



ENGINEERED POLYMER  
SYSTEMS, LLC

Brute-Top Hybrid Mortar System (HMS)

Brute-Top Hybrid MS is a chemical resistant, resin rich sand filled mortar that offers thermal shock resistance not typically found in epoxy resurfacing. The selection of a cycloaliphatic curing agent offers excellent chemical resistance as well as water spotting resistance. The HMS is typically installed as a slurry broadcast system where the sand filled system is installed then saturated with silica sand and then top coated. The unique resin / curing system is also used as the primer because of its excellent adhesion to concrete.

Brute-Top HMS offers a lower compressive strength than traditional epoxy resurfacing because of its thermal capabilities. The higher compressive strength and higher modulus of elasticity of traditional epoxy resurfacing makes them poor choices for thermal shock conditions. The unique blend of diluents, resins and curing agents blended with specifically formulated silica sands allows the HMS to function in temperature conditions from 0 to 170F (-18 to 77 C). The cure rate of the HMS is slower than traditional epoxy resurfacing but still allows the use of the floor within 24 hours.

Brute-Top HMS offers excellent chemical resistant to all chemicals typically found in bakeries or dairy plants. The use of hot water to wash down the floors will not affect the HMS provided the wash down water is within the temperature limits of the material.

TYPICAL PROPERTIES

Components	Resin	Activator
Viscosity 70F(21C)	700-1000 cps	55-120 cps
Flash Point	485°F (252C)	213°F (101C)
Pounds per gallon	9.6	8.33
Kilograms / liter	1.14	1.0
VOC	0.0	0.0

Mixed Components

	50F(10C)	70F(21C)	90F(32C)
Pot life (minutes)	90 - 100	50 - 70	30 - 40
Drying time (hours)			
Set to touch	16-20	12 - 14	8 - 10
Maximum recoat	- Floor must be ground prior to coating - no maximum recoat time		
Foot traffic	20-24	16-18	12-14
Floor installation temperature limits	50F(10C) – 90F(32C) (minimum to max)		
	Consult EPS for other temperatures.		

Physical Properties

Tensile Strength ASTM D638-10	
Cure Cycles	
7 days 77F(25C)	
Strength	720 psi
Modulus	2,130 psi
Elongation	85 %
Compressive strength ASTM C-579A	
7 days	5,800 psi (40 MPa)
Tensile strength ASTM C-307	
7 days	2,000 psi (13.8 MPa)
Flexural strength ASTM C-580	
7 days	2,000 psi (13.8 MPa)
Water absorption ASTM C-413	<0.1 %
Flammability ASTM D-635	-self extinguishing
Effective shrinkage ASTM C-883	passes test
Thermal compatibility ASTM C-884	pass test
Adhesion to concrete	>400 psi

PACKAGING

Brute-Top HMS is supplied in kit form. The resin is either packaged in 5 gallon pails or 55 gallon drums. The amine curing agent is either packaged in 5 gallon pails or 55 gallon drums. The mix ratio for liquids is 3.0:1 (resin: activator) by volume.

Each mix consists of 3 gallons (11.4 liters) of hybrid resin, 1.0 gallon (3.8 liters) of cycloaliphatic amine curing agent, one pint (0.5 liters) of colorant, two - 50 pound (22.7 kg) bags of PP Blend Silica Sand and two - 50 pound (22.7 kg) bags of HT Silica sand.

Each mix of primer consists of 3.0 gallons (11.4 liters) of hybrid resin and 1.0 gallon (3.8 liters) of cycloaliphatic amine curing agent. One pint (0.5 liters) to one quart (1 liter) of xylene can be added to the primer to enhance penetration into the concrete. When the primer has been applied a sparse broadcast of the PP Blend sand should be immediately broadcast into the wet primer. This helps hinder the resurfacer from tearing when it is applied if the primer has cured and it also provides a mechanical lock for adhesion of the resurfacer to the primer.

## ESTIMATING MATERIALS

Brute-Top HMS is typically installed with a screed box, pin rake or hand troweled. The minimum application thickness is 1/8 inch (3 mm) with the typical application thickness being 3/16 inch (4.8 mm). The mortar after being applied can be hand troweled to close the surface or rolled with a roller typically dipped in mineral spirits to close the surface. If non-skid is required the non-skid should be broadcast to excess into the wet surface of the resurfacer.

The theoretical coverage of one unit of resurfacer as indicated above is 110 square feet (10.2 sq m) at 3/16 inch (4.8 mm). Coverage will vary according to thickness. If there are holes or excessively worn areas these should be filled prior to applying Super EMS. Contact Engineered Polymer Systems for recommendations.

The theoretical coverage for 4 mixed gallons (15.2 liters) of primer applied at 8 mils will be 800 square feet (74.1 sq. m). The coverage will vary depending on thickness applied as well as porosity of the concrete.

## APPLICATION INSTRUCTIONS

Concrete should be tested for moisture transmission prior to installing any materials. Contact Engineered Polymer Systems for specific testing methods and ranges prior to installing these materials.

**Surface Preparation** – Shot blasting or diamond grinding are the preferred methods on concrete. The concrete should be blasted or ground to a 10 to 20 grit sand paper finish. Any oils or contaminants must be removed prior to installation. The perimeter of the area to be resurfaced should be keyed to eliminate any edges.

**Mixing** – The materials are packaged either in drum kits or prepackaged units. Contact Engineered Polymer Systems for detailed instructions on how to pour off drums. The prepackaged units should be mixed as follows:

- Pour the resin, hardener and colorant into a mortar mixer and mix for approximately 2 – 3 minutes.
- Add the four – 50 pound (22.7 kg) bags of aggregate individually and mix for 2-3 minutes or until completely wet out.
- Temperature affects the pot life and working time of the materials. The higher the temperature the shorter the working time. Do not mix more materials than can be installed with-in the pot life period.

### **Placement of Materials**

- Immediately pour the mixed material into a wheel barrow and then into a screed box or onto the floor. The material must be applied to the floor within 5-6 minutes of the completion of the mixing process. Any materials left in the wheel barrow or mixer will begin to set-up after the 5-6 minutes has passed and may not be workable.
- Typically the materials are then spread out by the use of a screed box, pin rake or hand trowel. The floor surface can be closed with the hand trowel or with a short nap roller cover on a long handle. If

a non-skid is being installed the aggregate should be broadcast until saturation on the fresh wet floor. The excess sand is then swept off after the resurfacer has cured and a topcoat to seal the sand is then installed. Consult Engineered Polymer Systems if any questions arise.

### **Clean-up**

Any mixing and application equipment should be cleaned up immediately upon completion of the job. Typically xylene is used to clean all the equipment.

### **Surface preparation prior to coating**

The cured surface of Brute-Top HMS must be ground prior to applying any topcoats if no non-skid was installed. This is typically done with 2-headed terrazzo grinders or larger diamond grinders. Care should be taken to only grind the surface smooth eliminating any high spots or bumps do not over grind tearing the surface.

### **Expansion Joints**

All expansion joints should be cut and filled with a material that is compatible with the topcoats being applied. Typically the joints are filled with a fast setting polyurea joint material.

### **Humidity and Dew Point**

Condensation can occur on the surface of concrete or epoxy when the substrate is below the dew point. This condensation can cause a film of moisture to form on the substrate interfering with adhesion or causing a blush. Check dew point temperatures prior to applying any materials. Any hazing of the film or greasy feeling may indicate a blush contact Engineered Polymer Systems prior to proceeding.

### **Disposal**

All materials should be disposed of in accordance with all Federal, State or Local regulations. Consult with EPA for regulations in your area.

## **STORAGE / SHELF LIFE**

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All materials should be stored in original – unopened containers in an enclosed building out of direct sunlight. Ideally the materials should be between 60 – 80F (16-27C) for 24 hours prior to installation. Installation of materials at temperatures outside of this range may make them difficult to install. The shelf life in unopened containers is a minimum of one year and typically much longer. Consult Engineered Polymer Systems if you have any concerns about materials.

## **SAFETY**

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### **CAUTION – READ MATERIAL SAFETY DATA SHEETS BEFORE USING ALL PRODUCTS.**

Follow recommendations for ventilation. Avoid contact with eyes or skin. Contact with skin requires washing with soap and water, eye contact requires immediately flushing / consult physician. If clothes become contaminated remove and wash prior to wearing.

These materials are for industrial use only.

## **WARRANTY / DISCLAIMER**

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All statements and recommendations are based on experience we believe to be reliable. The use or application of these products is beyond the control of Engineered Polymer Systems and therefore Engineered Polymer Systems does not make any warranty expressed or implied, as to results or hazards from its use. The suitability, risk and liability whatsoever of a product for any intended use shall be solely up to the user.

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