

# Superstick

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**FOR PROFESSIONAL USE ONLY; NOT FOR SALE TO OR USE BY THE GENERAL PUBLIC**

## #4040 FAST SET

### DESCRIPTION

SUPERSTICK #4040 HI-MOD Low Viscosity is a 100% solids, solvent-free two-component **MOISTURE INSENSITIVE** epoxy resin system. It develops high early strength to produce a unique **Hi- Modulus** of Elasticity. A multi-purpose Epoxy Resin System, ideal as an Impregnating Sealer and/or primer for spalled areas. FORTRESS 4040 FAST SET LV may be used as an epoxy mortar for patching spalls on DRY or DAMP Interior surfaces. It is excellent for pressure injection and gravity feeding cracks in both dry & damp concrete. It may also be used for bolt grouting.

**ADVANTAGES:** Easy mix ratio of 2 Parts A to 1 Part B by Volume  
 Very Low Viscosity  
 Provides a high early strength within 24 hours  
 Insensitive to moisture before, during and after cure  
 Low temperature cures – As low as 40°F (4°C)

**FORTRESS 4040 FAST SET Lo-Mod LV conforms to ASTM-C-881, Type I and IV, Grade 1, Class B & C, AASHTO-M235-91**

### PHYSICAL PROPERTIES

**Type:** Moisture Insensitive & Low temperature cure  
 Low Modulus, Low Viscosity Epoxy, Fast Setting Epoxy

**Mixing Ratio:** 2A to 1B by volume  
**Color:** Part A Resin Blue  
 Part B Hardener Yellow  
 Ad-Mix Green  
**Viscosity:** ASTM-D-2393 Ad-Mix 200-300 CPS (.2 -.3 Pa.S)  
**Pot Life:** Neat 10-15 minutes @ 75°F (24°C)  
**Tack Free Time:** \*\*\*40°F (4°C) 10 – 14 Hours  
 \*\*\*75°F (24°C) 1 – 3 Hours  
 \*\*\*90°F (32°C) 1 - 1½ Hours

**PACKAGING:** Available in 3 gallon and 15 gallon units.

**COVERAGE:** 1 Gallon of FORTRESS 4040 FAST SET HI-MOD LV contains 231 cubic inches. As an impregnating sealer or primer, apply at a rate of 80 to 150 sq. ft. per gallon depending on porosity. 1 gallon 4040 FAST SET mixed with 3½ - 4 gallons of loose aggregate yields 750-800 cu. in. of epoxy mortar. 1 gallon 4040 FAST SET mixed with 1 gallon aggregate will yield approx. 360 cu in. for bolt grouting.

### CAUTION:

- Do not thin. Solvents will prevent proper cure.
- Use only oven-dried aggregate.
- Maximum epoxy mortar is for interior use only. **See Note #1**
- Do not seal exterior slabs on grade. **See Note #1**
- Minimum age of concrete should be 28 days prior to application of mortar or sealer on slabs.
- Test for moisture vapor transmission prior to application of mortar or sealing slabs. Moisture passing through substrate by pressure during application and curing will cause bond failure.
- Not for injection of cracks under hydrostatic pressure.
- Do not inject cracks greater than ¼ inch without consulting Technical Service.
- Due to many variables in bonding damp or wet surfaces, be certain to test application under same conditions as full-scale work.

### NEAT BINDER

Bond Strength, PSI (Mpa)	ASTM-C-882		
2 Days (dry cure) Hardened concrete to hardened concrete or steel		3000 (21) min	
14 Days (moist cure) Hardened concrete to hardened concrete or steel		2300 (16) min	
Heat Deflection Temp. – 7 Days	ASTM-D-648	122°F (50°C)	
Linear co-efficient of shrinkage on cure	ASTM-D-2566	.003 max.	
Elongation at Break, %		34 min.	
Water Absorption 24 Hrs., %	ASTM-D-570	.5% max.	
Compressive Strength, PSI (Mpa)	ASTM-C-695		
		***40°F (4°C)	***75°F (24°C)
16 Hours	-----	3000 (21)	6000 (41)
24 Hours	-----	5000 (34)	8000 (55)
3 Days	3000 (21)	10,000 (69)	8500 (59)
7 Days	8000 (55)	11,500 (79)	10,400 (72)
Compressive Modulus		3.5 x 10 <sup>5</sup>	

### EPOXY MORTAR (1:5)

		***40°F (4°C)	***75°F (24°C)	***90°F (32°C)
16 Hours	-----	5000 (34)	5800 (40)	
24 Hours	-----	5500 (38)	7000 (48)	
3 Days	5000 (34)	6800 (47)	7500 (52)	
7 Days	8500 (59)	10,000 (69)	9500 (65)	
Compressive Modulus		8.2 x 10 <sup>5</sup> maximum		
Tensile Properties ASTM-D-638		14 Days Tensile Strength	7000 (48)	
		Elongation at Break, %	1.9	
Modulus of Elasticity, PSI			3.6 x 10 <sup>5</sup>	
Flexural Properties ASTM-D-790		14 Days Flexural Strength	12,000 (83)	
Tangent Modulus of Elasticity in Bending, PSI			3.7 x 10 <sup>5</sup>	

**TEMPERATURES:** Will cure at temperatures as low as 40° F., providing the temperature will be 40° F. and rising during the next 72 hours. Epoxy materials and aggregate should be stored at least 24 hours prior to use at 60° F., or higher. Epoxies stored below 60° F., will cause the epoxy to thicken substantially, making it difficult to properly blend the two materials and obtain a proper mating of resin and hardener.

**Protect from inclement weather and freezing.** If product temperature falls below 50° F. it is recommended that a product temperature of 70°F. be obtained prior to using.

**Store dry at 40°F - 95°F. Condition to 65°F - 85°F before using.**

# **HOW TO USE**

## **SURFACE PREPARATION:**

All surfaces must be structurally sound, clean and free of dirt, dust, oil, grease or any contaminant that would adversely affect the bond. Surfaces may be dry or damp\*, but free of standing water. On new concrete do not use a curing compound. If curing compounds have been used they must be removed. Sandblast or other approved mechanical methods are recommended.

**STEEL:** Sandblast to white metal finish.

**OLD CONCRETE:** All loose particles or soft, weak sections must be removed. Asphaltic oil, or any foreign contaminants that will effect the bond of the epoxy must be removed. All surfaces should be sandblasted. The sandblasting should completely clean the concrete and expose some aggregate. A minimum of 1/16 inch of the existing concrete surface should be removed. For spalled areas make a vertical saw cut to desired depth a minimum of 2" from distressed area. Remove all loose concrete to sound structural concrete.

## **MIXING:**

Pre-mix each component separately. Place in a clean container, 2 parts by volume of Component A (Resin) and then add 1 part of Component B (Hardener). Container should have a flat wall and flat bottom. Stir and mix until material is thoroughly blended. Mixing should be completed after 2 minutes of thorough blending.

The importance of thorough mix and blending cannot be over emphasized. The two components must be thoroughly mixed and mated. If you are mixing correctly, bubbles will be whipped into the mixture. Do not be concerned; this is a sign that you are mixing well. Improper mixing can result in soft or sticky spots. It is recommended, to eliminate problems of improper mixing, that you use two mixing containers. Mix thoroughly in one container. After you feel it is thoroughly mixed, scrape all the material from one container, to the second container. After material has been placed in the second clean container, thoroughly mix for an additional 1 to 1 ½ minutes. With this double type of mixing, any material that might not have been thoroughly mixed from the sides or the bottom of the first container will be easily placed in the center of the mix in the second container and thus will receive thorough mixing at that time. Mix only that quantity that can be used within its working time.

## **APPLICATION:**

**Impregnating Sealer or Primer** - Due to limited work life of the product it is wise to dump the material from the mixing container on the surface, allow to penetrate. Squeegee off excess while still a liquid. For priming, apply with a stiff brush or broom. Thoroughly and vigorously work into the surface and impregnate any dust that remains on the surface. If desired, broadcast a slight excess of fine granules into wet epoxy to create a non-slip surface

**To Anchor Bolts, Dowels and Pins** - FORTRESS 4040 FAST SET may be used neat, or with larger bolts, add approximately 1½ parts of 20/30 sieve, salt-free, kiln-dried aggregate to 1 volume of mixed FORTRESS 4040 FAST SET. The angular space around the bolt should not exceed ¼ inch; Depth of embedment is normally 15 times the bolt diameter.

**Spalled Areas (Interior Applications)** - Prime surfaces with FORTRESS 4040 FAST SET. Apply with stiff brush and work into the surface. To prepare epoxy mortar, slowly add 4-5 parts by loose volume of an oven-dried aggregate to 1 part of mixed FORTRESS 4040 FAST SET HI-MODLV, and mix until uniform consistency. Amount of aggregate may vary upon conditions. Apply epoxy mortar while epoxy is still tacky (usually within 15 minutes at 75°F.), finish with steel trowel and screeds. Wipe trowel lightly with a damp rag for a smooth finish. On applications where the patch must resemble that of the adjacent concrete, it is recommended that Portland Cement be sprinkled onto the wet epoxy surface. Lightly sprinkle with water and trowel to a smooth finish.

**Grouting Base Plates** - Add to the mixed FORTRESS 4040 FAST SET HI-MOD Epoxy, 1 to 1½ parts of 20/30 sieve, salt-free, kiln-dried aggregate by volume to 1 part of FORTRESS 4040 FAST SET. Place grout under base plate. Avoid contact with the underside of the plate. A ¼ inch space should remain from the top of the grout and the bottom of the plate. Maximum thickness of group per lift is 1½ inches. If multiple lifts are needed, allow for preceding layer to cool to touch before applying additional layer. The remaining ¼ inch space should be filled with a neat FORTRESS 4040 FAST SET HI-MOD. Pour sufficient quantity to neat epoxy to allow the level to rise slightly higher than the underside of the bearing plate.

**Injections** - Ideal for grouting of non-moving cracks in concrete. Recommended that the resin and hardener be maintained at 90°F prior to mixing. Elevated temperatures assist in maintaining reasonable epoxy resin temperatures for full depth penetration in cooler substrates. Cooler temperatures have a tendency of thickening the resin mix rapidly. Mix only that amount of FORTRESS 4040 HI-MODLV that can be used within the limited working time at the elevated temperatures.

**Gravity** - "Vee" out cracks. Blow and clean out thoroughly with oil-free compressor air. Pour premixed neat FORTRESS 4040 FAST SET HI-MOD until cracks are filled. More than one application may be required. Seal other side of slab if cracks are visible prior to filling.

**Pressure** - FORTRESS 4040 FAST SET HI-MOD may be used automated injection equipment or manual method. Set injection ports as required by the system used. Seal ports and cracks with FORTRESS 590 HI-MOD GEL or FORTRESS 1240/1241 RAPID SET GEL. When the epoxy adhesive seal has cured, inject FORTRESS 4040 FAST SET HI-MODLV with SLOW steady pressure until epoxy reaches next fitting. Crimp fitting and move to next fitting using same procedure along length of crack. If epoxy penetrates through slab, seal other side. After cure, apply direct flame to fittings and remove. Patch holes with FORTRESS 590 Epoxy Gel.

**Do Not Thin FORTRESS 4040 FAST SET HI-MOD** – Solvents will prevent proper cure.

### **CLEAN-UP :**

**Spills** - Ventilate area, and confine spill. Collect with absorbent material. Dispose of in accordance with the current, applicable, State and Federal regulations. Uncured materials can be removed with an approved solvent. Cured material can only be removed mechanically. Clean all tools and equipment immediately after use with a solvent such as Xylene, or Toluene. Clean hands with soap and water or industrial hand cleaner, not solvent.

**NOTE** - For bonding fresh plastic portland - cement to hardened concrete, use FORTRESS 580 HI-MOD.

**Special Note #1:** FORTRESS 4040 FAST SET is a High Modulus Epoxy. In its neat form and/or with minimum filler loading, the cured properties will produce a coefficient of expansion that is dissimilar to portland cement. Surface temperature changes have a very definite effect on the coefficient of expansion of exterior epoxy mortar/concrete applications. FORTRESS 4040 FAST SET, when used as an epoxy mortar/concrete for exterior applications can cause stresses at the bond line during these temperature changes.

For exterior applications for either epoxy mortar patching and/or as a sealer on slabs, we recommend FORTRESS 540 Low Modulus Superstick Epoxy Resin System.

FORTRESS 4040 FAST SET is not recommended as a sealer for exterior applications of slabs on grade.

**CAUTION - For professional use only; not for sale to or use by the general public.** Fortress's epoxies contain alkaline amines. Strong sensitizer; MAY CAUSE SKIN SENSITIZATION or allergic response ranging from a mild wheezing to a severe asthmatic type attack. Avoid contact with skin or eyes. IN CASE OF CONTACT immediately wash skin with soap and water. Flush eyes with water and obtain medical attention. Wear protective clothing, goggles, and barrier cream on all exposed skin

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