furnished.

### 2.3.2 Self-Coving

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NOTE: Self-coving will be used when highest  
standard of cleanliness is required.  
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Self-coving shall consist of conductive floor tile over a cove stick and  
shall have [cove cap] [and optional metal corners] as recommended by the  
manufacturer of the tile.

## 2.4 ACCESSORIES

Accessories shall be as recommended by the manufacturer of the flooring.

## 2.5 ELECTRICAL GROUND CONNECTION

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NOTE: The conductive vinyl tile 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 conductive tile manufacturers  
during design stage regarding connections to  
external ground. Designer will show ground  
connection to the external ground on the drawings.  
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Connection between the conductive floor system and the external grounding  
system shall be provided. Contact with the conductive floor system shall  
be with conductive grounding strip and shall have the greater of the  
following: a minimum contact area of 5806 square mm (9 square inch) 9  
square inch or the dimensions recommended by the manufacturer. The  
grounding conductor shall be as recommended by the manufacturer of the  
flooring.

## 2.6 COLOR

Color shall be [in accordance with Section 09915 COLOR SCHEDULE] [\_\_\_\_\_].

## PART 3 EXECUTION

### 3.1 SURFACE CONDITIONS

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NOTE: Curing and sealing compounds should not be  
used on concrete surfaces to receive conductive  
vinyl tile. If a curing compound is required, it  
must be coordinated for compatibility with the  
flooring adhesive.

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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. 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. Cracks and irregularities shall be patched with a portland cement underlayment with a liquid latex binder.

### 3.2 INSTALLATION OF CONDUCTIVE VINYL TILE

Conductive vinyl tile flooring shall be installed with conductive adhesive 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. A grounding strap shall be installed.

### 3.3 INSTALLATION OF WALL BASE

#### 3.3.1 Topset Cove Base

Topset cove base shall be installed in a manner recommended by the manufacturer of the base.

#### 3.3.2 Self-Coving

The conductive vinyl flooring shall be coved [100] [150] mm [4] [6] inch up all walls, columns and pilasters. The coving shall be terminated at the top against a cove cap. A cove stick shall be placed at the floor-wall junction to support the coving at the bend. Metal corners, where indicated, shall be installed at outside and inside corners.

### 3.4 CLEANING AND PROTECTING

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. Boardwalks shall be placed over flooring in areas where subsequent building operations might damage the floor. Tiles that become loose, broken, or curled prior to acceptance, or tiles that do not conform to resistance requirements of UL 779 shall be removed and replaced.

### 3.5 TESTING

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**NOTE: For explosive and ammunition facilities,  
delete this paragraph.**

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Between 4 and 30 days after flooring installation is completed, and prior to its use, the flooring shall be tested in accordance with the test methods and electrode construction of NFPA 99. The resistance average shall be less than 1,000,000 ohms and more than 25,000 ohms. The measurements shall be made between five or more points of contact on the

floor in each room. In addition at least one surface to ground measurement shall be made for each point pair measured. In rooms where more than 93 square meters 1000 square feet of conductive tile has been installed a minimum of one surface and one surface to ground measurement shall be made for each 19 square meters 200 square feet of conductive tile and the results averaged. No individual floor to ground measurement shall be less than 10,000 ohms. Tests shall be made by a technician experienced in such work.

### 3.6 TESTING FOR EXPLOSIVE AND AMMUNITION FACILITIES

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**NOTE: For explosive and ammunition facilities, edit  
the following paragraph. For all other facilities  
delete this paragraph.**

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Electrical resistance test shall be performed on the installed floor. Instruments used in making tests shall be used only when the room is free from exposed explosives and flammable gas mixtures. Maximum floor resistance shall be measured with a suitably calibrated ohmmeter, which may operate on a normal open-circuit output voltage of 500 volts dc and a short circuit current of 2.5 milliamperes with an effective internal resistance of approximately two million ohms. Minimum floor resistance will be measured with a suitably calibrated ohmmeter appropriate for the task. Each electrode shall weigh 2.3 kg 5 pounds and shall have a dry, flat, circular contact area 63.5 mm 2-1/2 inches in diameter, which shall comprise a surface of aluminum or tin foil 0.0125 to 0.025 mm 0.0005 to 0.001 inch thick, backed by a layer of rubber 6 mm 1/4 inch thick and measuring between 40 and 60 durometer hardness as determined with a Shore Type A durometer ASTM D 2240. The floor shall be clean and dry, "electrode jelly" such as brushless shaving soap or saline solution shall not be used. The resistance of the floor at any one location shall be more than 5,000 ohms in areas with 110-volts service and 10,000 ohms in areas with 220-volt service, and an average of less than 1,000,000 ohms in all areas as measured between a permanent ground connection and an electrode placed at any point on the floor and also as measured between two electrodes placed 914.4 mm 3 feet apart at any point on the floor. Measurements shall be made at five or more locations in each room. If the resistance changes appreciably with time during a measurement, the value observed after the voltage has been applied for above 5 seconds shall be considered to be the measured value.

-- End of Section --