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Advanced Materials

Epibond® 100 A/B High-temperature Epoxy Structural Adhesive

KEY PROPERTIES

- **High shear and peel strength**
- **High Dry / Wet Tg**
- **Service temperature up to 300°F (148.9°C)**
- **Good chemical and environmental resistance**
- **Gap-filling thixotropic paste**
- **2:1 mix ratio by volume**
- **No SVHC as defined under REACH***

DESCRIPTION

Epibond® 100 A/B is a extrudable, two-component, heat curing epoxy structural adhesive designed for high service temperatures up to 300°F (149°C). This product is suitable for bonding a wide variety of materials such as metals, composites and many other dissimilar substrates. The combination of high strength and high hot/wet Tg performance makes this adhesive well suited for aerospace and other demanding applications. Epibond® 100 A/B contains 5 mil (125microns) spacer beads to help provide the very uniform bond line required in high stress areas.

TYPICAL PROPERTIES

Property	Epibond® 100 A Resin	Epibond® 100 B Hardener	Mixed adhesive	Test Method
Color	Off-white	Amber	Off-white	Visual
Specific gravity	1.16	1.0	1.0	ASTM D-891
Viscosity at 77°F (25°C)	Semi-Paste	Paste	Thixotropic Paste	ASTM D-2196
Gel time, 150 gm at 77°F (25°C) (minute)			135 -145	ASTM D-2471

Mix ratio	Parts by weight	Parts by volume
Epibond® 100 A resin	100	2
Epibond® 100 B Hardener	44	1

PROCESSING

Under normal temperature conditions according to the standard mix ratio this material has a working time of approximately 100 - 120 minutes.

PRETREATMENT:

Substrates to be bonded should be properly surface treated and be free from contaminants.

Mixing:

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

* 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 December 19, 2012

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 0.3mm) 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. (3mm). 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.

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

Cure Time, hrs / Cure temp.	120°F (49°C)	130°F (54°C)	140°F (60°C)	150°F (66°C)
1.00	NA	NA	NA	2,548 (17.5)
1.50	299 (2.1)	330 (2.3)	1,229 (8.5)	NA
2.25	NA	NA	2,160 (14.9)	NA
2.50	NA	1,768 (12.2)	2,385 (16.4)	NA
3.00	494 (3.4)	2,528 (17.4)	NA	NA

NA: Not tested

Recommended cure cycle:
1 hours at ~150°F (65°C) Plus 3 to 5 hours at ~ 200°F (93°C) to 275°F (135°C).

TYPICAL CURED ADHESIVE PROPERTIES
(Not for specification purposes)

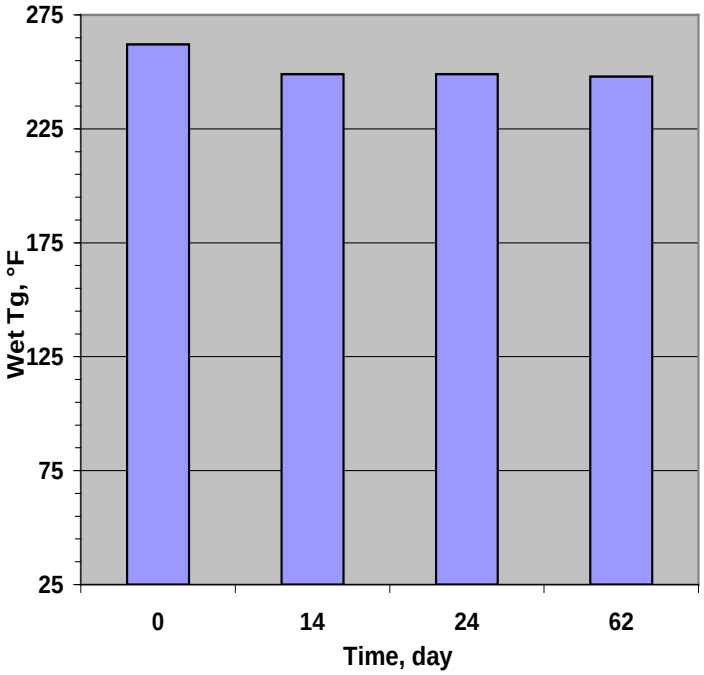
Substrate:
Phosphoric acid anodized and primed aluminium and appropriate surface treatment as indicated for Glass reinforced epoxy composite (GRC), and PEEK

Cure Schedule:
1.0 hour at 150°F (65°C) plus 5.0 hours at 200°F (93°C)

	Test	Units	Results	Test method
Tensile lap shear strength	Tested at 77°F (25°C), 10-mil glue line	psi (MPa)	5,000 (34.5)	ASTM D-1002
- Anodized and primed Al / Al	Tested at 77°F (25°C), 20-mil glue line	psi (MPa)	4,500 (31.0)	"
	Tested at 180°F (82°C), 20-mil glue line	psi (MPa)	3,800 (26.2)	"
	Tested at 200°F (93°C), 20-mil glue line	psi (MPa)	3,300 (22.8)	"
	Tested at 330°F (165.5°C), 10-mil glue line, cured 1.0 hour at 150°F (65°C) plus 3.0 hours at 275°F (135°C)	psi (MPa)	1,077 (7.4)	"
- Glass reinforced composites	Tested at 77°F (25°C), abraded & IPA treatment, 55-mil glue line	psi (MPa)	3,530 (24.3)	"
- PEEK / PEEK	Tested at 77°F (25°C), abraded & nitrogen treatment, 20-mil glue line	psi (MPa)	1,570 (10.8)	"

	Tested at 300°F (149°C) abraded & nitrogen treatment, 20-mil glue line	psi (MPa)	950 (6.5)	“
T- Peel strength	Tested at 77°F (25°C), 20-mil anodized & primed Al, 10-mil glue line	pli (N/mm)	22 (3.85)	ASTM D-1867
	Tested at 77°F (25°C), abraded and IPA on GRC, 45-mil glue line	pli (N/mm)	20 (3.50)	“
Tg by DMA	Dry Tg as cured	°F (°C)	262 (127)	ASTM D-7028
	Wet Tg after 62-day at 145°F at 85% RH	°F (°C)	248 (120)	

Hot / Wet Tg Vs. Exposured Time @ 145°F @ 85% RH



NEAT RESIN PROPERTIES	**Tensile strength** at 77°F (25°C)	psi (MPa)	7,500 (51.7)	ASTM D-638
	E-Modulus	ksi MPa	316 (2,178.7)	
	Elongation at break	%	4.4	
	Flexural strength at 77°F (25°C)	psi MPa	12,730 (87.8)	ASTM D-790
	Flexural modulus	ksi MPa	320.5 (2,209.8)	
	Compressive strength at 77°F (25°C)	psi MPa	10,460 (72.1)	ASTM D-695

	Shore D hardness		82	ASTM D-2250
	Poisson Ratio at 77°F		0.22	
	Shear modulus G' at 77°F (25°C)	Ksi MPa	130 (897)	ASTM D-5279
	140°F (60°C)	Ksi MPa	108.7 (750)	
	194°F (90°C)	Ksi MPa	89.4 (616)	
	284°F (140°C)	Ksi MPa	1.9 (13)	
DECOMPOSITION TEMPERATURE BY TGA	**Td (2%)**	°F (°C)	619 (326)	IPC-TM-650
	Td (5%)	°F (°C)	658 (348)	

CHEMICAL RESISTANCE

Fluid	Weight Absorption after 24-hours Immersion, %
Aviation gasoline 100LL	0.02
Jet-A	0.04
TKS 406B	0.03
Skydrol 500B-4	0.04
Turbo oil 2380	0.04
Royco 756A	0.03
X-IT Carbon Remover & Cleaner	0.15

STORAGE

When stored in a dry place in their original sealed containers at a temperature within +2°C and +40°C (+36°F and 104°F), Epibond® 100 A resin and Epibond® 100 B have a twelve month shelf-life from date of manufacture. Tightly reseal containers after each use.

HANDLING PRECAUTIONS

PRECAUTIONARY STATEMENT:

Huntsman Advanced Materials Americas LLC maintains up–to-date Material Safety Data Sheets (MSDS) 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 MSDS as mentioned above.

KEEP OUT OF REACH OF CHILDREN

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