



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

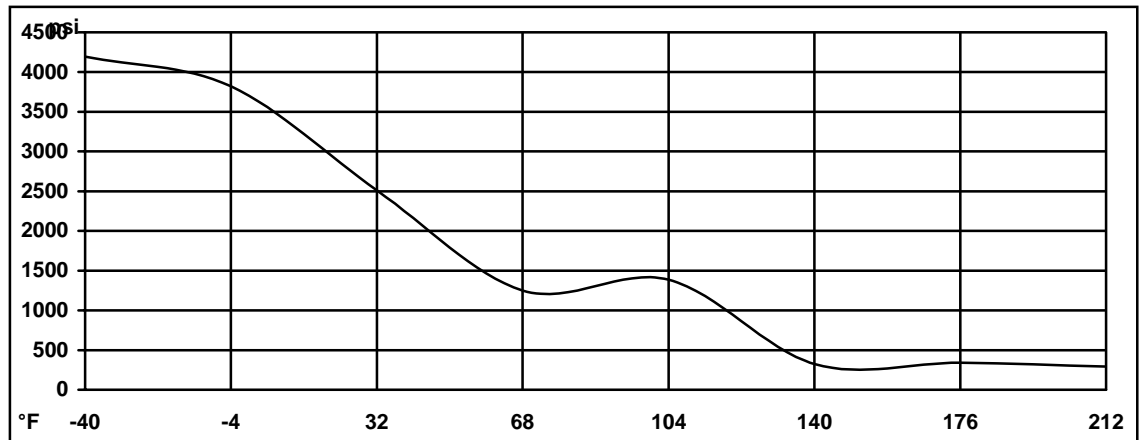
Average lap shear strengths of typical plastic-to-plastic joints (ISO 4587)

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.

Huntsman Advanced Materials warrants only that its products meet the specifications agreed with the user. Typical properties, where stated, are to be considered as representative of current production and should not be treated as specifications.

The manufacture of materials is the subject of granted patents and patent applications; freedom to operate patented processes is not implied by this publication.

While all the information and recommendations in this publication are, to the best of Huntsman Advanced Material's knowledge, information and belief, accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, WHETHER EXPRESS OR IMPLIED, INCLUDING BUT WITHOUT LIMINATION, AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

The behaviour of the products referred to in this publication in manufacturing processes and their suitability in any given end-use environment are dependent upon various conditions such as chemical compatibility, temperature, and other variables, which are not known to Huntsman Advanced Materials. It is the responsibility of the user to evaluate the manufacturing circumstances and the final product under actual end-use requirements and to adequately advise and warn purchasers and users thereof.

Products may be toxic and require special precautions in handling. The user should obtain Safety Data Sheets from Huntsman Advanced Materials containing detailed information on toxicity, together with proper shipping, handling and storage procedures, and should comply with all applicable safety and environmental standards.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent on manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

Except where explicitly agreed otherwise, the sale of products referred to in this publication is subject to the general terms and conditions of sale of Huntsman Advanced Materials LLC or of its affiliated companies including without limitation, Huntsman Advanced Materials (Europe) BVBA, Huntsman Advanced Materials Americas Inc., and Huntsman Advanced Materials (Hong Kong) Ltd.

Huntsman Advanced Materials is an international business unit of Huntsman Corporation. Huntsman Advanced Materials trades through Huntsman affiliated companies in different countries including but not limited to Huntsman Advanced Materials LLC in the USA and Huntsman Advanced Materials (Europe) BVBA in Europe.

Araldite is a registered trademark of Huntsman Corporation or an affiliate thereof in one or more, but not all, countries.

Copyright © 2007 Huntsman Corporation or an affiliate thereof. All rights reserved.

Huntsman Advanced Materials
10003 Woodloch Forest Drive
The Woodlands, Texas 77380

Tel: 888-564-9318

Fax: 281-719-4047

www.huntsman.com/advanced_materials