



## Hysol® EA 9296

### Adhesive Bonding Primer

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#### **Description**

Hysol 9296 is a one part water-borne chromated adhesive bonding primer for 121°C (250°F) service. This primer has been specifically formulated as a companion primer to Hysol EA 9696, a 121°C (250°F) service metal bond adhesive. It is applied with current aerospace primer spray equipment, and provides low VOC's of 196 g/liter. After a solvent flash of 15 to 30 minutes, it may be cured 60 minutes at 121°C (250°F) for optimum performance. The data contained herein were obtained with the companion film adhesive Hysol EA 9696.06NW.

#### **Features**

4 months storage stability @ 5°C (40°F). (Do not freeze)  
Worklife of up to 20 days @ 25°C (77°F) or up to 9 days @ 30°C (90°F)  
Parts may be stored for 6 months after primer cure when protected.  
Primer reactivation not required for second-stage bonding. (Surface preparation for rebondability is MEK wipe, light hand abrade [Scotch-Brite®] and MEK clean).

#### **Cost Effective**

24% solids improves effective coverage vs conventional 10% solids solvent-based primers.  
No special application equipment is required. Specifically developed for maximum transfer efficiency with high volume low pressure (HVLP).

#### **Enhanced Health & Safety - Environmental Compliance**

Meets latest South Coast Air Quality Management District (SCAQMD) Rule 1124 requirements effective January 2002 of 205 qms/l.  
196 grams per liter VOC.  
Flash point >95°C (200°F).  
Low odor.  
Easy equipment clean-up with water when primer is wet.

#### **High Performance**

121°C (250°F) thermal aging stability.  
Improved toughness helps prevent shop handling delaminations.  
Corrosion inhibiting.

## Uncured Primer Properties

Color	Yellow
Solids	24%
Weight	1.044 g/cc (8.7 lbs/gal)
Corrosion Inhibition Package	Chromates
Warranty (from date of shipment)	
@ 5°C (40°F)	4 months
@ 25°C (77°F)	20 days
Volatile Organic Compounds (VOC)	196 g/l**

\*\* SCAQMD Rule 1124 (less water)

## Handling

Store @ 5°C (40°F). DO NOT FREEZE.

After warming to room temperature 25°C (77°F), the primer can be applied by typical HVLP spray equipment after rolling or shaking to obtain a uniform solution. Since the primer contains insoluble pigments, COMPLETE MIXING AND AGITATION IS REQUIRED! Observe all necessary precautions for the proper and safe use of primers.

## Application

**Applying** - Bonding surfaces should be clean, dry and properly prepared. For optimum surface preparation consult the Hysol Surface Preparation Guide. The primer should be sprayed after mixing well (15 minutes using shaker or 60 minutes using paint roller) using the following procedure. Hysol 9296 should be cured for 60 minutes @ 121°C (250°F) detail temperature for optimum performance. The surface preparations for the aluminum panels should include a detergent cleaning followed by a FPL etch and concluding with the phosphoric acid anodization of the metal per ASTM 3933.

The following procedures were used in preparing laboratory test panels at 0.004-0.009 mm (0.15-0.35 mils) dried film thickness (DFT).

### **Air Atomization**

Gun:	DeVilbiss Model JGA-502 #30 Air Cap AV-16-EX Fluid Tip JVA 402 DEX Fluid Needle Valve
Line Pressure:	689 kPa (100 psi)
Pressure at Gun:	275 –345 kPa (40-50 psi)
Fan Pattern:	Full Spray
Volume Control:	As necessary to apply DFT per box coat. Suggest starting at 3/4 turns from off position.
Distance to Panels:	20-30 cm (8-12 inches) at 45°
Number of Coats:	One box coat per 0.0025-0.005 mm (0.1-0.2 mils) DFT
Interval Between Coats:	30-60 seconds
Flash-Off Conditions:	15-30 minutes at ambient temperature

**HVLP (High Volume Low Pressure) Application**

System: DeVilbiss HVLP System 89™  
 Gun: Model JGA-510  
 #57 Air Cap  
 JGA 4046-22 Fluid Tip & Needle Valve  
 Line Pressure: 345 kPa (50 psi)  
 Pressure at GUN: 69 kPa (10 psi)  
 Fan Pattern: Full Spray  
 Volume Controls: As necessary to apply 0.0025-0.005 mm (0.1-0.2 mils) DFT per box coat.  
 Air Valve Suggest starting at 1 ½ turns from off position.  
 Primer Valve Suggest starting at ¾ turns from off position.  
 Distance to Panels: 20-30 cm (8-12 inches) at 45°  
 Number of Coats: One box coat per 0.0025-0.005 mm (0.1-0.2 mils) DFT  
 Interval Between Coats: 30 seconds  
 Flash-Off Conditions: 15-30 minutes at ambient temperature

**Open Assembly Time** - Parts, which have been primed and cured, may be stored for up to 6 months. They should be protected from gross contamination during storage. Just prior to the adhesive application, the surfaces to be bonded should be wiped with a ketone solvent.

**Cleanup** - Overspray must be removed prior to curing the primer. Uncured primer may be removed with a ketone solvent in a well-ventilated area. Saturate a clean cloth or industrial wiper with solvent and apply just enough to do the job. Consult your solvent supplier's information pertaining to the safe and proper use of flammable solvents. Uncured wet primer may be cleaned up with water.

**Bond Strength Performance**

This primer is compatible with adhesives curing at 121°C (250°F). The following properties were obtained with Hysol EA 9696.06 NW film adhesive cured using a 60 minutes ramp to 121°C (250°F) followed by a 90-minute soak at 121°C (250°F) at 310 kPa (45 psi) pressure in a Lipton autoclave. Hysol 9296 primer was applied at 0.0025 mm (0.10 mils) to 0.0100 mm (0.40 mils), air dried for 15 to 30 minutes and baked at 121°C (250°F) for one hour before use. 2024-T3 bare and clad aluminum skins and facesheets were used as the substrates for mechanical property evaluations. Aluminum honeycomb core 6.36 mm (0.25 in) cell, 0.01 mm (0.004 in) N5052, 15.9 mm (0.625 in) thick and 1.28 g/cc (7.9 pcf) was used for honeycomb structures.

**Wide Area Overlap (WAO)** strength properties of the primer and adhesive system were evaluated based on wide area overlap tensile lap shears (ASTM D 3165). Adherends are 2024-T3 bare aluminum treated with phosphoric acid anodizing per ASTM D3933.

**Wide Area Overlap (WAO) Shear  
 Using Hysol EA 9696.06NW Adhesive  
 MPa ( psi)**

Primer	-55°C (-67°F)	25°C (77°F)	82°C (180°F)	121°C (250°F)
Hysol EA 9296	35.0 (5080)	33.8 (4900)	25.4 (3680)	14.1 (2040)

**Wide Area Overlap (WAO) Shear  
 Using Hysol EA 9696.06NW Adhesive  
 MPa ( psi)**

<b>Storage Interval</b>	<b>-55°C (-67°F)</b>	<b>25°C(77°F)</b>	<b>82°C (180°F)</b>	<b>121°C (250°F)</b>
Initial	35.9 (5210)	33.3 (4830)	25.3 (3670)	11.8 (1710)
6 months	34.2 (4960)	33.9 (4910)	24.4 (3540)	13.1 (1900)
1 year	36.1(5230)	34.5 (5000)	25.9 (3750)	11.3 (1640)

**Flatwise Tension (FWT) Strength Performance**

*Flatwise Tension Strength* properties of the primer and adhesive system were evaluated based on flatwise tension strength (ASTM C297). Adherends are 2024-T3 bare aluminum treated with phosphoric acid anodizing per ASTM D3933. Core size was 6.36 mm (0.25 in) cell, 0.01 mm (0.004 in) N5052, 15.9 mm (0.625 in) thick and 1.28 g/cc (7.9 pcf).

**Flatwise Tension (FWT)  
 Using Hysol EA 9696.06NW Adhesive  
 MPa ( psi)**

<b>Storage Interval</b>	<b>25°C(77°F)</b>	<b>82°C (180°F)</b>	<b>121°C (250°F)</b>
Initial	8.8 (1280)	5.5 (804)	1.2 (172)
3 months	9.1 (1320)	5.9 (856)	1.2 (167)
1 year	7.6 (1100)	4.9 (705)	1.6 (228)

**Peel Strength**

***Metal to Metal Climbing Drum Peel Strength*** tested per ASTM D1781. Adherends are 2024-T3 clad aluminum treated with phosphoric acid anodizing per ASTM D3933.

**Metal to Metal Climbing Drum (MMCD) Peel  
 Using Hysol EA 9696.06NW Adhesive  
 m.N/m ( in.lb/in)**

<b>Storage Interval</b>	<b>25°C(77°F)</b>
Initial	360 (81)
6 months	343 (77)
1 year	280 (63)

**Floating Roller Peel Strength** tested per ASTM D3167. Adherends are 2024-T3 bare aluminum treated with phosphoric acid anodizing per ASTM D3933.

**Floating Roller Peel (FRP)**  
**Using Hysol EA 9696.06NW Adhesive**  
**kN/m ( pli)**

<b>Storage Interval</b>	<b>-55°C(-67°F)</b>	<b>25°C(77°F)</b>
Initial	3.5 (20)	14.0 (80)
6 months	4.6 (26)	13.8 (79)
1 year	4.2 (24)	13.7 (78)

**Honeycomb Strength**

**Honeycomb Climbing Drum Peel** strength tested per ASTM D1781. Adherends are 2024-T3 clad aluminum treated with phosphoric acid anodizing per ASTM D3933. Core size was 6.36 mm (0.25 in) cell, 0.01 mm (0.004 in) N5052, 15.9 mm (0.625 in) thick and 1.28 g/cc (7.9 pcf).

**Honeycomb Climbing Drum (HCCD) Peel**  
**Using Hysol EA 9696.06NW Adhesive**  
**m.N/m ( in.lb/3 in)**

<b>Storage Interval</b>	<b>25°C(77°F)</b>
Initial	96 (65)
6 months	103 (70)
1 year	95 (64)

**Handling Precautions**

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

**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.

**WARNING!** This material contains a small amount of **Barium** chromate, a carcinogen, for corrosion protection. Avoid all skin contact. Causes eye irritation and may cause skin irritation such as allergic dermatitis.

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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.

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