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Advanced Materials

Araldite® AV 170

Structural Adhesives

Araldite® AV 170
One component epoxy adhesive

Key properties

- **Cures at 140-180°C**
- **Heat resistant to 120°C**
- **Very good peel strength**
- **Good chemical resistance**
- **Gap filling to 3mm**

Description

Araldite AV 170 is a multipurpose, one component heat curing thixotropic paste adhesive of high strength and toughness.
It is suitable for bonding a wide variety of metals, temperature resistant plastics and many other materials.

Product data

Property	AV 170
Colour (visual)	Off-white
Specific gravity	1.15 - 1.20
Viscosity (Pas)	thixotropic paste
Flash Point (°C)	> 100

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 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

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.

Minimum recommended cure schedule to reach LSS near to full cure (95%)					
Temperature	°C	140	160	180	220
Cure time	minutes	50	20	10	5

Typical LSS values on aluminium					
Temperature	°C	140	160	180	220
Cure time	minutes	60	60	60	60
Lap shear strength at 23°C	N/mm^2	23-26	26-30	28-30	30-32

Note: Temperatures below 140°C will not give adequate cure even when cure time is prolonged.
Cure temperature above 150°C should be avoided when joining materials of different coefficients of linear thermal expansion; otherwise stresses will be set up in the bond line on cooling. This effect is particularly marked where the bond surfaces are large.
At 220°C, cure time should not exceed 60 minutes

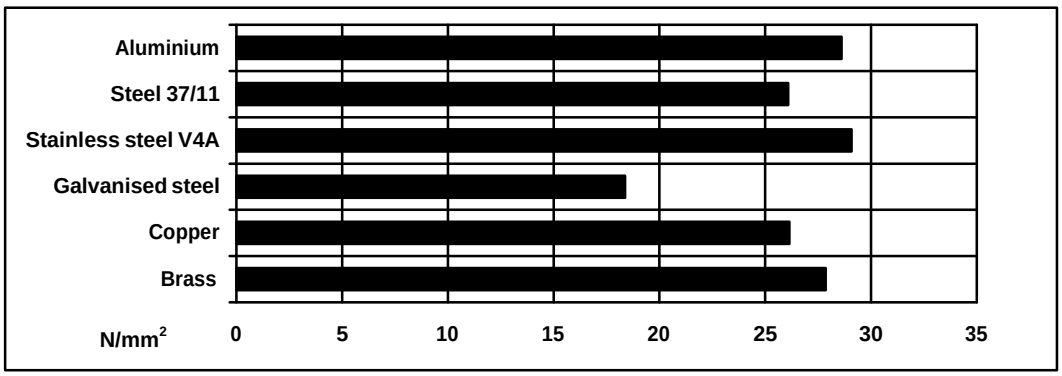
Typical cured properties

Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-jointing 114 x 25 x 1.5 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)

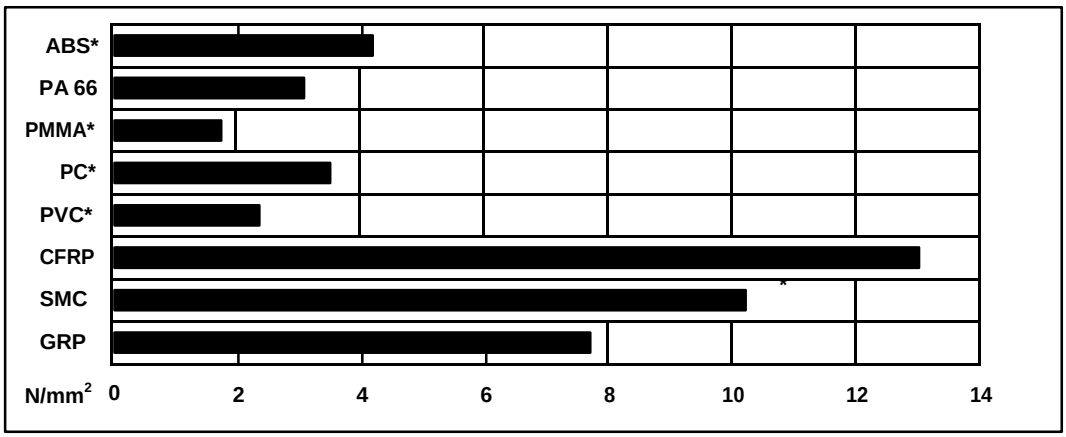
Cured for 60 mins at 150°C and tested at 23°C

Pretreatment - Sand blasting



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

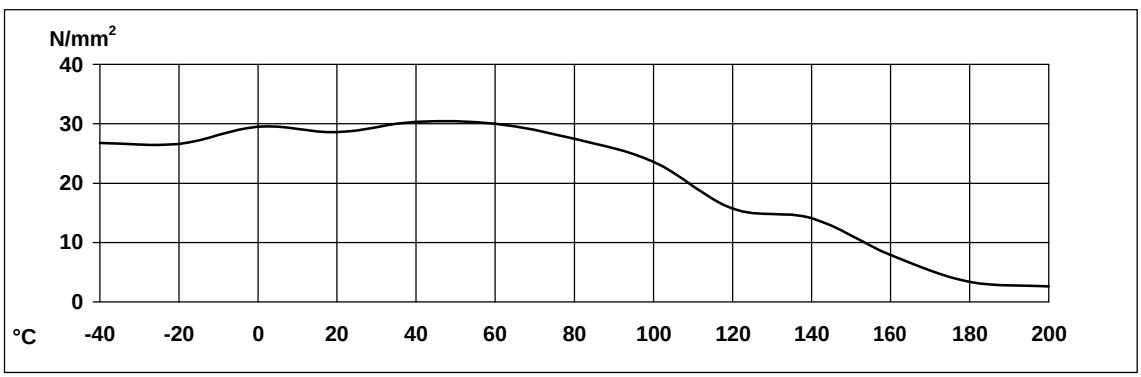
Cured for 60 mins at 150°C and tested at 23°C. Pretreatment - abraded



* : degradation of plastic substrates due to curing temperature conditions

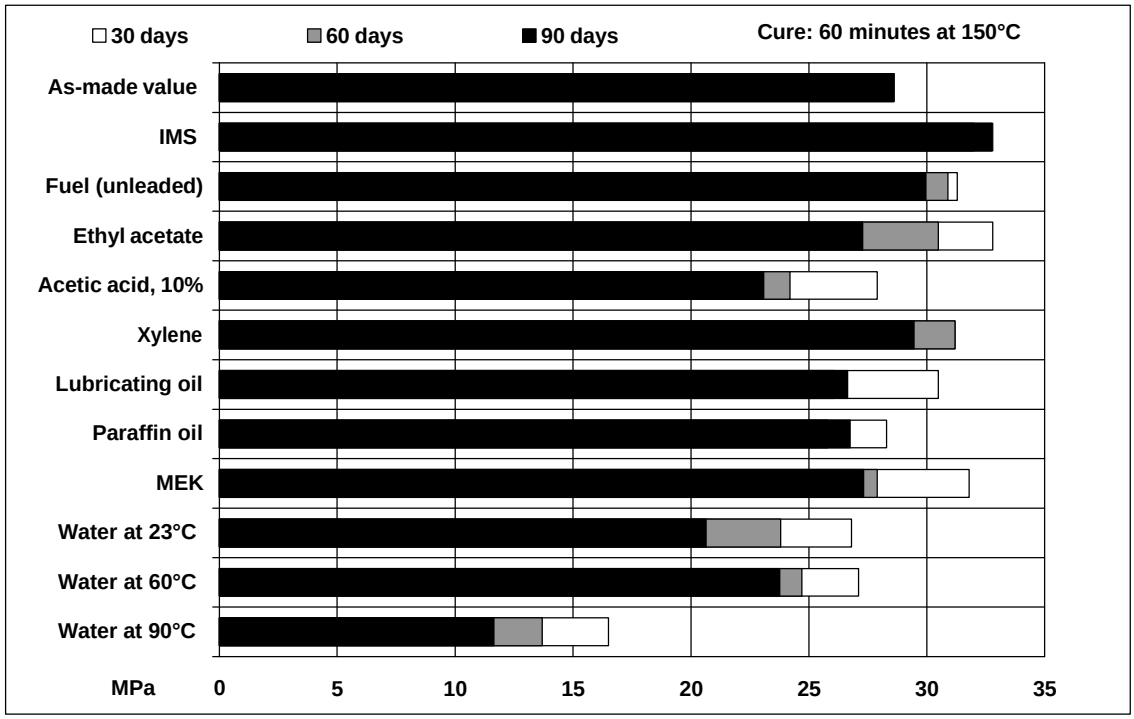
Lap shear strength versus temperature (ISO 4587) (typical average values)

Cure: 60 mins at 150°C



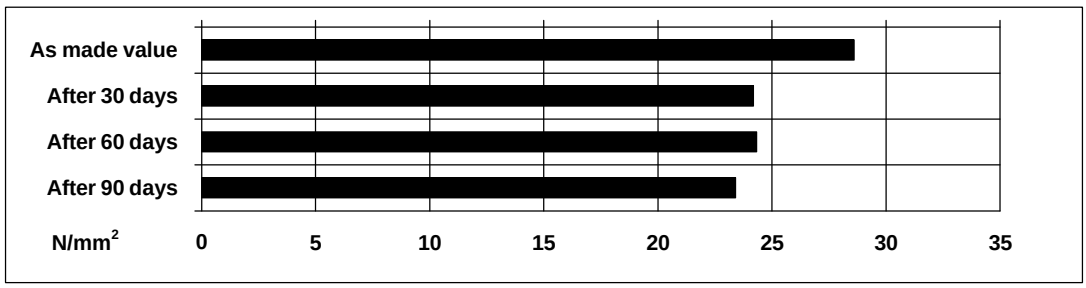
Lap shear strength after 30,60 and 90 days immersion in various media at 23 C otherwise stated

(typical average values)



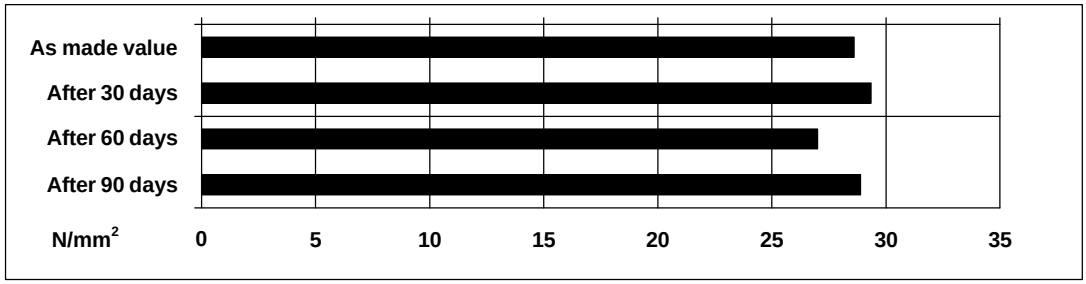
Lap shear strength versus tropical weathering (40/92, DIN 50015; typical average values on aluminium)

Cure:30 min at 150◦C



Lap shear strength versus heat ageing 70°C for 30, 60 and 90 days. Typical average value on aluminium

Cure:60 min at 150°C, tested at 23°C



Roller peel test (ISO 4578)

Cured 30 min/ 150°C	5.8 N/mm
Cured 30 min/ 180°C	6.6 N/mm
Glass Transition temperature (Tg)	129 °C (by DMA)

Thermal cycling cured 60 min at 150°C

100 cycles of 6 hours duration from -30°C to 70°C:	26.6 MPa

Tensile strength at 23°C (ISO 527)		25 MPa
E-modulus		1639 MPa
Elongation at break		1.4 %
Shear modulus G'(ISO 6721)	Cure: 2 hours/150°C	
	-20°C - 1.27 GPa	
	0°C - 1.18 GPa	
	23°C - 1.10 GPa	
	60°C - 0.88 GPa	
	100°C - 0.63 GPa	
	150°C - 13.3 MPa	
	180°C - 13.3 MPa	

Flexural Properties (ISO 178) Cure 2 hours/ 150ºC **,** tested at 23ºC	
Flexural Strength	46 MPa
Flexural Modulus	2013 MPa
Shore Hardness (D scale) (ISO 868/03) Cure 2 hours/ 150ºC **,** tested at 23ºC, 50%RH	D 78

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Storage

Araldite AV 170 may be stored for up to 2 years at 2 - 8°C. At 15-25°C the life of the product is 6 months after removal from storage at 2 - 8°C. 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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All recommendations for the use of our products, whether given by us in writing, verbally, or to be implied from the results of tests carried out by us, are based on the current state of our knowledge. Notwithstanding any such recommendations the Buyer shall remain responsible for satisfying himself that the products as supplied by us are suitable for his intended process or purpose. Since we cannot control the application, use or processing of the products, we cannot accept responsibility therefor. The Buyer shall ensure that the intended use of the products will not infringe any third party s intellectual property rights. We warrant that our products are free from defects in accordance with and subject to our general conditions of supply.

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