Hysol® EA 9390

Epoxy Paste Adhesive

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Description

Hysol EA 9390 is a two-component epoxy adhesive designed for composite repair. Its good wetting, high shear modulus and good hot/wet properties make it suitable as a wet lay-up resin for graphite or glass composite repairs.

Features

Low Viscosity
Good Hot/Wet Strength
Good Wetting
High Shear Modulus
Cures @ 200°F/93°C
BMS 8-301 Qualified

Uncured Adhesive Properties

	Part A	Part B	Mixed
Color	Tan	Violet	Violet
Viscosity @ 77°F	600 - 1,200 Poise	0.6 - 1.2 Poise	120 - 160 Poise
Brookfield, HBT	Spdl 6 @ 20 rpm	Spdl 1 @ 20 rpm	Spdl 3 @ 10 rpm
Viscosity @ 25°C	60 - 120 Pa·S	.06 - .12 Pa·S	12 - 16 Pa·S
Brookfield, HBT	Spdl 6 @ 2.1 rad/s	Spdl 1 @ 2.1 rad/s	Spdl 3 @ 1.05 rad/s
Density (g/ml)	1.22	0.95	1.10
Shelf life			
@ <40°F/4°C	1 year	1 year*	
@ <77°F/25°C	6 months	1 year*	
@ <90°F/32°C	2 months	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.

*Storage of Part B @ <40°F/4°C may cause crystallization. To remove crystals, slowly warm material to 150°F/66°C while stirring.

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	56

Pot Life (250 g mass) 2 hours
Method - ASTM D2471 in water bath.

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 250 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. Cured bondline thickness may range from 3 to 6 mils (0.08 to 0.15 mm). For composite repair (wet lay-up), follow the composite part manufacturer's repair instructions.

Curing - This adhesive may be cured:
220 minutes @ 200°F/93°C
150 minutes @ 250°F/121°C
130 minutes @ 300°F/149°C

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 1 hour @ 250°F/121°C. Adherends are 2024-T3 bare aluminum with phosphoric acid anodized per ASTM D3933.

	Typical Results	
Test Temperature, °F/°C	**psi**	**MPa**
-67/-55	2,200	15.2
77/25	2,600	17.9
180/82	3,000	20.7
250/121	3,600	24.8
300/149	2,700	18.6
350/177	1,700	11.7

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 >350°F/177°C.

Henkel QC Acceptance Testing

This data sheet provides users with typical properties obtained from this adhesive. These values are not meant to be used to develop aerospace QC acceptance testing. Users interested in establishing values and tests for routine QC acceptance should request the Henkel Aerospace Specification (LAS) which provides detail test methods and values used to certify this adhesive.

Bulk Resin Properties

Tensile Properties - tested using 0.125 inch/3.18 mm castings per ASTM D638.

Tensile Strength @ 77°F/25°C	8,200 psi	56.5
Tensile Modulus @ 77°F/25°C	418 ksi	2880 MPa
Elongation at Break, @ 77°F/25°C	2.5%	
Shore D Hardness @ 77°F/25°C	89	
Tg dry	345°F	174°C
Tg wet	302°F	150°C
Shear Modulus, dry @100°F/38°C	168 ksi	1,157 MPa
Shear Modulus, @100°F/38°C (water, 24 hours @ 200°F/93°C)	160 ksi	1,102 MPa

Electrical Properties - tested per ASTM D149, D150.

Dielectric Constant, 1 KHz, 77°F/25°C	4.19
Dissipation Factor, 1 KHz, 77°F/25°C	0.017

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

CAUTION! This material may cause eye and skin irritation or allergic dermatitis. It contains epoxy resins.

PART B

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

Hysol® is a registered trademark of Henkel Corporation.

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