Tufchem™ Silicate Concrete - Foundation Grade

SELECTION & SPECIFICATION DATA

Type

Inorganic potassium silicate polymer concrete

Description

Tufchem Silicate Concrete - Foundation Grade is a 2-component inorganic potassium silicate polymer concrete. It is formulated for the casting method of placement. It is supplied with factory dispersed polypropylene fibers to improve tensile properties and minimize hairline shrinkage cracking. It should be installed at a minimum thickness of 1.5 inches (38 mm).

Uses

Tufchem Silicate Concrete - Foundation Grade is resistant to all concentrations of most acids including sulfuric, hydrochloric, nitric, chromic, acetic and phosphoric.

Features

- User friendly, handles similarly to Portland cement concrete.
- Can be pumped using conventional pumping equipment.
- Does not generate heat during cure. No limit on placement thickness.
- High temperature resistance

Limitations

- Not resistant to alkaline or caustic solutions. It is not resistant to hydrofluoric acid or for use beyond its chemical resistance or thermal capabilities.
- Tufchem Silicate Concrete - Foundation Grade should be used over a membrane in continuously wet service areas.
- Requires formwork for vertical applications.
- Consult Armor with specific questions.

INSTALLATION GUIDANCE

Reference Specifications

CES-343 Armor Specification for the installation of Tufchem Silicate Concrete - Foundation Grade.

Installation Conditions

Tufchem Silicate Concrete - Foundation Grade is formulated for ideal handling at 70°F (21°C). Do not use below 50°F (10°C).

Ratio

1.0-part solution: 5.75-6.25 parts powder by weight

Ratio may be adjusted slightly to suit applicator's handling preferences.

Mixing

Pour measured quantity of solution into a clean, dry mixing vessel. Slowly add measured quantity of powder to solution and power mix until thoroughly wetted. For large volume applications Tufchem Silicate Concrete - Foundation Grade can be mixed using mobile ready-mix trucks. It can also be pumped using conventional concrete pumping equipment.

The mix ratio of Tufchem Silicate Concrete - Foundation Grade can be varied from 5.75:1 to 6.25:1 Powder to Solution by weight to adjust handling properties as desired. Consult CES-343 for full details.

To maximize adhesion to Portland cement concrete, apply Tufchem Silicate Solution as a primer and cast Tufchem Silicate Concrete-FG over it before the primer is allowed to dry.

Work Life

40 - 60 minutes at 50°F (10°C)
30 - 40 minutes at 70°F (21°C)
15 - 30 minutes at 90°F (32°C)

Cleanup

Water

CURE TIME

Temperature	Initial Set	Foot traffic	Full Cure
70°F (21°C)	30-45 minutes	16 hours	28 days

SAFETY

Safety

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.

Ventilation

Provide thorough air circulation during and after application until the material has cured when used in enclosed areas.

Tufchem™ Silicate Concrete - Foundation Grade

PACKAGING, ESTIMATING & HANDLING

Product	Code	Packaging
Tufchem Silicate Solution	19546	44 lb (20 kg) pail
	19547	600 lb (272 kg) drum
Tufchem Silicate Powder with polypropylene fibers	19537	55 lb (25 kg) bag
	29627	1,500 lb (680 kg) sack
	29571	1,875 lb (850 kg) sack
	19538	2,176 lb (987 kg) sack

A 319 lb (145 kg) unit consists of 1 x 44 lb (20 kg) pail of solution and 5 x 55 lb (25 kg) bags of powder and will yield 2.28 ft^3 (0.065 m^3). A 4,350 lb (1,973 kg) unit consists of 1 x 600 lb (272 kg) drum and 2 x 1,875 lb (850 kg) sacks and will yield 31.1 ft^3 (0.88 m^3). A 4,175 lb (1,894 kg) unit consists of 1 x 600 lb (272 kg) drum and 65 x 55 lb (25 kg) bags and will yield 29.8 ft^3 (0.84 m^3).

When using large sacks of powder maintain a mix ratio in the range of 5.75-6.25:1 powder to solution.

Theoretical Coverage

23.4 mixed lb per ft^2 at 2 inches thickness. (114.2 kg per m^2 at 50 mm thickness).
17.5 mixed lb per ft^2 at 1.5-inch thickness. (85.4 kg per m^2 at 38 mm thickness).
140 mixed lb per ft^3. (2243 kg per m^3).

Storage & Shelf Life

Maintain products in original packaging and sealed until ready for use. Estimated shelf life is 18 months when stored in a dry area at 70°F (21°C). Cover powder during storage to maximize shelf life. Actual shelf life may vary with storage conditions.

If there is any question with respect to the quality of the components, check reactivity prior to use. For assistance consult with Armor.

TYPICAL PHYSICAL PROPERTIES

Property	Typical Value
Color	Gray
Density, ASTM C138	140 lb/ft^3 (2,243 kg/m^3)
Compressive strength, ASTM C579,	
1-day	>1,600 psi (11.7 MPa)
7-day	>3,100 psi (21.4 MPa)
28-day	>3,600 psi (24.8 MPa)
Tensile strength, ASTM C190, 28-day	>725 psi (5 MPa)
Flexural strength, ASTM C580, 7-day	>900 psi (6.2 MPa)
Absorption, ASTM C413, 48 hr. immersion	5.2%
Bond strength to brick, pull blocks	>275 psi (1.9 MPa)
Shrinkage, ASTM C531, 28-day	0.2%
Coefficient of thermal expansion, ASTM C531, 75°F – 210°F	8.2 x 10^{-6} /°F (14.7 x 10^{-6}/°C)
Adhesion to:	
Sandblasted concrete	100 psi (0.7 MPa) unprimed 240 psi (1.7 MPa) primed
Cured Tufchem Silicate Concrete	150 psi (1.1 MPa) unprimed
Maximum service temperature	1,650°F (899°C)

Temperature limitations will vary with chemical exposure.

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