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Advanced Materials

Araldite® 2018 Structural Adhesive

Structural Adhesives

Araldite® 2018
Two component PU adhesive system

Key properties

- **Good UV stability**
- **Ideal for bonding thermoplastics**
- **Low shrinkage**
- **Flexible**
- **Room temperature curing**

Description

Araldite 2018 structural adhesive is a two component, room temperature curing, pale colored, lightly thixotropic liquid polyurethane adhesive for thermoplastic bonding.

Product data

Property	2018/A	2018/B	2018 (mixed)
Color (visual)	pale opaque	pale opaque	pale opaque
Specific gravity	ca 1.16	ca 1.10	ca 1.13
Viscosity at 77°F (cP)	12,000 – 18,000	3,000 – 6,000	ca 8,000
Pot Life (100 gm at 77°F)	-	-	40 minutes
Shelf life (36°F-104°F)	2 years	2 years	-
Flash point (°F)	>212	>212	-

Processing

Pretreatment

The strength and durability of a bonded joint are dependant on proper pretreatment 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 2018/A adhesive	100	100
Araldite 2018/B adhesive	95	100

Araldite 2018 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

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	16	12	4	-	-	-
LSS > 145 psi (1MPa)	minutes	-	-	-	45	25	4
Cure time to reach	hours	48	20	16	3	-	-
LSS > 1450 psi (10MPa)	minutes	-	-	-	-	30	12

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	1015
Steel 37/11	1160
Stainless steel V4A	1015
Galvanized steel	1523
Copper	580
Brass	653

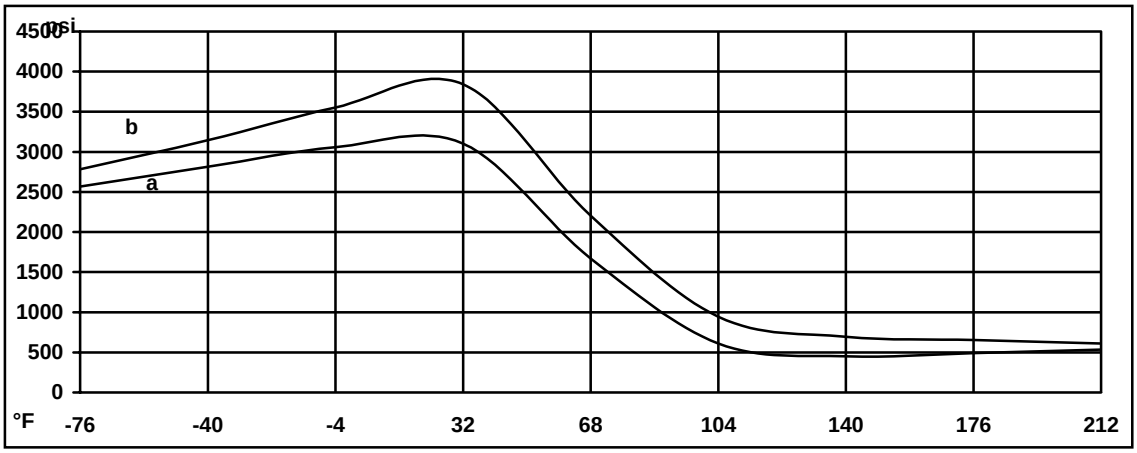
Average lap shear strengths of typical plastic-to-plastic joints (ISO 4587)

Cured for 16 hours at 104°F and tested at 73°F. Pretreatment - Lightly abrade and alcohol degrease.

Substrate	psi
GRP	1160
CFRP	1204
SMC	1015
ABS	1001
PVC	580
PMMA	537
Polycarbonate	899
Polyamides	421

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

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



Roller peel test (ISO 4578)

Cured 16 hours / 104°F (40°C) 23 pli (4.0 N/mm)

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

Flexural Strength 215 psi (1.48 MPa)

Flexural Modulus 2321 psi (16 MPa)

Elongation at break 45 %

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)

	30 days	60 days	90 days
	Psi		
As-made value	0	0	1123
IMS	Degraded		
Gasoline (petrol)	1008	383	854
Ethyl acetate	Degraded		
Acetic acid, 10%	497	229	64
Xylene	357	13	0
Lubricating oil	843	599	1263
Paraffin	1046	970	1263
Water at 73°F	383	587	473
Water at 140°F	508	435	363
Water at 194°F	508	290	145

Lap shear strength versus tropical weathering

(40/92, DIN 50015; typical average values)
Cure: 16 hours / 104°F (40ºC); Tested at 73 °F (23ºC)

	psi
As made value	1160
After 30 days	402
After 60 days	415
After 90 days	566

Lap shear strength versus heat ageing

Cure: 16 hours / 104°F (40°C)

	psi
As-made value	1073
30 days/ 158°F	1958
60 days/ 158°F	1784
90 days/ 158°F	2611

Thermal cycling

100 cycles of 6 hour duration from -22°F to 158°F (-30°C to 70°C): 1276 psi (8.8 MPa)

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Storage

Araldite 2018/A and Araldite 2018/B structural adhesives may be stored for up to three years at room temperature provided the components are stored in sealed containers. The expiry date is indicated on the label. Cartridges should not be stored for long periods after removal from the foil overpack.

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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