

**Advanced Materials**

**Araldite® AY 4446 / Hardener HY 4445**

Structural Adhesives

**TECHNICAL DATA SHEET**

**Araldite® AY 4446 / Hardener HY 4445  
Two component PU adhesive system**

**Key properties**

- Good UV stability
- Ideal for bonding thermoplastics
- Low shrinkage
- Flexible
- Room temperature curing

**Description**

Araldite® AY 4446 / Hardener HY 4445 is a two component, room temperature curing, pale coloured, lightly thixotropic liquid polyurethane adhesive for thermoplastic bonding.

**Product data**

Property	Hardener HY 4445	Araldite® AY 4446	Mix
Colour (visual) (A112)*	<i>pale opaque</i>	<i>pale opaque</i>	pale opaque
Specific gravity	ca 1.16	ca 1.10	ca 1.13
Viscosity at 25°C (Pas) (A81)*	12 – 18	3.5 – 6.5	ca. 8
Pot Life (100 gm at 25°C)	-	-	40 minutes
Lap shear strength at 23°C (A501)*	-	-	> 4 MPa

\* 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 pretreatment 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® AY 4446	100	100
Hardener HY 4445	95	100

**Application of adhesive**

The resin/hardener mix may be applied manually or robotically to the pretreated and dry joint surfaces. Huntsman's technical support group can assist the user in the selection of a suitable application method as well as suggest a variety of reputable companies that manufacture and service adhesive dispensing equipment.

A layer of adhesive 0.05 to 0.10 mm thick will normally impart the greatest lap shear strength to the joint. Huntsman stresses that proper adhesive joint design is also critical for a durable bond. The joint components should be assembled and secured in a fixed position as soon as the adhesive has been applied.

For more detailed explanations regarding surface preparation and pretreatment, adhesive joint design, and the dual syringe dispensing system, visit [www.araldite2000plus.com](http://www.araldite2000plus.com).

**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 times to minimum shear strength**

Temperature	°C	10	15	23	40	60	100
Cure time to reach	hours	16	12	4	-	-	-
LSS > 1MPa	minutes	-	-	-	45	25	4
Cure time to reach	hours	48	20	16	3	-	-
LSS > 7MPa	minutes	-	-	-	-	30	12

LSS = Lap shear strength.

**Typical cured properties**

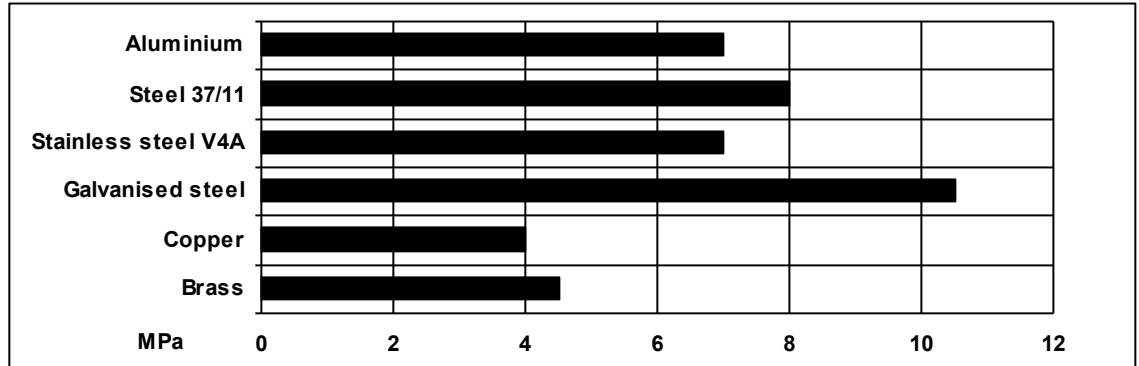
Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-jointing 114 x 25 x 1.6 mm strips of aluminium alloy. The joint area was 12.5 x 25 mm in each case.

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) (typical average values)

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

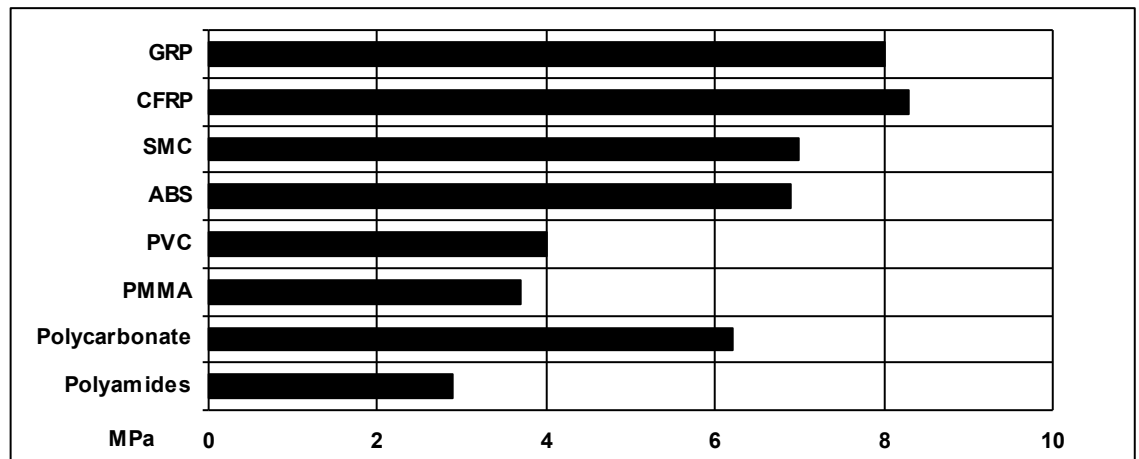
Pretreatment - Sand blasting



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

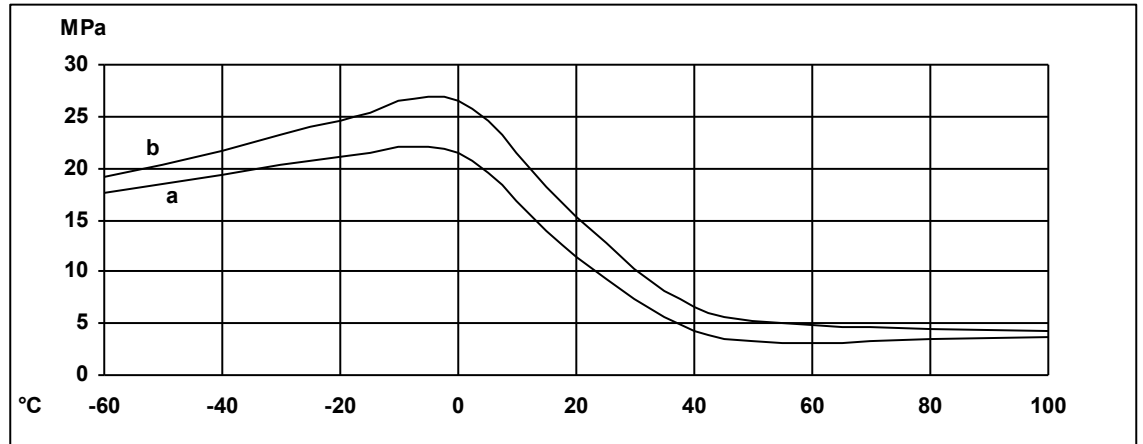
Cured for 16 hours at 40°C and tested at 23°C

Pretreatment - Lightly abrade and alcohol degrease.



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

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



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

Cure: 16 hours /40°C

4.0 N/mm

### Tensile strength at 23°C (ISO 527) (typical average values)

7 MPa

Tensile modulus

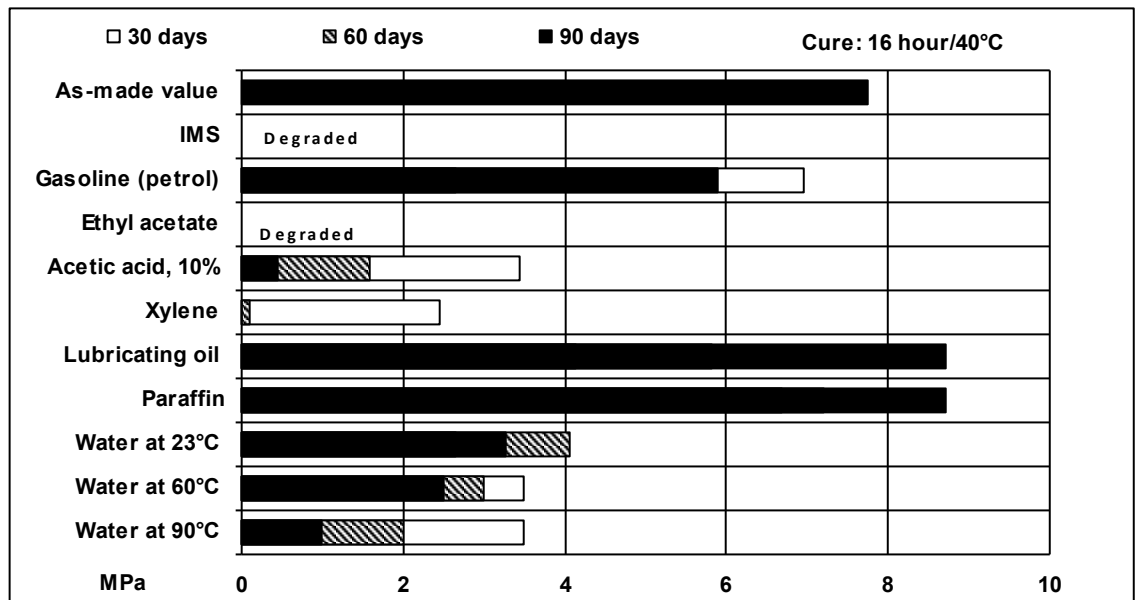
16 MPa

Elongation at break

45 %

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

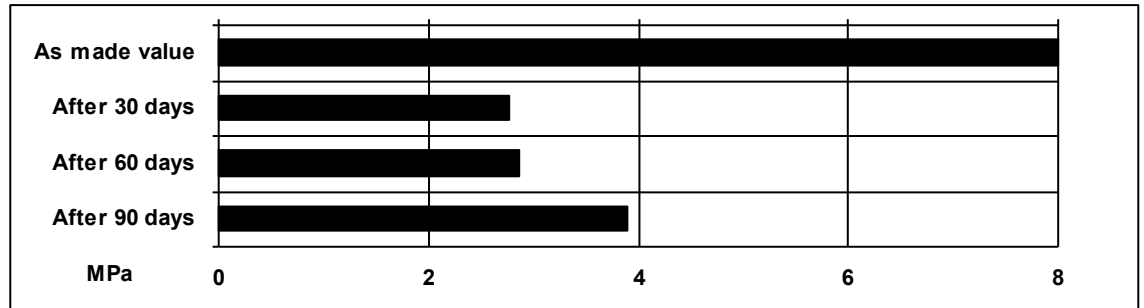
Unless otherwise stated, L.S.S. was determined after immersion for 90 days at 23°C



### Lap shear strength versus tropical weathering (typical average values)

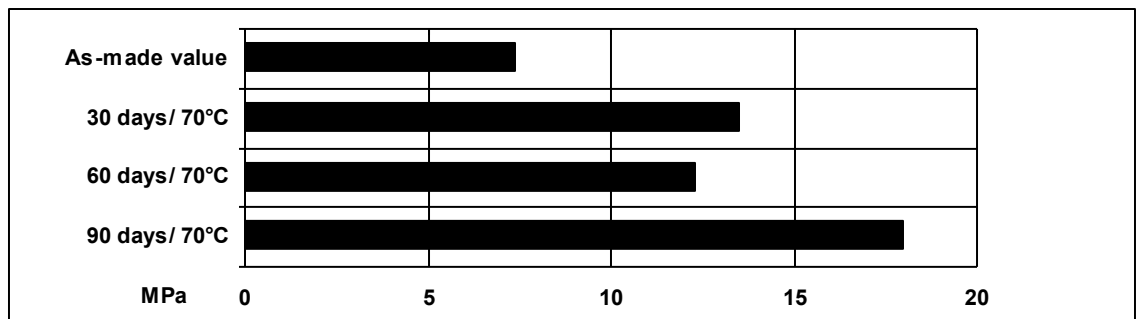
(40/92, DIN 50015)

Cure: 16 hours/40°C; Test: at 23°C



### Lap shear strength versus heat ageing (typical average values)

Cure: 16 hours/40°C



### Thermal cycling (typical average values)

100 cycles of 6 hour duration from -30°C to 70°C:

8.8 MPa

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**Storage**

Araldite® AY 4446 and Hardener HY 4445 must be stored at room temperature and the components must be stored in sealed containers. The expiry date is indicated on the label.

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**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.

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