

ARALDITE® 2021-1 Structural Adhesive

Product Description

ARALDITE® 2021-1 structural adhesive is a two-component, room temperature curing, methacrylate-based, general purpose adhesive for rapid assembly operations with a wide variety of substrates.

Features

- Working time: 4-5 minutes
- One to one volume mix ratio
- High peel strength
- Multi-purpose
- Excellent bond to a wide range of plastics, composites and metals
- Suitable for service at temperatures up to 212°F (100°C)

Typical Properties*

Property	ARALDITE® 2021-1 A	ARALDITE® 2021-1 B	Mixed System
Appearance	Off white	Beige / yellow	Pale yellow
Density, g/cm ³	1.00	0.95	~1
Viscosity at 25°C (Brookfield, spindle # 7 and at 10 rpm), cPs	287,600	63,200	--
Working time at 25°C, 10 g, min	--	--	4.00-5.00
Flash point (°F)	10	10	--

*Properties are based on Huntsman test methods. Copies are available upon request

Processing

Mix Ratio

Product	Parts by weight	Parts by volume
ARALDITE® 2021-1 A	100	100
ARALDITE® 2021-1 B	95	100

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.

ARALDITE® 2021-1 structural adhesive is available in cartridges designed for use with disposable 18-21 elements mixing nozzles and can be applied as a ready to use adhesive.

Application of adhesive

The resin/hardener mix may be applied manually or with an automated dispensing equipment to the pretreated and dry joint surfaces. A 0.002 to 0.004 in (0.05 to 0.10 mm) thick adhesive layer will normally impart the greatest lap shear strength to the joint. A proper adhesive joint design is also critical for a durable bond. The joint components should be assembled and maintained in a secure 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 soapy water before the adhesive residue has had time to cure. The removal of cured residue is a difficult and time-consuming operation. If solvents such as acetone are used for cleaning, operators should take the appropriate precautions to avoid skin and eye contact.

Cure times to reach minimum shear strength

Tested at 23°C (73°F) and 55% R. H.	
Cure time to reach lap shear strength > 145 psi (1 MPa), minutes	7
Cure time to reach lap shear strength > 1450 psi (10 MPa), minutes	13

Typical Physical Properties

Unless otherwise stated, the data were determined with typical production batches using standard test methods. They are typical values only, and do not constitute a product specification.

The figures below were all determined by testing standard specimens made by lap-jointing 4.5 x 1.0 x 0.063 in (114 x 25 x 1.6 mm) strips. The bond area was 0.5 x 1.0 in (12.5 x 25 mm) in each case.

Average of 3 test specimens lap shear strength, metal-metal joints. Substrates were degreased with IPA.

Substrate	Substrates were cured at 25°C (77°F) for 24 hours and tested at 23°C (73°F),	Substrates were cured at 40°C (104°F) for 16 hours and tested at 23°C (73°F),	Test Method
	psi	psi	
Primed aluminum, 2024T3 Clad	4,140	3,220	ASTM D1002
Treated steel, RC #14	2,860	4,130	ASTM D1002
Stainless steel, V4A	2,930	2,680	ASTM D1002

Average of 3 test specimens lap shear strength, plastic-plastic joints. Substrates were lightly abraded and degreased with IPA.

Substrate	Substrates were cured at 25°C (77°F) for 24 hours and tested at 23°C (73°F),	Substrates were cured at 40°C (104°F) for 16 hours and tested at 23°C (73°F),	Test Method
	psi	psi	
ABS	470 (substrate failure)	510 (substrate failure)	ASTM D1002
PVC	830 (substrate failure)	810 (substrate failure)	ASTM D1002
PC	640 (substrate failure)	970 (substrate failure)	ASTM D1002
PMMA	560 (substrate failure)	510 (substrate failure)	ASTM D1002

Average of 3 test specimens lap shear strength on primed aluminum substrates. Substrates were degreased with IPA, cured at 40°C for 16 hours and tested at 23°C, after immersion in 23°C media.

Media	Initial, psi	30 days, psi	60 days, psi	90 days, psi	Test Method
Gasoline	3,220	2,530	2,700	2,670	ASTM D1002
10% Acetic acid	3,220	2,920	3,200	2,680	ASTM D1002
Xylene	3,200	2,980	3,280	3,470	ASTM D1002
Water	3,200	2,810	3,070	3,030	ASTM D1002

Average of 3 test specimens lap shear strength on primed aluminum substrate versus tropical weathering, 92% RH at 40°C. Substrates were degreased with IPA, cured at 40°C for 16 hours and tested at 23°C.

Initial, psi	30 days, psi	60 days, psi	90 days, psi	Test Method
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3,220	3,400	3,870	4,240	ASTM D1002
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Average of 3 test specimens lap shear strength on primed aluminum substrate versus temperature. Substrates were degreased with IPA and cured at 40°C for 16 hours and tested at different temperature.

-40°C (40°F)	23°C (73°F)	100°C (212°F)	Test Method
2,220 psi	3,220 psi	730 psi	ASTM D1002

Additional properties.

Property	Value	Test Method
T-peel test on primed aluminum substrate, cured at 40°C for 16 hours and tested at 23°C,	7 pli	ASTM D1876 Rev A
Shore D hardness, sample cured at 40°C for 16 hours and tested at 23°C	82	ASTM D2240

Storage

ARALDITE® 2021-1 may be stored for 24 months at 2°C to 8°C provided the components are stored in the original sealed containers. The expiration date is indicated on the packaging.

The product may be placed at room temperature before use, the total time at room temperature should not exceed 6 months. Long term exposure above 25°C will reduce the shelf life of the product.

Precautionary Statement

Huntsman Advanced Materials Americas LLC maintains up-to-date Safety Data Sheets (SDS) 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 SDS as mentioned above.

KEEP OUT OF REACH OF CHILDREN

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