HUNTSMAN

Structural Adhesives

Araldite® AV 138M with Hardener HV 998

Two component epoxy adhesive

Key properties

- **Low out gassing / volatile loss**
- **Excellent chemical resistance**
- **Temperature resistant to 120°C**
- **Cures at temperatures down to 5°C**
- **Thixotropic, gap filling paste**

Description

Araldite AV 138M with Hardener HV 998 is a two component, room temperature curing paste adhesive of high strength. When fully cured the adhesive will have excellent performance at elevated temperatures and has high chemical resistance. It is suitable for bonding a wide variety of metals, ceramics, glass, rubbers, rigid plastics and other materials, and is widely used in many industrial applications where resistance to aggressive or warm environments are required. The low out gassing makes this product suitable for specialist electronic telecommunication and aerospace applications.

Typical product data

Property	AV 138M	HV 998	Mixed adhesive
Colour (visual)	beige	grey	grey
Specific gravity	ca. 1.7	ca. 1.7	ca. 1.7
Viscosity (Pas)	thixotropic	thixotropic	thixotropic
Pot Life (100 gm at 25°C)	-	-	35 mins

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

Mix ratio	Parts by weight	Parts by volume
Araldite AV138M	100	100
Hardener HV 998	40	40

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

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.

Curing times

Temperature	°C	10	15	23	40	60	80	100
Cure time	hours	48	36	24	16	1	-	-
	minutes	-	-	-	-	-	15	10
LSS at 23°C	N/mm^2	10	11	13	14	15	16	18

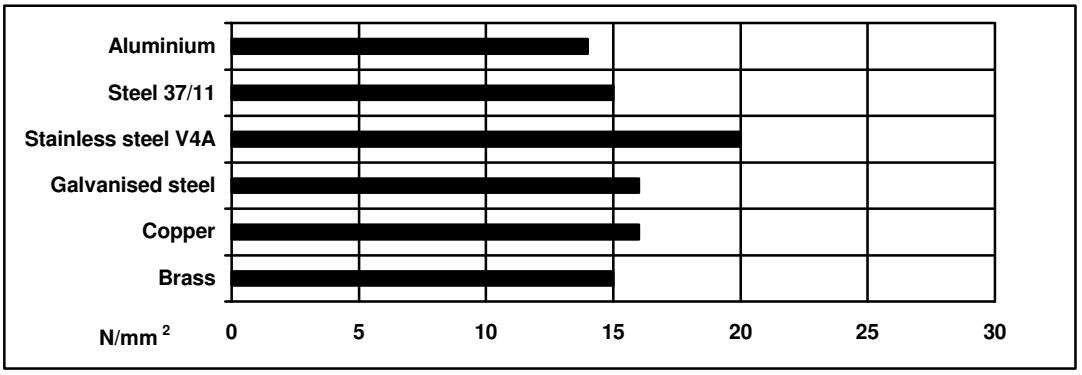
LSS = Lap shear strength.

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)

Cure: 16 hours at 40°C and tested at 23°C
Pretreatment - Sand blasting



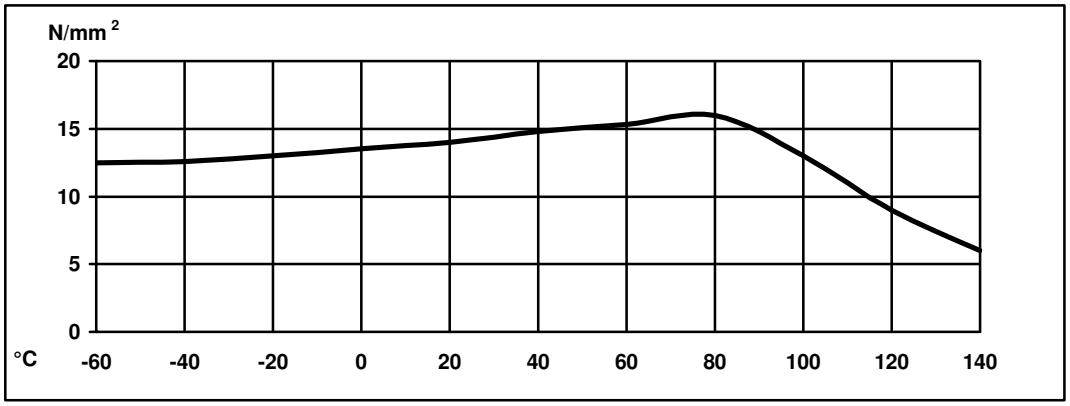
Shear modulus (DIN 53445)

Cure: 16 hours at 40°C

25°C - 3GPa
50°C - 2GPa
75°C - 0.4GPa
100°C - 0.1GPa
125°C - 3MPa
150°C - 2MPa

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

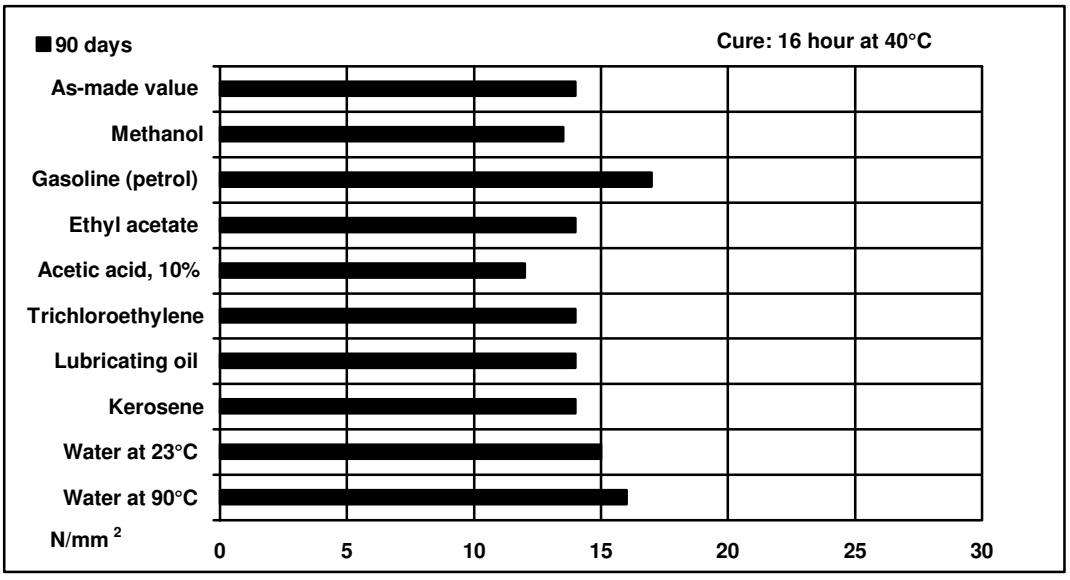
Cure: 16 hours at 40°C



Roller peel test (ISO 4578)	
Cure: 16 hours at 40°C	1.8 N/mm
Shore hardness	D84-86
Tensile strength	
Cure: 16 hours at 40°C	43 MPa
Tensile modulus	4.7 GPa
Elongation at break	1.2%
Electrolytic corrosion (DIN 53489) - Cure: 16 hours at 40°C	
Tested 4 days in 40°C/92% RH as specified in DIN 50015	Rated AN1
Coefficient of linear thermal expansion (VSM 77110)	
Tested over range 18-93°C. Cure: 16 hours at 40°C	$67x10^{-6}K^{-1}$
Volume resistivity (VSDE 0303) at 22°C	$1.8x10^{17}$ ohm cm at 50 Hz
Electric strength (VSM 7710) at 22°C	45.8 kV (instantaneous value)
Fatigue test on simple lap joints (DIN 532852)	
Cure: 16 hours at 40°C. Test frequency 90-130Hz	
25% of static failing load	$>10^7$ cycles to failure
30% of static failing load	10^5-10^6 cycles to failure

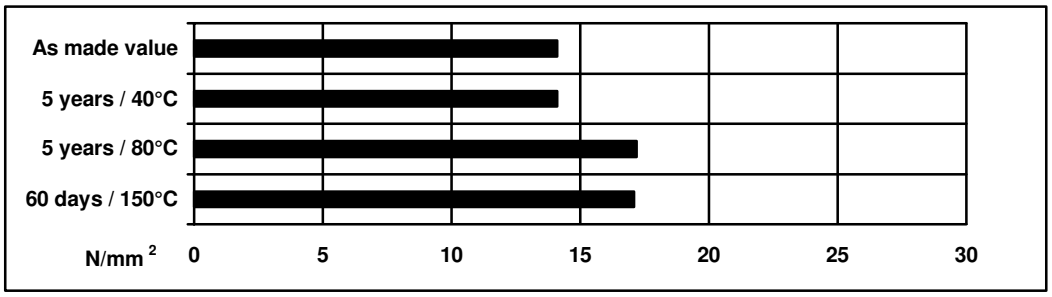
Lap shear strength versus immersion in various media (typical average values)

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



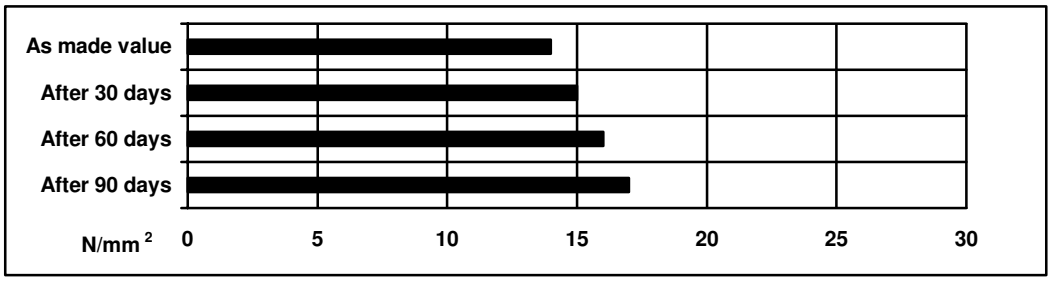
Lap shear strength versus heat ageing

Cure: 16 hours at 40°C



Lap shear strength versus tropical weathering

(40/92, DIN 50015; typical average values)
Test at 23°C



Storage

Araldite AV 138M and hardener HV 998 may be stored for up to 6 years and 3 years respectively at room temperature provided that 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.

Duxford, Cambridge
England CB2 4QA

Tel: +44 (0) 1223 832121
Fax: +44 (0) 1223 493322
www.araldite.com