

**SECTION 09 30 00**  
**CERAMIC TILING**

**PART 1 - GENERAL**

**1.1 DESCRIPTION**

- A. This section specifies floor tile.

**1.2 RELATED WORK**

- A. Sealing of joints where specified: Section 07 92 00 JOINT SEALANTS.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES.
- B. Samples:
1. Floor and base tile.
  2. Grout.
- C. Product Data:
1. Ceramic tile, marked to show each type, size, and shape required.
  2. Latex-Portland cement mortar and grout.
  3. Slip resistant tile.
- D. Certification:
1. Master grade, ANSI A137.1.
  2. Manufacturer's certificates indicating that the following materials comply with specification requirements:
    - a. Latex-Portland cement mortar and grout.

**1.4 DELIVERY AND STORAGE**

- A. Deliver materials in containers with labels legible and intact and grade-seals unbroken.
- B. Store material to prevent damage or contamination.

**1.5 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in text by basic designation only.
- B. American National Standards Institute (ANSI):
- A10.20-1988.....Safety Requirements for Ceramic Tile, Terrazzo, and Marble Works
- A108.1A-1999.....Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar
- A108.1B-1999.....Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with dry-Set or latex-Portland Cement Mortar
- A108.1C-1999.....Contractors Option; Installation of Ceramic Tile in the Wet-Set method with Portland Cement

Mortar or Installation of Ceramic Tile on a  
Cured Portland Cement Mortar Setting Bed with  
Dry-Set or Latex-Portland Cement Mortar

A108.4-1999.....Installation of Ceramic Tile with Organic  
Adhesives or Water Cleanable Tile Setting Epoxy  
Adhesives

A108.5-1999.....Installation of Ceramic Tile with Dry-Set  
Portland Cement Mortar or Latex-Portland Cement  
Mortar

A108.6-1999.....Installation of Ceramic Tile with Chemical  
Resistant, Water Cleanable Tile-Setting and  
Grouting Epoxy

A108.8-1999.....Installation of Ceramic Tile with Chemical  
Resistant Furan Resin Mortar and Grout

A108.9-1999.....Installation of Ceramic Tile with Modified Epoxy  
Emulsion Mortar/Grout

A108.10-1999.....Installation of Grout in Tilework

A108.11-1999.....Interior Installation of Cementitious Backer  
Units

A108.12-1999.....Installation of Ceramic Tile with EGP (Exterior  
Glue Plywood) Latex-Portland Cement Mortar

A108.13-1999.....Installation of Load Bearing, Bonded, Waterproof  
Membranes for Thin-Set Ceramic Tile and  
Dimension Stone

A118.1-1999.....Dry-Set Portland Cement Mortar

A118.3-1999.....Chemical Resistant, Water Cleanable Tile-Setting  
Epoxy and Water Cleanable Tile-Setting and  
Grouting Epoxy Adhesive

A118.4-1999.....Latex-Portland Cement Mortar

A118.5-1999.....Chemical Resistant Furan Mortars and Grouts for  
Tile Installation

A118.6-1999.....Standard Cement Grouts for Tile Installation

A118.7-1999.....Polymer Modified Tile Gouts for Tile  
Installation

A118.8-1999.....Modified Epoxy Emulsion Mortar/Grout

A118.9-1999.....Cementitious Backer Units

A118.10-1999.....Load Bearing, Bonded, Waterproof Membranes for  
Thin-Set Ceramic Tile and Dimension Stone  
Installation

A118.11-1999.....EGP (Exterior Glue Plywood) Latex-Portland  
Cement Mortar

- A136.1-1999.....Organic Adhesives for Installation of Ceramic Tile
- A137.1-1988.....Ceramic Tile
- C. American Society For Testing And Materials (ASTM):
- A185-06.....Steel Welded Wire Fabric, Plain, for Concrete Reinforcing
- C241-90 (R2005).....Abrasion Resistance of Stone Subjected to Foot Traffic
- C627-93(R1999).....Evaluating Ceramic Floor Tile Installation Systems Using the Robinson-Type Floor Tester
- C954-00.....Steel Drill Screws for the Application of Gypsum Board on Metal Plaster Base to Steel Studs from 0.033 in (0.84 mm) to 0.112 in (2.84 mm) in thickness
- C979-99.....Pigments for Integrally Colored Concrete
- C1002-01.....Steel Self-Piercing Tapping Screws for the Application of Panel Products
- C1027-99.....Determining "Visible Abrasion Resistance on Glazed Ceramic Tile"
- C1028-96.....Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull Meter Method
- D. Marble Institute of America (MIA): Design Manual III-1999
- E. Tile Council of America, Inc. (TCA):
- 2003 - 2004.....Handbook for Ceramic Tile Installation

## **PART 2 - PRODUCTS**

### **2.1 TILE**

- A. Comply with ANSI A137.1, Standard Grade, except as modified:
1. Inspection procedures listed under the Appendix of ANSI A137.1.
  2. Abrasion Resistance Classification:
    - a. Tested in accordance with values listed in Table 1, ASTM C 1027.
    - b. Class IV, 6000 revolutions.
  3. Slip Resistant Tile for Floors:
    - a. Coefficient of friction, when tested in accordance with ASTM C1028, required for level of performance:
      - 1) Not less than 0.6, for wet and dry conditions.
  4. Factory Blending: For tile with color variations, within the ranges selected during sample submittals blend tile in the factory and package so tile units taken from one package show the same range in colors as those taken from other packages and match approved samples.

5. Factory-Applied Temporary Protective Coating:

- a. Protect exposed face surfaces (top surface) of tile against adherence of mortar and grout by pre-coating with a continuous film of petroleum paraffin wax, applied hot.
- b. Do not coat unexposed tile surfaces.
- c. Pre-wax tiles set or grouted with furan or epoxy or latex modified mortars.

**2.2 SETTING BED MATERIALS**

A. Acceptable Manufacturers:

1. Bostik Construction Products, Huntington Valley, PA.
2. Laticrete International, Bethany, CT.
3. Mapei Corporation, Elk Grove Village, IL.
4. Summitville Tiles, Inc., Summitville, OH.

B. Dry-Set and Polymer Modified Thin-Set Mortar: Two component system; factory prepared, high bond strength dryset mortar and liquid polymer additive; ANSI A118.4.

1. Polymer Additive: Acrylic latex or Styrene Butadiene latex additive.
2. Acceptable Products:
  - a. Hydroment Tile Mate and Flex-A-Lastic 447 Flexible Mortar Admixture, Bostic Construction Products.
  - b. Laticrete 4237 Mortar Admix with Laticrete 211 Crete Filler, Laticrete International. Kerabond and Keralastic, Mapei Corporation.

**2.4 GROUTING MATERIALS**

A. Coloring Pigments:

1. Pure mineral pigments, limeproof and nonfading, complying with ASTM C979.
2. Add coloring pigments to grout by the manufacturer.
3. Job colored grout is not acceptable.
4. Use is required in Commercial Portland Cement Grout, Dry-Set Grout, and Latex-Portland Cement Grout.

B. Latex-Portland Cement Grout: ANSI A118.6 color as specified.

1. Unsanded grout mixture for joints 3.2 mm (1/8 inch) and narrower.
2. Sanded grout mixture for joints 3.2 mm (1/8 inch) and wider.

**2.5 PATCHING AND LEVELING COMPOUND**

A. Portland cement base, polymer-modified, self-leveling compound, manufactured specifically for resurfacing and leveling concrete floors. Products containing gypsum are not acceptable.

B. Shall have minimum following physical properties:

1. Compressive strength - 25 MPa (3500 psig) per ASTM C109/C109M.

- 2. Flexural strength - 7 MPa (1000 psig) per ASTM C348 (28 day value).
- C. Capable of being applied in layers up to 38 mm (1-1/2 inches) thick without fillers and up to 100 mm (four inches) thick with fillers, being brought to a feather edge, and being trowelled to a smooth finish.
- D. Primers, fillers, and reinforcement as required by manufacturer for application and substrate condition.
- E. Ready for use in 48 hours after application.

## **2.7 WATER**

- A. Clean, potable and free from salts and other injurious elements to mortar and grout materials.

## **2.8 CLEANING COMPOUNDS**

- A. Specifically designed for cleaning masonry and concrete and which will not prevent bond of subsequent tile setting materials including patching and leveling compounds and elastomeric waterproofing membrane and coat.
- B. Materials containing acid or caustic material not acceptable.

# **PART 3 - EXECUTION**

## **3.1 ENVIRONMENTAL REQUIREMENTS**

- A. Maintain ambient temperature of work areas at not less than 16 degree C (60 degrees F), without interruption, for not less than 24 hours before installation and not less than three days after installation.
- B. Maintain higher temperatures for a longer period of time where required by manufacturer's recommendation and ANSI Specifications for installation.
- C. Do not install tile when the temperature is above 38 degrees C (100 degrees F).
- D. Do not install materials when the temperature of the substrate is below 16 degrees C (60 degrees F).
- E. Do not allow temperature to fall below 10 degrees C (50 degrees F) after fourth day of completion of tile work.

## **3.2 ALLOWABLE TOLERANCE**

- A. Variation in plane of sub-floor, including concrete fills leveling compounds:
  - 1. Not more than 1 in 1000 (1/8 inch in 10 feet) where dry-set Portland cement, and latex-Portland cement mortar setting beds and chemical-resistant bond coats are used.

## **3.3 SURFACE PREPARATION**

- A. Cleaning New Concrete or Masonry:
  - 1. Chip out loose material, clean off all oil, grease dirt, adhesives, curing compounds, and other deterrents to bonding by mechanical

- method, or by using products specifically designed for cleaning concrete and masonry.
2. Use self-contained power blast cleaning systems to remove curing compounds and steel trowel finish from concrete slabs where ceramic tile will be installed directly on concrete surface with thin-set materials.
  3. Steam cleaning or the use of acids and solvents for cleaning will not be permitted.
- B. Patching and Leveling:
1. Mix and apply patching and leveling compound in accordance with manufacturer's instructions.
  2. Fill holes and cracks and align concrete floors that are out of required plane with patching and leveling compound.
    - a. Thickness of compound as required to bring finish tile system to elevation shown.
    - b. Float finish except finish smooth for waterproofing.
    - c. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.

### **3.4 CERAMIC TILE - GENERAL**

- A. Comply with ANSI A108 series of tile installation standards in "Specifications for Installation of Ceramic Tile" applicable to methods of installation.
- B. Comply with TCA Installation Guidelines
- C. Workmanship:
1. Lay out tile work so that no tile less than one-half full size is used. Make all cuts on the outer edge of the field.
  2. Set tile firmly in place with finish surfaces in true planes. Align tile flush with adjacent tile unless shown otherwise.
  3. Form intersections and returns accurately.
  4. Cut and drill tile neatly without marring surface. All edges shall be wet saw cut.
  5. Completed work shall be free from hollow sounding areas and loose, cracked or defective tile.
  6. Remove and reset tiles that are out of plane or misaligned.
  7. Floors:
    - a. Align finish surface of new tile work flush with other and existing adjoining floor finish where shown.
    - b. Shove and vibrate tiles over 200 mm (8 inches) square to achieve full support of bond coat.
  8. Joints:

- a. Keep all joints in line, straight, level, perpendicular and of even width unless shown otherwise.

### **3.5 GROUTING**

A. Grout Type and Location:

1. Grout for paver tile: Latex-Portland cement grout.

B. Workmanship:

1. Install and cure grout in accordance with the applicable standard.
2. Portland Cement grout: ANSI A108.10.
3. Furan and Commercial Portland Cement Grout: ANSI A108.8 and in accordance with the manufacturer's printed instructions.
4. Dry-set grout: ANSI A108.5.

### **3.6 MOVEMENT JOINTS**

- A. Prepare tile isolation joints for installation of sealant. Refer to Section 07 92 00, JOINT SEALANTS.
- B. TCA details EJ 171-02.
- C. Rake out grout at joints at toe of base not less than 6 mm (1/4 inch) deep.

### **3.7 CLEANING**

- A. Thoroughly sponge and wash tile. Polish glazed surfaces with clean dry cloths.
- B. Methods and materials used shall not damage or impair appearance of tile surfaces.
- C. The use of acid or acid cleaners on glazed tile surfaces is prohibited.

### **3.8 PROTECTION**

- A. Keep traffic off tile floor, until grout and setting material is firmly set and cured.
- B. Where traffic occurs over tile floor, cover tile floor with not less than 9 mm (3/8 inch) thick plywood, wood particle board, or hardboard securely taped in place. Do not remove protective cover until time for final inspection. Clean tile of any tape, adhesive and stains.

### **3.9 TESTING FINISH FLOOR**

- A. Test floors in accordance with ASTM C627 to show compliance with codes 1 through 10.

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