

LOCTITE EA 9380 AERO

Epoxy Paste Adhesive

(KNOWN AS Hysol EA 9380)

INTRODUCTION

LOCTITE EA 9380 AERO is a low temp curing two-part adhesive that can be applied to large parts via a controlled meter mix operation or via dual cartridge static mixer kits. LOCTITE EA 9380 AERO offers the strength, toughness and high temperature resistance of heat curing film adhesives with greater flexibility and ease of use.

FEATURES

- Low temp curing two-part adhesive
- Meter mixable
- High strength, toughness and high temp resistance
- Prebond humidity resistant

Benefits

- Long assembly times
- Facilitates automated application
- Film type properties in paste form
- No surface carbonation

Uncured Properties

	<u>Part A</u>	<u>Part B</u>	<u>Mixed</u>
Color	Black	White	Grey
Mix Ratio			
by volume	100	50	
by weight	100	55	
Density, g/cc	0.92	0.99	0.97
Viscosity @ 86°F/30°C ¹	700-3700 poise 70-370 Pa·s	600-2500 poise 60-250 Pa·s	
Working Life @ 77°F/25°C ²	-	-	3 hours
Surface Carbonation	-	-	None
Vertical Slump @ 77°F/25°C	-	-	0.4 inches 10 mm
▪ 0.12 inch/3 mm thick			
Shelf life @ 0°F/-18°C	1 year	1 year	
@ <40°F/4°C	1 year	1 year	
@ 77°F/25°C	4 months	1 year	

Footnotes:

1. Measured using parallel plate Rheometry. Measurements made at 10 rad/sec.
2. Time available for part assembly with retention of complete adhesive properties, measured in 0.016/0.4 mm thick layer

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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	55
By Volume	100	50

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

Application

Mixing - Combine Part A and Part B in the correct ratio and mix thoroughly. Heat build-up during or after cure is normal. Maximum temperature recorded in a 1 lb / 450 g mass was 100°F/38°C.

Applying - Bonding surfaces should be clean, dry and properly prepared. For optimum surface preparation consult the LOCTITE Surface Preparation Guide. Material may pre-heated to 86°F/30°C to improve flow when dispensing from dual cartridge containers.

Curing - This adhesive may be cured at temperatures at or above 160°F/70°C. The recommended range is 160°F/70°C to 175°F/80°C for 240 minutes.

Cleanup - It is important to remove excess adhesive from the work area and application equipment before it hardens. Acetone 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 Shear Strength

Tensile lap shear strength tested per ASTM D1002 after curing 4 hours @ 160°F/70°C. Adherends are 2024-T3 AlClad aluminum, phosphoric acid anodized per ASTM D3933.

Typical Results

<u>Test Temperature, °F/°C</u>	<u>psi</u>	<u>MPa</u>
-67/-55	4,650	32
77/25	5,350	36
180/82	4,200	29
250/121	2,500	17

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Floating Roller Peel

Floating roller peel tested per ASTM D3167 after curing 4 hours @ 175°F/79°C. Adherends are 2024-T3 AlCad aluminum, phosphoric acid anodized per ASTM D3933.

Test Temperature, °F/°C
77/25

Typical Results

<u>lb/in</u>	<u>N/25mm</u>
40	178

Service Temperature

Service temperature is defined as being the onset of the glass transition using a 4 hours @ 160°F/70°C cure. The service temperature is 200°F/93°C.

Bulk Resin Properties**Compressive Properties**

Compressive Strength @ 77°F/25°C	11,300 psi	78 MPa
Compressive Modulus @ 77°F/25°C	355 ksi	2950 MPa
Shore D Hardness @ 77°F/25°C	77	
Tg Dry	200°F	93°C
Tg Wet	225°F	108°C

Adhesive Cure

Degree of Cure, %	4 hrs. @ 160°F/70°C	80-85
Tg onset, as cured		200°F/93°C
▪ Saturated @ 160°F/70°C & 85% R.H.		225°F/108°C
▪ % H ₂ O Absorbed, w/w		4.0

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Film Comparisons

	LOCTITE EA 9380 AERO	LOCTITE EA 9628 AERO	LOCTITE EA 9696 AERO
Form	Paste	Supported Film	Supported Film
Film Weight, psf (g/m ²)	-	0.060 (293)	0.060 (293)
Support Fabric	None	Non-woven	Non-woven
Adhesive Cure	4 hrs. @ 160°F/70°C	1.5 hrs. @ 235°F/113°C	1 hr. @ 250°F/120°C
Adherends	2024-T3 Clad, PAA, BR127	2024-T3 Bare, PAA, BR127	2024-T3 Bare, PAA, BR127
Tensile Lap Shear, psi (MPa)			
-67°F/-55°C	4,650 (32.1)	5,500 (37.9)	6,700 (46.2)
77°F/25°C	5,350 (36.9)	5,800 (40.0)	6,300 (43.5)
180°F/82°C	4,200 (29.0)	5,100 (35.2)	4,550 (31.8)
250°F/120°C	2,500 (17.2)	2,100 (14.5)	2,200 (15.2)
Tensile Lap Shear Hot/Wet, psi (MPa) ▪ 2000 hrs. @ 160°F/70°C & 85% R.H. ▪ Tested @ 180°F/82°C	3,900 (26.9)	2,650 (18.3)	2,750 (19.0)
Bell Peel Tested @ 75°F/25°C, lb/in (N/25mm)	40 (178)	55 (240)	80 (350)
Glass Transition Temperature (T _g), °F (°C) ▪ As Cured ▪ Water Saturated, 160°F/70°C @ 85% R.H.	210 (99) 220 (104)	230 (110) 180 (82)	225 (107) 200 (93)

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.



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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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