

Advanced Materials**Araldite® 2021****Structural Adhesives****TECHNICAL DATA SHEET****Araldite® 2021****Two component toughened methacrylate adhesive system****Key properties**

- Rapid curing
- High peel strength
- Multi purpose
- Excellent bond to a wide range of plastics, composites and metals
- Suitable for service at temperatures up to 100 °C

Description

Araldite® 2021 is a two component, room temperature curing, methacrylate general purpose adhesive for rapid assembly operations on a wide range of substrates.

Product data

Properties	2021/A	2021/B	2021 (mixed)
Colour (visual)	off white	beige / yellow	pale yellow
Specific gravity	1.03	0.96	ca. 1
Viscosity at 25°C (Pas)	ca. 45	ca. 40	ca. 45
Pot Life (100 gm at 25°C)	-	-	2-3 minutes
Flash point (°C)	10	10	-

Processing**Pretreatment**

The strength and durability of a bonded joint are dependant on proper pretreatment of the surfaces to be bonded, however the methacrylate adhesives can be used effectively with little surface preparation.

Ideally 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.

Mix ratio	Parts by weight	Parts by volume
Araldite® 2021/A	100	100
Araldite® 2021/B	90	100

Araldite® 2021 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 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.

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
Cure time to reach	hours	-	-	-	-
LSS > 1MPa	minutes	20	12	8	2
Cure time to reach	hours	-	-	-	-
LSS > 10MPa	minutes	30	25	18	5

LSS = Lap shear strength.

Note that the adhesive will reduce in volume by ca. 13% during cure.

Typical cured properties

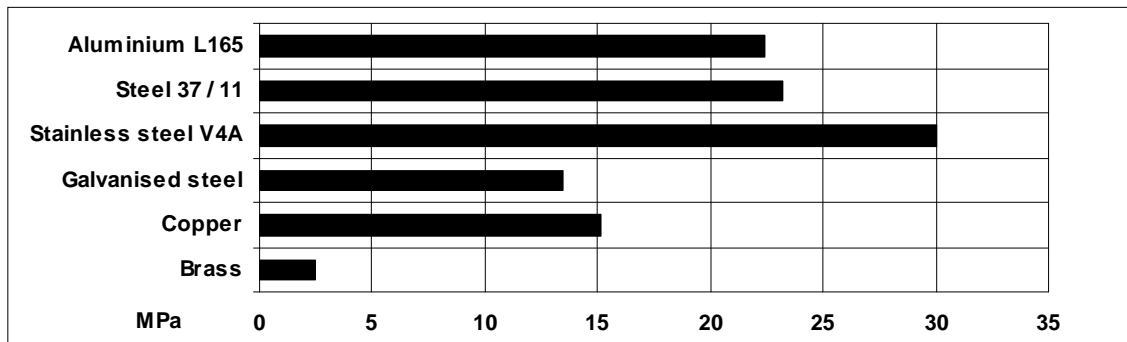
Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-jointing 114 x 25 x 1.6 mm strips of aluminium alloy. The joint area was 12.5 x 25 mm in each case.

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 7 days at 23°C and tested at 23°C

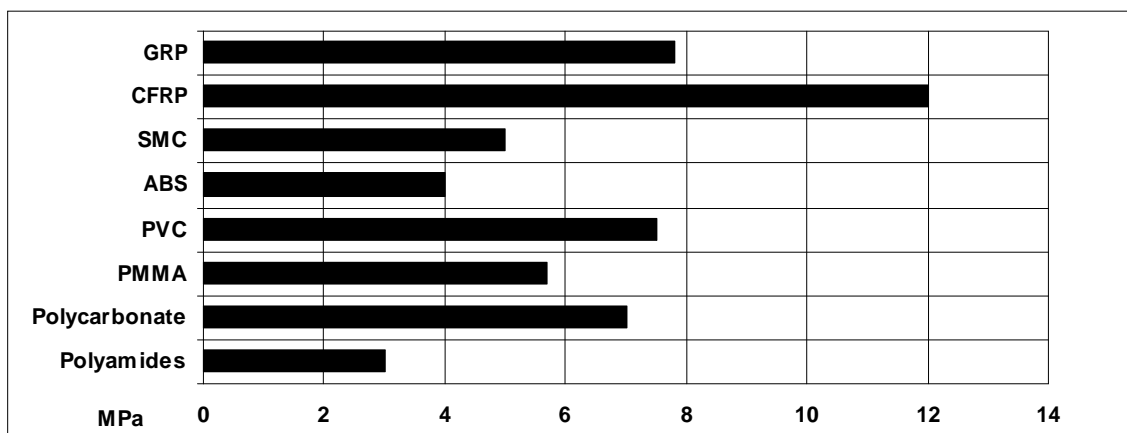
Pretreatment - Sand blasting



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

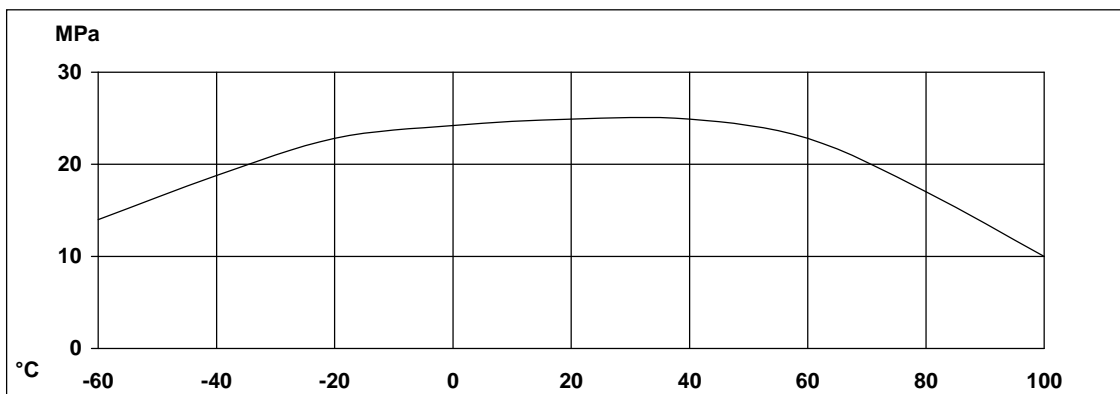
Cured for 16 hours at 40°C and tested at 23°C

Pretreatment - Lightly abrade and alcohol degrease.



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

Cure: = 7 days at 23°C



Roller peel test (ISO 4578)

11N/mm

Shore hardness:

D78

Elongation at break:

50 - 75%

Flexural Properties (ISO 178) Cure 1 day/ 23°C tested at 23°C

Flexural Strength

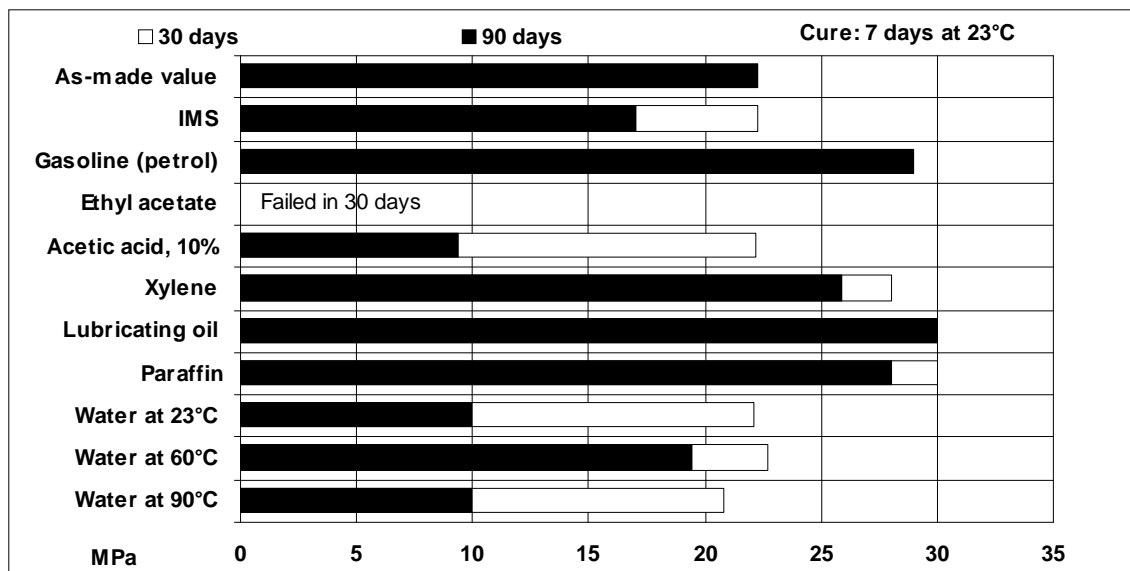
36 MPa

Flexural Modulus

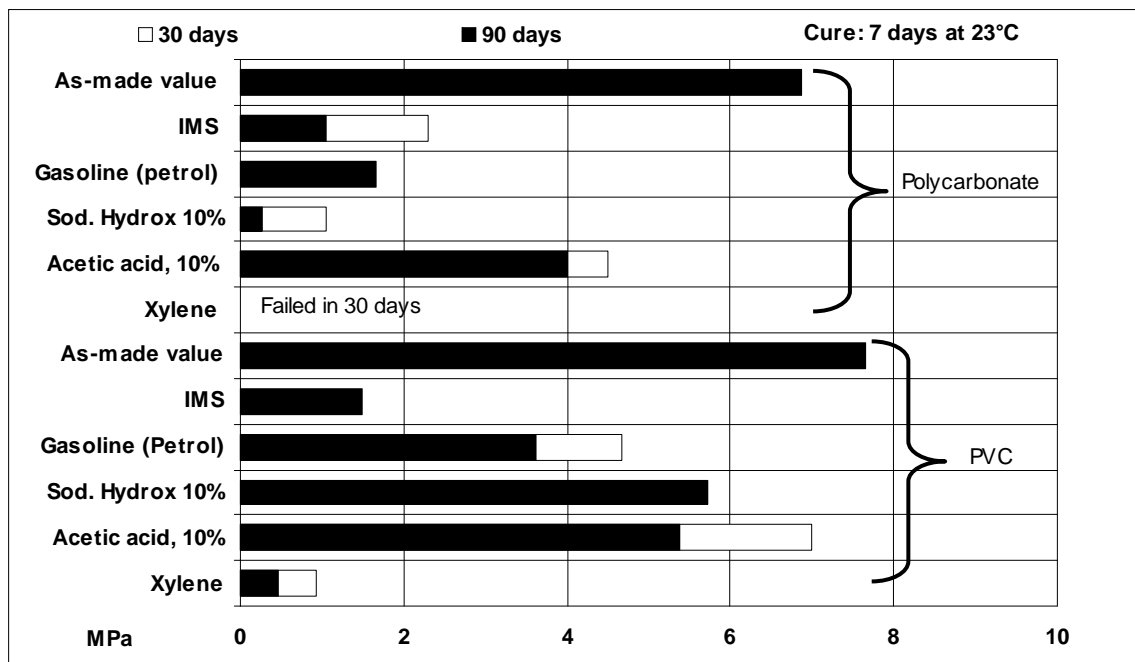
1430 MPa

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

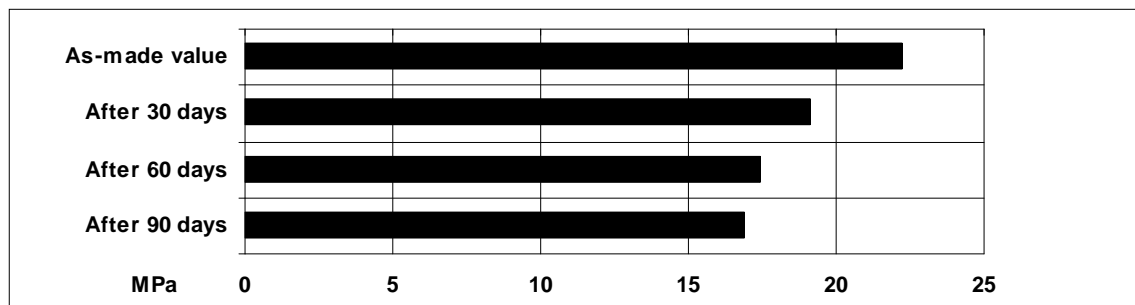


Plastic substrates – Polycarbonate and PVC



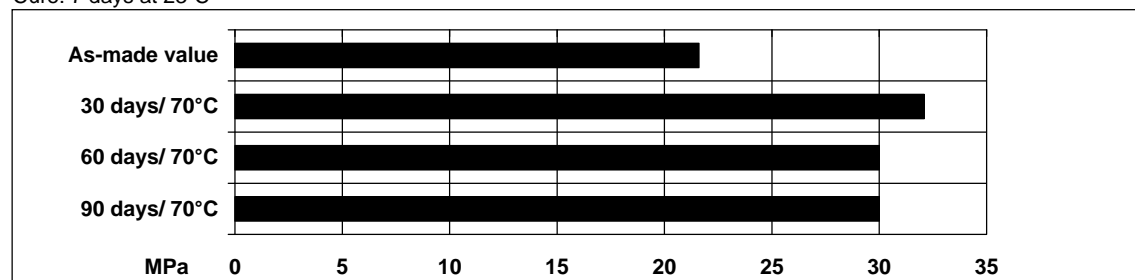
Lap shear strength versus tropical weathering (40/92, DIN 50015: typical average values)

Cure: 7 days at 23°C



Lap strength versus heat ageing

Cure: 7 days at 23°C



Thermal cycling

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

29 MPa

Test carried out using a load cycle frequency of 90 Hz.

Storage

Araldite® 2021/A and Araldite® 2021/B may be stored for up to 18 months at 2 - 8°C provided the components are stored in sealed containers. When stored at 15 - 25°C the life is a maximum of 12 months. The expiry date, assuming storage at 2 - 8°C is indicated on the packaging.

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.

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