



## TECHNICAL INFORMATION

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CES-311

05/20 SUPERSEDES 10/12 PAGE 1 OF 7

### **ERGONARMOR SPECIFICATION FOR INSTALLATION**

#### **TUFCHEM™ TILING SYSTEMS**

##### **1. SCOPE**

- 1.1 Corrosion-resistant tile flooring is broadly used in the food and beverage and pharmaceutical processing industries as a durable and aesthetically pleasing floor to provide protection to concrete from organic and inorganic acids, salts, detergents, alkali cleaning agents, oils, solvents and a variety of organic foodstuffs as typically found in industrial food processing facilities. The tile lining functions as a mechanical and thermal barrier to protect the underlying concrete and provide a sanitary and hygienic working surface.
- 1.2 The following specification governs materials, preparation and installation of TUFCHEM Tiling Systems tile flooring system, employing the sonic embedment method of application. This method was designed to achieve maximum performance and aesthetics from the finished floor.
- 1.3 The corrosion-resistant tile floor system shall be installed onto a substrate prepared using either of the following methods, depending on the construction method used to create the slope in the floor:
  - 1.3.1. Directly bonded to a pre-sloped structural concrete slab, using a 100% epoxy setting bed at a nominal 3/16 in.-1/8 in. (2.4-3.2 mm) thick.
  - 1.3.2. Bonded to a sand/cement sloping bed consisting of a latex-modified Portland cement mixture specifically prepared with minimal moisture content. Minimum thickness of sloping bed shall be 3/4 in. (19 mm), maximum thickness 3 in. (75 mm). Tiling contractor shall be familiar with requirements of mix design suitable to accept subsequent tile lining.
- 1.4 Architect Selections:

**TUFCEM™ TILING SYSTEMS**  
**SPECIFICATION CES-311**  
**05/20 SUPERSEDES 10/12 PAGE 2 OF 7**

Architect/specifier has selected the following project-specific materials as noted below:

Membrane: \_\_\_\_\_  
Tile: \_\_\_\_\_  
Shape: \_\_\_\_\_  
Tile Surface Texture: \_\_\_\_\_  
Tile Color: \_\_\_\_\_  
Setting Bed Material: \_\_\_\_\_  
Side Jointing: \_\_\_\_\_  
Expansion Jointing: \_\_\_\_\_

## **2. MATERIALS OF CONSTRUCTION**

### **2.1 Ceramic Tile**

#### **2.1.1 Tile Properties**

Tile shall be fully vitrified industrial ceramic units, exhibiting the following physical properties (project specific, to be completed by specifier, (typical example below):

Thickness:  $\frac{3}{4}$  in. (18 mm)

Shape: 4 in. x 8 in. (100 x 200 mm) rectangular for edging and 4  $\frac{1}{4}$  in. x 5 in. (108 x 127 mm) hexagonal for open floor areas, with integral spacer lugs.

Hardness: >7 on Moh Scale.

Absorption: 0.1% - 0.3%.

Acid Resistance: No trace of deterioration when tested to DIN EN99.

Color: As specified by Architect after consultation with an ErgonArmor representative.

Surface Texture: R11, R12, R12 V04, R12 V06, and R13 V10.

### **2.2 Setting Bed**

#### **2.2.1 Epoxy Setting Bed - Normal Service Applications**

The setting bed material shall be Thinset™ Adhesive, a 100% reactive epoxy adhesive composed of an epoxy resin, chemically curing hardener and Thinset Filler as outlined on ErgonArmor data sheet CE158, most current revision. The epoxy setting bed shall have a minimum tensile strength of 2500 psi (17.2 MPa) when tested in accordance with ASTM C307. Water absorption of the setting bed

**TUFCEM™ TILING SYSTEMS**  
**SPECIFICATION CES-311**  
**05/20 SUPERSEDES 10/12 PAGE 3 OF 7**

material shall not be greater than 0.3% (ASTM C413) and shall be suitable for the sonic embedment method of installation.

**2.2.2 Epoxy Setting Bed - Severe Service Applications**

For areas of severe thermal shock or chemical exposure, epoxy setting bed shall be Thinset™ Novolac Adhesive, a 100% reactive epoxy adhesive consisting of 6710 Resin, 6711 Hardener and Thinset Filler as outlined on ErgonArmor data sheet CE158A, most current revision. The epoxy setting bed be suitable for the sonic embedment method of installation.

**2.2.3 Epoxy Setting Bed - Electrically Conductive Flooring Application**

For areas where an electrically conductive flooring system is required, epoxy setting bed shall be Thinset Novolac Adhesive Carbon Grade, a 100% reactive epoxy adhesive composed of 6710 Resin, 6711 Hardener and PENNTROWEL™ L/F Filler - Carbon Grade as outlined on ErgonArmor data sheet CE158B, most current revision. The epoxy setting bed shall be suitable for the sonic embedment method of installation.

**2.2.4 Epoxy Setting Bed - Primer**

For projects where additional protection of Penntrowel Epoxy Primer is desired under the setting bed, or for projects where a fully cured concrete or concrete leveling bed cannot be assured, Penntrowel Epoxy Primer (data sheet CE-139) shall be applied onto the concrete and allowed to dry to touch before installation of Thinset Adhesive.

**2.3 Side Jointing Grout**

**2.3.1 Water-Cleanable Epoxy Grout**

Chemically resistant grout shall be Penntrowel™ EZ Grout 100, designed specifically to be compatible with the sonic embedment method of installation as outlined on ErgonArmor data sheet CE-321 most current revision. Grout shall be a 100% solids epoxy composition, consisting of three components. Grout must be able to completely fill .080 in. (2 mm) joint without voids or pinholes.

**2.3.2 Water Cleanable Novolac Grout**

**TUFCEM™ TILING SYSTEMS**  
**SPECIFICATION CES-311**  
**05/20 SUPERSEDES 10/12 PAGE 4 OF 7**

For more severe chemical exposure, chemically resistant grout shall be Penntrowel™ EZ Grout 200, designed specifically to be compatible with the sonic embedment method of installation as outlined on ErgonArmor data sheet CE-330 most current revision. Grout shall be 100% solids, epoxy composition, consisting of three components. Grout must be able to completely fill .080 in. (2 mm) joint without voids or pinholes.

#### 2.3.3 Furan Grout

For applications requiring the chemical resistance of furan-based grouts, chemically-resistant furan grout shall be Furalac™ Red Panel as outlined on ErgonArmor data sheet CE- 130, most current revision. The grout shall be resistant to organic and non-oxidizing inorganic acids, most cleaning agents and detergents, oils, solvents and mineral salts. The grout shall be compatible with fully vitrified ceramic tile, and low absorption 0.5% or less. Required installation method adjustments shall be made when using this type of grout.

#### 2.3.4 Vinyl Ester Grout

Where resistance to strong bleaching agents, chlorine and strong oxidizing inorganic acids, vinyl ester grout shall be used as a side joint material. The vinyl ester grout shall be Pennchem™ Tile Grout as outlined on ErgonArmor data sheet CE271, most current revision, or Pennchem CIP Tile Grout (CE-160). Required installation method adjustments shall be made when using this type of grout. Consult ErgonArmor for tile waxing information.

### 2.4 Expansion Joints

2.4.1 Expansion Joints are required to accommodate mechanical or thermal stresses in the flooring. Expansion joints shall be placed as required to allow for thermal differential stresses between tile lining and substrate.

#### 2.4.2 Expansion Joint - Type

Expansion joints shall be one of the following types of expansion joint design:

2.4.2.1 Liquid Applied Jointing - Shall be Flexjoint™ Joint Filler as outlined on ErgonArmor data sheet CE133, most current revision, and shall

**TUFCEM™ TILING SYSTEMS**  
**SPECIFICATION CES-311**  
**05/20 SUPERSEDES 10/12 PAGE 5 OF 7**

exhibit a Shore A hardness of 70-80. TUFCEM II Joint Sealant (data sheet CE-135) shall be used in areas requiring maximum movement capability with less load bearing capability and shall have a Shore A hardness of 20-30. Flexjoint U500 (CE-134) with a shore A hardness of 70-80 and quick set characteristics shall be used where those properties are desired.

A 100% closed cell foam rod should be installed, such that the foam rod shall be placed into the joint bottom and correct depth to width profiles shall be maintained. Joint width shall be a nominal 3/8 in. (9 mm).

- 2.4.2.2 Prefabricated Jointing - Shall be an ErgonArmor prefabricated Joint Sealing System using pre-vulcanized extruded rubber and stainless steel channel. Consult ErgonArmor for details.

2.4.3 Expansion Joint Locations

Consult ErgonArmor for project-specific details. Expansion joints shall generally be installed in accordance with industry-accepted practice with-in the following guidelines:

- 1 - Around all fixed objects except drains.
- 2 - Around the periphery of all rooms.
- 3 - All points of movement in concrete slab.
- 4 - Expansion Joints shall be located near the crown of a sloped floor.
- 5 - Drains should be located as nearly as possible to the midpoint between expansion joints.

2.5 Membranes

- 2.5.1 For projects where a chemical-resistant waterproofing membrane layer is desired between the structural concrete slab and sand: cement sloping bed, one of the following membranes shall be selected after consultation with a representative of ErgonArmor to determine most suitable membrane selection:

- 2.5.1.1 Penncoat™ 101 ¼ in. (6 mm) hot melt membrane
- 2.5.1.2 Tufchem™ II 1/8 in. (3 mm) cold applied liquid membrane
- 2.5.1.3 Penncoat 600 1/16 in. (1.5 mm) sheet membrane

**3. CONCRETE PREPARATION**

- 3.1 New concrete shall be structurally sound, homogeneously poured, clean,

**TUFCEM™ TILING SYSTEMS**  
**SPECIFICATION CES-311**  
**05/20 SUPERSEDES 10/12 PAGE 6 OF 7**

free of dirt or contamination, and dry. It shall have been moist-cured to achieve 3,000 psi (20 MPa) minimum compressive and 200 psi (1.4 MPa) tensile strength. The base slab shall be wood float finished, with no low spots where puddles can form when slab is flooded with water. Concrete should have smooth surface and be sloped to drain at 1/8 in. per foot (10 mm per m) or as mutually agreed by owner, architect and contractor.

Consult ErgonArmor regarding maximum allowed residual moisture content before proceeding tile work.

Prior to commencement of any work, the flooring contractor shall thoroughly examine all floor surfaces, and report any conditions which will adversely affect proper floor installation including low spots and bird-baths, and a suitable method to repair shall be agreed.

- 3.2 Existing concrete which is clean, dry, structurally sound, and can safely support the superimposed load shall be considered satisfactory. Contaminated concrete which otherwise meets these requirements shall be thoroughly cleaned and left clean and dry. Eroded, broken, chipped and cracked concrete shall be repaired and cured prior to installation of tile or brick. If not provided in the existing slab, a slope of 1/8 in. per foot (10 mm per m) to the drains shall be established unless agreed in writing to be less.

3.3 Sand-cement Sloping Bed

¾ in. to 3 in. (20 mm to 75 mm) of latex impregnated sand/cement sloping bed of adequate strength and of correct mix design shall be used to create slope to drain when required. Sloping bed shall be installed by tile installation contractor and shall be of a mix design and surface finish suitable for Tufchem Tiling Systems.

**4. INSTALLATION**

- 4.1 Installation of all components of tile lining including membrane, sloping bed, tile and setting bed, grout, and expansion joints shall be by an ErgonArmor approved and trained contractor familiar with the installation techniques associated with Tufchem Tiling Systems.

- 4.2 A test panel of a nominal 100 square feet (10 sm) shall be installed for inspection before commencement of work and shall be used to establish expected standards to which subsequent work shall be performed. Written sign-offs as to acceptance of test panel shall be provided by general contractor, owner, or architect as required for the specific project.

- 4.3 Commencement of work by tiling contractor shall be deemed as acceptance of structural concrete substrate. Deficiencies such as cracks, incorrect elevations, bird-baths, incorrect slopes, or other shall be noted in writing by tiling contractor and resolved before commencement of tile lining work.

## **5. INSTALLATION TEMPERATURES**

- 5.1 Tufchem Tiling Systems utilize a variety of resinous chemically setting materials whose performance and handling characteristics are affected by adverse temperature conditions. All installation work shall be performed at temperatures between 50°F and 80°F (10°C - 26°C). In the event required temperatures cannot be met, agreement shall be made in advance of commencement of work as to who is to accept responsibility for providing required climactic conditions.

## **6. SAFETY PRECAUTIONS / DISCLAIMER**

- 6.1 Mixes and applications of this product present a number of hazards. Read and follow the hazard information, precautions and first aid directions on the individual product labels and safety data sheets before using. While all statements, technical information, and recommendations contained herein are based on information our company believes to be reliable, nothing contained herein shall constitute any warranty, express or implied, with respect to the products and/or services described herein and any such warranties are expressly disclaimed. We recommend that the prospective purchaser or user independently determine the suitability of our product(s) for their intended use. No statement, information or recommendation with respect to our products, whether contained herein or otherwise communicated, shall be legally binding upon us unless expressly set forth in a written agreement between us and the purchaser/user. For all Terms and Conditions of Sale see [ergonarmor.com](http://ergonarmor.com).
- 6.2 Please contact ErgonArmor for specific recommendations at (877) 982-7667 or +1-601-933-3595.