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USACE / NAVFAC / AFCEA / NASA UFGS-09445 (March 2005)  
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Preparing Activity: USACE MasterFormat™ 2004 - 09 66 23  
Superseding  
UFGS-09445 (August 2004)

## UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated 23 June 2005

Latest change indicated by CHG tags

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03/05

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### SECTION 09445

#### RESINOUS TERRAZZO FLOORING

03/05

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NOTE: This guide specification covers the requirements for resinous terrazzo flooring and conductive resinous terrazzo flooring.

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.

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PART 1 GENERAL

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NOTE: The resinous terrazzo floor systems covered by this guide specification may be used in lieu of portland cement terrazzo where the light weight of the thin set system would be advantageous.

The conductive resinous terrazzo flooring is primarily intended for use in areas where volatile materials are handled, clean-rooms, parachute assembly areas, etc. These systems, which have a wear factor four times better than cementitious terrazzo and five to six times better than vinyl may be used, when economically justified, in hard wear areas where there is a need for a high degree of cleanliness, a decorative effect, and some chemical resistance. These systems will not be used over

lightweight concrete and will not be used in lieu of quarry tile in kitchens.

The selection of a floor system for a location where resistance to specific conditions is important should be based upon the ability of the system to withstand required exposure conditions. For example, polyesters are suitable where resistance to detergents is required but should not be used in laboratory or other areas where spillage of sodium hydroxide or similar strong alkaline solution occurs; epoxies should not be used where resistance to oxidizing acids is required or where resistance to temperatures in excess of 54 degrees C (130 degrees F) is required; latex mastic and resin emulsions should not be used where resistance to strong acids or alkalis is required. Each job should be evaluated on its own merits considering exposure conditions, costs, and local experience with the various systems.

Areas to receive terrazzo will be shown on the drawings. Color should be shown by specifying a selected plate number from the NTMA publication, "Terrazzo Information Guide." Example: NTMA terrazzo catalog, plate No. S-301-4. Colors selected may be any combination of standard marble granules of domestic origin available in the local market, but it is highly desirable that color combinations be designated by NTMA color plates.

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## 1.1 REFERENCES

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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.

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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 56 (2002a) Flash Point by Tag Closed Cup Tester

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 99 (2005) Health Care Facilities

NATIONAL TERRAZZO & MOSAIC ASSOCIATION (NTMA)

NTMA Info Guide (2000) Terrazzo Information Guide

## 1.2 SUBMITTALS

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NOTE: Review submittal description (SD) definitions in Section 01330 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

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, 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.

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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.] [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-02 Shop Drawings

Approved Detail Drawings[; G][; G, [\_\_\_\_]]  
Strips[; G][; G, [\_\_\_\_]]

Control Joint Strips[; G][; G, [\_\_\_\_]]

Drawings indicating the type, size, and layout of divider strips and control joint strips.

#### SD-03 Product Data

Resin  
Mixing, Proportioning, and Installation  
Cleaning and Sealing

Resin manufacturer's descriptive data, mixing, proportioning, and installation instructions. Maintenance literature for terrazzo cleaning and sealing shall be included.

#### SD-04 Samples

Resinous Terrazzo Flooring

Two 150 x 150 mm 6 x 6 inches, (minimum) samples of each color of resinous terrazzo and two 150 mm 6 inches lengths, of each type of strip.

#### SD-07 Certificates

Conductive Resinous Terrazzo Flooring

Certificates indicating conformance with specified requirements. Certificates shall be accompanied by certified test reports showing that the conductive resinous terrazzo floor has been tested and meets the requirements specified.

### 1.3 GENERAL REQUIREMENTS

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NOTE: 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.

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Resinous terrazzo flooring, in the colors indicated, shall be applied in the areas shown on the approved detail drawings. Flooring shall be [[an epoxy terrazzo system that conforms to the requirements specified in paragraphs 2.01A and B of NTMA Info Guide] [or] [a polyester terrazzo flooring system that conforms to the requirements specified in paragraphs 2.01A and B of NTMA Info Guide.]] [a conductive [epoxy terrazzo system that conforms to the requirements specified in paragraphs 2.01A, B, and H of NTMA Info Guide.] [or] [polyester terrazzo flooring system that conforms to the requirements specified in paragraphs 2.10A, B, and J of NTMA Info Guide

].]

#### 1.4 QUALIFICATION OF APPLICATOR

Applicator shall be approved by the resin manufacturer and shall have a minimum of 3 years experience in the application of the materials to be used and shall have completed 8 successful installations within the past 2 years.

#### 1.5 DELIVERY AND STORAGE

Materials shall be delivered to the project site in manufacturer's original unopened containers. Materials shall be kept in a clean, dry, area with temperatures controlled between 10 and 33 degrees C 50 and 90 degrees F.

#### 1.6 ENVIRONMENTAL REQUIREMENTS

Areas to receive terrazzo shall be maintained at a temperature above 10 degrees C 50 degrees F for 2 days prior to installation and for 7 days following installation.

### PART 2 PRODUCTS

#### 2.1 PRIMER

Primer shall be a material recommended by the resin manufacturer which will penetrate the pores of the substrate and bond with the topping to form a permanent monolithic bond between the substrate and the topping.

#### 2.2 RESIN

Resin for the specified terrazzo flooring shall conform to the requirements shown in NTMA Info Guide.

#### 2.3 FILLERS

Fillers, if required, shall be inert mineral or cellulosic material as recommended by the manufacturer and best suited for the resin binder used. Fillers shall be furnished in the quantity necessary to impart the required color and physical characteristics.

#### 2.4 MARBLE CHIPS

Marble chips shall be of domestic origin of sizes and colors to match NTMA Info Guide color plate indicated [on the drawings] [in Section 09915 COLOR SCHEDULE]. Chips shall be a range of sizes up to and including the NTMA Standard No. 0 and Standard No. 1 for 6 mm 1/4 inch thick floors and Standard No. 0 through Standard No. 2 for 10 mm 3/8 inch thick floors.

#### 2.5 STRIPS

##### 2.5.1 Divider Strips

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NOTE: Location of strips will be shown on the drawings. Strips should be used at logical stops and expansion joints. Manufacturer's literature should be reviewed when making selections for strips.

**Plastic divider strips and control joint strips  
should be used with conductive type terrazzo.**

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Divider strips shall be as deep as required, [\_\_\_\_\_] mm gauge and of [brass] [zinc] [plastic in color as indicated [on the drawings] [in Section 09915 COLOR SCHEDULE]].

**2.5.2 Control Joint Strips**

Control joint strips shall be as deep as required, [\_\_\_\_\_] mm gauge and of [brass] [zinc] [plastic in color as indicated [on the drawings] [in Section 09915 COLOR SCHEDULE]]. Neoprene filler shall be [\_\_\_\_\_] mm inches thick in color as indicated [on the drawings] [in Section 09915 COLOR SCHEDULE].

**2.6 GROUT**

Grout shall be as recommended by the manufacturer of the resin.

**2.7 SEALER**

Sealer shall have a pH factor between 7 and 10 and shall be a penetrating type specially prepared for use on terrazzo. The sealer shall not discolor or amber the terrazzo and shall produce a slip resistant surface. Flash point of sealer shall be a minimum of 27 degrees C 80 degrees F when tested in accordance with ASTM D 56.

**PART 3 EXECUTION**

**3.1 PREPARATION OF CONCRETE SUBFLOOR**

Installation of the floor topping shall not commence until the concrete substrate is at least 28 days old. The concrete surfaces shall be prepared in accordance with the instructions of the resin manufacturer.

**3.2 MIXING, PROPORTIONING, AND INSTALLATION**

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**NOTE: Terrazzo topping thickness will be determined by the marble chip size indicated in the selected NTMA-01 color plate referenced in paragraph MARBLE CHIPS. If the cross-section is less than 10 mm (3/8 inch) the use of No. 1 and No. 0 size chips will be required. Delete last sentence if resinous terrazzo bases are not required.**

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Mixing, proportioning, and installing shall be in accordance with the approved instructions of the manufacturer. Strips shall be installed in locations indicated. The topping shall be applied to give a finish thickness of [6] [10] mm [1/4] [3/8] inch. Bases shall be cove type cast-in-place with 25 mm 1 inch radius cove and shall be [100] [150] mm [4] [6] inch high.

**3.3 TESTING**

Between 30 and 45 days after flooring installation is completed, and prior to its use, the conductive resinous terrazzo flooring shall be tested in accordance with paragraph 12-4.1.3.8(b) (7) of NFPA 99. The resistance of

the conductive floor at any one location shall be more than 5,000 ohms in areas with 110 volts service, more than 10,000 ohms in areas with 220 volt service, and average less than 1,000,000 ohms and more than 25,000 ohms in all areas.

#### 3.4 CLEANING AND SEALING

The terrazzo shall be washed with a neutral cleaner and where required shall be cleaned with a fine abrasive to remove any stains or cement smears. The cleaned surfaces shall be rinsed. When dry, a terrazzo sealer shall be applied in accordance with the manufacturer's directions.

#### 3.5 PROTECTION

The terrazzo work shall be covered and protected from damage until completion of the work of all other trades.

-- End of Section --