Araldite® 2013-1 A/B

Two Component Epoxy Paste Adhesive

Product Description

Araldite® 2013-1 is a two component, room temperature curing paste adhesive of high strength and toughness. It is thixotropic with good environmental and chemical resistance. Although it is designed as a metal bonding adhesive it is also suitable for bonding other materials such as ceramics, glass, rubbers, rigid plastics and a wide variety of other materials in common use.

Key Features

- Metal colored paste
- Suitable for vertical applications
- Good environmental and chemical resistance
- Bonds a wide variety of materials

Typical Properties

Property	Araldite 2013-1 A (Resin)	Araldite 2013-1 B (Hardener)	A/B Mixed	Test Method
Color	Gray soft paste	Beige soft paste	Gray paste	Visual
Specific Gravity	1.4	0.9	1.2	ASTM D-1475
Viscosity at 77F, cP	380-720	thixotropic	thixotropic	ASTM D-2196
Pot Life (100g at 25°C), mins	--	--	80 - 90	--
Mix Ratio by volume	100	60	--	--
Mix Ratio by weight	100	100	--	--

Typical Cured Properties

Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-bonding 5” x 1”x 0.003” strips of primed aluminum panel. The joint area was 1” x 0.5” in each case.

The figures were determined with typical production batches using standard testing methods. They are provided solely as technical information and do not constitute a production specification.

Average handling shear strengths of typical primed aluminum to primed aluminum bonds.

Panels degreased with IPA, cured and tested at 25°C (77°F).

Time	Lap Shear Strength (psi)	Test Method
5.5 hours	>150	ASTM D-1002
9.5 hours	>1500	ASTM D-1002

Average lap shear strengths of typical metal to metal bonds.

Panels degreased with IPA, cured 24 hours at 25°C (77°F) and tested at 25°C (77°F).

Substrate	Lap Shear Strength (psi)	Test Method
Treated steel	2410	ASTM D-1002
Stainless steel	2390	ASTM D-1002
Primed aluminum	2010	ASTM D-1002

Average lap shear strengths of typical plastic to plastic bond.

Panels lightly abraded and degreased with IPA, cured 7 days at 25°C (77°F) and tested at 25°C (77°F).

Substrate	Lap Shear Strength (psi)	Test Method
ABS	380	ASTM D-1002
PVC	400	ASTM D-1002
PC	380	ASTM D-1002
PMMA	210	ASTM D-1002

Average lap shear strength versus tropical weathering (40°C / 92% Relative Humidity).

On primed aluminum panels. Panels degreased with IPA, cured 24 hours at 25°C (77°F) and tested at 25°C (77°F).

Time	Lap Shear Strength (psi)	Test Method
Initial LSS	2010	ASTM D-1002
After 30 days	2190	ASTM D-1002
After 60 days	2590	ASTM D-1002
After 90 days	2580	ASTM D-1002

Average lap shear strength after immersion in various media.

On primed aluminum panels. Panels degreased with IPA cured 24 hours at 25°C (77°F) before immersion. Test method ASTM D-1002 at 25°C.

Time	25°C (psi)	Gasoline (psi)	10% Acetic Acid (psi)	Xylene (psi)	25°C Water (psi)	70°C Water (psi)
Initial cure (25°C, 24 hours)	2010	2010	2010	2010	2010	2010
After 30 days	2190	1530	180	1610	1780	1250
After 60 days	2340	740	<1	1640	2010	1360
After 90 days	2200	640	50	1710	1850	1410

Average lap shear strength versus heat aging (70°C).

On primed aluminum panels. Panels degreased with IPA, cured 24 hours at 25°C (77°F) before aging and tested at 25°C (77°F).

Time	Lap Shear Strength (psi)	Test Method
Initial LSS	2010	ASTM D-1002
After 30 days	2690	ASTM D-1002
After 60 days	2650	ASTM D-1002
After 90 days	2470	ASTM D-1002

Shear Modulus (ISO 6721) (typical average values)

Cure: 16 hours at 40°C

-50°C: 2700 MPa
23°C: 990 MPa
75°C: 18 MPa
150°C: 17 MPa

Glass Transition temperature DMA (typical average values)

Cure: 16 hours at 40°C: 63.3°C

Cure: 24 hours at 25°C: 66.7°C

Tensile Properties (ISO 527)

Cure 16 hours at 40°C (typical average values) – tested at 23°C

Tensile Strength: 22 MPa
Tensile Modulus: 1370 MPa
Elongation at break: 1.8%

Processing

Pre-treatment
The strength and durability of the adhesive bond are dependent on proper treatment of the surfaces to be bonded. At the very least, the surfaces should be cleaned with an effective degreasing agent such as acetone or other proprietary degreasing agents in order to remove all traces of oil, grease, dirt and other surface contaminants.

Low Grade alcohol, gasoline (petrol) or paint thinners must never be used.

The strongest and most durable bonded assemblies are obtained by either mechanically abrading or chemically etching ("pickling") the degreased surfaces. Mechanical abrading should be followed by a second degreasing treatment.

Application of adhesive
The resin/hardener mix is applied manually or robotically to the pre-treated and dry joint surfaces. Huntsman's technical support group can assist the user in the selection of a suitable application method as well as suggest a variety of reputable companies that manufacture and service adhesive dispensing equipment.

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. It should also be noted that bonded assembly design also critical in providing a durable bond. The components to be bonded together should be assembled and maintained in a fixed position as soon as the adhesive has been applied. For more detailed explanations regarding surface preparations and pre-treatment, assembly design, and the twin cartridge dispensing system, visit www.araldite adhesives.com

Equipment maintenance
All tools should be cleaned with hot soapy water before the adhesive has cured. If solvents such as acetone are used for cleaning, operators should take all the necessary precautions in order to prevent eyes or skin contact.

Storage

When stored in its original sealed packaging at a temperature between 2°C (36°F) and 40°C (104°F), Araldite 2013-1A/B Adhesive has 3 years shelf life from the date of manufacture.

Precautionary Statement

Our products are generally quite harmless to handle provided that certain precautions normally taken when handling chemicals are observed. The uncured materials must not, for instance, be allowed to come in contact with foodstuffs or food utensils, and measures should be taken to prevent the uncured materials from coming in contact with the skin, since people with particularly sensitive skin may be affected. The wearing of impervious rubber or plastic gloves will normally be necessary; likewise, the use of eye protection. The skin should be thoroughly cleansed at the end of each working period by washing with soap and warm water. The use of solvents is to be avoided. Disposable paper- not cloth towels- should be used to dry the skin. Adequate ventilation of the working area is recommended. These precautions are described in greater detail in the Safety Data sheets for the individual products and should be referred to for fuller information.

First Aid!
Refer to SDS as mentioned above.

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