Hysol® EA 9359.3

Epoxy Paste Adhesive

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Description

Hysol EA 9359.3 is two-component structural adhesive which exhibits high peel and high tensile lap shear strength. It contains 5 mil/0.13 m glass beads for bondline thickness control. This adhesive has excellent resistance to water, salt spray and most organic fluids. A variety of substrates such as metals, thermoplastics and composites may be bonded using Hysol EA 9359.3. Hysol EA 9359.3 is offered in a two:one cartridge with static mixer.

Features

Easy Mix
Good Environmental Resistance
Non Sag
High Shear Strength
Bondline Thickness Control
High Peel Strength
Available in Two:One Cartridge with Static Mixer

Uncured Adhesive Properties

	Part A	Part B	Mixed
Color	Yellow	Blue	Green
Viscosity @ 77°F	2,000 Poise	1,000 Poise	
Brookfield, HBT	Spdl 7 @ 20 rpm	Spdl 6 @ 20 rpm	
Viscosity @ 25°C	200 Pa·S	100 Pa·S	
Brookfield, HBT	Spdl 7 @ 2.1 rad/s	Spdl 6 @ 2.1 rad/s	
Density (g/ml)	1.12	1.11	1.12
Shelf life			
@ <40°F/4°C	1 year	1 year	
@ <77°F/25°C	1 year	1 year	
@ <90°F/32°C	1 year	1 year	

This material will normally be shipped at ambient conditions, which will not alter our standard warranty, provided that the material is placed into its intended storage upon receipt. Premium shipment is available upon request.

Note: Volume measurement is not recommended for structural applications unless special precautions are taken to assure proper ratios.

Handling

Mixing - This product requires mixing two components together just prior to application to the parts to be bonded. Complete mixing is necessary. The temperature of the separate components prior to mixing is not critical, but should be close to room temperature (77°F/25°C).

Mix Ratio	Part A	Part B
By Weight	100	44
By Volume	2	1

Pot Life	100 gm mass	60 minutes
	200 gm mass	50 minutes
	450 gm mass	40 minutes

Method - ASTM D2471 in water bath, @ 77°F/25°C.

Peak Exotherm (450 gm mass) is >300°F/149°C @ 40 minutes.

Application

Mixing - Combine Part A and Part B in the correct ratio and mix thoroughly. THIS IS IMPORTANT! Heat buildup during or after mixing is normal. Do not mix quantities greater than 450 grams as dangerous heat buildup can occur causing uncontrolled decomposition of the mixed adhesive. TOXIC FUMES CAN OCCUR, RESULTING IN PERSONAL INJURY. Mixing smaller quantities will minimize the heat buildup.

Applying - Bonding surfaces should be clean, dry and properly prepared. For optimum surface preparation consult the Hysol Surface Preparation Guide. The bonded parts should be held in contact until the adhesive is set. Handling strength for this adhesive will occur in 24 hours (>77°F/25°C), after which the support tooling or pressure used during cure may be removed. Since full bond strength has not yet been attained, load application should be small at this time.

Curing - This adhesive may be cured for 5 to 7 days @ 77°F/25°C to achieve normal performance. Accelerated cures up to 200°F/93°C (for small masses only) may be used as an alternative. For example, 1 hour @ 180°F/82°C will give complete cure.

Cleanup - It is important to remove excess adhesive from the work area and application equipment before it hardens. Denatured alcohol and many common industrial solvents are suitable for removing uncured adhesive. Consult your supplier's information pertaining to the safe and proper use of solvents.

Bond Strength Performance

Tensile Lap Shear Strength

Tensile lap shear strength tested per ASTM D1002 after curing for 7 days @ 77°F/25°C. Adherends are 2024-T3 alclad aluminum, phosphoric acid anodized per ASTM D3933.

	Typical Results	
Test Temperature, °F/°C	psi	MPa
-67/-55	4,000	27.6
77/25	4,500	31.0
180/82	2,000	13.8
200/93	1,000	6.9

Peel Strength

T-Peel strength tested per ASTM D1876 after curing for 7 days @ 77°F/25°C. Adherends are 2024-T3 alclad aluminum, phosphoric acid anodized per ASTM D3933.

	Typical Results	
Test Temperature, °F/°C	Lb/in	N/25 mm
77/25	60	267

Service Temperature
Service temperature is defined as that temperature at which this adhesive still retains 1000 psi (6.9 MPa) using test method ASTM D1002 and is approximately 200°F/93°C.

Bulk Resin Properties

Tensile Properties - tested using 0.125 inch/3.18 mm castings per ASTM D638.
Adhesive cure: 5 days @ 77°F/25°C and 1 hour @ 200°F/93°C

Tensile Modulus, @ 77°F/25°C	310 ksi	2136 MPa
Elongation at Break, @ 77°F/25°C	7.7%	
Shear Modulus, dry @ 77°F/25°C (by RDS)	149 ksi	1027 MPa
Shear Modulus, wet @ 77°F/25°C (by RDS)	89 ksi	613 MPa

	Dry	**Wet**[1]
T_g (Tan Delta by DMTA) @ 77°F/25°C cure	134°F/51°C	150°F/66°C
T_g (Tan Delta by DMTA) @ 200°F/93°C cure	185°F/85°C	149°F/65°C

[1]Wet exposure: 30 days @ 160°F/71°C, 95% RH

Compressive Properties - tested using 0.5 inch x 1 inch (12.7 x 25.4 mm) right cylinders @ 77°F/25°C per ASTM D695.

Compressive Strength cured @ 77°F/25°C	7,700 psi	53.0 MPa
Compressive Strength cured @ 200°F/93°C	21,000 psi	145 MPa

Handling Precautions
Do not handle or use until the Material Safety Data Sheet has been read and understood.
For industrial use only.

General:
As with most epoxy based systems, use this product with adequate ventilation. Do not get in eyes or on skin. Avoid breathing the vapors. Wash thoroughly with soap and water after handling. Empty containers retain product residue and vapors, so obey all precautions when handling empty containers.

PART A
WARNING! As with most epoxy adhesives, the uncured adhesive may cause eye and skin irritation such as allergic dermatitis. Contains epoxy resins.

PART B
WARNING! This material causes eye and skin irritation or allergic dermatitis. It contains amines.

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