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HUNTSMAN

Product Data

ARALDITE® AV 118
EPOXY ADHESIVE PASTE

DESCRIPTION: Araldite AV 118 epoxy adhesive is a one-component, multi-purpose paste that is designed for heat curing at temperatures from 248°F to 356°F (120°C to 180°C). The tough, high-strength adhesive is well suited for metal bonding and joining materials including ceramics, glass, rubber and temperature-resistant plastics.

APPLICATIONS: Metal- to-metal bonding.

ADVANTAGES:

- Good heat resistance to 248°F (120°C)
- Good peel strength
- Good chemical resistance

TYPICAL PROPERTIES:

Property	Test Method	Test Values[1] One Component Epoxy
Color/appearance	Visual	Beige paste
Specific Gravity	ASTM D-792	1.10 - 1.20
Viscosity at 77°F (25°C), cP		90,000

PROCESSING

Pretreatment

The strength and durability of a bonded joint are dependant on proper treatment of the surfaces to be bonded. At a minimum, joint surfaces should be cleaned with a good degreasing agent such as acetone 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

Adhesive Application

The resin/hardener mix is applied with a spatula, to the pretreated and dry joint surfaces.
A layer of adhesive 0.002 to 0.004 in. (0.05 to 0.10mm thick) will normally impart the greatest lap shear strength to the joint.
The joint components should be assembled and clamped as soon as the adhesive has been applied. An even contact pressure throughout the joint area will ensure optimum cure.

Mechanical processing

Specialist firms have developed metering, mixing and spreading equipment that enables the bulk processing of adhesive.
Huntsman Advanced Materials will be pleased to advise customers on the choice of equipment for their particular needs.

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, operators should take the appropriate safety precautions and, in addition, avoid skin and eye contact.

Curing times

Temperature	° F (°C)	248 (120)	284 (140)	320 (160)	356 (180)
Cure time	minutes	60	45	20	10
Lap shear strength at 74°F (23 °C)	psi (N/mm^2)	2900 – 3,480 (20-24)	3,625 – 4,060 (25-28)	4,205 – 4,640 (29-32)	4,060 – 4,640 (28-32)

Note: Temperatures below 248°F (120 °C) will not give adequate cure even when cure time is prolonged.

Cure temperatures above 302°F (150 °C) should be avoided when joining materials with different coefficients of linear thermal expansion because stresses will be set up in the bond line upon cooling. This effect is particularly marked where the bond surfaces are large.

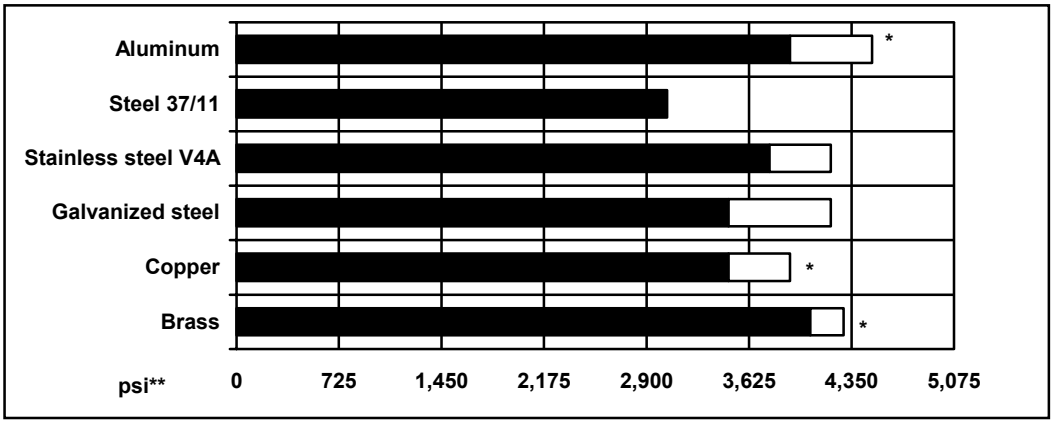
Typical cured properties

Unless otherwise stated, the figures given below were determined by testing standard specimens made by lap-jointing 6.6 x 1.0 x 0.06 in.(170 x 25 x 1.5mm) strips of aluminum alloy. The joint area was 0.5 x 1.0 in. (12.5 x 25mm) 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 45 mins at 302°F (150 °C) and tested at 74°F (23°C)
Pretreatment - Sand blasting

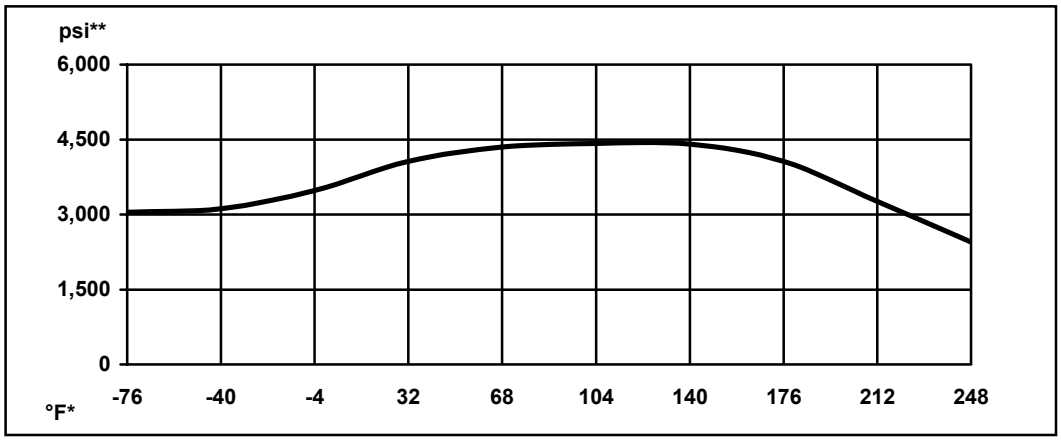


* Failure stress close to elastic limit yield stress of the metal.

** 725 psi = 5 N/mm^2; 1450 psi = 10 N/mm^2; 2,175 psi = 15 N/mm^2; 2,900 psi = 20 N/mm^2; 3,625 psi = 25 $/mm^2$; 4,350 psi = 30 N/mm^2; 5,075 psi = 35 N/mm^2.

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

Cure: 45 mins at 302°F (150°C)



*-76°F = -60°C; -40°F = -40°C; -4°F = -20°C; 32°F = 0°C; 68°F = 20°C; 104°F = 40°C; 140°F = 60°C; 176°F = 80°C; 212°F = 100°C; 248°F = 100°C

** 1,500 psi = 10 N/mm^2; 3,000 psi = 20 N/mm^2; 4,500 psi = 30 N/mm^2; 6,000 psi = 40 N/mm^2

Roller peel test (ISO 4578)

Cured 30 mins at 302°F (150°C), pli (N/mm) 57.1 (10)

Coefficient of thermal expansion (VDE 304),

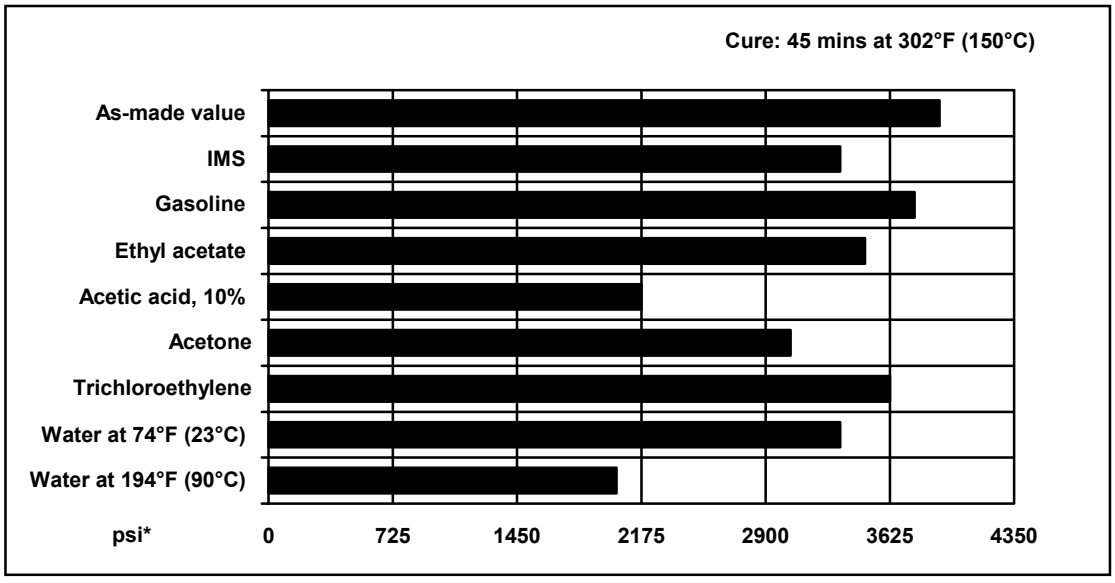
at 68°F-140°F (20°C-60°C) in./in./ºC $57x10^{-6}$

at 68°F-212°F (20°C-100°C) in./in./°C $68x10^{-6}$

Electrolytic corrosion (DIN 53489) Grade A 1

Lap shear strength after 90 days immersion in various media

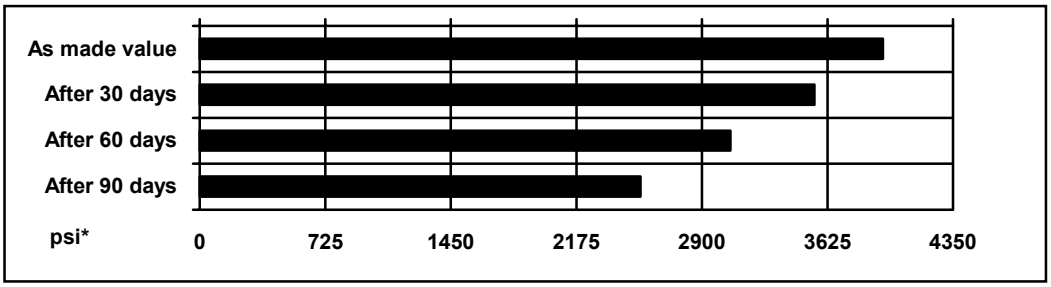
at 74°F (23°C), Typical average values.



* 725 psi = 5 N/mm^2; 1,450psi = 10 N/mm^2; 2,175 psi = 15 N/mm^2; 2,900 psi = 20 N/mm^2; 3,625 psi = 25 N/mm^2; 4,350 psi = 30 N/mm^2;

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

Cured: 30 min at 302°F (150°C); Tested at 74°F (23°C)



* 725 psi = 5 N/mm^2; 1,450psi = 10 N/mm^2; 2,175 psi = 15 N/mm^2; 2,900 psi = 20 N/mm^2; 3,625 psi = 25 N/mm^2; 4,350 psi = 30 N/mm^2;

Shear modulus (DIN 53445)

Cure:45 min/302°F (150°C), Ksi (GPa)	
77°F (25°C)	174 (1.2)
122°F (50°C)	160 (1.1)
167°F (75°C)	145 (1.0)
212°F (100°C)	102 (0.7)
257°F (125°C)	43.5 (0.3)
302°F (150°C)	1,305 psi (9 MPa)

Electrical Properties

Thermal Conductivity, W/mK	0.21
Surface Resistivity, ohms	4.8 E+13
Dielectric Strength, volt/mil	600
Volume Resistivity, ohms-cm	6.0 E+16
Dielectric Constant, at 50Hz/1KHz/10KHz	4.1/4.2/4.0
Loss Tangent, % at 50Hz/1KHz/10KHz	0.9/0.9/0.9

CAUTION:

Huntsman Advanced Materials Americas Inc. maintains up–to-date Material Safety Data Sheets (MSDS) 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. Copies of the latest MSDS may be requested by calling our customer service group at 800-367-8793 or emailing your request to adhesives_group@huntsman.com.

FIRST AID!

Eyes and skin: Flush eyes with water for 15 minutes. Contact a physician if irritation persists. Wash skin thoroughly with soap and water. Remove and wash contaminated clothing before reuse.
Inhalation: Remove subject to fresh air.
Swallowing: Dilute by giving water to drink and contact a physician promptly. Never give anything to drink to an unconscious person.

KEEP OUT OF REACH OF CHILDREN

FOR PROFESSIONAL AND INDUSTRIAL USE ONLY

IMPORTANT LEGAL NOTICE:

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WARRANTY: Huntsman warrants to the Buyer that the Product will conform to the published specifications for that Product at the time of manufacture, and that the Product will be free from defects in material and workmanship in normal use.

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WARNING: Technical data and results are based upon tests under controlled laboratory conditions and must be confirmed by Buyer by testing for its intended conditions of use. The Product has not been tested for, and therefore is not recommended or suitable for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended or likely, or for uses for which implantation within the human body is intended, and Huntsman assumes no liability for any such uses.