



## S-4000 FURAN CHEMICAL RESISTANT MORTAR & GROUT

**PRODUCT DESCRIPTION:**

S-4000 Furan mortar and grout is a two-part system (liquid resin and powder catalyst) for use where chemical resistance is important. When properly cured, S-4000 is resistant to most non-oxidizing acids, alkalis, solvents, oils, greases, salts, detergents and steam cleaning up to 350°F. The use of S-4000 as a grout requires a waxed tile/brick surface and appropriate installation skills as S-4000 cannot be water washed off the surface during initial cleanup. S-4000 Furan meets or exceeds ANSI A118.5 specifications. S-4002 B powder/catalyst is 100% carbon filled for optimum chemical resistance. S-4000 can be used to set and grout tile or brick using either the Tile Setter's method or the Bricklayer's method.

**USES:**

S-4000 mortar and grout is recommended for use in bakeries, breweries, bottling plants, dairies, distilleries, canneries, chemical plants, commercial kitchens, electroplating plants, food processing plants and meat packing plants.

**LIMITATIONS:**

S-4000 mortar and grout must be mixed and used at the specified temperature limits. Mix in small batches (12 lbs. maximum recommended). The best handling characteristics are achieved when material temperatures are between 70°F and 80°F. S-4000 should not be directly set over concrete, or come in contact with water or any alkaline materials such as cement dust during the curing process. Summitville supplies a low temperature additive to cure S-4000 in temperatures as low as 30° F. In cases where the grout/mortar comes in contact with chlorine or nitric acid, S-5000 Epoxy Grout is recommended.

**TECHNICAL DATA Physical Properties:**

Hardness (Shore D) 7 days @ 73°F	65
Hardness (Shore D) 28 days	75
Linear shrinkage, (% 30 days at @ 73°F)	0.35
Compressive strength (ASTM C579)	6000 psi (41.4 MPa)
Flexural strength (ASTM C580)	2000 psi (13.8 MPa)
Tensile strength (ASTM C307)	900 psi (6.2 MPa)
Bond strength to wire cut brick faces (ASTM C321)	752 psi (5.0 MPa)
Bond strength to matte surface brick (ASTM C321)	580 psi (4.0 MPa)
Maximum service temperature	350°F (m°C)
Working Time (ASTM C308) @ 73°F (1000 gram sample)	25 to 35 minutes
Initial setting time (ASTM C308) @ 73°F (1000 gram sample)	40 to 50 minutes
Color of mortar	Black
Absorption (ASTM C413)	0.17%
Product Density	1.18lb./gallon

**Sample size greatly affects cure speed. The following chart below is based upon a 12-pound recommended mix size. The numbers below are provided for comparison to the 2.2 pound (1000 gram) sample test above as an example of how batch size changes cure speed.**

12 lb. Mix	60°F	70°F	80°F	90°F
Working time (min.)	60-90	15-30	8-10	5-8
Final set time (hrs.)	48-60	14-24	5-7	2-4

## INSTALLATION :

Install in accordance with ANSI A 108.8. Substrate surface must be dry, free from coatings, oil, dirt and dust. **Contamination by water or any alkaline material such as cement dust must be avoided while S-4000 is in the uncured state.**

**Mixing:** S-4000 is furnished in two parts—Furan Resin and Powder/Catalyst. Stir S-4000A Liquid Furan Resin before using. To 1 part (by wt.) of S-4000A liquid, add approximately 1.8 parts of S-4000B for tile setter's method; for bricklayer's method, add approximately 2 parts of S-4000B. A *slow* speed mechanical mixer may be used. **DO NOT STORE, USE, OR MIX IN DIRECT SUNLIGHT.**

**NOTE:** Mix ratio can vary slightly depending on temperature and application conditions.

Batch size should not exceed 12 pounds. At 70°F, keep both powder and resin cool and mix smaller batches at temperatures up to 80°F. At temperatures below 60°F, powder and resin must be warmed to 70°F. **DO NOT EXCEED 80°F.** Keep mixed material in a thin layer (3/4" thick max.) on bottom of mixing pan.

Do not mix more mortar than can be used in 15 minutes at 70°F (consult working time chart for other temperatures). Discard any material that has started to set/stiffen.

## APPLICATION:

S-4000 can be applied to waxed floor brick and paver tile using tile setters and conventional bricklayers' methods. Brick or tile must be clean and dry. Temperature of brick and tile must be min. of 60°F but not over 80°F. Room temperatures below 60°F may be raised to the minimum by the use of portable heaters. A low temperature additive may also be used.

Tile Setters Method: With a firm, straight edge hard rubber float (*Gundlach GK-2, Barwalt UFF 1B or similar*), force as much S-4000 into joints as possible, using sufficient pressure and flow to avoid air pockets or voids. Before the S-4000 loses its plasticity, remove excess with rubber float in a squeegee fashion working diagonally to joints to facilitate removal without pulling material from joints.

## CAUTION:

*Liquid Furan Resin is flammable.*

## CLEAN-UP:

**Tools:** S-4000 may be cleaned from equipment with SL-100, isopropyl alcohol, or MEK (methyl ethyl ketone) before S-4000 has started to chemically react. **Do not use solvents for cleaning hands.** Clean hands with waterless hand cleaner.

**NOTE:** Isopropyl alcohol and MEK are highly flammable.

**Floors:** If using waxed brick, allow floor to cure 48 hours at 70°F minimum, before steam cleaning. Allow longer cure times for lower temperatures and/or higher pressure cleaning machines. Nozzle pressure of 60 psi is acceptable. Use a heated water fan spray with 140°F or higher water as measured at the nozzle to melt wax.

## PROTECTING NEW TILEWORK:

To avoid damage to finished tile work, schedule floor installations to begin only after all structural work, building enclosure and overhead finishing work, such as ceilings, painting, mechanical and electrical work are completed. Keep all traffic off finished tile floor until it has fully cured or provide up to 3/4" thick plywood protection over Kraft paper to protect floors before installation materials have fully cured.

## COLOR:

Color is #991 Black.

## PACKAGING: 1 unit =120 pounds

**1 – 40 pound (A)**

**2 – 40 pound (B)**

S-4000 Series is available in 40 lb. buckets of resin (S-4000A) and 40 lb. bags of powder/catalyst (S-4002B).

**Refer to coverage chart section for setting and grouting coverage.**

## SPECIFICATIONS:

Material: Chemical-Resistant Furan mortar and grout shall be S-4000, a two-component mix consisting of: (1) a liquid component consisting of furfural alcohol based resin, and (2) a 100% carbon/catalyst filler. The powder/catalyst is specially graded for optimum workability and minimum porosity when installed correctly, and contains a special blend of activating hardeners. S-4000 Furan meets or exceeds ANSI A118.5 specifications and shall be supplied by Summitville Tiles, Inc., Summitville, Ohio.

**CHEMICAL RESISTANCE:**

Based on 28-day immersion at 75°F temperature.

**R** – Recommended, **#** - Recommended to 80°F only , **N** - Not Recommended

	<b>S-4000</b>		<b>S-4000</b>		<b>S-4000</b>
Acetic Acid, 3%	R	Carbon Tetrachloride	R	Nitric Acid, 5%	N
Acetic Acid, 10%	R	Chlorine Water	N	Nitric Acid, 20% and over	N
Acetic Acid, glacial	R	Chloroacetic Acid, 10%	R	Nitrotoluene	N
Acetic Anhydride	R	Chlorobenzene	R	Phenol	N
Acetone	N	Chromic Acid	N	Phosphoric Acid, 10%	R
Ammonia (household)	R	Citric Acid	R	Potassium Persulfate	R
Ammonium Bromide	R	Cooking Grease	R	Pyridine # Saturated Sugar Solution	R
Amyl Alcohol	R	Cresol	N	Sodium Carbonate, 30%	R
Aniline	N	Ethyl Alcohol	R	Sodium Hydroxide, up to 30%	R
Barium Hydroxide, 3%	R	Ethyl Bromide	N	Sodium Hydroxide, over 30%	R
Beer	R	Ethylene Glycol Monobutanate	R	Soy Sauce	R
Benzene	R	Ferric Chloride	R	Sulfuric Acid, 10%	R
Benzyl Acetate	R	Hydrobromic Acid	N	Sulfuric Acid, 45%	R
Benzyl Alcohol	R	Hydrochloric Acid, 10%	R	Sulfuric Acid, over 50%	N
Bromine Water	N	Hydrochloric Acid, 37%	R	Tetrafulan	N
Butanol	R	Hydrofluoric Acid, 10%	R	Trisodium Phosphate	R
Butyl Acetate	R	Hydrofluoric Acid, 48%	R	Vegetable Oil	R
Calcium Chloride, 45%	R	Lactic Acid, 3%	R	Vinegar	R
Calcium Hydroxide	R	Lactic Acid, 10%	R	Wine	R
Carbon Disulfide	R	Nitrobenzene	R		