

Advanced Materials**Araldite® 2022 Structural Adhesive**

Structural Adhesives

Araldite® 2022**Two component toughened methacrylate adhesive system****Key properties**

- Good sanding properties
- Ideal for bonding thermoplastics
- Excellent resistance to gasoline and oils
- Tolerant to “less than ideal” pretreatment
- Gap filling to 0.157 in (4mm)

Description

Araldite 2022 structural adhesive is a two component, room temperature curing, methacrylate adhesive for fast assembly operations on a wide range of substrates including those which can be “difficult to bond”.

Product data

Properties	2022/A	2022/B	2022 (mixed)
Color (visual)	Off white	Yellow	Beige
Specific gravity	1.03	0.97	1.00
Viscosity at 77°F (cp)	ca 70,000	ca 45,000	ca 60,000
Pot Life (100 gm at 77°F)	-	-	ca 10 mins
Flash point (°F)	10	10	-

Processing**Pretreatment**

The strength and durability of a bonded joint are dependant on proper pretreatment of the surfaces to be bonded, however the methacrylate adhesives can be used effectively with little surface preparation.

Ideally 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.

Mix ratio	Parts by weight	Parts by volume
Araldite 2022/A adhesive	100	100
Araldite 2022/B adhesive	94	100

Araldite 2022 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
Cure time to reach	hours	-	-	-	-
LSS > 145 psi (1MPa)	minutes	60	25	18	15
Cure time to reach	hours	-	-	-	-
LSS > 1450 psi (10MPa)	Minutes	90	45	30	20

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 73°F (23°C) and tested at 73°F (23°C)

Pretreatment - Sand blasting

Substrate	psi
Aluminum L165	3658
Steel 37 / 11	3052
Stainless steel V4A	2611
Galvanized steel	2194
Copper	1880
Brass	2181

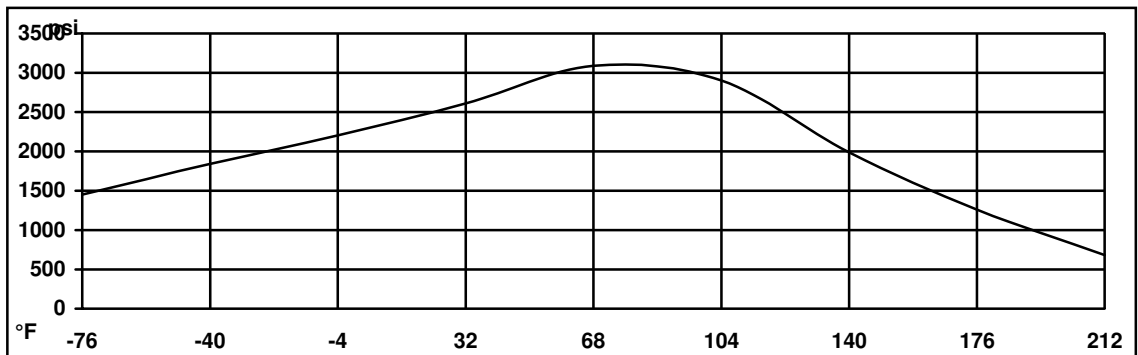
Average lap shear strengths of typical plastic-to-plastic joints (ISO 4587)

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	1131
CFRP	1726
SMC	783
ABS	1015
PVC	1015
PMMA	885
Polycarbonate	725
Polyamides	218

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

Cure: 7 days / 73°F (23°C)

**Roller peel test (ISO 4578)**

23 pli (4N/mm)

Shore hardness:

D75

Elongation at break:

50 - 75%

Flexural Properties (ISO 178) Cure 1 day / 73°F (23°C) tested at 73°F (23°C)

Flexural Strength

6,295 psi (43.4 MPa)

Flexural Modulus

245,447 psi (1692.3 Mpa)

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

Substrate – aluminum; Values: psi

	30 days	60 days	90 days
	psi		
As-made value			3636
IMS	2284		1173
Gasoline	3471		2901
Ethyl acetate			
Acetic acid, 10%			3101
Xylene			
Lubricating oil	3114		2616
Paraffin	2718		651
Water at 73°F	1939		918
Water at 140°F	2054		843
Water at 194°F	1633		880

Plastic substrates – Polycarbonate and PVC; Cure: 7 days at 73°F (23°C)

	30 days		90 days
Polycarbonate	psi		
As-made value			798
IMS	1257		976
Gasoline	870		638
Sod. Hydroxide 10%	817		651
Acetic acid, 10%	925		899
Xylene	Failed		
PVC	psi		
As-made value			1091
IMS			1257
Gasoline	880		441
Sod. Hydroxide 10%	1098		1066
Acetic acid, 10%			1046
Xylene	51		

Lap shear strength versus tropical weathering (40/92, DIN 50015: typical average values)

Cure: 7 days at 73°F (23°C)

	psi
As-made value	3961
After 30 days	1548
After 60 days	1060
After 90 days	1687

Lap strength versus heat ageing

Cure: 7 days at 73°F (23°C)

	psi
As-made value	3626
30 days / 158°F	2901
60 days / 158°F	3046
90 days / 158°F	3292

Thermal cycling100 cycles of 6 hour duration from -22°F to 158°F (-30°C to 70°C):
Test carried out using a load cycle frequency of 90 Hz.

2,770 psi (19.1 MPa)

Storage

Araldite 2021/A and Araldite 2021/B may be stored for up to 18 months at 32°F-46°F (0°C-8°C) provided the components are stored in sealed containers. When stored at 59°F-77°F (15°C-25°C) the life is a maximum of 12 months. The expiry date, assuming storage at 32°F-46°F (0°C-8°C) is indicated on the packaging.

**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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