Technical Process Bulletin

LOCTITE EA 934NA AERO
Epoxy Paste Adhesive
(KNOWN AS Hysol EA 934NA)

INTRODUCTION
LOCTITE EA 934NA AERO is a two-component thixotropic paste adhesive, which cures at room temperature and possesses superior strength to 300°F/149°C and higher. Its thixotropic nature and good compressive strength make it ideal for potting, filling and fairing, as well as for shim applications. LOCTITE EA 934NA AERO is qualified to MMM-A-132 Type 1, Class 3 with a room temperature cure.

FEATURES
- Room Temperature Cure
- Good Gap Filler
- 300°F/149°C Performance
- Potting Material
- MMM-A-132 Qualified
- Develops Strength Rapidly

Uncured Properties

	Part A	Part B	Mixed
Color	Gray	Amber	Gray
Viscosity @ 77°F	3500–9000 Poise	10 - 30 Poise	800 Poise
Brookfield, HBT	Spdl 7 @ 20 rpm	Spdl 1 @ 20 rpm	Spdl 6 @ 20 rpm
Viscosity @ 25°C	350 - 900 Pa·S	1 - 3 Pa·S	80 Pa·S
Brookfield, HBT	Spdl 7 @ 2.1 rad/s	Spdl 1 @ 2.1 rad/s	Spdl 6 @ 2.1 rad/s
Density (g/ml)	1.52	0.96	1.30
Shelf life			
@ 0°F/-18°C	1 year	1 year	
@ <40°F/4°C	1 year	1 year	
@ <77°F/25°C	3 months	1 year	
@ <90°F/32°C	2 months	1 year	

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	33

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

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Pot Life (450 gram mass) 40-50 minutes @ 77°F/25°C
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 1 pound 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 8 hours @ 77°F/25°C, after which the support tooling or pressure used during cure may be removed. (Alternates are: 20 minutes @ 140°F/60°C, or 1 minute @ 205°F/96°C.) 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 @ 200°F/93°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 @ 90°F/32°C. Adherends are 2024-T3 bare aluminum treated with phosphoric acid anodized per ASTM D3933.

	Typical Results	
Test Temperature, °F/°C	**psi**	**MPa**
-67/-55	3,100	21.4
77/25	3,700	25.5
180/82	2,800	19.3
300/149	1,200	8.3
500/260	450	3.1

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 300°F/149°C.

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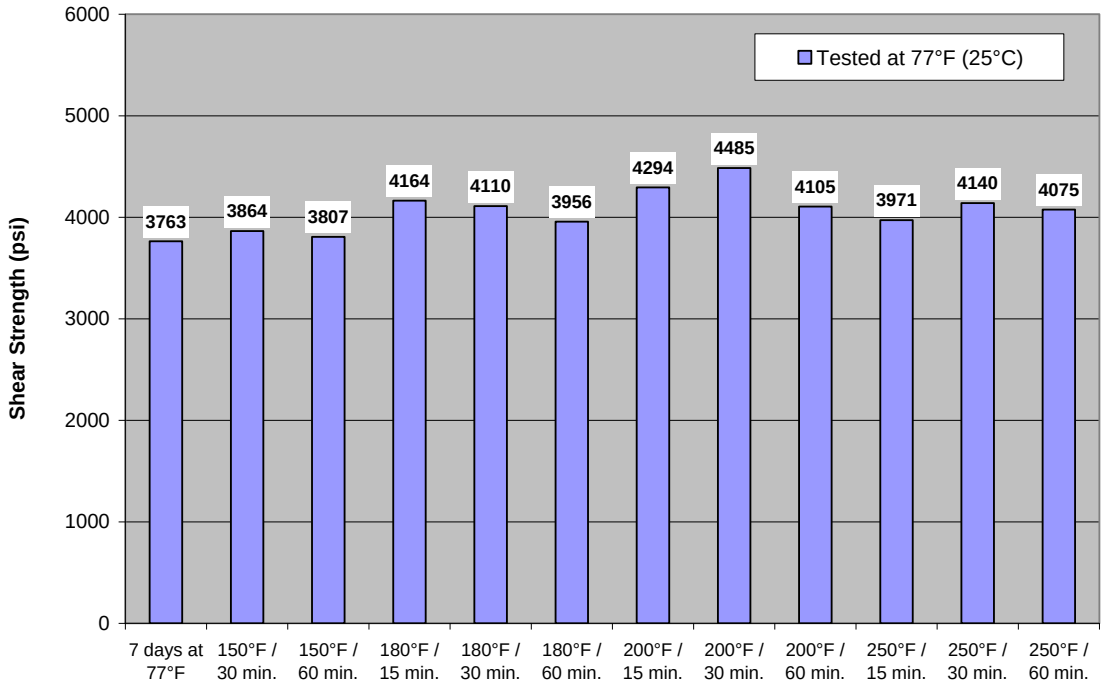
		Typical Results Tested at 77°F/25°C	
Fluid Exposure	**Conditioning**	**psi**	**MPa**
Water	30 days at 77°F/25°C	3,500	24.1
Isopropyl Alcohol	7 days at 77°F/25°C	3,300	22.7
Hydraulic Oil	7 days at 77°F/25°C	3,500	24.1
JP-4 Fuel	7 days at 77°F/25°C	3,500	24.1
Salt Spray	30 days at 105°F/41°C	3,300	22.7

Cure Chart Performance

Henkel Hysol EA 934NA
Adhesive Cure Condition vs Tensile Lap Shear Strength
2024T3 Bare 0.063" (1.6mm) Thick / PAA / 20 psi (1.4 bar)



°C = (°F-32) x 5/9
MPa = psi / 145

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Bulk Resin Properties

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

Tensile Strength @ 77°F/25°C	5,800 psi	40.0 MPa
Tensile Modulus @ 77°F/25°C	550 ksi	3790 GPa
Elongation at Break @ 77°F/25°C	1.2%	
Shore D Hardness @ 77°F/25°C	85	
Tg Dry		
(Cure 7 days @ 77°F/25°C)	159°F	71°C
(Cure 1 hour @ 200°F/93°C)	264°F	129°C

Compressive Properties - tested using 0.5 inch/12.7 mm castings per ASTM D695.

Compressive Strength @ 77°F/25°C (ultimate)	9,500 psi	65.5 MPa
Compressive Strength @ 300°F/149°C (ultimate)	2,500 psi	17.2 MPa

Electrical Properties - tested per ASTM D149, D150.

Dielectric Constant (1KHz, 77°F/25°C)	7.24
Dissipation Factor (1KHz, 77°F/25°C)	0.028

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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