

Advanced Materials**Araldite® AW 2104 / Hardener HW 2934**

Structural Adhesives


 chemical-concepts.com
800.220.1966
 410 Pike Road • Huntingdon Valley, PA 19006
TECHNICAL DATA SHEET

Araldite® AW 2104 / Hardener HW 2934

Two component epoxy paste adhesive

Key properties

- Fast curing
- General purpose
- Low shrinkage
- Bonds a wide variety of materials
- Tough and resilient

Description

Araldite® AW 2104 / Hardener HW 2934 is a rapid cure, multipurpose, two component, room temperature curing, high viscosity liquid adhesive of high strength and toughness.

It is suitable for bonding a wide variety of metals, ceramics, glass, rubbers, rigid plastics, and most other materials in common use. It is a versatile adhesive for the craftsman as well as most industrial applications.

Product data

Property	Araldite® AW 2104	Hardener HW 2934	Mix
Colour (visual) (A112)*	opaque	pale yellow	pale yellow
Specific gravity	1.16-1.18	1.15-1.18	ca 1.18
Viscosity at 25 °C (Pas)*	20-60 (A191)	25-65 (A191)	typically 25-65
Pot Life (100 gm at 25°C)	-	-	5 - 8 minutes
Lap shear strength at 25 °C (A501)*	-	-	> 20 MPa

* Specified data are on a regular basis analysed. Data which is described in this document as 'typical' is not analysed on a regular basis and is given for information purposes only. Data values are not guaranteed or warranted unless if specifically mentioned.

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 or other proprietary degreasing agents in order to remove all traces of oil, grease and dirt.

Low grade alcohol, gasoline (petrol) 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® AW 2104	100	100
Hardener HW 2934	100	100

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 0.05 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.

Typical times to minimum shear strength

Temperature	°C	10	15	23	40	60	100
Cure time to reach	hours	-	-	-	-	-	-
LSS > 1MPa	minutes	35	20	20	5	2	<1
Cure time to reach	hours	2	-	-	-	-	-
LSS > 10MPa	minutes	-	70	60	25	10	2

LSS = Lap shear strength.

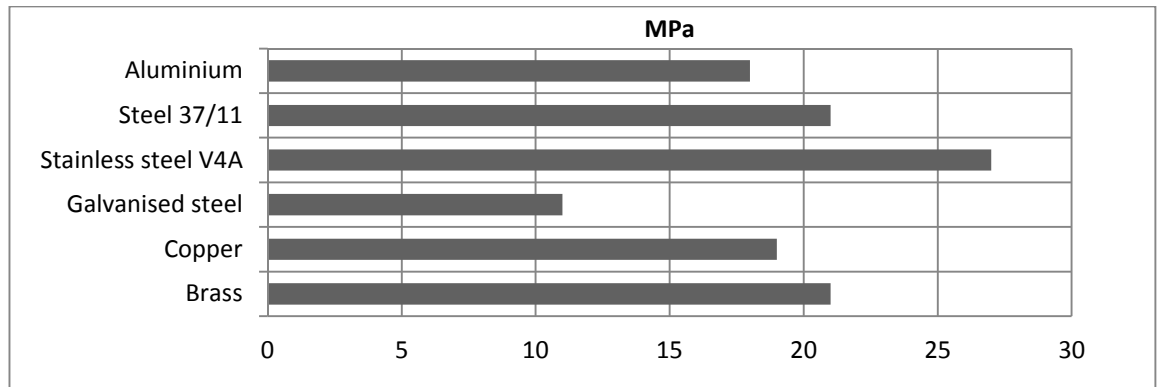
Typical cured properties

Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-jointing 114 x 25 x 1.6 mm strips of aluminium alloy. The joint area was 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.

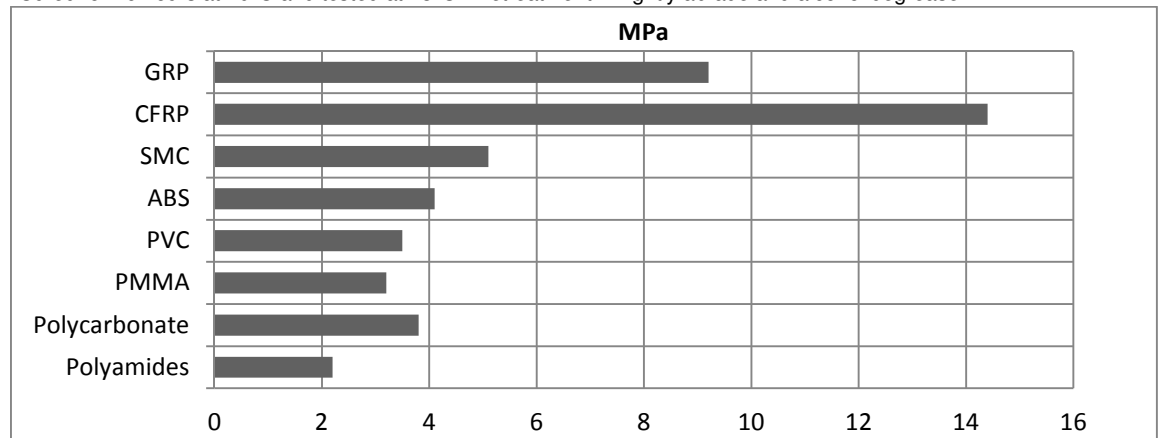
Average lap shear strengths of typical metal-to-metal joints (ISO 4587) (typical average values)

Cured for 16 hours at 40°C and tested at 23°C. Pretreatment - Sand blasting



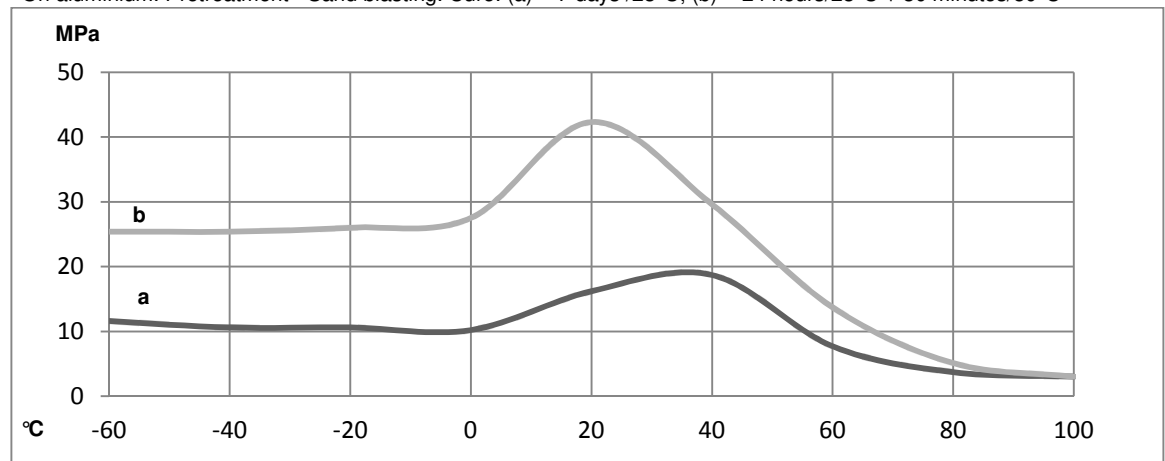
Average lap shear strengths of typical plastic-to-plastic joints (ISO 4587) (typical average values)

Cured for 16 hours at 40°C and tested at 23°C. Pretreatment - Lightly abrade and alcohol degrease.



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

On aluminium. Pretreatment - Sand blasting. Cure: (a) = 7 days /23°C; (b) = 24 hours/23°C + 30 minutes/80°C



Roller peel test (ISO 4578) (typical average values) On etched aluminium

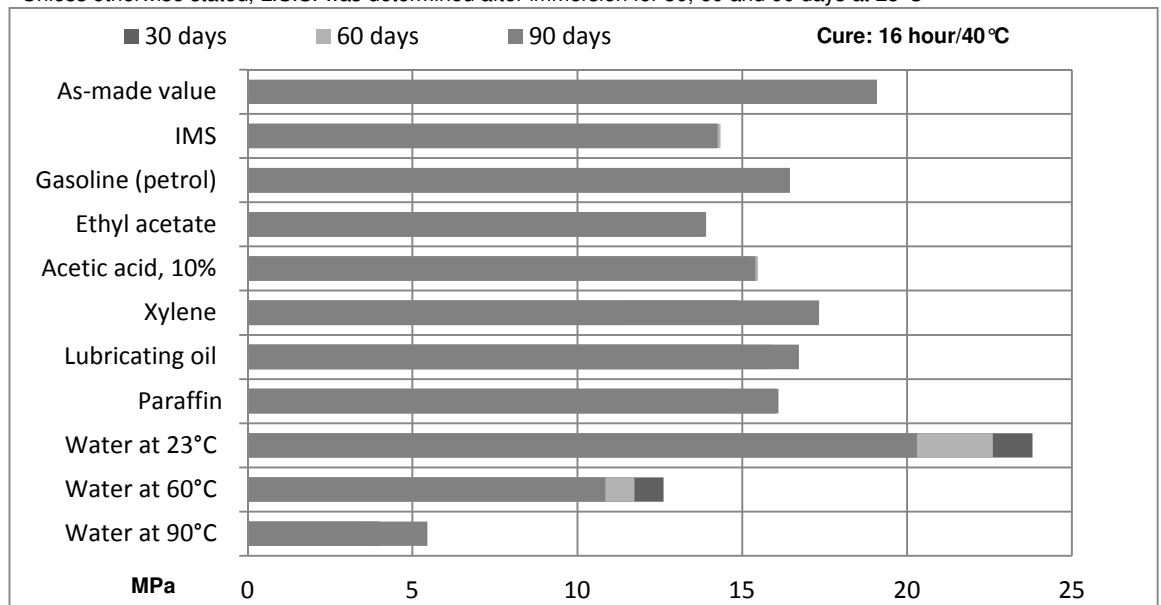
Cure: 48 hours / 20°C	3.5 N/mm
Cure: 16 hours / 40°C	5.5 N/mm
Cure: 2 hours / 80°C	5.5 N/mm

Flexural Properties (ISO 178) (typical average values)

Cure 16 hours at 40°C , tested at 23°C	
Flexural Strength	46 MPa
Flexural Modulus	1654 MPa

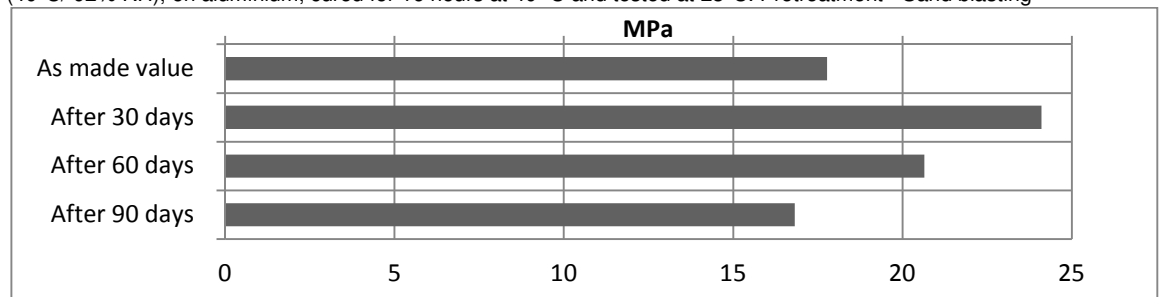
Lap shear strength versus immersion in various media (ISO 4587) (typical average values)

On aluminium, cured for 16 hours at 40°C and tested at 23°C. Pretreatment - Sand blasting
 Unless otherwise stated, L.S.S. was determined after immersion for 30, 60 and 90 days at 23°C



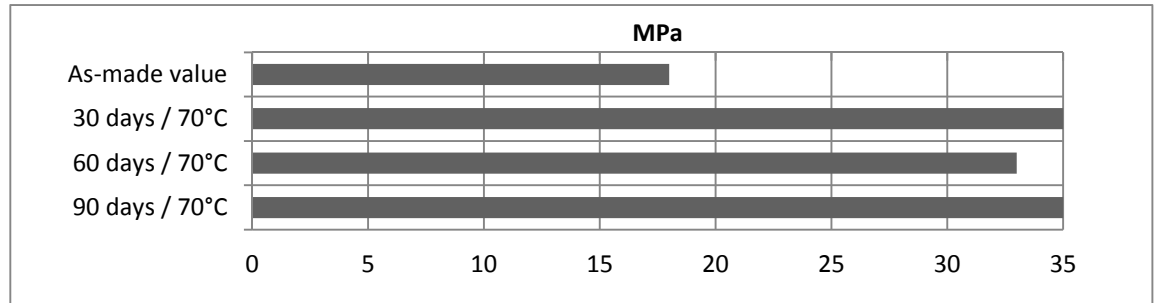
Lap shear strength versus tropical weathering (ISO 4587) (typical average values)

(40°C/ 92% RH), on aluminium, cured for 16 hours at 40°C and tested at 23°C. Pretreatment - Sand blasting



Lap shear strength versus heat ageing (ISO 4587) (typical average values)

On aluminium, cured for 16 hours at 40°C and tested at 23°C. Pretreatment - Sand blasting



Additional electrical properties	Test values	Test methods
Dielectric strength (Volt/mil)	425	ASTM D-149
Surface resistivity (Ohm)	1.5 E+15	IEC 60093
Volume resistivity (Ohm-cm)	5.7 E+14	IEC 60093
Dielectric constant at 50Hz/1kHz/10kHz	4.4/ 4.4/ 4.3	IEC 60250
Loss tangent, % at 50Hz/1kHz/10kHz	0.8/ 0.7/ 1.0	IEC 60250

Storage

Araldite® AW 2104 and Hardener HW 2934 must be stored at room temperature provided the components are stored in sealed containers. The expiry date is indicated on the label.

Handling precautions**Caution**

Our products are generally quite harmless to handle provided that certain precautions normally taken when handling chemicals are observed. The uncured materials must not, for instance, be allowed to come into contact with foodstuffs or food utensils, and measures should be taken to prevent the uncured materials from coming in contact with the skin, since people with particularly sensitive skin may be affected. The wearing of impervious rubber or plastic gloves will normally be necessary; likewise the use of eye protection. The skin should be thoroughly cleansed at the end of each working period by washing with soap and warm water. The use of solvents is to be avoided. Disposable paper - not cloth towels - should be used to dry the skin. Adequate ventilation of the working area is recommended. These precautions are described in greater detail in the Material Safety Data sheets for the individual products and should be referred to for fuller information.

Huntsman Advanced Materials warrants only that its products meet the specifications agreed with the user. Specified data are analysed on a regular basis. Data which is described in this document as 'typical' or 'guideline' is not analysed on a regular basis and is given for information purposes only. Data values are not guaranteed or warranted unless if specifically mentioned.

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chemical-concepts.com

800.220.1966

410 Pike Road • Huntingdon Valley, PA 19006

Huntsman Advanced Materials (Switzerland) GmbH

Klybeckstrasse 200
CH - 4057 Basel
Switzerland

Tel: +41 (0)61 299 11 11

Fax: +41 (0)61 299 11 12

www.huntsman.com/advanced_materials