Technical Process Bulletin

LOCTITE EA 9390 AERO
Epoxy Paste Adhesive
(KNOWN AS Hysol EA 9390)

INTRODUCTION
LOCTITE EA 9390 AERO 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 at 200°F/93°C
- BMS 8-301 Qualified

Uncured Properties

	Part A	Part B	Mixed
Color	Light Beige	Blue	Violet
Viscosity @ 77°F	940 Poise	0.9 Poise	100 Poise
Brookfield, HBT	Spdl 6 @ 20 rpm	Spdl 1 @ 20 rpm	Spdl 3 @ 10 rpm
Viscosity @ 25°C	94 Pa·S	0.09 Pa·S	10 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	0.94	1.15
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.

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

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

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Pot Life (250 gram mass) 2 hours @77°F/25°F
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 LOCTITE 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

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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.

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 MPa
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.

DISPOSAL INFORMATION
Dispose of spent remover and paint residue per local, state and regional regulations. Refer to HENKEL TECHNOLOGIES MATERIAL SAFETY DATA SHEET for additional disposal information.

PRECAUTIONARY INFORMATION
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.

Before using this product refer to container label and HENKEL TECHNOLOGIES MATERIAL SAFETY DATA SHEET for additional precautionary, handling and first aid information.

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Note

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