Epibond® 8000 FR A/B Flame Retardant Epoxy Structural Adhesive

Product Description

Epibond® 8000 FR A/B is an extrudable two-component epoxy structural adhesive designed for applications requiring FST properties or flame retardancy (FAR 25.853). This adhesive is suitable for bonding a wide variety of composite materials, metal and other dissimilar substrates. Epibond® 8000 FR A/B does not contain any halogenated nor antimony-based flame retardants additives. This adhesive has a convenient mix ratio, moderate work life, and is easily dispensed from cartridges or metering equipment.

Features

- FST properties
- High shear and peel strength
- Service temperature up to 180°F (82°C)
- Very-low halogen content
- Curable from ambient to elevated temperatures
- Gap-filling thixotropic paste
- No SVHC as defined under REACH*

*Does not intentionally contain any Substances of Very High Concern (SVHC) for authorization as published by the European Chemicals Agency (ECHA) pursuant to Article 59 REACH as of October 15, 2014

Typical Properties*

Property	Test Method	Epibond® 8000 FR A Resin	Epibond® 8000 FR B Hardener	Mixed System
Appearance	Visual	Off White	Light blue	Off White
Density, g/cm^3	ASTM D792	1.4	1.3	1.3
Viscosity at 25°C, cP	ASTM D2196	Semi-Paste	Paste	Thixotropic

*Typical properties are based on Huntsman's test methods. Copies are available upon request.

Processing

Under normal temperature conditions according to the standard mix ratio this material has a working time of approximately 50 - 55 minutes.

Mix Ratio

Product	Parts by weight	Parts by volume
Epibond® 8000 FR A Resin	100	2
Epibond® 8000 FR B Hardener	48	1

Mix both components thoroughly for several minutes until a homogeneous mixture is obtained, or dispense from a 2:1 200 mL or 50 mL dual barrel cartridge. For the 200 mL size, use an MC 10-mm dia. x 18-element spiral mixing nozzle or equivalent. For the 50 mL, use an MC 06-mm dia. x 18- element spiral mixing nozzle or equivalent.

Application

The mixed adhesive should be spread with a spatula to the suitably pretreated dry joint surfaces. A layer of adhesive 0.004 to 0.012 inches (0.1 to 0.3 mm) thick will normally provide the maximum lap shear strength. This adhesive, however, has been designed to be effective in layers up to 0.12 in. (3 mm). The components to be bonded should be assembled and clamped as soon as the adhesive has been applied. Even contact pressure throughout the joint area during cure will ensure optimum performance.

Parameter	Description	Value
Mixed flow at 77°F (25°C), in	IMS-LA-INST-005	<1.0
Extrusion rate at 70 psi, g/min	Dispensability with 1/8” nozzle	65

Handling Strength

Measured by lap shear strength with PPA and primed Aluminum at RT, in psi (MPa)

Cure time and temperature	Lap Shear Strength, psi (MPa)
3 hours at 77°F (25°C)	185 (1.3)
4 hours at 77°F (25°C)	1,835 (12.7)
5 hours at 77°F (25°C)	2,010 (13.9)
30 min at 135°F (57°C)	2,780 (19.2)

Processing Data

Parameter	Value
Gel time, 100 g, at 77°F (25°C)	65 – 70 min
Typical Cure Cycles	5 - 7 days at 77°F, or
	1.5 hours at 135°F

Typical Physical Properties

Unless otherwise stated, the data were determined with typical production batches using standard test methods. They are typical values only, and do not constitute a product specification.

Substrates (plastics and phosphoric acid anodized & primed aluminum) were quickly wiped with Isopropyl alcohol, dried with lint free towel, and then blown with dry nitrogen prior to adhesive application. Samples were cured for 1.5 hours at 135°F (57°C).

Property	Test Method	Test Condition	Value
Tensile lap shear strength, psi (MPa) Anodized & Primed Aluminum	ASTM D1002	 at -67°F (-55°C) at 77°F (25°C) at 160°F (71°C) at 180°F (82°C) at 212°F (100°C) at 250°F (121°C)	 4,000 (27.6) 3,900 (26.9) 2,400 (16.5) 1,290 (8.9) 750 (5.2) 600 (4.1)
PVC (e.g. Kydex® 6565) PC (e.g. Kydex® FST) XU35710 FST Benzoxazine glass laminate		at 77°F (25°C) at 77°F (25°C) at 77°F (25°C)	665 (4.6) 441 (3.0) >2,100 (>13.8)
Tensile strength, psi (MPa)	ASTM D638	at 77°F (25°C)	5,260 (36.3)
E-Modulus, ksi (MPa)	ASTM D638	at 77°F (25°C)	497 (3426.7)
Elongation at break, %	ASTM D638	at 77°F (25°C)	2.5
Flexural strength, psi (MPa)	ASTM D790	at 77°F (25°C)	9,050 (62.4)
Flexural modulus, ksi (MPa)	ASTM D790	at 77°F (25°C)	432 (2,978.5)
Compressive strength, psi (MPa)	ASTM D695	at 77°F (25°C)	16,300 112.4)
Glass transition temperature, T_g, °F (°C)	ASTM D7028	DSC DMA	162.5 (72.5) 158 (70)
Hardness, Shore D	ASTM D2250	at 77°F (25°C)	85
Shear modulus G', ksi (MPa)	ASTM D5279	at 77°F (25°C) at 140°F at 158°F at 176°F	218 (1,506) 118 (814.4) 30.6 (211.4) 5.4 (37.1)
Roller peel strength, pli (N/mm) on 0.02" &0.04" Al	ASTM D3167	at 77°F (25°C)	23 (4.0)

Typical Physical Properties, continued

Property	Test Method	Test Condition		Value
Flammability	CFR 25.853, Appendix F, Part 1	60-sec vertical burn, honeycomb panel Outside or inside burn: Flame extinguish time, sec Burn length, in Drip extinguish time, sec 12-sec vertical burn on neat resin(0.25” x 3” x 12”) Flame extinguish time Burn length Drip extinguish time 50-sec vertical burn on neat resin(0.25” x 3” x 12”) Flame extinguish time Burn length Drip extinguish time 60-sec vertical burn on neat resin (0.5” x 0.5” x 12” bar) Flame extinguish time Burn length Drip extinguish time		 <10 <1 <1 0.3 0 No drip 1.75 1.3 No drip 10 2.7 No drip
Smoke density, Ds (specific optical density)	ASTM E662	at 4-minutes		97 max. avg.
Toxic gas concentrations of smoke at 4-min, ppm	--	HCN CO - Ref NOx SO2 + H2S HF HCl		25 85 80 10 1.5 5.0
Decomposition temperature, °F	IPC-TM-650	T_d (2%) T_d (5%)		518 577
Halogen Content	Energy Dispersion X-ray Fluorescence	Resin	Chlorine Bromine	< 1,000 ppm Not detectable
		Hardener	Chlorine Bromine	< 150 ppm Not detectable

Storage

Epibond® 8000 FR A/B Epoxy Adhesives should be stored in a dry place in the original sealed container at temperatures between 2°C and 40°C (36°F and 104°F). Tightly reseal containers after each use. Under these storage conditions, the products have a shelf-life of **1 year** (from date of shipment). The components should not be exposed to direct sunlight.

Precautionary Statement

Huntsman Advanced Materials Americas LLC maintains up-to-date Safety Data Sheets (SDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Users should review the latest MSDS to determine possible health hazards and appropriate precautions to implement prior to using this material.

First Aid!
Refer to SDS as mentioned above.

KEEP OUT OF REACH OF CHILDREN

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