



## S-400 SETTING & GROUTING EPOXY (TCA Formula AARII-HT Epoxy Mortar & Grout)

### PRODUCT DESCRIPTION:

S-400 is a Tile Council of America formula AARII-HT, epoxy mortar and grout that meets or exceeds requirements of ANSI A118.3 and is USDA approved. S-400 is a two-part 100% solids epoxy system designed to resist attacks by many acids, alkalis and other chemical compounds that normally break down cement mortars and grouts. S-400 is sag resistant and should be specified for setting or grouting ceramic tile on any wall or floor installation. S-400 has exceptional bond strength and will remain rigid and cohesive at temperatures up to 350°F. Floor brick may be installed and grouted with S-400 in accordance with the chemical resistance chart. NOTE: When more stringent chemical resistance is required, S-4000 Furan or S-5000 Epoxy should be used.

### USES:

S-400 is recommended for use in distilleries, refineries, chemical laboratories, breweries, dairies and food processing plants.

### LIMITATIONS:

Surface temperature of substrate should be above 50°F during tile installation. Continuous exposure of cured S-400 above 350°F is not recommended.

### TECHNICAL DATA: Physical Properties

Hardness (Shore D) 7 days	70 to 80
Hardness (Shore D) 28 days	80 to 90
Linear shrinkage, %	0.01
Compressive Strength, psi (ASTM C-109)	Greater than 6000
Shear bond strength, psi (ANSI-A118.3)	1200 psi
Tensile strength	1200 psi
Pot life at 72°F, hrs.	1
Cure time at 72°F, hrs.	12 to 16
Temperature limitation, °F	350
Working time, min. at 72°F	60
Sag using 6" x 6" x ½" quarry tile @72°F	0.00

### INSTALLATION:

**Substrate:** S-400 is recommended for use on cured concrete, plaster, drywall, metal, fiberglass, glass, masonry surfaces, cementitious backerboard and plywood. Substrate shall be prepared in accordance with ANSI A108.4.

Surface to receive S-400 must be structurally sound, dry and free of sealers, coatings, oil, dirt and dust and above 50° F. New masonry surfaces should be sufficiently cured, dimensionally stable and free from cracks. It is advisable to brush all surfaces with a stiff brush to remove any loose material that may be encountered. Consult the Tile Council of North America [Handbook for Ceramic Tile Installations](#) and ANSI A108 for specific setting descriptions.

**Mixing:** S-400 is furnished in 2 parts and exact proportions and thorough mixing of the parts with one another is absolutely essential for satisfactory curing and performance. Empty contents of Part A (liquid portion) into mixing bucket. Add Part B (solids portion) gradually and mix thoroughly using either hand tools or a slow speed power mixer. *Care should be taken to avoid whipping air into the mix.* Mix until smooth and free of lumps. It is highly recommended that complete units be mixed, however, if necessary to split a unit, weigh out 3 parts of Part B to 1 part of Part A, be sure to mix part B before removing any portion. Clean tools with warm water immediately after use.

**WORKING CHARACTERISTICS:** S-400 is ideally installed at temperatures from 70° to 80°F. At higher temperatures, the pot life, open time and clean-up time are reduced; however, it is more fluid and easier to work. At lower temperatures these factors are reversed. Working surface temperature can vary from room temperature and should be taken into consideration. Do not begin application of S-400 until the temperature of the room and substrate is above 50°F and rising. Maintain a temperature of 60°F or higher during the curing period. S-400 must be stored at approximately 70°F for 24 hours prior to use. Depending upon storage and packaging practices, normalizing time may be significantly longer.

Temperature	Pot Life	Open Time	Clean-Up Time	Set Time
60°F (16° C)	1 ½ hours	3 ½ hours	1 ½ hours	24-30 hours
75°F (24° C)	1 hour	2 ¼ hours	1 hour	16-20 hours
90°F (32° C)	30 minutes	1 ½ hours	30 minutes	12-14 hours

**Vertical Surfaces:**

All vertical work must be performed within 20 minutes (at or below 70°F) of mixing the A and B portion of the product. If manufacturer’s date is over 1 year, S-30 should be added. Directions: 0.2 lbs of S-30 per 3 gallon unit. Mix S-30 into part A of the epoxy a minimum of 8 hours before use.

**APPLICATION:**

**As a setting Mortar:** Spread mixed S-400 with a notched trowel, then set tile. Use a 1/8” notched trowel for ceramic mosaics to achieve a 1/16” bed. Use a ¼” notched trowel for smooth or shallow ribbed pavers providing a finished bed of 1/8”. Use a ¼” x 3/8” square notched trowel for heavy ribbed backed tile such as Quarry Tile.

**SETTING:**

Full coverage of the setting material on the back of the tile is desirable to prevent broken and cracked tile. The National Tile Contractors Association recommendation to accomplish full coverage is as follows: Apply mortar to substrate using the flat side of the trowel to fill any voids and “key” the material to the substrate. Using the proper sized-notched trowel, comb the mortar evenly in one direction only. Do not “swirl”. Set the tile in the mortar with the edge of the tile parallel to the comb lines. To remove air voids, push the tile back and forth in the mortar perpendicular to the comb lines.

Once the S-400 begins to set (lose tackiness and/or becomes stiff), it should be discarded as proper bonding will not be accomplished. Allow 16 hours to elapse before grouting tile. Check for proper bond by removing a freshly set tile from the mortar and verifying proper adhesive transfer and coverage every few tiles.

**As a Grout:** With a firm, straight edge rubber trowel (*Gundlach GK-2, Barwalt UFF 1B or similar*) force as much S-400 into joints as possible, using sufficient pressure and flow to avoid air pockets or voids. Before the S-400 loses its plasticity, remove excess with rubber trowel in a squeegee fashion working diagonally to the joints to facilitate removal without pulling material from joints.

**CLEAN-UP:**

For initial clean up: Use a white plastic scrub pad or an epoxy sponge and a sufficient amount of clean tepid water. Avoid water migration into ungrouted joints. Warm water with a small amount of SL-86 added will speed clean up. Change cleaning water and scrub pads/sponges often to avoid leaving a sticky film on the tile. Do not leave standing water on uncured epoxy joints after initial cleaning. At 70° F, perform final clean up after 10 hours but before 24 hours. Use cure time chart to estimate and adjust accordingly for other temperatures. Use a white scrub pad or epoxy sponge with SL-86 and water. Clean completely, as S-400 is difficult to remove after it cures for over 24 hours. Wide tile joints may have a slight concave appearance after grout cure. Cover with Kraft paper after final clean up to protect from other construction debris during cure period. SL-100 can be used to remove cured epoxy residue.

**CAUTION:**

Protect from dirt and all traffic for 16 hours, heavy traffic and dirt for 48 hours. Do not grout in direct sunlight. Cure S-400 a minimum of seven days at 70°F before chemical exposure.

**COVERAGE:**

Setting: Sq.ft./gallon unit using

1/4" x 1/4" sq. notch trowel

18 to 20 sq. ft./gallon

1/4" x 3/8" sq. notch trowel

12 to 15 sq. ft./gallon

Refer to Coverage tables for grouting coverage.

**PROTECTING NEW TILE WORK:**

To avoid damage to finished tilework, 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 of finished tile floors 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.

**PACKAGING:**

S-400 is available in 1 gallon and 3 gallon unit sizes.

**COLORS:**

Palomino 917, Morel 928, Brownstone 931, Sand Beige 934, Brown 945, Confederate Gray 958, Gray 961, Black 991, Red 998. Custom colors are available with minimum quantity.

**SPECIFICATIONS:**

Material: Setting mortar and tile grout shall be S-400, a two-component mix consisting of specially graded silica aggregate (#7 on M.O.H. Scale of Hardness), color-fast pigments, a special blend of activating hardeners and liquid epoxy resin free which is of water and organic solvents; as manufactured by Summitville Tiles, Inc., Summitville, Ohio. The material in the mixed state shall not allow tile to sag on vertical surfaces when installed properly. In the reacted state, S-400 shall remain rigid and cohesive in intermittent temperatures up to 350°F. Acid and alkali resistant epoxy mortar and grout shall meet or exceed ANSI A118.3 and Tile Council of America AARII-HT, as approved by the United States Department of Agriculture.

Color: Color shall be #\_\_\_\_\_.

**Chemical Resistance Guide for S-400**

Chemical	S-400	Chemical	S-400	Chemical	S-400	Chemical	S-400
Acetic Acid, Glacial	N	Butyl Acetate	C	Formic Acid Glacial	N	Soy Sauce	R
Acetic Acid 3%	R	Calcium Chloride	R	Hydriotic Acid 20%	R	Sulfuric Acid 45%	R
Acetic Acid 10%	C	Calcium Hydroxide	R	Hydrobromic Acid 10%	R	Tetrahydrofuran	N
Acetic Anhydride	N	Carbon Disulfide	C	Hydrochloric Acid 37%	R	Trisodium Phosphate	R
Acetone	C	Carbon Tetrachloride	R	Lactic Acid 3%	C	Vegetable Oil	R
Ammonia (household)	R	Chloroacetic 10%	N	Nitric Acid 10%	R	Wine	R
Ammonium Bromide 30%	R	Chlorobenzene	N	Nitrobenzene	N		
Alcohol	R	Chlorine water (bleach)	R	Nitrotoluene	R		
Aniline	N	Chromic Acid 10%	R	Phenol	N		
Barium Hydroxide	R	Citric Acid 20%	R	Phosphoric Acid 10%	R		
Beer	R	Cooking Grease	R	Potassium Hydroxide 5%	R		
Benzyl Acetate	C	Cresol	N	Potassium Persulfate 50%	R		
Benzyl Alcohol	N	Ethyl Bromide	N	Pyridine 20%	C		
Benzaldehyde	N	Ethylene Glycol Monobuturate	R	Saturated Sugar Solution	R		
Bromine Water	R	Ferric Chloride	R	Sodium Carbonate	R		
Butanol	R	Formic Acid 10%	C	Sodium Hydroxide 35%	R		

R= Recommended      N= Not Recommended      C= Conditional Contact Summitville Tiles, Inc.