

Advanced Materials**Araldite® 2010-1 Structural Adhesive**

Structural Adhesives

Araldite® 2010-1**Two component fast toughened epoxy paste adhesive****Key properties**

- Fast curing
- Toughened
- Low shrinkage
- High shear and peel strength
- Bonds a wide variety of materials

Description

Araldite 2010-1 structural adhesive is a fast cure, multipurpose, two component, room temperature curing, thixotropic paste adhesive of high strength and toughness.

It is suitable for bonding a wide variety of metals, ceramics, glass, rubbers, rigid plastics, and most other materials in common use.

Product data

	2010-1/A	2010-1/B	2010-1 (mixed)
Color (visual)	Neutral	Pale yellow	Pale yellow
Specific gravity	ca 1.16	ca 1.15	ca 1.16
Viscosity at 77°F (cP)	ca 140,000	ca 65,000	ca 80,000
Pot Life (100 gm at 77°F)	-	-	ca 10 minutes
Flash point (°F)	>392	257	-

Processing**Pretreatment**

The strength and durability of a bonded joint are dependant 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, iso-propanol (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.

Mix ratio	Parts by weight	Parts by volume
Araldite 2010-1/A Adhesive	100	100
Araldite 2010-1/B Adhesive	100	100

Araldite 2010-1 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 an 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.

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.

Times to minimum shear strength

Temperature	°F	50	59	73	104	140	212
Cure time to reach	hours	4	2	-	-	-	-
LSS > 145 psi (1MPa)	minutes	-	-	30	15	5	<5
Cure time to reach	hours	24	9	3	1	-	-
LSS > 1450 psi (10MPa)	minutes	-	-	-	-	20	5

LSS = Lap shear strength.

Typical cured properties

Unless otherwise stated, the figures given 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. The figures were determined with typical production batches using standard testing methods. They are provided solely as technical information and do not constitute a product specification.

Average lap shear strengths of typical metal-to-metal joints (ISO 4587)

Cured for 16 hours at 104°F(40°C) and tested at 73°F (23°C); Pretreatment - Sand blasting

Substrate	psi
Aluminum	2727
Steel 37/11	1958
Stainless steel V4A	3321
Galvanized steel	2611
Copper	2857
Brass	2538

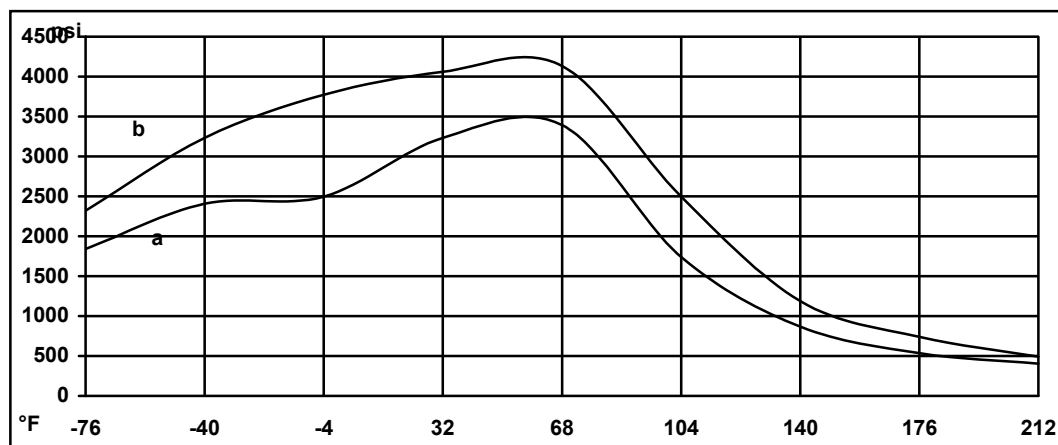
Average lap shear strengths of typical plastic-to-plastic joints (ISO 4587)

Cured for 16 hours at 104°F (40°C) and tested at 73°F (23°C). Pretreatment - Lightly abrade and alcohol degrease.

Substrate	psi
GRP	725
CFRP	1871
SMC	856
ABS	479
PVC	363
PMMA	189
Polycarbonate	363
Polyamides	348

Lap shear strength versus temperature (ISO 4587) (typical average values)

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



Roller peel test (ISO 4578) Cure: 16 hours / 104°F (40°C)

34 pli (6 N/mm)

Glass transition temperature

~104°F (~40°C)

(measured by DSC)

Flexural Properties (ISO 178) Cure: 16 hours/ 104°F (40°C) tested at 73°F (23°C)

Flexural Strength

6,527 psi (45 MPa)

Flexural Modulus

274,847 psi (1895 MPa)

Lap shear strength versus immersion in various media at 73°F (23°C) (typical average values)

Cure: 16 hours / 104°F (40°C)

	30 days	60 days	90 days
	psi		
As-made value			3336
IMS	3046	2611	2466
Gasoline	3989	3916	3191
Ethyl acetate	2321	2611	3046
Acetic acid, 10%	3046	2466	2176
Xylene	3771	3336	3191
Lubricating oil	2176	2611	3916
Paraffin	2321	2466	3336
Water at 73°F	4061	2756	3336
Water at 140°F	1233	1015	1160
Water at 194°F	1015	1015	1160

Lap shear strength versus tropical weathering

(40/92, DIN 50015; typical average values)

Cure: 16 hours / 104°F (40°C); Tested at 73 °F (23°C)

Substrate	psi
As-made value	3336
After 30 days	2611
After 60 days	1740
After 90 days	1595

Lap shear strength versus heat aging

Cure: 16 hours / 104°F (40°C)

Substrate	psi
As-made value	3336
30 days / 158°F	3350
60 days / 158°F	3495
90 days / 158°F	3481

Thermal cycling

100 cycles of 6 hour duration from -22°F to 158°F (-30°C to 70°C): 4293 psi (29.6 MPa)

Test carried out using a load cycle frequency of 90 Hz.

Storage

Araldite 2010-1/A and Araldite 2010-1/B structural adhesive should be stored in a dry place, in the sealed original container, at temperatures between +2°C and +40°C (+36°F and 104°F). Under these storage conditions, the shelf life is 3 years. 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 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.

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