Royal Adhesives and Sealants, LLC
600 Cortlandt Street
Belleville, NJ 07109 USA
Tel: (888) 442-7362
Tel: (973) 751-3000
Fax: (973) 751-8407
Web: www.royaladhesives.com

ISO 9001:2000

TECHNICAL INFORMATION

EPOSET® M Series Brush Setting Adhesives

Product Information

The EPOSET M Brush Adhesives set the industry standard for setting fibers in paintbrushes. All the products consist of two components that react when mixed. The adhesives cure at room temperature.

Elementis designed the EPOSET adhesives for the demanding requirements of paint brushes:

- Excellent solvent and water resistance
- Low shrinkage
- Excellent adhesion to natural bristles
- Excellent adhesion to synthetic fibers
- Good wetting
- Controlled penetration
- Excellent adhesion to wood, plastic, metal, ceramic and leather

EPOSET adhesive systems consist of the EPOSET resin (Part A) and the EPOCURE® curative (Part B). The most widely accepted curative, EPOCURE 69, comes in three colors—blue, yellow, and clear.

Penetration

The EPOSET product line offers the brush maker penetration control with a family of products. Penetration varies with such variables as temperature, humidity, filament type, diameter & surface, void space, brush & ferrule design, curative level, and resin viscosity. Many of these factors vary, so Elementis Specialties offers a family of eight products that vary in viscosity.

The EPOSET M Series ranges from M-0.5 with penetration level of 1/16 inch to M-7 with a penetration of ½ inch. The brush maker has additional control by changing the amount of curative. The table on the next page lists the typical viscosity of each EPOSET resin. The figures at the end of this document show the change in penetration level with the change in curative level.

Processing

EPOSET M Series are designed for use with meter-mix equipment. Equipment with the capability of mixing two grades of EPOSET with the curative provide the brush maker with all the tools to control penetration.

The EPOSET resin and EPOCURE 69 curative have a typical work-life of about 30 minutes. This offers the flexibility to mix either by hand or with meter-mix equipment.

EPOSET RESIN GRADES

Penetration Grade	Viscosity Range @ 95F, cps	Wt./Gal. Range, lbs.	Stoichiometric Mix Ratios with EPOCURE 69 Parts by Weight
EPOSET M-0.5	12,000-22,000	14.2-14.6	100A : 8.0B
EPOSET M-1	9,500-22,000	14-14.4	100A : 8.5B
EPOSET M-1.5	6,500-17,500	13.8-14.2	100A : 9.0B
EPOSET M-2.0	6,000-15,000	13.4-13.8	100A : 9.5B
EPOSET M-2.5	5,000-14,500	13.2-13.6	100A : 10.0B
EPOSET M-3.0	4,000-14,000	12.9-13.3	100A : 10.5B
EPOSET M-3.5	3,500-12,500	12.7-13.1	100A : 11B
EPOSET M-4.0	3,000-11,000	12.6-13.0	100A : 11.5B
EPOSET M-5	3,000-11,000	12.0-12.4	100A : 12B
EPOSET M-6	2,500-8,000	11.5-11.9	100A : 14B
EPOSET M-7	2,500-7,000	11.2-11.6	100A : 15B

Typical Adhesive Pullout Strength Properties

Filament pullout strength was determined by embedding single filaments or bundles of 50 filaments in a typical EPOSET/EPOCURE 69 epoxy castings. Test samples were cured for 7 days at room temperature before testing.

System: EPOSET M 2.5/EPOCURE 69 Blue

Filament Type	A	B	C
Ketlar (tapered polyester)	1.19	1.2	50.8
Rib Ketema Quad Polyester	1.23	1.76	59.3
Tynex 12-8 (nylon) DuPont	1.39	1.76	59.3
Orel (polyester) DuPont	1.21	1.48	65.8
Chinex 12-8 (nylon) DuPont	2.15	2.2	82.6
Modex (acrylic)	2.7	2.84	88.8
Proprietary Blend (nylon)	1.5	1.53	67
Proprietary Blend (polyester)	1.87	1.79	66.4

a) Single filament after 7 days at room temperature cure.
b) Single filament after 7 days at room temperature cure + 30 days soaking in 1% detergent in water.
c) Bundle of 50 filaments tested after 7 days at room temperature.

The following adhesive pullout strength was observed with bundles of 50 nylon (DuPont) filaments, before and after solvent soaking.

System: EPOSET M 3/EPOCURE 69 Blue

Pullout strength is expressed in pounds.

Cure Schedule	Control Before Soaking	After 7 Days Soaking in Ethanol	After 7 Days Soaking 2% Detergent in Water
2 hrs. @ R.T. + 4 hrs. @ 140 °F + overnight @ R.T.	137	129	116
7 days @ R.T.	118	75	110
14 min. @ 130°F + 7 days @ R.T.	102	67	107
4 hrs. @ 140°F + 18 hrs. @ R.T.	116	76	106

Adhesion as a function of filament geometry and polymer type is shown in Figure 8.

HARDENER

EPOCURE 69 clear hardener weighs 8.20 pounds per gallon and has a viscosity range between 60-110 cps, at 77 °F.

Recommended Cure Schedule

2 hours at room temperature + 4 hours at 140 °F **OR** 7 days at room temperature.

Chemical Resistance

In general, cured EPOSET M grade brush setting adhesives have excellent resistance to mineral spirits, detergent and water, MEK and toluol/ethanol blend.

Typical test results of EPOSET grades M-3 and M-5 with EPOCURE 69 hardener at respective ratios are tabulated below. The results shown are percent weight gain or loss (-) after 7 days exposure to designated solvent at room temperature except where noted. Additional chemical resistance information is shown in Figures 2 thru 7.

EPOSET M-3 and M-5/EPOCURE 69-B

	Mix Ratio A : B (PBW)	1:1 Volume Blend Toluene/Ethanol	Methyl Ethyl Ketone	Varsol 18	1% Detergent in Water
EPOSET M-3/ EPOCURE 69B	100:8	D*	9.73	0.020	0.39
	100:9	20.3	10.9	-0.020	0.41
	100:10	23.3	12.8	-0.030	0.49
	100:11	24.5	13.8	0.001	0.59
	100:12	D*	13.5	0.005	1.05
EPOSET M-5/ EPOCURE 69B	100:12	28.27	16.43	-0.03	0.38

*Disintegrated or delaminated

Storage

These materials should be stored in a dry environment within a temperature range of 16 °C to 27 °C (60 °F to 80 °F). Extremes of temperature beyond this range may result in crystallization or polymerization of the materials. Introduction of a nitrogen blanket into the containers before closing will improve the storage life of the products.

Safety

These materials are intended for industrial use only and the practices of good housekeeping, safety and cleanliness should be followed before, during and after use.

Although the system contains low volatility materials, nevertheless, care should be taken in handling. Adequate ventilation of work place and ovens is essential. These materials may cause dermatitis in susceptible individuals. Keep off skin and out of eyes. In case of accidental skin contact, wash thoroughly with soap and water. In case of eye contact, flush eyes thoroughly with water and consult

a physician immediately. Refer to Material Safety Data Sheets for additional information.

Store materials in a cool, dry area at 60 °F to 80 °F in unopened containers. Open containers should be tightly re-sealed immediately after use.

Disposal

Contaminated or unused material should be reacted and cured to a solid mass. All applicable federal and state regulations should be investigated and followed.

ADDITIONAL INFORMATION

Visit our web site at:
www.royaladhesives.com

Contact us at:
Royal Adhesives and Sealants, LLC
600 Cortlandt Street
Belleville, NJ 07109-3384
(888) 442-7362 Toll-free
(973) 751-3000 Phone
(973) 751-8407 Fax