

## Araldite<sup>®</sup> 2013 Adhesive

### Product Description

Araldite<sup>®</sup> 2013 structural adhesive 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 most other materials in common use.

### Features

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

### Typical Properties\*

Property	Araldite <sup>®</sup> 2013 A	Araldite <sup>®</sup> 2013 B	Mixed System
Appearance	Grey soft paste	Beige soft paste	Grey paste
Density, g/cm <sup>3</sup>	~1.4	~0.9	~1.2
Viscosity at 25°C, cP	380,000 - 720,000	Thixotropic	Thixotropic
Pot life at 25°C, 100 g, min	--	--	~50 - 80

\*Properties are based on Huntsman test methods. Copies are available upon request

### Processing

#### Mix Ratio

Product	Parts by weight	Parts by volume
Araldite <sup>®</sup> 2013 A	100	100
Araldite <sup>®</sup> 2013 B	60	100

### Pretreatment

The strength and durability of a bonded joint are dependent on proper treatment of the surfaces to be bonded. At the very least, joint surfaces should be cleaned with a good degreasing agent such as acetone, isopropanol (for plastics) or other proprietary degreasing agents in order to remove all traces of oil, grease and dirt. Low-grade alcohol, gasoline, or paint thinners should never be used. The strongest and most durable joints are obtained by either mechanically abrading or chemically etching (“pickling”) the degreased surfaces. Abrading should be followed by a second degreasing treatment.

Araldite® 2013 structural adhesive is available in cartridges incorporating mixers and can be applied as ready to use adhesive with the aid of the tool recommended by Huntsman Advanced Materials.

### Application of adhesive

The resin/hardener mix may be applied manually or robotically to the pretreated 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 in (0.05 to 0.10 mm) thick will normally impart the greatest lap shear strength to the joint. Huntsman stresses that proper adhesive joint design is also critical for a durable bond. The joint components should be assembled and secured in a fixed position as soon as the adhesive has been applied. For more detailed explanations regarding surface preparation and pretreatment, adhesive joint design, and the dual syringe dispensing system, visit [www.araldite2000plus.com](http://www.araldite2000plus.com).

### Equipment Maintenance

All tools should be cleaned with hot water and soap before adhesives residues have had time to cure. The removal of cured residues is a difficult and time-consuming operation. If solvents such as acetone are used for cleaning, operatives should take the appropriate precautions and, in addition, avoid skin and eye contact.

### Cure times to reach minimum shear strength

Temperature, °F	50	59	73	104	140	212
Cure time to reach LSS* > 145 psi (1 MPa), hours minutes	17 -	10 -	4 -	- 90	- 20	- 6
Cure time to reach LSS > 1450 psi (10 MPa), hours minutes	27 -	13 -	10 -	2 -	- 40	- 6

\*LSS = Lap shear strength

### Typical Physical Properties

Unless otherwise stated, the data were determined with typical production batches using standard test methods. They are typical values only, and do not constitute a product specification.

Unless a different specification is given, the figures below were all determined by testing standard specimens made by lap-jointing 4.5 x 1 x 0.063 in (114 x 25 x 1.6 mm) strips of aluminum alloy. The joint area was 0.5 x 1 in (12.5 x 25 mm) in each case.

Samples were cured at 104°F (40°C) for 16 hours and tested at 23°C, unless otherwise noted.

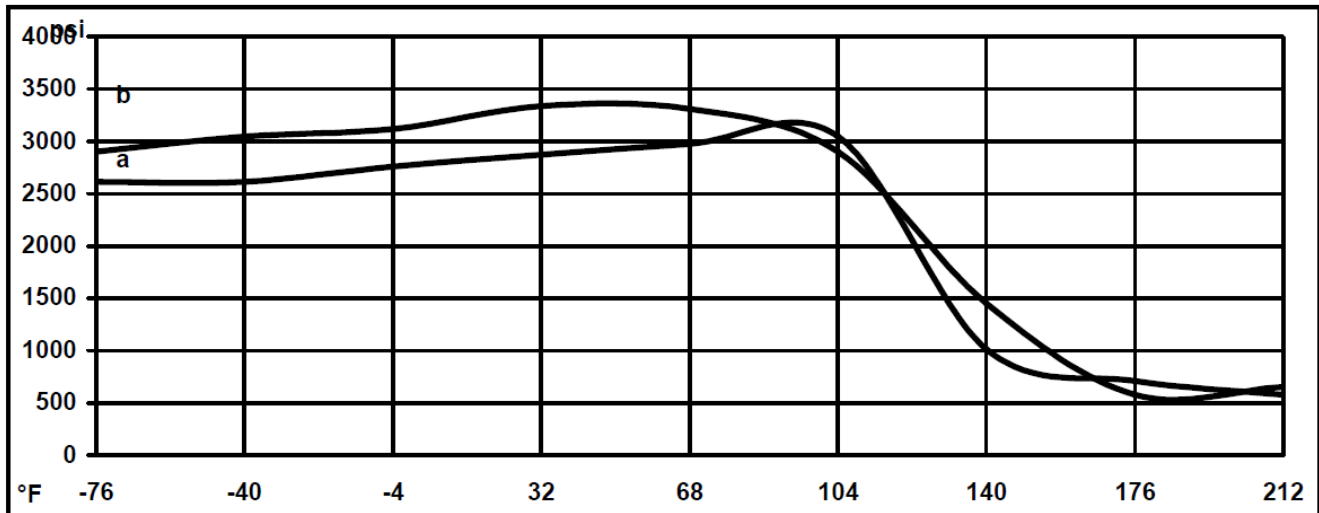
Property	Value			Test Method
Average lap shear strength, metal-metal joints, sand blasting pre-treatment, psi				ISO 4587
Aluminum	2,634			
Steel 37/11	2,170			
Stainless steel V4A	3,503			
Galvanized steel	2,122			
Copper	2,712			
Brass	2,701			
Average lap shear strength, plastic-plastic joints, lightly abrade and alcohol degrease pre-treatment, psi				ISO 4587
GRP	1,204			
CFRP	1,769			
SMC	1,218			
ABS	450			
PVC	624			
PMMA	334			
Polycarbonate	392			
Polyamides	247			
Lap shear strength, after immersion in 23°C media, psi	30 days	60 days	90 days	ISO 4587
As-made value	--	--	2,811	
IMS	2,286	2,158	1,936	
Gasoline	2,730	2,648	2,466	
Ethyl acetate	2,321	2,611	3,046	
Acetic acid, 10%	1,913	840	338	
Xylene	2,473	3,056	2,764	
Lubricating oil	2,176	2,611	2,986	
Paraffin	2,321	2,466	2,975	
Water at 73°F	1,827	1,740	2,975	
Water at 140°F	1,877	1,740	1,584	
Water at 194°F	2,002	1,730	661	

Lap shear strength, exposure to tropical weather,* psi		DIN 50015
As-made value	2,698	
30 days	2,828	
60 days	2,640	
90 days	2,335	
Lap shear strength, heat aging at 158°F, psi		--
As-made value	2,799	
30 days	2,944	
60 days	2,480	
90 days	3,046	
Roller peel test, pli (N/mm)		ISO 4578
Cure: 16 hours / 104°F (40°C)	23 (4.0)	
20 min / 176°F (80°C)	23 (4.0)	
Flexural strength, psi (MPa)	6,686 (46.1)	ISO 178
Flexural modulus, psi (MPa)	359,433 (2478.2)	ISO 178
Shear modulus, psi (GPa)		DIN 53445
77°F (25°C)	362,594 (2.5)	
122°F (50°C)	145,038 (1.0)	
167°F (75°C)	4,351 (0.030)	

\*40/92, DIN 50015; typical average values; test at 23°C.

**Figure 1. Lap shear strength versus temperature (ISO 4587) (typical average values)**

Cure: (a) = 7 days at 73°F (23°C); (b) = 24 hours at 73°F (23°C) + 30 min / 176°F (80°C)



## **Storage**

**Araldite® 2013 Adhesive** should be stored in a dry place, in the original sealed containers, at temperatures between 2°C and 40°C (36°F and 104°F). Under these storage conditions, the product has a shelf life of **3 years** (from date of manufacture). The product should not be exposed to direct sunlight.

If stored below 60°F, the adhesive should be brought to 60°F - 77°F and conditioned at this temperature for some time prior to use.

## **Precautionary Statement**

Huntsman Advanced Materials Americas LLC maintains up-to-date Safety Data Sheets (SDS) 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 SDS as mentioned above.

**KEEP OUT OF REACH OF CHILDREN**

**FOR PROFESSIONAL AND INDUSTRIAL USE ONLY**

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