



Tufchem™ Silicate Gunite

SELECTION & SPECIFICATION DATA

Type	Inorganic potassium silicate gunite
Description	Two-component inorganic potassium silicate gunite lining material formulated for spray application to 1.5-inch (38 mm) thickness or more. Properly installed, it yields a strong dense acid-resistant lining that protects concrete and steel substrates from a wide range of corrosive acids.
Uses	<ul style="list-style-type: none">• Coal-fired power plant chimneys and breechings• FGD scrubber outlet ductwork• Molten sulfur pits• Ash hoppers• Coke wharf structures
Features	<ul style="list-style-type: none">• 100% potassium silicate bonded chemistry• High temperature resistance• Resistant to all concentrations of most acids including sulfuric, hydrochloric, nitric, chromic, acetic and phosphoric
Limitations	<ul style="list-style-type: none">• Not resistant to alkaline or caustic solutions. It is not resistant to hydrofluoric acid or for use beyond its chemical or thermal resistance limits.• Tufchem Silicate Gunite should be used over a membrane in immersion and wet service areas where operating temperatures will be below the moisture dew point.• Consult Armor with specific questions.

INSTALLATION GUIDANCE

Reference Specifications	CES-322 Armor Specification for the installation of Tufchem Silicate Gunite CES-329 Anchor Spacing for Tufchem Silicate Gunite CES-339 Gunite Linings for Sulfur Pits
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Installation Conditions	Tufchem Silicate Gunite is formulated for ideal handling at 70°F (21°C). Do not use below 50°F (10°C).
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Ratio	1.0-part solution: 6.0 parts powder by weight
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Use caution varying from this ratio. A wetter mix may result in slumping while a drier mix may result in excessive dusting. Consult CES-322 for full details.

Mixing	Before adding the gunite powder to the hopper, dampen it by combining 1.0-1.5 pints water per 50 lb bag of powder (0.5 L per 22.7 kg bag) in a rotating blade mixer. Over-dampening will cause the product to set prematurely. Pre-wet the solution supply hoses before beginning the guniting operation. Solution used for this purpose can be recovered and reused. Convey dampened powder to the gunite nozzle. Adjust flow and pressure of Tufchem Silicate Solution being introduced at the nozzle head to insure uniform wetting and thorough mixing. Use a water ring with a greater number of smaller holes to allow higher pressures. The feel and expertise of the nozzle man is critical in setting pressures and ring size to optimize handling for the humidity and temperature conditions. Maintain adequate pump pressures. Only personnel familiar with the intricacies of applying potassium silicate gunites should be employed to apply Tufchem Silicate Gunite. For small casting repairs, Tufchem Silicate Gunite can be mixed using concrete mixing equipment and cast in a similar fashion to concrete.
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Cleanup	Water
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CURE TIME

Temperature	Initial Set	Foot traffic	Full Cure
70°F (21°C)	30-45 minutes	16 hours	7 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.
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Ventilation	Provide thorough air circulation during and after application until the material has cured when used in enclosed areas.
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**PACKAGING, ESTIMATING & HANDLING**

Product	Code	Packaging
Tufchem Silicate Gunitite Solution	29641 29636	50 lb (22.7 kg) pail 600 lb (272 kg) drum
Tufchem Silicate Gunitite Powder	29590	50 lb (23 kg) bag

Tufchem Silicate Gunitite is not supplied as a pre-proportioned unit. Mix materials at the gunitite nozzle at a ratio of 6 parts powder to 1 part solution by weight.

Theoretical Coverage	Mixed density is 126 lb/ft ³ (2,018 kg/m ³). Allow 21 mixed lb/ft ² at 2-inch thickness (103 kg/m ² at 50 mm thickness). Allow 15.75 mixed lb/ft ² at 1.5-inch thickness (77 kg/m ² at 38 mm thickness). Allow adequate allowance for rebound. Rebound amount is a function of the orientation and angle of the guniting operation (overhead, horizontal, floor). Consult installation specification CES-322 for more detail.
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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.
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TYPICAL PHYSICAL PROPERTIES

Property	Typical Value
Color	White
Density, ASTM C138	126 lb/ft ³ (2,018 kg/m ³)
Compressive strength, ASTM C579, 28-day	>2,700 psi (18.6 MPa)
Flexural strength, ASTM C580, 7-day	>550 psi (3.8 MPa)
Shrinkage, ASTM C531, cast specimens 28-day	0.1%
Coefficient of thermal expansion, ASTM C531, 75°F - 210°F	8.2 x 10 ⁻⁶ /°F (14.7 x 10 ⁻⁶ /°C)
Thermal conductivity, ASTM C1113, 300°F (150°C)	5.7 BTU/hr-ft·°F (9.9 W/m·K)
Maximum service temperature	>1,000°F (537°C)
Temperature limitations may vary with chemical exposure.	

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