

Advanced Materials

Araldite® 2011

Structural Adhesives

Araldite® 2011

Pasty two-component adhesive based on epoxy resin

Specific properties

- All-purpose adhesive
- Long service life Low
- shrinkage
- Good resistance to dynamic loads
- For bonding a wide range of the most common materials

Product description

Araldite 2011 is a room temperature curing, paste-like, all-purpose, two-component adhesive.

The paste is characterized by good contact adhesion and toughness and is suitable for bonding a wide range of metals, ceramics, glass, rubber, hard plastics and most common materials. It is a versatile adhesive that is suitable for both craftsmen and most industrial applications.

Product data

	2011/A	2011/B	2011 (mixed)
Color (visual)	colorless	light yellow	light yellow
Density	approx. 1.15	approx. 0.95	approx. 1.05
Viscosity at 25°C (Pas)	30-50	20-35	30-45
Service life (100 g at 25°C)	-	-	approx. 100 minutes
Shelf life (2-40 C) °	3 years	3 years	-

Processing

Pre-treatment

The prerequisite for achieving strong and durable bonds is appropriate pre-treatment of the bonding surface.

The bonding surfaces are best cleaned thoroughly with a good grease solvent such as acetone or a company-specific grease solvent to remove oil, grease and dirt.

Alcohol, benzine or paint thinner should not be used for this purpose.

The best strength is achieved if the degreased bonding surfaces are mechanically roughened or chemically pre-treated (pickling). After mechanical roughening, further degreasing is essential.

Mixing ratio	Weights	Volume parts
Araldite 2011/A	100	100
Araldite 2011/B	80	100

Araldite 2011 is available in cartridges, complete with mixer, and can be used as a ready-to-use adhesive with the tool recommended by Huntsman Advanced Materials.

Applying the adhesive

The resin/hardener mixture is applied manually or mechanically to the pre-treated and dry bonding surfaces. Huntsman's Technical Support Team can assist the user in selecting a suitable application method and recommend a variety of reputable companies that manufacture and service adhesive application equipment. Adhesive joints with a thickness of 0.05 to 0.10 mm generally produce the best tensile shear strength. Huntsman emphasizes that a proper adhesive joint is essential for a durable bond. The adhesive components should be arranged and secured in a fixed position once the adhesive has been applied. For more information on surface preparation and pre-treatment, bonding and working with double cartridges, please visit www.araldite2000plus.com.

Cleaning the tools

All tools are best cleaned with hot water and soap before adhesive residues can harden. Removing already hardened residues is laborious and time-consuming. When using a solvent such as acetone, the usual precautionary measures must be observed. In addition, avoid contact with skin and eyes.

Curing conditions

Temperature	°C	10	15	23	40	60	100
Curing time	Hours	24	12	7	2	-	-
ZSF > 1MPa	minutes	-	-	-	-	30	6
Curing time	Hours	36	18	10	3	-	-
ZSF > 10MPa	minutes	-	-	-	-	45	7

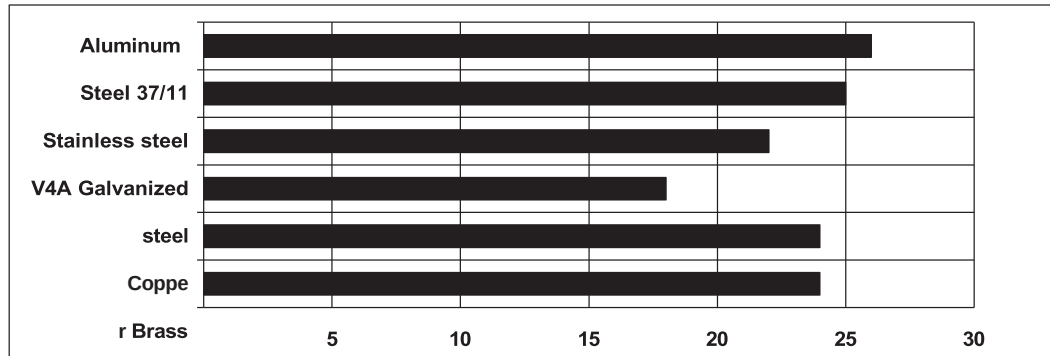
ZSF = tensile shear strength

Typical hardening properties

Unless otherwise specified, standard aluminum alloy test specimens measuring 114 x 25 x 1.6 mm were used to determine the values given below. The overlap area was 12.5 x 25 mm in each case. The values were determined using standard test methods on typical production batches. They are for technical information only and do not constitute a product specification.

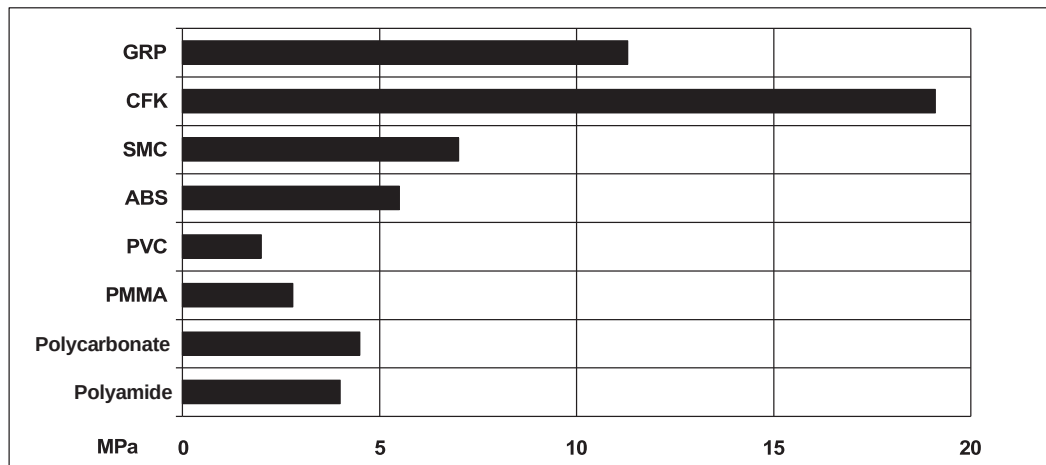
Typical mean values of the tensile shear strength of various metal bonds (ISO 4587)

Curing: 16 hours at 40°C; test temperature: 23°C Pre-treatment
sandblasting



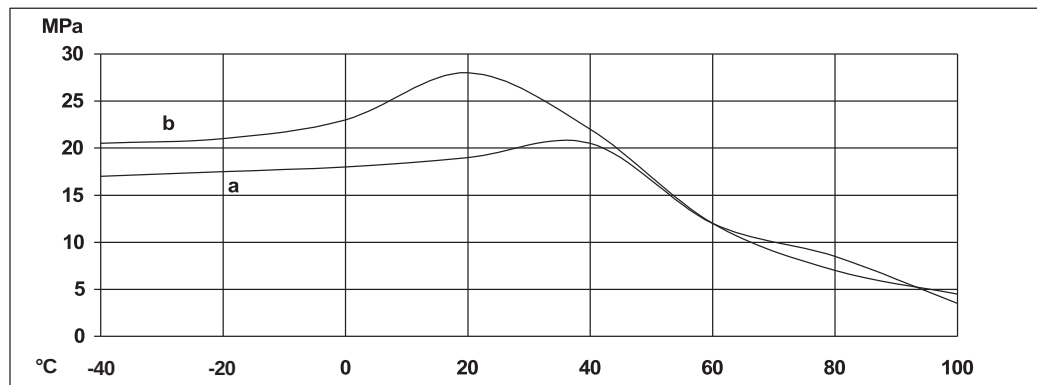
Typical mean values of the tensile shear strength of various plastic bondings (ISO 4587)

Curing: 16 hours at 40°C; test temperature: 23°C Pre-treatment:
Light roughening and degreasing with alcohol.



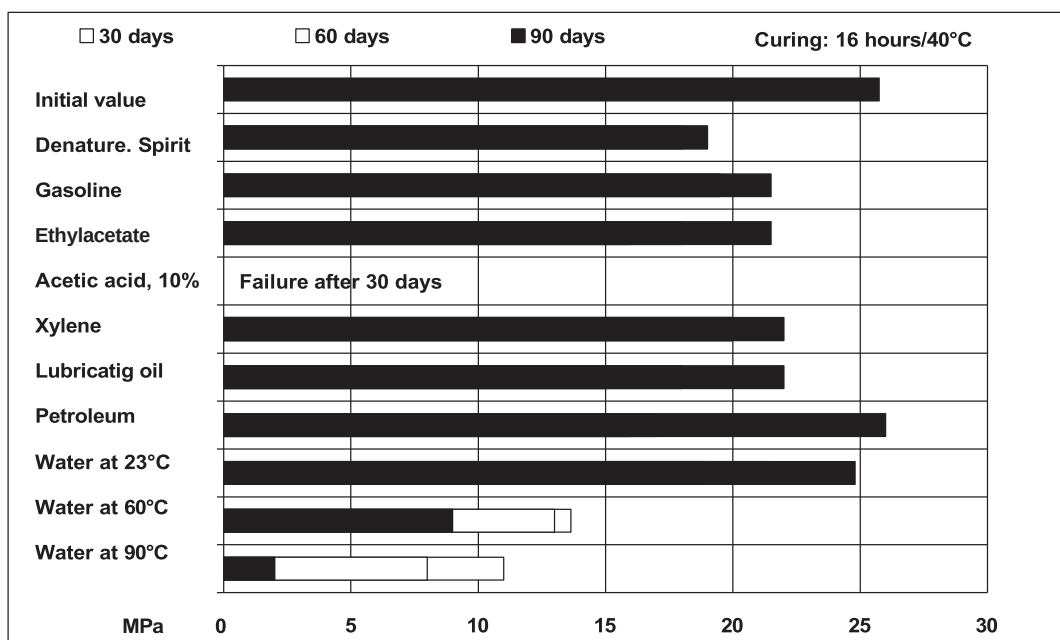
Tensile shear strength as a function of temperature (ISO 4587) (typical mean values)

Hardening: (a) = 7 days/23 °C; (b) = 24 hours/23 °C + 30 minutes/80 °C



Roller peel test (ISO 4587)	Hardening 16 hours/40°C	5 N/mm
Glass transition temperature	Curing: 16 hours at 40°C	approx. 45 C
Electrolytic corrosion effect (DIN 53489) (curing 16 hours at 40°C or 20 minutes at 100°C)		
Test: During 4 days in a climate cell (climate 40/92 according to DIN 50015)		
Characteristic value according to specific standard		A - A/B 1.2
Minimum dielectric strength at 50 Hz, 24°C (VSM 77170)		
Mixing ratio	Initial value:	25-27 kV/mm
100:80 parts by weight	Value after 1 minute:	22-24 kV/mm
Water vapor permeability (NF 41001) (38 C, 90% RH) (curing: 5 days/23 C)		
Testing a 1 mm thick layer		16g/m ² /24 hours
Water absorption (ISO 62-80)		
24 hours at 23 C °		0,8%
30 minutes at 100 C		1,3%
Thermal conductivity (ISO 8894/90) Hardening: 20 minutes/100 C		
Test: At 23 C °		0.22W/mK
Shear modulus (DIN 53445) Hardening: 16 hours/40 C		
-50°C - 1.5GPa		
0°C - 1.2GPa		
50°C - 0,2GPa		
100°C - 7,0Mpa		
Flexural strength/E-modulus (ISO 178) Curing 16 hours / 40°C (test temperature: 23°C)		
Flexural strength		60 MPa
E-modulus		1904 MPa

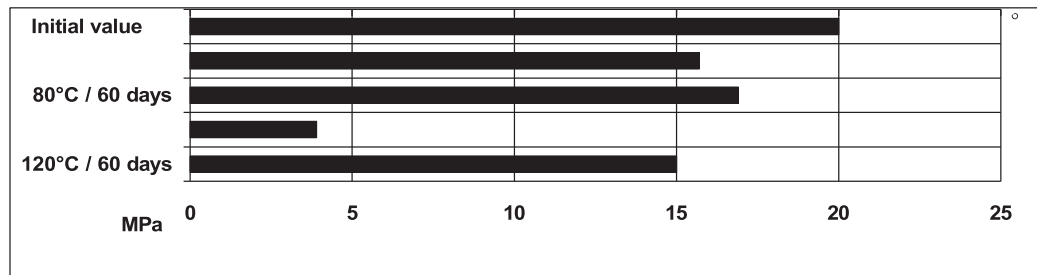
Tensile shear strength after storage in various agents at 23°C (typical mean values)



Tensile shear strength after heat aging

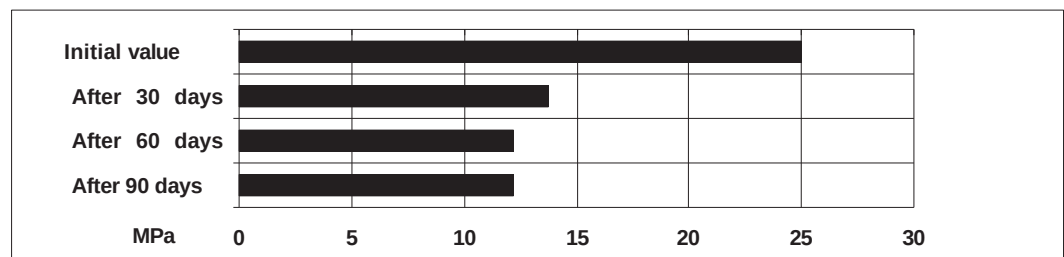
Curing: 16 hours/40 CC

Testing: at 23°C, 50% RH



Tensile shear strength after storage in a tropical climate (40/92, DIN 50015; typical mean values)

Hardening: 16 hours/40°C: Test at 23°C.



Continuous vibration test (DIN 53285)

Curing: 20 minutes/100 °C Average static tensile shear strength: 16.3MPa

The test was carried out using a load change frequency of 90 Hz.

Threshold strength at a load of % of the
static tensile shear strength

30
20
15

Load cycles

$10^5 - 10^6$
 $10^6 - 10^7$
 $> 10^7$

Storage

Araldite 2011/A and Araldite 2011/B can be stored for up to 3 years at room temperature, provided that the components remain in their original containers. The expiry date is printed on the product labels.

Precautionary measures**Attention!**

Huntsman Advanced Materials products can be processed without danger, provided that the usual precautions for handling chemicals are observed. Uncured materials should be kept away from food. To avoid allergic reactions, it is strongly recommended that impervious rubber or plastic gloves and safety goggles are worn. Wash hands thoroughly with warm water and soap after each working day. The use of solvents should be avoided. Then dry the skin with disposable paper towels— no textiles— . The work area should be well ventilated; if necessary, an extraction system should be installed above the workplace. A description of all precautionary measures can be found in the safety data sheets for the individual products. We will be happy to send these to you on request.

Huntsman Advanced Materials

Our technical application advice, whether verbal, in writing or by means of tests, is based on our current state of knowledge. However, it does not release you from the obligation to test the products supplied by us for their suitability for the intended processes and purposes. The application, use and processing of the products are beyond our control and are therefore exclusively your responsibility. Any existing industrial property rights of third parties must be observed. We guarantee the flawless quality of our products in accordance with our General Terms and Conditions of Sale and Delivery.

Huntsman Advanced Materials warrants only that its products will meet the specifications agreed with the user. Typical properties stated are representative of current production and should not be construed as specifications.

The manufacture of materials is subject to patents granted or pending and this publication should not be construed as a license to use any patented process.

While the information and recommendations set forth in this publication are accurate to the best of Huntsman Advanced Materials' knowledge and belief at the date of publication, NOTHING IN THIS PUBLICATION SHALL BE CONSTRUED AS AN EXPRESS OR IMPLIED WARRANTY, INCLUDING BUT NOT LIMITED TO, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. THE USER MUST ALWAYS SATISFY HIMSELF AS TO THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF PRODUCTS FOR A PARTICULAR PURPOSE.

The performance of the products listed in this publication in production processes and their suitability for a particular end use are dependent upon various conditions, such as chemical compatibility, temperature and other variables not known to Huntsman Advanced Materials. The user is responsible for evaluating the production conditions and the end product under actual end use conditions and for providing appropriate advice and warnings to purchasers and users.

The products may be toxic and require special care in handling. The user is required to request Material Safety Data Sheets from Huntsman Advanced Materials detailing toxicity and proper handling and storage procedures and to comply with all applicable safety and environmental standards.

Hazardousness, toxicity and behavior of the products may change when used with other materials and are dependent on production conditions or other processes. Hazardousness, toxicity and behavior must be determined by the user and communicated to handling and processing personnel and end users.

Unless otherwise expressly agreed, the sale of the products listed in this publication is subject to the terms and conditions of Huntsman Advanced Materials LLC or its affiliates, 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 operates through Huntsman Group companies in various countries, including but not limited to Huntsman Advanced Materials LLC in the USA and Huntsman Advanced Materials (Europe) BVBA in Europe.

[Araldite® 2011] is a registered trademark of Huntsman Corporation or one of its affiliates. Copyright © 2007 Huntsman Corporation or its affiliates. All rights reserved.

Huntsman Advanced Materials
(Switzerland) GmbH
Klybeckstrasse 200
4057 Basel
Switzerland

Tel: +41 (0)61 966 33 33
Fax: +41 (0)61 966 35 19
www.huntsman.com/advanced_materials