

Advanced Materials**Araldite® AW4858/ Hardener HW4858**

Structural Adhesives

ARALDITE® AW4858/ Hardener HW4858
Two component epoxy adhesive system**Key properties**

- Very high lap shear and peel strength
- Bonds a wide variety of materials (metal, composite and thermoplastics)
- Good moisture resistance
- Extremely tough and resilient adhesive
- Long pot life, ideal for large composite part assemblies

Description

ARALDITE® AW 4858/ Hardener HW 4858 is a two-component room temperature curing black coloured epoxy adhesive paste of high strength and toughness. Performances can be enhanced by post-curing at elevated temperature. It is suitable for bonding a wide variety of metals, and especially designed for bonding composites..

Product data

Property	Araldite® AW4858	Hardener HW4858	Mixed Adhesive
Colour (visual)	Black	Yellowish	Black
Specific gravity	1.2	1.0	approx. 1.1
Viscosity at 20°C (Pa.s)	20 - 30	2 - 5	thixotropic
Pot Life (100 gm at 25°C)			150 min

Processing**Pretreatment**

The strength and durability of a bonded joint are dependent 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® AW4858	100	100
Hardener HW4858	42	50

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

Araldite® AW4858/ Hardener HW 4858 is 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	10	15	23	40	60	100
Cure time to reach	hours	15	12	6			
LSS > 1N/mm ²	minutes				90	25	< 5
Cure time to reach	hours	24	15	7	2		
LSS > 10N/mm ²	minutes					35	15

LSS = Lap shear strength.

Typical cured properties

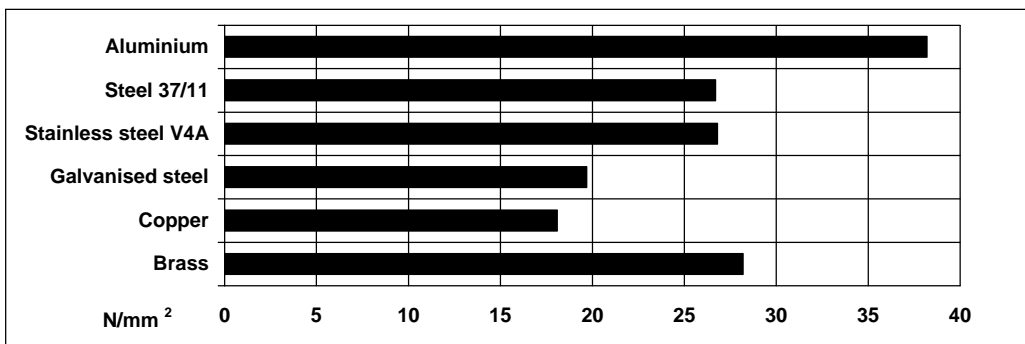
Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-jointing 114 x 25 x 1.6 mm strips of aluminium alloy. The joint area was 12.5 x 25 mm in each case.

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)

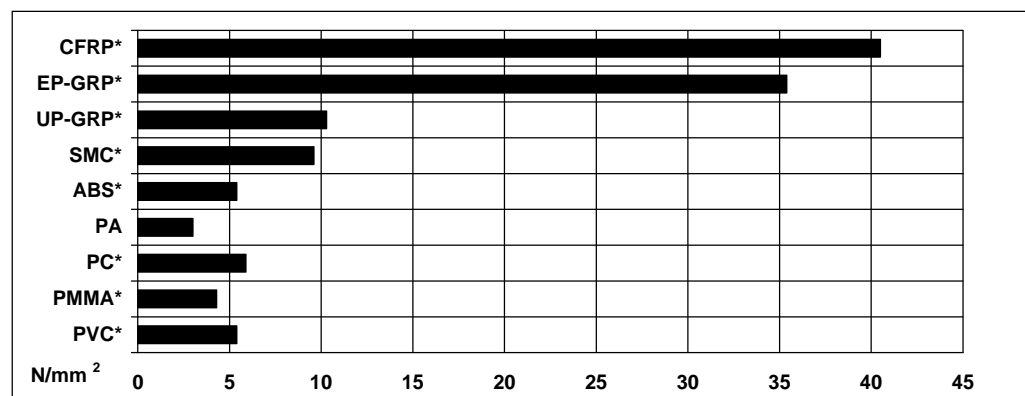
Cured for 16 hours at 40°C and tested at 23°C

Pretreatment - Sand blasting



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

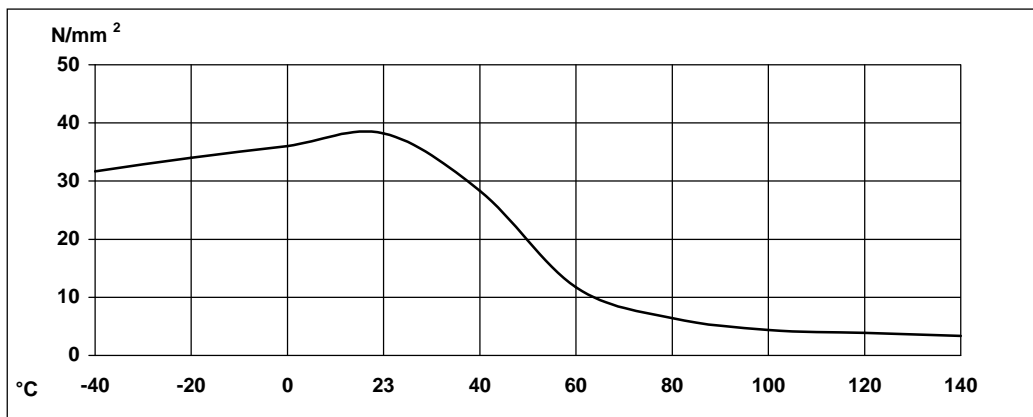
Cured for 16 hours at 40°C and tested at 23°C. Pretreatment - Lightly abrade and alcohol degrease.



*: substrate failure or substrate delamination

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

Cure: 16 hrs at 40°C, bonding on aluminium sandblasted and degreased



Roller peel test (ISO 4578)

6 N/mm

Cured: 16 hours at 40°C

Glass transition temperature

Cure: 16 hours at 40°C

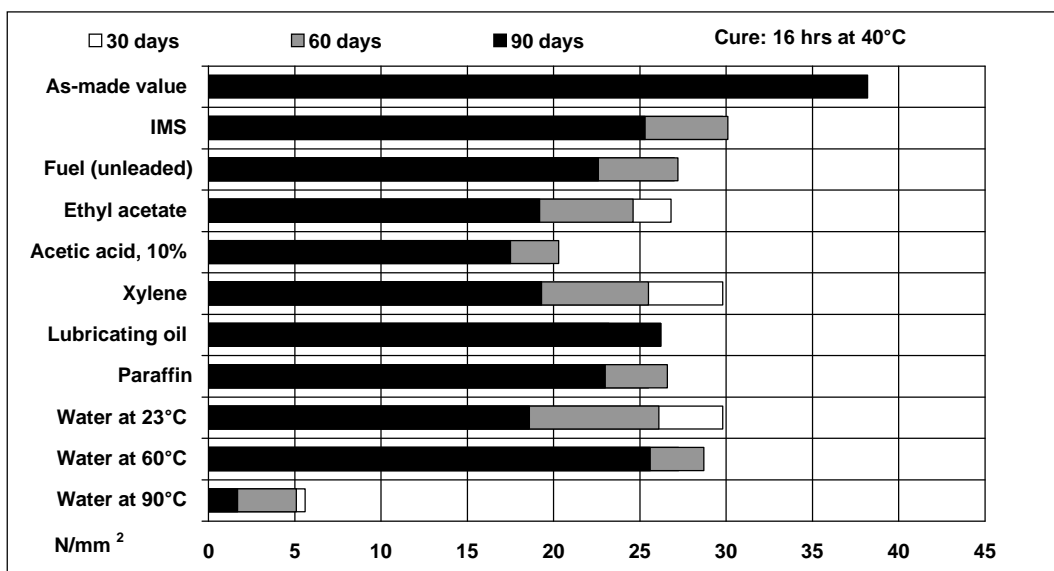
56°C by DSC

Cure: 16 hours at 40°C+ 1 hour at 80°C

67°C by DSC

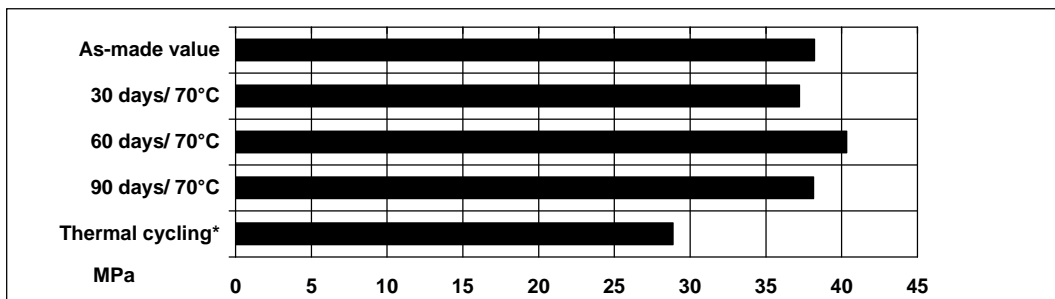
Lap shear strength versus immersion in various media (typical average values) (ISO 4587)

Unless otherwise stated, L.S.S. was determined after immersion for 30,60 and 90 days at 23°C



Lap shear strength versus heat ageing (ISO 4587)

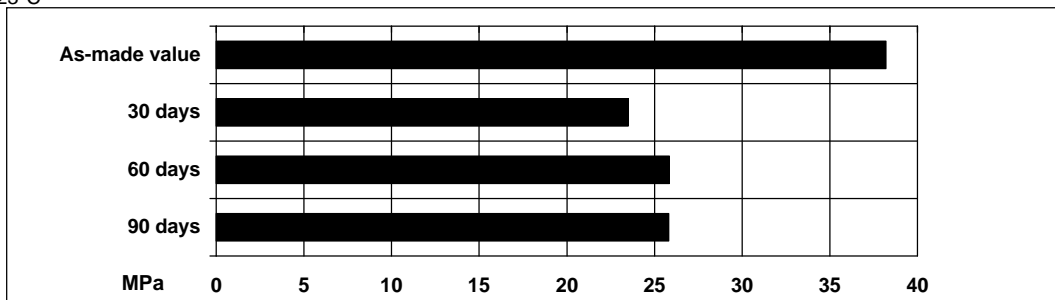
Cure: 16 hours at 40°C, on aluminium sandblasted and degreased, tested at 23°C



*25 cycles -30°C to + 70°C

Lap shear strength versus tropical weathering (ISO 4587)

(40/92, DIN 50015; typical average values) Cure: 16 hours at 40°C, on aluminium sandblasted and degreased, tested at 23°C



Tensile strength at 23°C (ISO 527)

31 MPa

E-modulus

1600 MPa

Elongation at break

7 %

Flexural strength at 23°C (ISO178)

61 MPa

Flexural modulus

1650 MPa

Shore Hardness (D scale) (ISO 868/03)

Cure 16 hours/ 40°C , tested at 23°C, 50%RH

75 D

Shear modulus G'(ISO 6721)

Cure: 16 hours/ 40°

-40°C - 1.3 GPa

0°C - 980 MPa

23°C - 800 Mpa

60°C - 9.0 MPa

90°C - 7.2 MPa

Storage

ARALDITE® AW 4858 and Hardener HW 4858 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.

Huntsman Advanced Materials

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.

Huntsman Advanced Materials warrants only that its products meet the specifications agreed with the buyer. Typical properties, where stated, are to be considered as representative of current production and should not be treated as specifications.

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 our knowledge, information and belief, accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

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., 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.

Araldite is a registered trademark of Huntsman Corporation or an affiliate thereof.

Copyright © 2008 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

