



Hysol® EA 9602.3

Epoxy Film Adhesive

Henkel Corporation
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Description

Hysol EA 9602.3 is a modified epoxy adhesive normally cured @ 250-270°F/121-132°C. It is a beige colored, tacky, supported or unsupported film. The adhesive can be used for metal-to-metal bonds and honeycomb structures. It exceeds the requirements of federal specification MMM-A-132, Type 1, Class 2, and military specification MIL-A-25463, Type 1, Classes 1 and 2. This adhesive has exceptional stability at room temperature in the uncured state. It resists common aircraft fluids, water, salt water, and high humidity. High peel and tensile shear strength are maintained over a wide temperature range. This product is offered as a supported tape at 0.045 and 0.060 lbs/ft² (220+293g/m²), and unsupported film in a weight of 0.060 lbs/ft² (293g/m²).

Features

- Exceptional Metal-to-Metal and Honeycomb Bonds
- Resistant to common aviation fluids
- Film adhesive
- Exceptional out-time

Handling

This product is in film form and is ready to use as received. The adhesive should be removed from cold storage and allowed to warm to room temperature (77°F/25°C). All moisture should be removed from the protective packaging before opening. The adhesive film has a protective liner(s) on it that must be removed prior to parts assembly (see "Applying" below). The liner(s) is a contrasting color from the adhesive to allow the user easy confirmation of removal.

Application

Storage Life - This product requires refrigerated storage. Store @ 0°F/-18°C or below for maximum storage life. Warranty life @ 0°F/-18°C is 6 months from date of shipment. Store only in sealed containers to prevent moisture contamination. Allow all moisture to evaporate from container before opening for use.

Applying - Bonding surfaces should be clean, dry and properly prepared. For optimum surface preparation consult the Hysol Surface Preparation Guide. The adhesive film, with one liner left on it, may be tacked to the detail part for cutting to shape and size. The liner should remain with the adhesive until just before assembly of the detail to the other faying surface. This will minimize contamination of the adhesive bond. The bonded parts should be held in contact until the adhesive has cured. A cure pressure of 25 to 50 psi /172 to 345 kPa is sufficient to assure proper part mating.

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Users should review the Materials Safety Data Sheet (MSDS) and product label for the material to determine possible health hazards, appropriate engineering controls and precautions to be observed in using the material. Copies of the MSDS and label are available upon request.

LOCTITE

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Test Temperature	Supported Adhesive (0.045 psf/220 g/m ²)		Supported Adhesive (0.060 psf/290 g/m ²) with EA 9202 Primer		Unsupported Adhesive (0.060 psf/290 g/m ²) with EA 9202 Primer	
	Typical Results		Typical Results		Typical Results	
	<u>°F/°C</u>	<u>In • lb/in</u>	<u>M•n/m</u>	<u>In • lb/in</u>	<u>M•n/m</u>	<u>In • lb/in</u>
-67/-55	57	254	73	325	55	245
77/25	69	307	77	342	76	338
160/71	65	289	66	294	--	--
180/82	60	267			--	--
200/93	--	--			79	351
250/121	45	200				

Effects of environmental exposure on climbing drum peel strength (metal-to-metal), using supported adhesive (0.060 psf/293 g/m²), with Hysol EA 9202 primer.

Supported Adhesive (0.060 psf/293g/m ²) w/ Hysol EA 9202 Primer After Exposure to*:	<u>Test Temperature</u>		<u>Test Temperature</u>		<u>Test Temperature</u>	
	-67°F/-55°C		77°F/25°C		200°F/93°C	
	<u>In • lb/in</u>	<u>M•n/m</u>	<u>In • lb/in</u>	<u>M•n/m</u>	<u>In • lb/in</u>	<u>M•n/m</u>
Control	73	325	77	342	66	294
160°F/71°C - 500 hours	71	316	90	400	80	356
95% RH - 30 days, 120°F/49°C	64	285	79	351	72	320
Skydrol 500B -30 days, 120°F/49°C	81	360	78	346	75	334
-67°F/-55°C soak - 192 hours	79	351	89	396	80	356
Tap H ₂ O - 30 days, 77°F/25°C	78	346	87	387	79	351

Flatwise Tensile Strength (Honeycomb Sandwich):

The following properties were obtained with Hysol EA 9602.3 cured under 35 - 50 psi/241 to 340 kPa in an autoclave @ 250°F/121°C for one hour, 30 minute heat-up. Hysol EA 9202 corrosion inhibiting primer was sprayed to 0.2 mils/0.005mm and baked for one hour @ 250°F/121°C prior to bonding.

Flatwise Tensile strength tested per ASTM C297 after curing as shown above. Adherends are sodium dichromate - sulfuric acid etched 2024-T3 Alclad aluminum, 0.020 inch/0.508mm or 0.04 inch/1.02mm thick skins per ASTM D2651-90, bonded to 7.0 lb/ft³/112 kg/m³ core, 0.25 inch/6.35mm cell, 0.004 inch/0.1mm foil, 3003 alloy, 0.5 inch/12.7mm thick.

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	Typical Results		Typical Results		Typical Results	
	psi	MPa	psi	MPa	psi	MPa
-67/-55	1,350	9.3	1,300	9.0	1,700	11.7
77/25	950	6.5	950	6.5	1,350	9.3
160/71	800	5.5	650	4.5	1,000	6.9
180/82	700	4.8	500	3.4	900	6.2
200/93	600	4.1	400	2.8	750	5.2

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 235°F/113°C.

Handling Precautions

Do not handle or use until the Material Safety Data Sheet has been read and understood.

For industrial use only.

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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.

ONE PART

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

Hysol® is a registered trademark of Henkel Corporation

Rev. 1/01

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