

Advanced Materials**Araldite® 2040 Structural Adhesive****Structural Adhesives****Araldite® 2040****Two component flexible polyurethane adhesive****Key properties**

- **Ideal for bonding plastics**
- **Low shrinkage**
- **Good flexibility**
- **Ideal for thick bondlines**
- **Gap filling properties**

Description

Araldite 2040 polyurethane adhesive is a general-purpose, two-part system for bonding a wide variety of substrates. The cured material is very flexible. Araldite 2040 polyurethane adhesive is well suited for bonding polycarbonate and polyamides as well as primed metals.

Product data

Property	Component A (resin)	Component B (hardener)	Mixed Adhesive
Color (visual)	white	black	Black paste
Specific gravity	1.1	1.2	1.2
Viscosity at 77°F (cp)	ca. 48,000	ca. 50,000	ca. 50,000
Pot Life (100 gm at 77°F)	-	-	approx. 15 minutes

Processing**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, 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
Component A (resin)	92	100
Component B (hardener)	100	100

Araldite 2040 polyurethane 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

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	17	10	6	-	-	-
LSS > 145 psi (1MPa)	minutes	-	-	-	90	45	8
Cure time to reach	hours	80	55	35	16	4	-
LSS > 1160 psi (8 MPa)	minutes	-	-	-	-	-	25

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	1247
Steel 37/11	1059
Stainless steel V4A	1204
Galvanized steel	1001
Copper	1494
Brass	1030

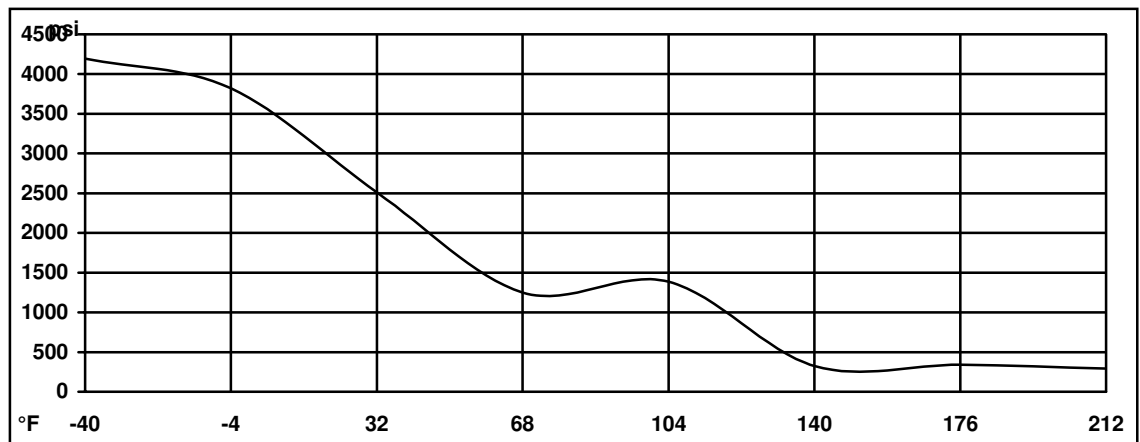
Average lap shear strengths of typical plastic-to-plastic joints (ISO 4587)

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	1088
CFRP	1218
SMC	769
ABS	609
PVC	551
PMMA	624
Polycarbonate	740
Polyamides	334

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

Cure: 16 hours at 104°F (40°C)

**Roller peel test (ISO 4578)**

Cured: 16 hours at 104°F (40°C)

23 pli (4 N/mm)

Glass transition temperature

Cure: 16 hours at 104°F (40°C)

86°F (30°C) by DMA

Lap shear strength versus immersion in various media (typical average values)

Unless otherwise stated, L.S.S. was determined after immersion for 90 days at 73°F (23°C); Cure: 16 hours at 104°F (40°C)

	30 days	60 days	90 days
	psi		
As-made value			1247
IMS	160	145	81
Fuel (unleaded)	261	232	252
Ethyl acetate	58	73	70
Acetic acid, 10%	29	0	0
Xylene	116	160	103
Lubricating oil	1378	812	1056
Paraffin	1465	1711	1178
Water at 73°F	1276	1233	489
Water at 140°F	1128	702	
Water at 194°F	Degraded		

Lap shear strength versus tropical weathering

(40/92, DIN 50017; typical average values)

Cure: 16 hours at 104°F (40°C) Test: at 73°F (23°C)

	psi
As made value	1247
After 30 days	470
After 60 days	756
After 90 days	Degraded

Lap shear strength versus heat ageing

Cure: 16 hours at 104°F (40°C)

	psi
As-made value	1247
30 days / 158°F	2089
60 days / 158°F	2184
90 days / 158°F	1781

Thermal cycling (substrate: aluminum)

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

1,146 psi (7.9 MPa)

Tensile strength at 73°F (23°C) (ISO 527)

1,305 psi (9 MPa)

Tensile modulus

6,237 psi (43 MPa)

Elongation at break

165 %

Storage

Araldite 2040/A and 2040/B adhesives may be stored for up to one year at 59°F-77°F (15°C-25°C) provided the components are stored in sealed containers. The expiry date is indicated on the label.

Handling precautions**Caution**

To protect against any potential health risks presented by our products, the use of proper personal protective equipment (PPE) is recommended. Eye and skin protection is normally advised. Respiratory protection may be needed if mechanical ventilation is not available or is insufficient to remove vapors. For detailed PPE recommendations and exposure control options consult the product MSDS or a Huntsman EHS representative.

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