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Advanced Materials

Araldite® AY 105-1 / Hardener HY 991

Structural Adhesives

Araldite® AY 105-1 / Hardener HY 991

Two component liquid epoxy adhesive

Key properties

- **Medium viscosity flowable liquid**
- **Good performance to >100°C**
- **Excellent water and humidity resistance**
- **Good chemical resistance**

Description

Araldite® AY 105-1 / Hardener HY 991 is a multipurpose, two component, room temperature curing flowable adhesive of high strength and environmental resistance.

It is suitable for bonding a wide variety of metals, ceramics, glass, rubber, rigid plastics and most other materials in common use.

Typical product data

	Araldite® AY 105-1	Hardener HY 991	Mixed adhesive
Colour (visual)	Clear liquid	Yellow/brown	Pale brown
Specific gravity	1.1 -1.2	0.88 - 0.98	ca. 1.1
Viscosity (Pa s)	6 - 8.5	15 - 35	ca. 15
Pot Life (100 gm at 25°C)	-	-	>45 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.

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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.

Typical curing times

Temperature	°C	10	15	20	40	60	100
Cure time (hours) to LSS >1N/mm^2	hours	16	12	6	1½	½	6 mins
Cure time (hours) to LSS >10 N/mm^2	hours	48	24	16	3	¾	8 mins

LSS = Lap shear strength.

Typical cured properties

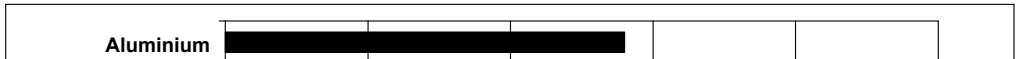
Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-jointing 170 x 25 x 1.5 mm strips of aluminium alloy. The joint area was 12.5 x 25 mm in each case.

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

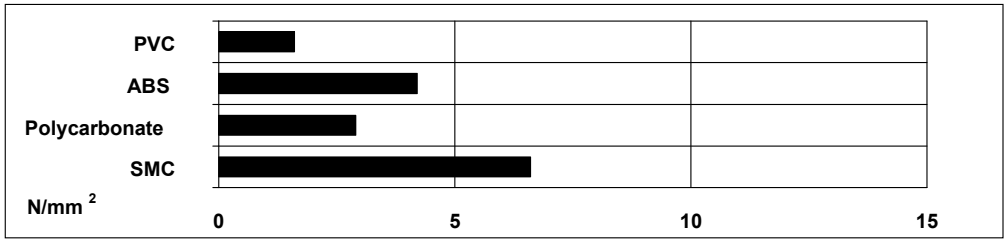
Pretreatment - Sand blasting



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

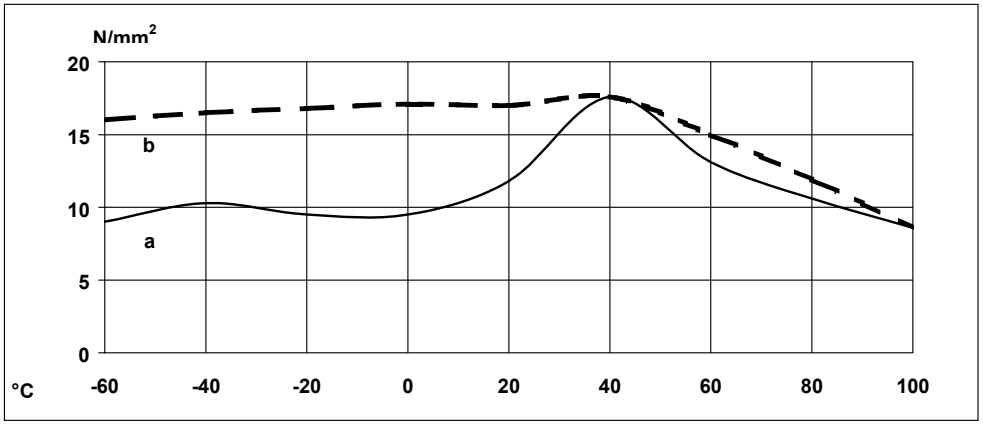
Cure: 16 hours at 40°C and tested at 23°C

Pretreatment – Lightly abrade and alcohol degrease



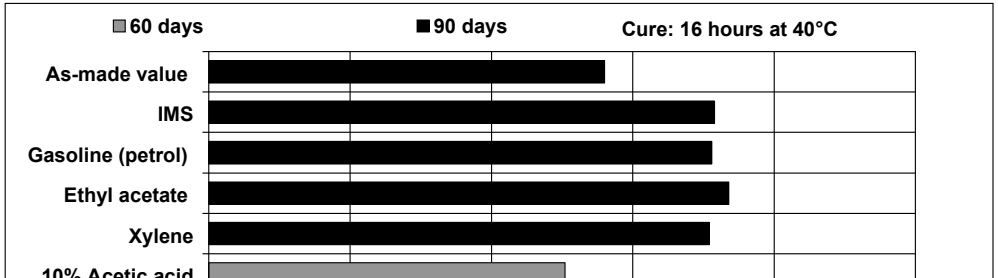
Lap shear strength versus immersion in various media (ISO 4587) (typical average value)

Cure: (a) 7 days at 23°C (b) 24 hrs at 23°C + 30 mins at 80°C



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

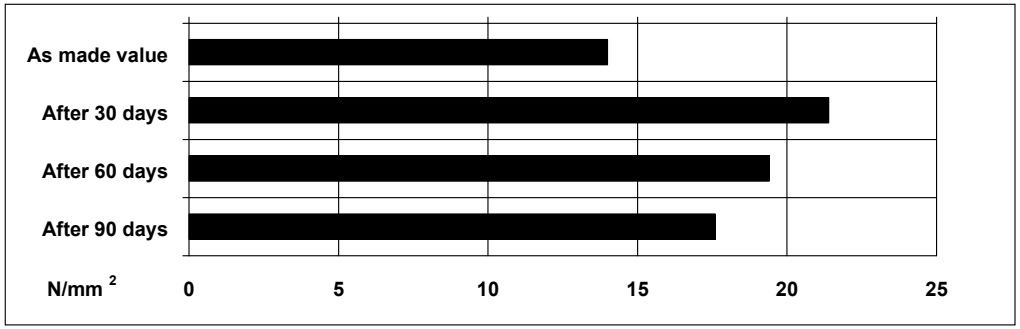
Unless otherwise stated, L.S.S. was determined after immersion for 90 days at 23°C



Lap shear strength versus tropical weathering

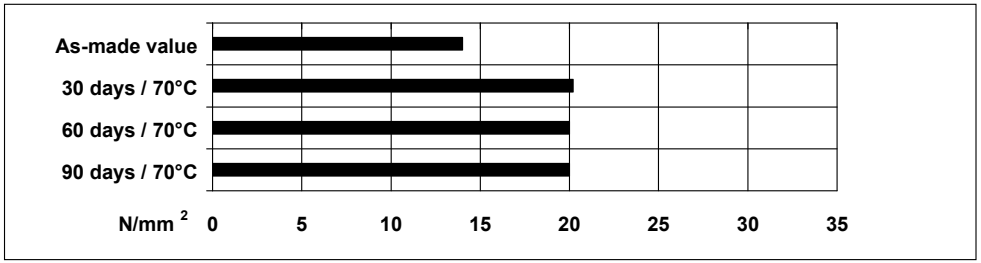
(40/92, DIN 50015; typical average values)

Cure: 16 hours at 40°; test: at 23°C.



Lap shear strength versus heat ageing

Cure:16 hours at 40°C



Coefficient of linear thermal expansion (ASTM-D696-44)

Cure: 16 hours at 40°C 70 - 80 x 10-6K-1

Storage

Araldite® AY 105-1 and Hardener HY 991 may be stored for up to 6 years at 2 – 40ºC 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 food-stuffs 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
(Switzerland) GmbH
Klybeckstrasse 200
4057 Basel