Advanced Materials

Araldite® AV 4076-1 / Hardener HV 5309-1

Structural Adhesives

Technical Data

Araldite® AV 4076-1 / Hardener HV 5309-1
Two component epoxy paste adhesive

Key properties

- **Thixotropic – non slumping**
- **Toughened adhesive resilient bond**
- **Suitable for Metal and Composite bonding**
- **High shear and peel strength**

Description

Araldite AV 4076-1 / Hardener HV 5309-1 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..

Product data

	Araldite AV 4076-1	Hardener HV 5309-1	mixed
Colour (visual)	Translucent paste	Neutral paste	Neutral paste
Specific gravity	ca 1.16	ca 1.4	ca 1.3
Viscosity (Pas)	thixotropic	thixotropic	thixotropic
Pot Life (100 gm at 25°C)	-	-	ca 60 minutes

Processing

Pretreatment

The strength and durability of a bonded joint are dependant 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 AV 4076-1	100	100
Araldite HV 5309-1/B	116	100

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 0.10 mm 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	15	23	40	60	100
Cure time to reach	hours	10	6	2	-	-
LSS > 1N/mm^2	minutes	-	-	-	40	5
Cure time to reach	hours	20	14	4	-	-
LSS > 10N/mm^2	minutes	-	-	-	75	12

LSS = Lap shear strength.

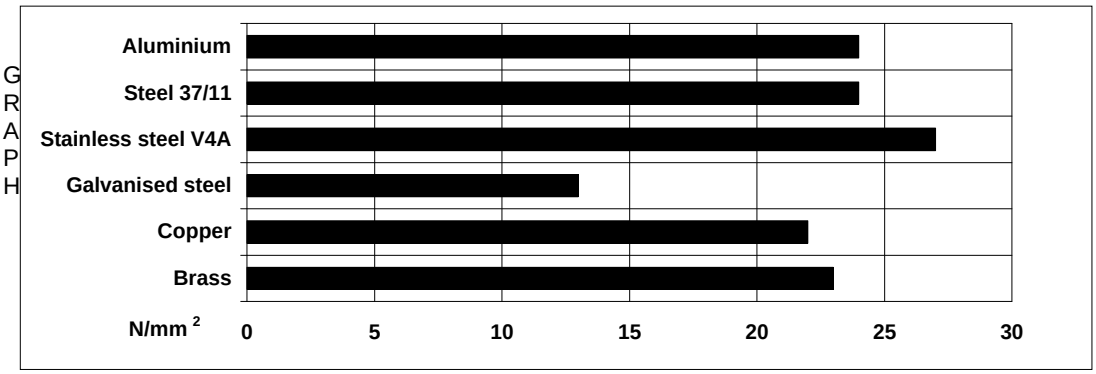
Typical cured properties

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.

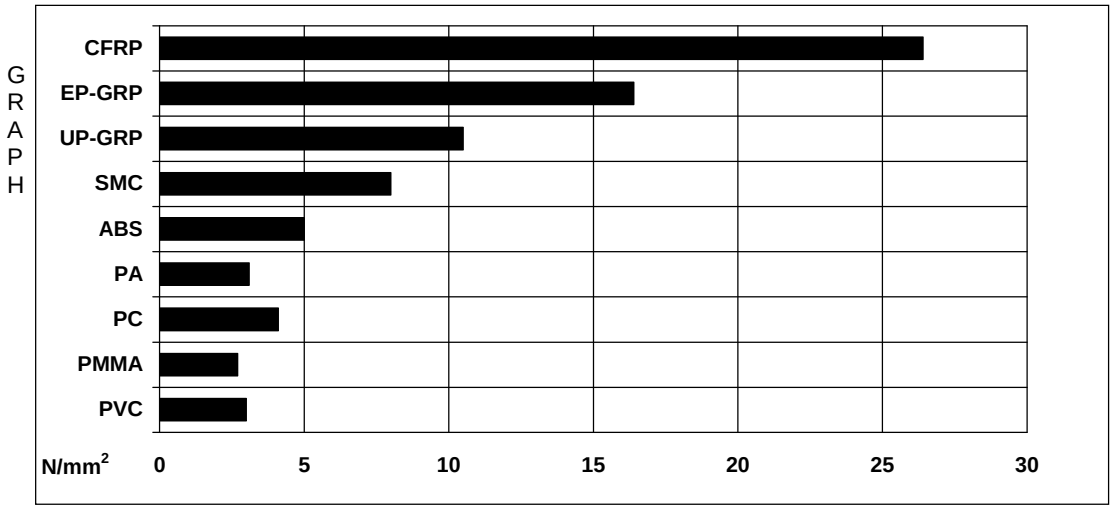
Average lap shear strengths of typical metal-to-metal joints (ISO 4587)

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



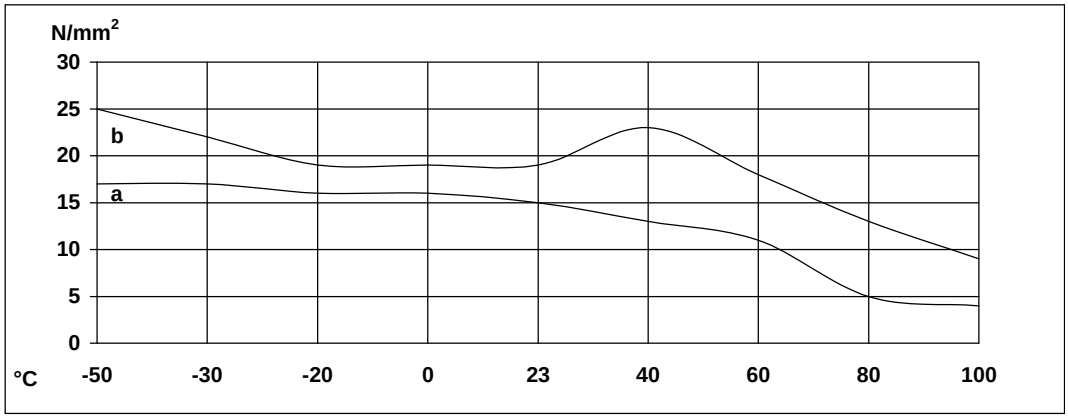
Average lap shear strengths of typical plastic-to-plastic joints (ISO 4587)

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)

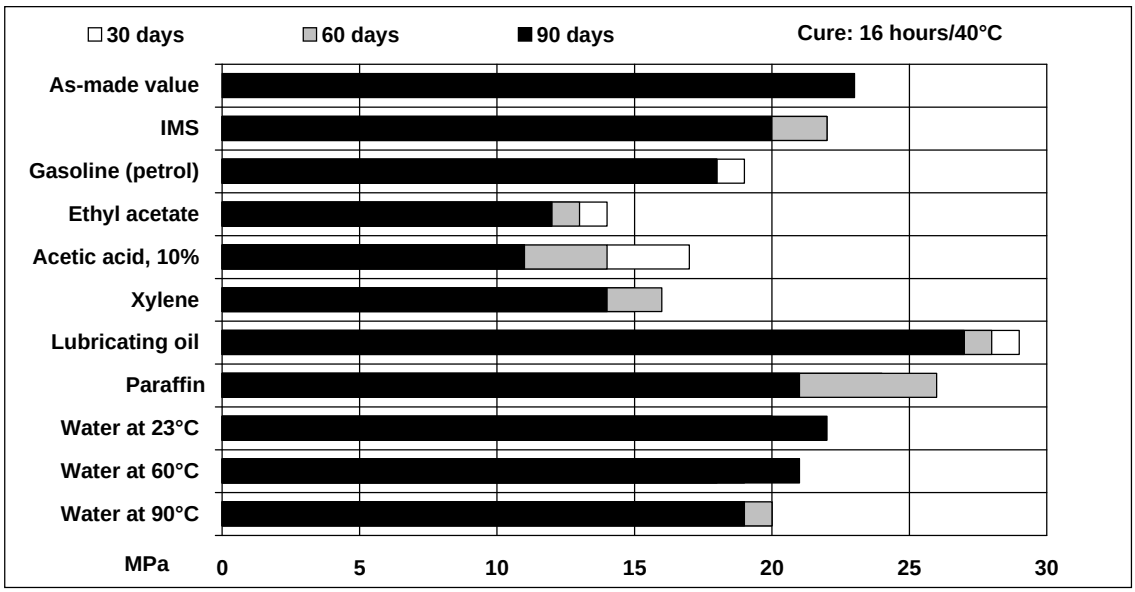
Cure: 24 hours at 23°C + 30 minutes at 80°C (a) on GRE (b) on aluminium



Roller peel test (ISO 4578)	Cured 16 hours/40°C	4 N/mm
Glass transition temperature (DSC)	Cure: 16 hours at 40°C	ca. 64°C
	Cure 4 hours at 60°C	ca. 78°C
Tensile strength at 23°C (ISO 527)		20 MPa
Tensile modulus		1 Gpa
Elongation at break		5 %

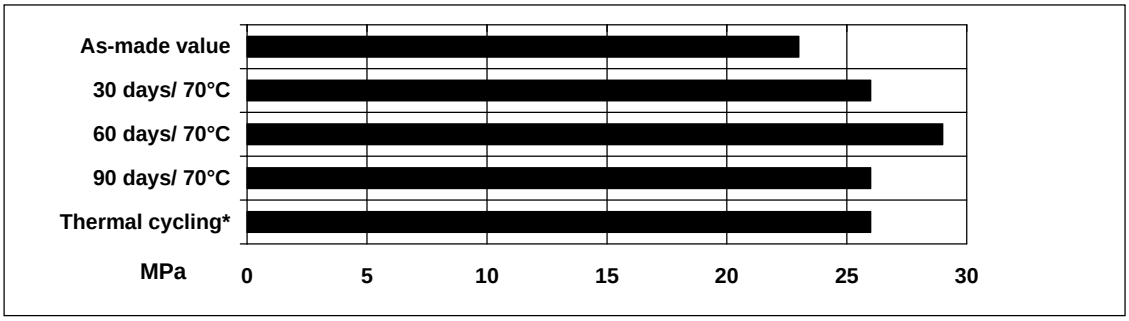
Lap shear strength versus immersion in various media (typical average values)

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



Lap shear strength versus heat ageing

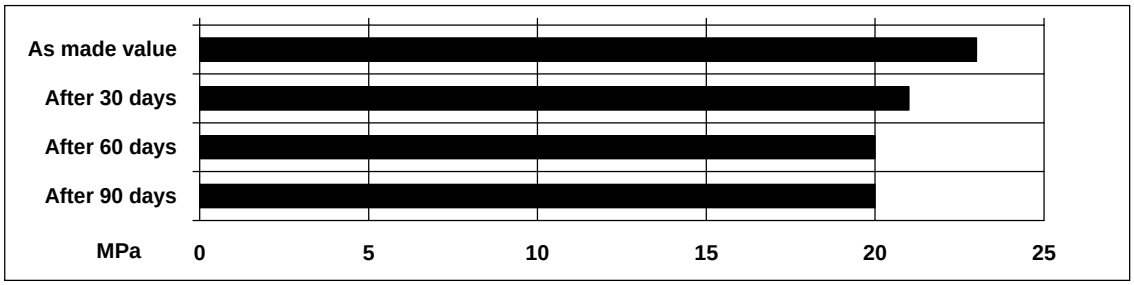
Cure: 16 hours/40°C Test: at 23°C, 50% rh



*25 cycles -30°C to + 70°C

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

Cure:16 hours/40°C: Test at 23°C.



Shear modulus (DIN 53445)
Cure: 48 hrs at 23ºC plus 8 hrs at 60ºC

Temperature	G'
0°C	0.6 GPa
25°C	0.5 GPa
50°C	0.4 GPa
75°C	0.3 GPa
100°C	100 MPa
125ºC	10 MPa

Storage

Araldite AV 4076-1 and Hardener HV5309-1 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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