

Advanced Materials

Araldite® AV 4738 / Hardener HV 4739

Structural Adhesives

Araldite® AV 4738 / Hardener HV 4739

Epoxy paste adhesive for composite pipe bonding

Key properties

- Temperature resistant to 150 °C
- Excellent resistance to most common chemicals
- Non flowing paste for ease of application
- Gap filling
- Bonds metals and reinforced composites such as GRP and GRE
- Good performance after cure at ambient temperature
- Application filed for KIWA potable water approval
- Properties further enhanced by postcuring

Description

Araldite® AV 4738 / Hardener HV 4739 is a two component, ambient temperature curing paste adhesive, which after post-curing either at application or in service, will give bonds with temperature resistance up to 150 °C and excellent resistance to common chemicals. It is suitable for bonding a range of metals and polymeric substances such as GRE, GRP, ABS and SMC.

Typical product data

Property	Araldite® AV 4738	Hardener HV 4739	Mixed Adhesive
Appearance (A112)*	light grey thixotropic paste	pale grey thixotropic paste	Grey paste
Density at 25 °C (A16)*	1.45 - 1.55	1.75 – 1.85	ca 1.6
Viscosity at 25 °C (A81)*	500- 800 Pa.s	34 – 64 Pa.s	-
Gel time at 40 °C (A144)*	-	-	40 - 50 minutes
Pot Life (100g at 25 °C)	-	-	40 - 50 minutes
Lap shear Strength on Aluminum at 23 °C (A501)	-	-	> 10 MPa
Cure 24 hours at 23 °C	-	-	-
Glass transition Tg ½ A171	-	-	120 °C minimum

* Specified data are on a regular basis analysed. Data which is described in this document as 'typical' is not analysed on a regular basis and is given for information purposes only. Data values are not guaranteed or warranted unless if specifically mentioned.

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® AV 4738	100	100
Hardener HV 4739	25 – 27.5*	22 – 23*

Resin and hardener should be mixed together at room temperature stirring thoroughly.

*: a mix ratio of 100:27.5 by weight can be used in order to increase slightly the glass transition temperature. This technical datasheet was generated using a mix ratio of 100:25 by weight.

Application of adhesive

The resin/hardener mix is applied directly or with a spatula, to the pretreated and dry joint surfaces.

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 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 times to minimum shear strength

Temperature	°C	15	25	40	60
Cure time to reach	hours	7	3	1	-
Lap shear strength > 1N/mm ²	minutes	-	-	-	15
Cure time to reach	hours	15	4	1½	-
Lap/shear strength > 10 N/mm ²	minutes	-	-	-	30

Good properties are obtained after ambient temperature curing, but in order to achieve optimum performance properties an elevated temperature cure or post-cure is recommended. Suggested post-cure schedules are: 2hrs at 80°C or 1 hr at 120°C or by post-curing in service

Typical cured properties

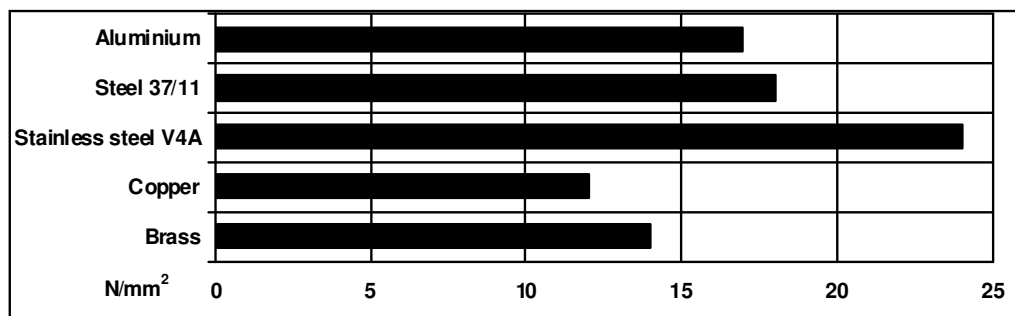
Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-jointing 170 x 25 x 1.5 mm strips of aluminium alloy. The joint area was 12.5 x 25 mm in each case.

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) (typical average values)

Cured for 24 hours at 23°C + 4 hours at 120°C and tested at 23°C

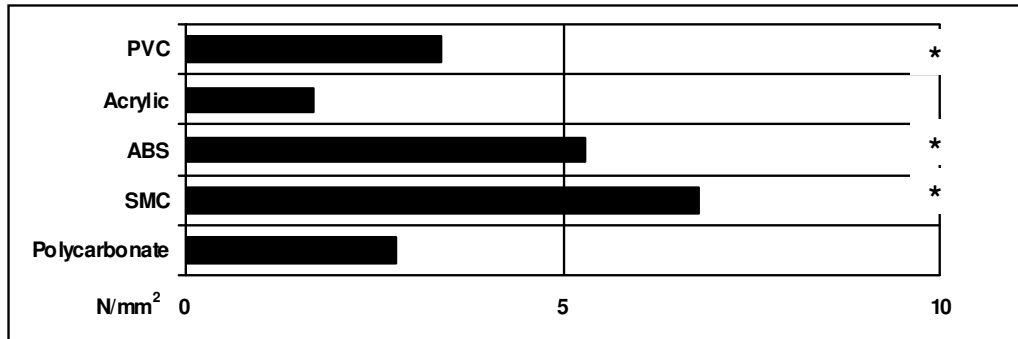
Pretreatment - Sand blasting



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

Cured for 24 hours at 23°C + 4 hours at 80°C and tested at 23°C

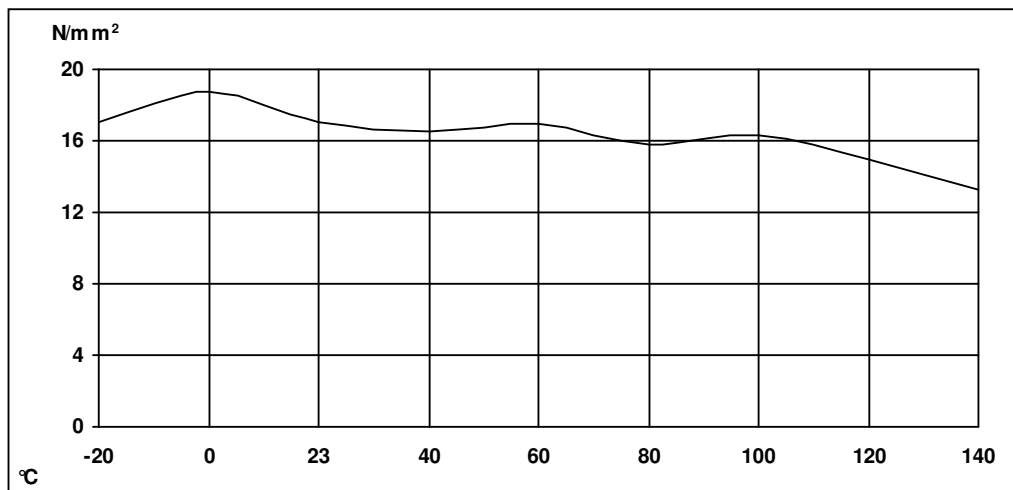
Pretreatment - Lightly abrade and alcohol degrease.



* Indicates substrate failure

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

Cure: 24 hours at 23°C + 4 hours at 120°C



Roller peel test (ISO 4578) (typical average values)

Substrate: Aluminium alloy

Cured 7d at 23°C

2.6 N/mm

Cured 7d/ 23°C + 1 hour at 80°C

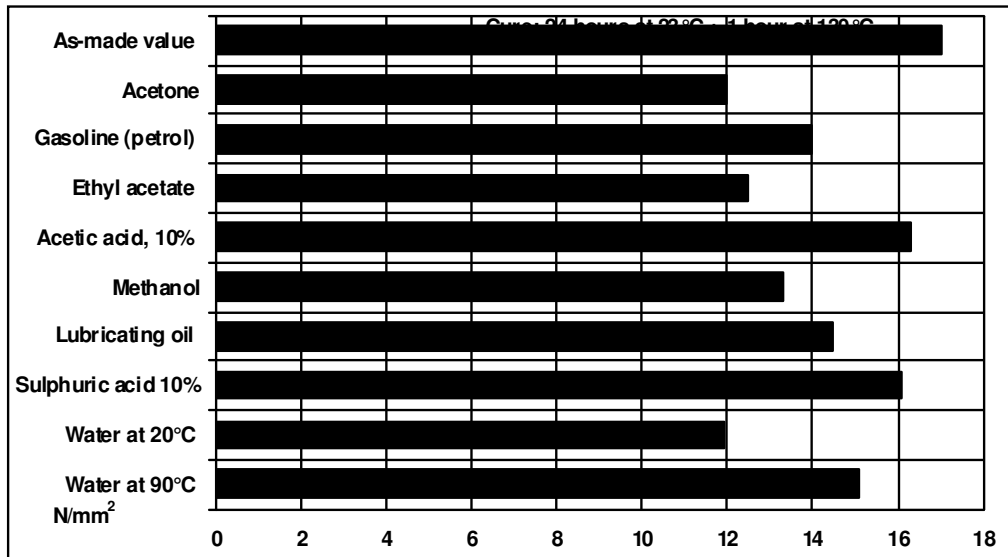
4.6 N/mm

Cured 7d/23°C + 1 hour/125°C

5.6 N/mm

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

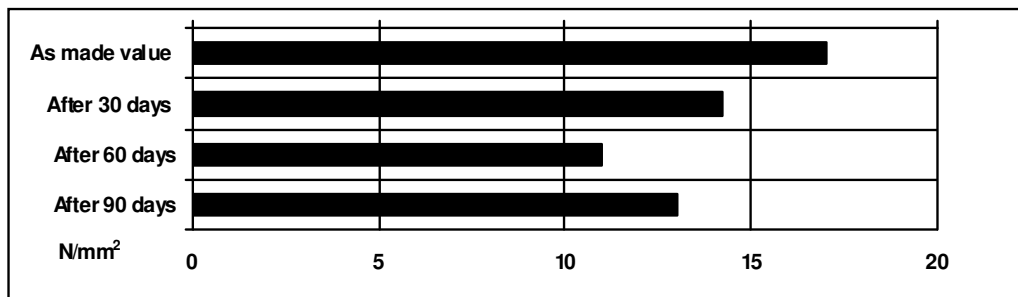
Unless otherwise stated, L.S.S. was determined after immersion for 90 days at 23°C



Lap shear strength versus tropical weathering (typical average values)

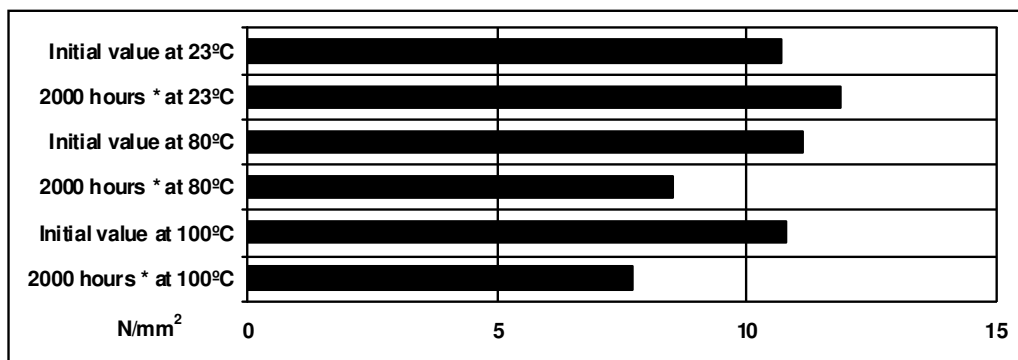
(40/92, DIN 50015; typical average values)

Cure: 24 hours at 23°C + 4 hours at 120°C and tested at 23°C



Lap shear strength vs. water immersion on GRE (typical average values)

Cure: 7 days at 23°C + 4 hours at 120°C – overlap 25mm x 15mm



Immersion in water at specified temperature and tested at that temperature.

Storage

Araldite® AV 4738 and Hardener HV 4739 must be stored at room temperature and the components must be 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.



Huntsman Advanced Materials warrants only that its products meet the specifications agreed with the user. Specified data are analysed on a regular basis. Data which is described in this document as 'typical' or 'guideline' is not analysed on a regular basis and is given for information purposes only. Data values are not guaranteed or warranted unless if specifically mentioned.

The manufacture of materials is the subject of granted patents and patent applications; freedom to operate patented processes is not implied by this publication.

While all the information and recommendations in this publication are, to the best of Huntsman Advanced Material's knowledge, information and belief, accurate at the date of publication, **nothing herein is to be construed as a warranty, whether express or implied, including but without limitation, as to merchantability or fitness for a particular purpose. In all cases, it is the responsibility of the user to determine the applicability of such information and recommendations and the suitability of any product for its own particular purpose.**

The behaviour of the products referred to in this publication in manufacturing processes and their suitability in any given end-use environment are dependent upon various conditions such as chemical compatibility, temperature, and other variables, which are not known to Huntsman Advanced Materials. It is the responsibility of the user to evaluate the manufacturing circumstances and the final product under actual end-use requirements and to adequately advise and warn purchasers and users thereof.

Products may be toxic and require special precautions in handling. The user should obtain Safety Data Sheets from Huntsman Advanced Materials containing detailed information on toxicity, together with proper shipping, handling and storage procedures, and should comply with all applicable safety and environmental standards.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent on manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

Except where explicitly agreed otherwise, the sale of products referred to in this publication is subject to the general terms and conditions of sale of Huntsman Advanced Materials LLC or of its affiliated companies including without limitation, Huntsman Advanced Materials (Europe) BVBA, Huntsman Advanced Materials Americas Inc., Huntsman Advanced Materials (UAE) FZE, Huntsman Advanced Materials (Guangdong) Company Limited, and Huntsman Advanced Materials (Hong Kong) Ltd.

Huntsman Advanced Materials is an international business unit of Huntsman Corporation. Huntsman Advanced Materials trades through Huntsman affiliated companies in different countries including but not limited to Huntsman Advanced Materials LLC in the USA and Huntsman Advanced Materials (Europe) BVBA in Europe.

All trademarks mentioned are either property of or licensed to Huntsman Corporation or an affiliate thereof in one or more, but not all, countries.

Copyright © 2012 Huntsman Corporation or an affiliate thereof. All rights reserved

Huntsman Advanced Materials

(Switzerland) GmbH
Klybeckstrasse 200
4057 Basel
Switzerland

Tel: +41 (0)61 299 11 11
Fax: +41 (0)61 299 11 12

www.huntsman.com/advanced_materials
Email: advanced_materials@huntsman.com