HUNTSMAN

Structural Adhesives

Araldite® 2015 (AV 5308 / HV 5309-1)
Two component epoxy paste adhesive

Key properties

- **Thixotropic**
- **Toughened adhesive**
- **Gap filling, non sagging up to 10mm thickness**
- **Suitable for SMC and GRP bonding**
- **High shear and peel strength**

Description

Araldite 2015 is a two component, room temperature curing paste adhesive giving a resilient bond. It is thixotropic and non sagging up to 10mm thickness. It is particularly suitable for SMC and GRP bonding.

Typical product data

Property	2015 A (AV 5308)	2015 B (HV 5309-1)	Mixed Adhesive
Colour (visual)	neutral paste	neutral paste	neutral paste
Specific gravity	1.4	1.4	1.4
Viscosity at 25°C (Pas)	thixotropic	thixotropic	thixotropic
Pot Life (100 gm at 25°C)	-	-	30 - 40 minutes

Processing

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 (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 2015 A	100	100
Araldite 2015 B	100	100

The resin and hardener should be blended until they form a homogeneous mix.

Resin and hardener are also 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 is applied with a spatula, to the pretreated and dry joint surfaces.
A layer of adhesive 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. We 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, operatives should take the appropriate precautions and, in addition, avoid skin and eye contact.

Times to minimum shear strength

Temperature	°C	10	15	23	40	60	100
Cure time to reach	hours	12	7.5	4	1	-	-
LSS > 1N/mm^2	minutes	-	-	-	-	17	6
Cure time to reach	hours	21	13	6	2	-	-
LSS > 10N/mm^2	minutes	-	-	-	-	35	7

LSS = Lap shear strength.

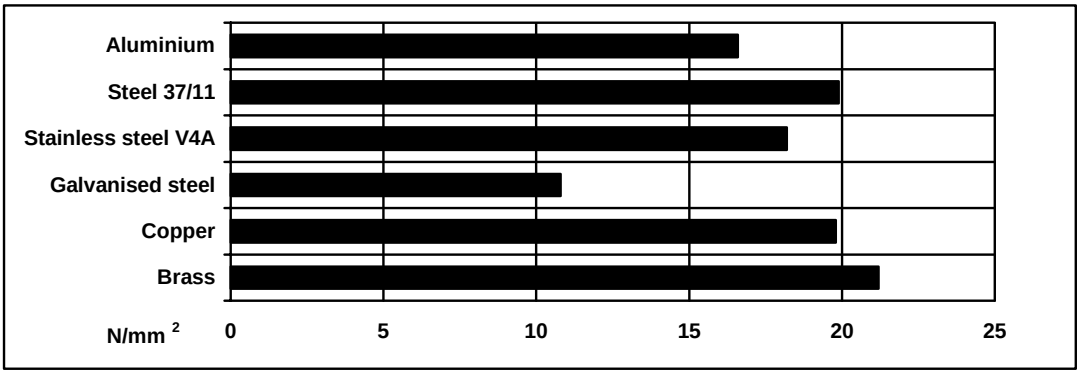
Typical cured properties

Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-jointing 170 x 25 x 1.5 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.

Note: The data in this edition is based on recent retesting of the product.

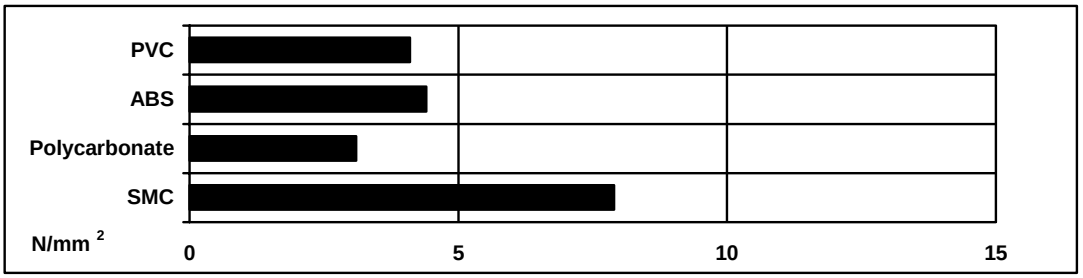
Average lap shear strengths of typical metal-to-metal joints (ISO 4587)

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)

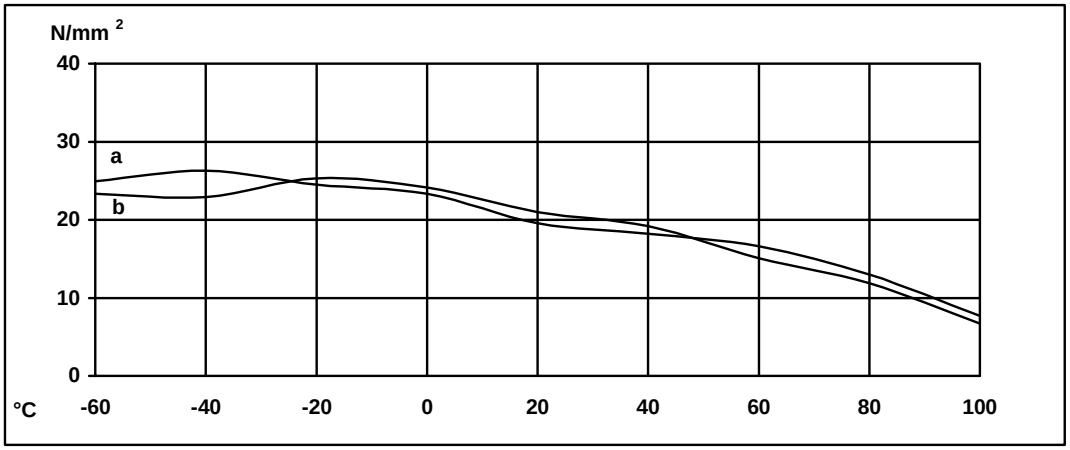
Cured for 1 hour at 80°C and tested at 23°C. Pretreatment - Lightly abrade and alcohol degrease.



Tensile strength at 23°C (ISO 527) 30 MPa
Tensile modulus 2 Gpa
Elongation at break 4.4 %

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

Cure: (a) = 7 days at 23°C; (b) = 24 hours at 23°C + 30 minutes at 80°C



Roller peel test (ISO 4578)

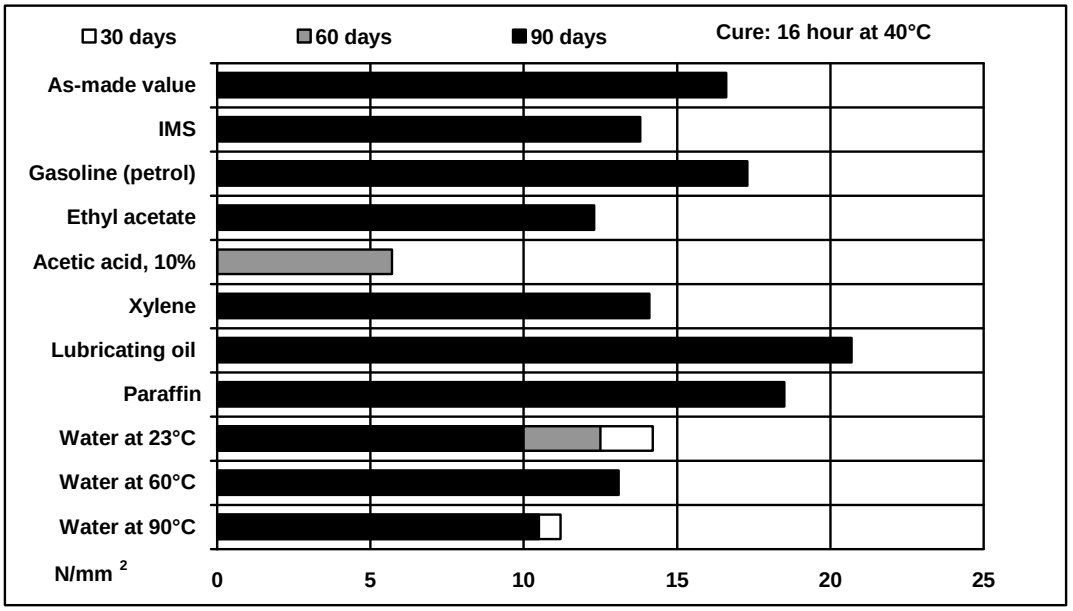
Cured 16 hours at 40°C	4 N/mm

Glass transition temperature

Cured 16 hours at 40°C	67°C by DSC
Cured 1 hour at 80°C	87 by shear modulus DIN 53445
Dielectric constant (500v at 25°C)	5.6 at 1 kHz

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

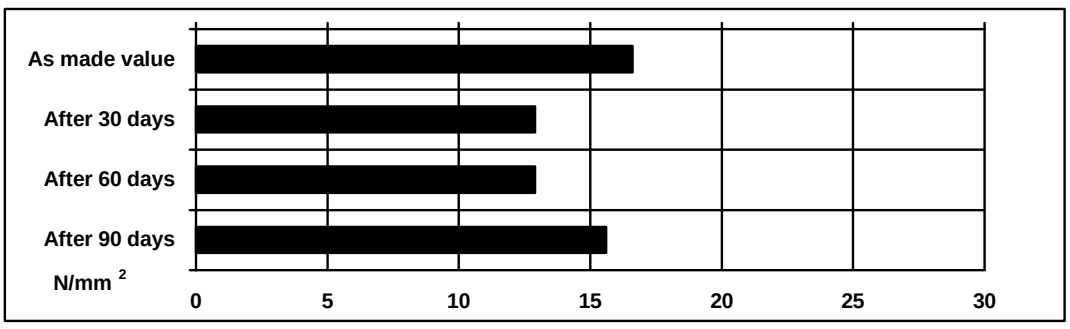
Unless otherwise stated, L.S.S. was determined after immersion for 90 days at 23°C



Lap shear strength versus tropical weathering

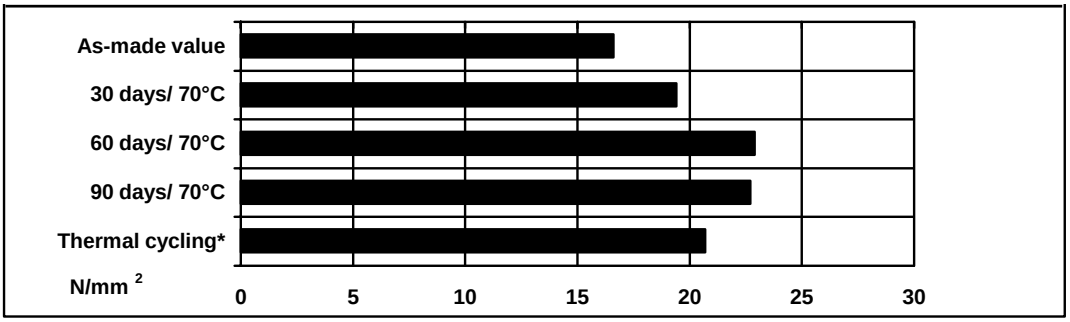
(40/92, DIN 50015; typical average values)

Cure: 16 hours at 40°C, tested at 23°C



Lap shear strength versus heat ageing

Cure: 16 hours at 40°C



*25 cycles -30°C to + 70°C

Shear modulus (DIN 53445)

Cure: 1 hour at 80°C

Temperature	G'	Λ
0°C	1.0 Gpa	0.25
25°C	0.9 Gpa	0.25
50°C	0.8 Gpa	0.35
75°C	0.2 Gpa	1.9
100°C	2 MPa	0.5

Flexural Properties (ISO 178) Cure 16 hours/ 40ºC tested at 23ºC

Flexural Strength 42.7 MPa

Flexural Modulus 1813.6 MPa

Resistance to fatigue (40 Hz at 23°C) (quoted as cycles to failure)

Maximum applied load	Sandblasted aluminium	Chromate pickled aluminium
20% of static failing load	$>10^7$	$>10^7$
25% of static failing load	$>10^7$	10^7
30% of static failing load	3×10^6	8×10^5

(Static failing load 16 N/mm^2)

Storage

Araldite 2015 A and B may be stored for up to 3 years 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.

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