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Advanced Materials

ARALDITE® 5861 A/B

UL RECOGNIZED SYSTEM COMPONENT IN UL RECOGNIZED 180°C CLASS ELECTRICAL INSULATION SYSTEM

Description

ARALDITE® 5861 A/B epoxy adhesive is a rapid-cure, multi-purpose, two-component bonding system that cures at room-temperature and exhibits high strength and toughness. It is suitable for bonding a wide variety of metals, ceramics, glass, rubbers, rigid plastics, and most common electrical insulation materials.

Applications

ARALDITE® 5861 A/B epoxy adhesive is suitable for bonding:

Electrical insulation
Ceramics
Glass
Plastics
Vulcanized rubber
Metal

Advantages

High shear and peel strength
Tough and resilient
Rapid cure
Bonds a wide variety of materials
Good dielectric properties

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Typical Properties

Product	Test Values	Test Method
ARALDITE® 5861 Resin		
Appearance	Opaque Viscous Liquid	Visual
Specific Gravity	1.17	ASTM D-792
Viscosity @ 25ºC (77ºF), cP	35,000	ASTM D-2393
ARALDITE® 5861 Hardener		
Appearance	Light Yellow Viscous Liquid	Visual
Specific Gravity	1.17	ASTM D-792
Viscosity @ 25ºC (77ºF), cP	30,000	ASTM D-2393
Mixed System		
Specific Gravity	1.17	ASTM D-792
Pot Life, 100 gr. mass, at 25ºC (77ºF), min.	4	ASTM D-2471
Viscosity @ 25ºC (77ºF), cP	33,000	ASTM D-2393

Mix Ratio

Resin to Hardener (by weight and volume)	100 : 100

Recommended Cure Schedules

Temperature	Handling Strength	Minimum Cure Time
50°F (10°C)	35 minutes	2 hours
59°F (15°C)	20 minutes	70 minutes
77°F (25°C)	20 minutes	60 minutes
104°F (40°C)	5 minutes	25 minutes
140°F (60°C)	2 minutes	10 minutes
212°F (100°C)	1 minute	2 minutes

Dielectric Properties

Property	Test Values	Test Method
Dielectric Strength, v/mil	425	ASTM D-149
Dielectric Constant, 25°C (77°F)		IEC 60250
@ 50 Hz	4.4	
@ 1 kHz	4.4	
@ 10 kHz	4.3	
Dissipation factor, 25°C(77°F), %		IEC 60250
@ 50 Hz	0.8	
@ 1 kHz	0.7	
@ 10 kHz	1.0	
Volume Resistivity, 25°C (77°F)ohm-cm	5.7 E+14	IEC 60093
Surface Resistivity, 25°C (77°F)ohm	1.5 E+15	IEC 60093

Typical Cured Properties

Application of Insulation Bonding Compound

The resin/hardener mix is applied with a spatula to the pretreated and dry joint surfaces.

A layer of adhesive 0.002 to 0.004-inches (0.05 to 0.10-mm) thick will normally impart the greatest lap shear strength to a joint.

The joint components should be assembled and clamped as soon as the adhesive has been applied. Even contact throughout suffices to ensure proper cure.

Standard Test Specimens

Unless otherwise stated, the figures given below were all determined by testing standard specimens made up by lap-jointing 4-inch x 1-inch x 0.06-inch (10-cm x 2.5-cm x 1.5-mm) strips of aluminum. The joint area was 0.5 x 1 inch (12.5 mm x 2.5 cm) in each

Effects of Cure Time and Temperature

Lap Shear Strength, psi (MPa)	**Test Method** DIN 53283
Cure Cycle	**Test Values**[(1)]
7 days @ 25ºC (77ºF)	2,600 (17.9)
24 hrs. @ 25ºC (77ºF) + 30 min. @ 80ºC (176ºF)	5000 (34.5)

Effects of Test Temperatures

Lap Shear Strength, psi (MPa)
(Load applied 10 min. after reaching temperature)

Cure Cycle	**Test Values**[1]
7 days @ 25ºC (77ºF)	
Tested @ -40°C (-40°F)	1600 (11)
-20°C (-4°F)	1500 (10.3)
0°C (32°F)	1500 (10.3)
20ºC (68ºF)	2400 (16.6)
40°C (104°F)	2700 (18.6)
60°C (140°F)	1100 (7.6)
80°C (176°F)	500 (3.4)
24 hrs. @ 25ºC (77ºF) + 30 min. @ 80ºC (176ºF)	
Tested @ -40°C (-40°F)	3500 (24.1)
-20°C (-4°F)	3600 (24.8)
0°C (32°F)	3900 (26.9)
20ºC (68ºF)	5000 (34.5)
40°C (104°F)	4300 (29.6)
60°C (140°F)	2000 (13.8)
80°C (176°F)	800 (5.5)

[1] Tested at 25ºC (77ºF)

Effects of Immersion

Lap Shear Strength, psi (MPa)
Cure cycle 16 hrs. @ 40ºC (104ºF). Immersion for 90 days in media listed.

Media	Test Values[1]
Standard - As prepared	2700 (18.6)
IMS	2000 (13.8)
Gasoline	2400 (16.6)
Ethyl Acetate (30 days)	2000 (13.8)
Acetic Acid 10%	2200 (15.2)
Xylene	2500 (17.2)
Lubricating Oil - HD3O	2400 (16.6)
Paraffin	2300 (15.9)
Water @ 20°C (68°F)	200 (1.4)
Water @ 90°C (194°F)	800 (5.5)

[1] Tested at 25ºC (77ºF)

Effects of Tropical Exposure

Lap Shear Strength, psi (MPa)
(40ºC/104ºF/92% R.H.)

Test Method
DIN 53283

Cure Cycle	Exposure Time	Test Values[1]
16 hrs. @ 40ºC (104°F)	0 days	2700 (18.6)
	30 days	3500 (24.1)
	60 days	3000 (20.7)
	90 days	2400 (16.6)

[1]Tested @ 77°F (25°C)

Effects of Heat Aging

Lap Shear Strength, psi (MPa)
(*Cured 16 hours @ 104°F/40°C)*

Test Method
DIN 53283

Aging Temperature	Exposure Time	Test Values
70ºC (158°F)	0 days	2700 (18.6)
	30 days	5000 (34.5)
	60 days	4800 (33.1)
	90 days	5000 (34.5)

Lap Shear Strength on Metal Substrates, psi (MPa)
(*Cured 16 hours @ 104°F (40°C)*)

Metal	Substrate Thickness (mm)	Test Values
Carbon Steel	1.0	300 (2)
Stainless Steel	1.0	4000 (27.6)
Galvanized Steel[1]	1.5	1800 (12.4)
Copper	1.5	2800 (19.3)
Brass	1.5	3100 (21.4)

[1] Surface degreased only, not roughened.

Physical Properties

	Test Values	Test Method
Glass Transition Temperature, ºC (ºF)	48 – 53 (118 – 127)	ASTM E-381
Hardness, Shore D	78 – 83	
Coefficient of Thermal Expansion,ppm./ºC	65 – 70	ASTM E-381
Thermal Conductivity, W/mk	0.22	ISO 8894/90

Handling

Keep containers closed to prevent moisture absorption and contamination.Work in a well-ventilated area and use clean, dry tools for mixing and applying. Combine the resin and hardener according to mix ratio. Mix together thoroughly and use immediately after mixing. Material temperature should not be below 18ºC (65°F) when mixing.closed. Use with adequate ventilation. Wash thoroughly after handling.

Thermosetting systems generate heat when curing. The amount of heat and the period of time in which heat is released vary significantly between systems. Additionally, ambient or compound temperature, amount of material mixed, and construction and shape of the mold or container can also be factors in the temperature profile of a mixed system.

In some cases, the thermosetting reaction can be vigorous, generating heat sufficient to cause decomposition of the system with subsequent liberation of large volumes of acrid smoke. A good rule of thumb is never mix more material than can be applied during the stated pot life or gel time. Also take care when using materials in applications other than stated on the Product Data Sheet, i.e., a laminating resin for casting.

Please feel welcome to call our Product Information Department or your local Huntsman Advanced Materials representative for instructions before beginning a project.

Storage

ARALDITE® 5861 A/B epoxy adhesive should be stored in a dry place, in the sealed original container, at temperatures between +2°C and +40°C (+35.6°F and 104°F). Under these storage conditions, the shelf life is 3 years. The product should not be exposed to direct sunlight.

Precautionary Statement

Huntsman Advanced Materials Americas LLC maintains up–to-date Material Safety Data Sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Users should review the latest MSDS to determine possible health hazards and appropriate precautions to implement prior to using this material.

First Aid!
Refer to MSDS as mentioned above.

KEEP OUT OF REACH OF CHILDREN

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