Hysol® EA 9330.3

Epoxy Paste Adhesive

Description
Hysol EA 9330.3 is a two-component thixotropic paste adhesive with low slump and high peel strength. This easy mix system maintains high tensile shear strength to 160°F/71°C. Hysol EA 9330.3 is the thixotropic version of Hysol EA 9330.

Features
Two Component System
Low Slump
Room Temperature Cure
Easy Mix
High Peel Strength

Uncured Adhesive Properties

	Part A	Part B	Mixed
Color	Gray	Clear	Gray
Viscosity, 77°F	4,000 Poise	300 Poise	
Brookfield, HBT	Spdl 7 @ 20 rpm	Spdl 5 @ 20 rpm	
Viscosity, 25°C	400 Pa·S	30 Pa·S	
Brookfield, HBT	Spdl 7 @ 2.1 rad/s	Spdl 5 @ 2.1 rad/s	
Density	1.17 gm/ml	1.06 gm/ml	1.14 gm/ml
Warranty Life			
@ <40°F/4°C	1 year	1 year	
@ <77°F/25°C	1 year	1 year	
@ <90°F/32°C	1 year	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.

Pot Life (100 gm mass) 60 minutes
Method - ASTM D 2471 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 250 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 Hysol 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 - Hysol EA 9330.3 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 alclad aluminum treated with phosphoric acid anodizing per ASTM D3933.

	Typical Results	
Test Temperature, °F/°C	**psi**	**MPa**
-67/-55	5,700	39.3
77/ 25	4,900	33.8
160/71	1,700	11.7
180/82	1,100	7.6

Tensile Lap Shear Strength with Variable Bondline Thicknesses

	Typical Results									
Bondline Thickness (mm):	**3 mils**	**0.08mm**	**5 mils**	**0.13mm**	**10 mils 0.25mm**		**50 mils**	**1.27mm**	**75 mils 1.91mm**	
Test Temperature	**psi**	**MPa**	**psi**	**MPa**	**psi**	**MPa**	**psi**	**MPa**	**psi**	**MPa**
77°F/25°C	5,200	35.8	5,000	34.5	4,800	33.1	4,200	28.9	3,800	26.2

Tensile Lap Shear Strength with Variable Cure Conditions - all specimens cured 5 days @ 77°F/25°C plus a post cure as noted:

	Typical Results									
Post Cure @ 160°F/71°C:	**3 days**		**7 days**		**15 days**		**30 days**		**60 days**	
Test Temperature	**psi**	**MPa**	**psi**	**MPa**	**psi**	**MPa**	**psi**	**MPa**	**psi**	**MPa**
77°F/25°C	5,400	37.2	6,000	41.3	6,100	42.0	6,200	42.7	6,000	41.3
160°F/71°C	2,300	15.8	2,100	14.5	2,200	15.2	2,400	16.5	2,100	14.5

T-Peel Strength with Variable Bondline Thicknesses

T-Peel strength tested per ASTM D1876 after curing for 5 days @ 77°F/25°C.
Adherends are 2024-T3 alclad aluminum treated with phosphoric acid anodizing per ASTM D3933.

	Typical Results									
Bondline Thickness:	**3 mils 0.08mm**		**5 mils 0.13mm**		**10 mils 0.25mm**		**20 mils 0.50mm**		**30 mils 0.76mm**	
Test Temperature	**Lb/ in**	**N/25 mm**	**Lb/ in**	**N/25 mm**	**Lb/ in**	**N/25 mm**	**Lb/ in**	**N/25 mm**	**Lb/ in**	**N/25 mm**
77°F/25°C	50	8.8	50	8.8	55	9.6	60	10.5	58	10.2

T-Peel Strength with Variable Peel Rate

T-Peel tested per ASTM D1876 except for peel rate. Cure and adherends as noted above.

	Typical Results									
Peel Rate (In./Min.):	**2**		**5**		**10**		**12**		**30**	
Test temperature	**Lb/ in**	**N/25 mm**	**Lb/ in**	**N/25 mm**	**Lb/ in**	**N/25 mm**	**Lb/ in**	**N/25 mm**	**Lb/ in**	**N/25 mm**
77°F/25°C	45	8.0	45	7.7	45	7.9	45	7.9	45	8.2

Bell Peel Strength

Bell Peel tested after curing 5 days @ 77°F/25°C.

	Typical Results	
Test Temperature, °F/°C	**pli**	**N/mm**
-67/-55	29	5.0
77/25	93	16.3
160/70	12	2.1

Service Temperature

Service temperature is defined as that temperature at which this adhesive still retains 1000 psi (6.9 MPa) using test method ASTM D 1002 and is 180°F/82°C.

Henkel QC Acceptance Testing

This data sheet provides users with typical properties obtained from this adhesive. These values are not meant to be used to develop aerospace QC acceptance testing. Users interested in establishing values and tests for routine QC acceptance should request our internal specification (DAS), which provides detail test methods and values used to certify this adhesive.

Bulk Resin Properties	**Typical Results**	
Density **-** tested per ASTM D1622, gm/cc	1.11	
Tensile Properties – tested using 0.125 inch/3.18 mm castings per ASTM D638.		
Tensile Strength, @ 77°F/25°C	6,100 psi	42.0 MPa
Tensile Modulus, @ 77°F/25°C	390 ksi	2687 MPa
Elongation at Break, % @77°F/25°C	9	
Shore D Hardness @ 77°F/25°C	81	
T_g (by DMTA)	129°F	54°C
Electrical Properties **-** tested per ASTM D149, D150.		
Dielectric Constant, 1 KHz, 77°F/ 25°C	4.46	
Dissipation Factor, 1 KHz, 77°F/25°C	0.013	

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.

PART A
WARNING! As with most epoxy based systems, the uncured adhesive may cause eye and skin irritation or allergic dermatitis. Contains epoxy resins**.**

PART B
DANGER! Causes severe skin and eye burns. Vapors may be irritating to the respiratory tract.

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