



Technical Process Bulletin

LOCTITE EA 9392 AERO

Epoxy Paste Adhesive

(KNOWN AS Hysol EA 9392)

INTRODUCTION

LOCTITE EA 9392 AERO is a two-component paste adhesive, which cures at room temperature and possesses excellent shear strength at high temperatures. This product exhibits excellent toughness and yields durable bonds over a wide temperature range.

FEATURES

- Easy Mix Components
- Tough Durable Bonds
- Good Gap Filling/Potting Adhesive
- Thixotropic

Uncured Properties

	<u>Part A</u>	<u>Part B</u>	<u>Mixed</u>
Color	Gray	Amber	Gray
Viscosity @ 77°F	4,200 Poise	6,600 Poise	
Brookfield, HBT	Spdl 7 @ 20 rpm	Spdl Tbar C @ 5 rpm	
Viscosity @ 25°C	420 Pa·S	660 Pa·S	
Brookfield, HBT	Spdl 7 @ 2.1 rad/s	Spdl 6 @ 0.5 rad/s	
Density (g/ml)	1.37	1.0	1.29
Shelf life			
@ <40°F/4°C	1 year	1 year	
@ <77°F/25°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.

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).

<u>Mix Ratio</u>	<u>Part A</u>	<u>Part B</u>
By Weight	100	32
By Volume	100	44

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

Pot Life (100 g mass) 75 minutes @ 77°F/25°C
Method - ASTM D2471 in water bath.



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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 LOCTITE 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 5 days @ 77°F/25°C. Adherends are 2024-T3 Bare PAA aluminum.

<u>Test Temperature, °F/°C</u>	Typical Results	
	<u>psi</u>	<u>MPa</u>
-67/-55	3,500	24.1
77/25	4,300	29.6
180/82	2,500	17.2
250/121	2,000	13.8
300/149	1,300	9.0
350/177	1,000	6.9

Blister Shear Strength

Blister shear strength tested on 2024-T3 bare FPL etched per ASTM D3165 after curing for 7 days @ 77°F/25°C.

<u>Test Temperature, °F/°C</u>	Typical Results	
	<u>psi</u>	<u>MPa</u>
-67/-55	3,000	20.7
77/25	4,000	27.6
180/82	2,500	17.2
250/121	2,000	13.8
300/149	1,000	6.9



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Peel Strength

T Peel strength tested per ASTM D1876 after curing for 5 days @ 77°F/25°C. Adherends are 2024-T3 bare PAA aluminum.

<u>Test Temperature, °F/°C</u>	<u>Typical Results</u>	
	<u>Lb/in</u>	<u>N/25mm</u>
77/25	20	89

Bell Peel strength tested per ASTM D1876 after curing for 7 days @ 77°F/25°C. Adherends are 2024-T3 bare PAA aluminum.

<u>Test Temperature, °F/°C</u>	<u>Typical Results</u>	
	<u>Lb/in</u>	<u>N/25mm</u>
77/25	40	178
180/82	30	133

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	6,000 psi	41.3 MPa
Tensile Modulus @ 77°F/25°C	475 ksi	3,273 MPa
Elongation at Break @ 77°F/25°C	4%	
Tg Dry - Cured 7 days @ 77°F/25°C	164°F	73°C
Tg Wet*- Cured 7 days @ 77°F/25°C	144°F	62°C
Tg Dry - Cured 1 hour @ 180°F/82°C	356°F	180°C

*Wet conditioning was determined after immersion in 77°F/25°C water until equilibrium.

Compressive Properties - tested using cylindrical samples 1.15 inch/29.2 mm diameter x 1 inch/25.4 mm height per ASTM D695. The adhesive cure was 7 days @ 77°F/25°C.

<u>Test Temperature @ 77°F/25°C</u>	<u>Typical Results</u>	
Compressive Strength @ 2% off-set	9,300 psi	64.1 MPa

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.



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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.

Note

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