



TDS.22.3.2A

Matrix

Fiber - Infused
Geopolymer
Concrete Series

Matrix™ is a Series of fiber reinforced, engineering cementitious composite (ECC) Geopolymer mix designs, engineered for harsh, and extreme environments. Matrix™ is Green Technology and ideal for use in applications requiring quick return to service (RTS). Matrix doesn't shrink, and can also be sprayed up as a vertical overhead mix, consisting of lightweight, trowel-able material.

The Matrix™ Series is available in many custom designs for Fire Proofing (M-250-FP); resistance to all types of acids (see back of page), doesn't shrink, and can be colored. and is an excellent choice for concrete storage vessels containing nuclear waste. Matrix is highly recommended for use in the following industrial applications:

Petrochemical, Mining, Fertilizer, Foundry, and Oil & Gas Industries – to include off-shore drilling platforms. Matrix can be used in any other application (typically observed with Portland Cement) and in conjunction with other green systems like BFRP (Basalt Fiber Reinforced Polymer) Rebar as an alternative to corrosive steel rebar.

Matrix Specifications:

Compressive Strengths

- 3 Hours Custom
- 24 Hours Custom
- 7 Days Typical 4000 psi
- 28 Days Custom 5000 – 9000 psi

Flexural Strength

- 7 Days Typical 600 - 800 psi
- 28 Days Typical 800 - 1200 psi

Splitting Tensile Strength

- 7 Days Typical 600 - 800 psi
- 28 Days Typical 1000 - 1600 psi

Bond Strength

Greater Bond Modulus v. PCC

Product Yield

- ◆ 1, 5 Gallon Pail is equal to 0.5 ft³
- ◆ 1, 3-Part System is equal to 1.0 ft³



Recommendations: Mixing, Placing & Finishing

MIXING: When mixing pails, pour 1.1 gallons of water into Matrix Mixes, and mix at low speed revolutions for 2 – 3 minutes. When mixing the 3-Part System, use 2.2 gallons of water. **Note:** Pour ~80% of the water into the mix first, then the balance after initial mixing time. Avoid high-speed mixing to prevent entrapped air that can come with excessive mixing – either at the plant or after the truck arrives. Matrix is designed to suspend aggregate, even at higher slumps.

PLACING: Placement procedures are similar to Portland mixtures. The placement area should be clean and free of debris; and moistened but not wet. The minimum depth should be no less than 0.5 inches for a good flat surface and contact area. Avoid “feathering in” the edges.

FINISHING: Finishing procedures are similar to Portland, however, no bleed water will develop, and no curing compounds are necessary. Matrix may attain a blueish color, but will dissipate during curing process.

Matrix™ is resistant to freeze / thaw cycles, most natural and man-made reagents and immune to Chloride and Sulfate attack, along with various concentrations of acids with little to no loss of mass:

- M-200 Resistant to Sulfuric Acid – up to 98% Concentrations**
- M-250 Lightweight - Sprayable Fire-Proofing – w/ Acid Resistance**
- M-300 Resistant to Hydrochloric Acid – up to 57% Concentrations**
- M-400 Resistant to Acetic Acid – up to 98% Concentrations**
- M-500 Resistant to Phosphoric Acid – up to 85% Concentrations**
- M-600 Resistant to Hydrofluoric Acid – up to 50% Concentrations**

Temperature Range

Typical range is from above Freezing up to 120°F; with a Target Temperature of 85 - 90°F for Optimal placement characteristics. The higher the temperature, the faster the set time. The ground, or existing concrete temperature, should be no more than 120°F. It's important to remember that all pre-testing should be conducted in the field; under similar temperature conditions as the application, vs in a laboratory. Matrix is Exothermic for the first 30 seconds after the water is mixed, and then becomes Endothermic thereafter. Therefore, about 20 – 30 degrees [F] of heat is generated from the initial water mixing process, and then the material no longer produces heat, but rather absorbs it. That is why the maintenance of the application's targeted temperature conditions be maintained – even in trials.

Caution is advised for Water Additions!

The Matrix Series of mixes are designed to only require approximately one-half (1/2) or less of the water that is typically required to increase the slump in Portland Cement mixtures. Please refrain from adding additional water beyond what's recommended without first consulting our experts.

Normal Safety Precautions

Just like Portland, batching procedures for Matrix are critical. Employees should be protected from inhaling dry materials and any materials making contact with skin or clothing, and should be cleaned immediately. Matrix has a higher pH than Portland in its dry state, however after batching, and in its plastic phase, Matrix has a similar pH as Portland.

Typical Shelf-Life and Storage

The shelf-life of stored Matrix materials is approximately 3 years for unopened Pails and Plastic Bags when stored in a humidity and temperature controlled environment.

Testing and Approvals

Matrix complies with ASTM C1157 Standard Performance Specification for Hydraulic Cement, and all applicable building code requirements for interaction with conventional reinforcing steel, strength and modulus properties.

Matrix does not comply with typical industrial Portland Cement specifications due to the absence of Portland Cement.

Disclaimer: The information contained herein is to guide customers in determining whether Matrix™ is a suitable product for their applications. It is suggested that all customers inspect and test products before their final use and satisfy themselves as to the product's performance and suitability for their application. Nothing noted herein shall constitute as a warranty, expressed or implied, including any warranty of merchantability or fitness, nor is protection from any law or patent inferred. Matrix products must be used in accordance with applicable codes and manufacturer's instructions. The exclusive remedy for any proven claims is material replacement.