S-5400 VINYL ESTER MORTAR AND GROUT

PRODUCT DESCRIPTION:
S-5400 is a two part highly chemical resistant vinyl ester mortar and grout that meets or exceeds industry requirements. S-5400 is for setting and grouting of floor brick, quarry tile, pavers, fully vitrified brick, porcelain tile and ceramic mosaics. S-5400 is designed to be used in many applications requiring vinyl ester chemical resistance including CIP rooms. S-5400 is recommended for use in distilleries, refineries, chemical laboratories, breweries, dairies, food processing plants, etc. S-5400 is sag resistant and should be specified for setting or grouting ceramic tile on any wall or floor installations. S-5400 not only has exceptional bond strength (greater than 1000 P.S.I.), but it will remain rigid and cohesive at constant temperatures up to 250°F.

USES:
S-5400 is recommended for use in distilleries, refineries, laboratories, food processing plants and commercial kitchens. Typically installed in CIP rooms, chemical trenches, splash and spill containment areas etc requiring resistance to strong oxidizers such as chlorine and chlorinated cleaners and strong acids such as chromic and nitric acids.

Physical Properties

Property	Test Method	S-5400 Typical Value
Density	ASTM C 905	120 pcf (1.922 gm/cm^3)
Water Absorption	ASTM C 413	0.28%
Linear Shrinkage	ASTM C 531	0.30%
Modulus of Elasticity	ASTM C 580	1.9 x 10^6 psi (1.3 x 10^5 kg/cm^2)
Compressive Strength 7 Days @75° F	ASTM C 579	12,000 psi (844 kg/cm^2)
Tensile Strength 7 Days @75° F	ASTM C 307	2,200 psi (154 kg/cm^2)
Bond Strength to Brick 14 Days @75° F	ASTM C 321	> 300 psi (21 kg/cm^2) brick failure

LIMITATIONS : Surface temperature of substrate should be between 50°F and 90°F during installation and cure. Continuous exposure of cured S-5400 above 250°F is not recommended. Protect from temperatures below 50°F, water exposure, and weather during installation and cure period. Do not use tools or equipment contaminated with Portland cement, other grouts, resins, or any other materials not approved by Summitville Tiles technical services. All tools, measuring, and mixing equipment must be clean and dry. Reactions may occur with contaminated tools and/or equipment. S-5400 as a grout is not water cleanable from brick/tile. Use waxed brick/tile only.

INSTALLATION:
Substrate: S-5400 is recommended for use on cured concrete, masonry surfaces, and cement backer units (CBU). The surface to receive S-5400 must be structurally sound, dry and free of sealers, coatings, oil, dirt and dust and installation area must meet ANSI A 108.01 and 108.02 requirements. 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. Vacuum all grout joints to remove possible debris/contamination from grout area prior to application of S-5400 as a grout. Waxed tile/brick must have wax on the final surface face only and not on sides or back. Do not stack waxed brick/tile face to back as this will transfer wax to the back of brick/tiles and create a poor bond or bond failure. Consult ANSI A-108, and any other applicable standards for specific setting descriptions.
Mixing: S-5400 is furnished in 2 parts. Exact proportions and thorough mixing of parts “A” and “B” with one another is absolutely essential for satisfactory curing and performance. The final working viscosity can be altered by the amount of part “B” added. To “butter” brick for use in the “bricklayers” setting method, use approximately 100 pounds of powder to one 30 pound part A unit. For grouting using the “Tilesetters” method, use slightly less than 97.5 pounds of powder to one 30 pound part A unit. ALWAYS

MEASURE USING WEIGHT AND NOT VOLUME. Empty contents of part “A” into mixing bucket and mix thoroughly using either hand tools or a slow spin powered mixer. Add part “B” powder to part “A” Care must be taken to avoid whipping air into this mix. Continue to mix until smooth and free of lumps. It is highly recommended that complete units are mixed at a time; however, if necessary to split a unit, weigh out 1 part “A” to 3.25 of part “B”. Part “B” can be adjusted slightly to loosen/thicken material. Clean tools with warm soapy water immediately after use.

Working Characteristics: S-5400 is ideally installed at temperatures from 55° to 75°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 must be taken into consideration. Do not begin application of S-5400 until the temperature of the room and substrate are above 50°F during the curing period. S-5400 and brick/tiles must be stored at 60-80°F for at least 24 hours before use. If stored on pallets instead of separated units, allow the pallet of material to warm to proper temperature for one week minimum.

Working and Cure Times

Temperature	Pot Life	Clean Up Time	Initial Set Time	Final Cure
50°F (10°C)	25-30 min	30 Min	6-8 Hours	9 Days
75°F (21°C)	15-20 min	20 Min	1-2 Hours	7 Days
90°F (32°C)	5-10 min	10 min	45-60 Min	5 Days

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.

APPLICATION:
As a Setting Mortar: Spread mixed S-5400 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. Once the S-5400 begins to set (becomes non-sticky and/or starts to stiffen) it should be discarded, as proper bonding will not be accomplished. Allow 12 hours at 70°F to elapse before grouting tile.
As a grout: S-5400 as a grout is not water cleanable from brick/tile. Use waxed brick/tile only. With a firm, straight edge rubber trowel (*Gundlach GK-2, Barwalt UFF 1B or similar)* or using a steel trowel, force as much S-5400 into joints as possible, using sufficient pressure and flow to avoid air pockets or voids. Before the S-5400 loses its plasticity, remove excess with a rubber float in a scraping or squeegee fashion working diagonally across joints to facilitate removal without pulling material from joints. Be careful when pushing and cleaning grout so as not to scrape wax off tile/brick tops and mix it into mortar. Removing wax will allow S-5400 to bond to tile/brick and intermixed wax will create weak bond spots. If a second pass is required to fill grout joints completely, the second fill should be performed within 24 hours in CLEAN joints at 75°F and 50% RH to attain best bond to the first pass.

VERTICAL SURFACES:
All vertical work must be completed within 10 minutes of mixing product at 70°F. Lower temperatures may result in longer work times and higher temperatures will result in shorter work times.

CLEAN-UP:
Clean tools gloves, mixing equipment, etc. immediately using hot water mixed with SL-100 before S-5400 begins to firm up/cure. Solvent based cleaners (Methylene Chloride) will be required for removal of cured S-5400.
To tool joints before cure, apply SL-100 and water at a 50/50 mix and use a white Scotchbrite pad.

S-5400 is not water cleanable. Steam clean only. Steam clean S-5400 after 24 hours minimum grout cure time at 70ºF.

CAUTION:
Protect from dirt and all traffic for 16 hours, heavy traffic and dirt until after steam cleaning and inspection. Do not grout in direct sunlight. Cure S-5400 a minimum of seven days at 70°F before chemical exposure.

PROTECTING NEW TILEWORK:
To avoid damage to finished tilework, schedule floor installations to begin only after all structural work, building enclosure and overhead finished work, such as ceilings, painting, mechanical and electrical work are completed. Keep all traffic off of finished tile floors until the floor has fully cured or provide up to ¾" thick plywood protection over Kraft paper to protect floors before installation materials have fully cured.

PACKAGING:
S-5400 is supplied in 30 lb. liquid part A resin in buckets. Part B is supplied in 50 pound buckets. The ratio of resin to powder by weight only, not by volume is 1 A to 3.25 B.
Proper Mix is 130 pounds total
1 quantity (30 pounds) bucket of A liquid
2 buckets (50 pounds) of part B powder

STORAGE AND HANDLING:
Shelf life from date of manufacture of S-5400 powder is four (4) months and resin is three (3) months IF STORED below 70ºF and 50% RH in original sealed containers, protected from sunlight, weather, and water exposures. Do not freeze uncured product. S-5400 resin is flammable. Powder will be irritating to the skin and may cause peroxide burns. Take all precautions against exposure of eyes, skin, and clothing while handling and mixing S-5400 including precautions against splashes, inhalation, electrostatic discharge, and ignition. Review product SDS for full precautions and enact proper safety precaution controls systems before handling materials.

COLOR:
Color is #991 Black, #915 Antique White. Custom colors available with minimum order.

S-5400 Chemical Resistance

Chemical		Chemical		Chemical		Chemical	
Acetic Acid 35%	R	Calcium Hydroxide	R	Hydriotic Acid 20%	R	Sodium Carbonate	R
Acetic Anhydride	S	Carbon Disulfide	S	Hydrobromic Acid 10%	R	Sodium Hydroxide 50%	R
Acetone 10%	S	Carbon Tetrachloride	R	Hydrochloric Acid 50%	R	Sodium Hydroxide Saturated	R
Allyl Alcohol	N	Chloroacetic 25%	R	Lactic Acid 85%	R	Sodium Hypochlorite (Bleach) 18%	R
Ammonia (household)	R	Chlorobenzene	N	Methylene Chloride	N	Sodium Gluconate (saturated)	R
Ammonium Bromide 30%	R	Chlorine water (bleach)	R	Mineral Spirits	R	Soy Sauce	R
Aniline	N	Chromic Acid 10%	R	Nitric Acid 10%	R	Sulfuric Acid 75%	R
Aqua Regia	N	Chromic Acid 50%	S	Nitric Acid 20%	N	Sulfuric Acid 98%	N
Barium Hydroxide	R	Citric Acid	R	Nitrobenzene	N	Tetrahydrofuran	N
Beer	R	Cooking Grease	R	Nitrotoluene	N	Toluene	N
Benzyl Acetate	N	Cresol	N	Oleic Acid	R	Trisodium Phosphate	R
Benzyl Alcohol	N	Ethyl Alcohol	S	Phenol	N	Vegetable Oil	R
Benzaldehyde	N	Ethyl Bromide	N	Phosphoric Acid 100%	R	Wine	R
Bromine Water 5%	R	Ethylene Glycol Monobutarate	R	Potassium Hydroxide 25%	R	Xylene	S
Butanol	R	Ferric Chloride	R	Potassium Persulfate 50%	R		
Btyl Acetate	N	Formic Acid 10%	R	Pyridine 20%	N		
C alcium Chloride	R	Formic Acid Glacial	R	Saturated Sugar Solution	R		

R=	Recommended	N=	Not Recommended	C=	Conditional Contact Summitville Tiles, Inc.
S=	Splash/Spill only				

COVERAGE:
Setting: square feet/mixed pound: using

¼" x ¼" square notch trowel	1.25 sq. ft./pound
¼" x 3/8" square notch trowel	0.83 sq. ft./pound

Please Refer to Grout Coverage Tables at www.Summitville.com for Grouting Coverage