

Advanced Materials

Araldite® 2031-1

Structural Adhesives

TECHNICAL DATASHEET

Araldite® 2031-1

Black epoxy paste adhesive system

Key properties

- Thixotropic – non slumping
- Toughened adhesive, resilient bond
- Suitable for metal and composite bonding
- High weathering resistance
- Contains spacers to ensure a minimum bond line thickness of 0.05 mm

Description

Araldite® 2031-1 epoxy adhesive is a two-component, room temperature curing paste adhesive giving a resilient bond. It is thixotropic and non-sagging up to 10mm thickness. It is particularly suitable for GRP, CFRP and SMC bonding.

Product data

Property	Component A (resin)	Component B (hardener)	Mixed Adhesive
Colour (visual) (A112)*	black paste	black paste	black paste
Specific gravity	approx. 1.2	approx. 1.4	approx. 1.3
Viscosity at 25 °C (Pas)	thixotropic	thixotropic	thixotropic
Lap shear strength at 25 °C (A501)*			> 20 MPa
Pot Life (100 gm at 25°C)			60 - 70 min

* 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 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
Component A (resin)	100	100
Component B (hardener)	120	100

Araldite® 2031-1 is also 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 adhesive contains spacers to ensure a minimum bond line thickness of 0.05 mm.

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.

Typical times to minimum shear strength

Temperature	°C	10	15	23	40	60	100
Cure time to reach	hours	12	7	3	-	-	-
LSS > 1 MPa	minutes	-	-	-	90	15	3
Cure time to reach	hours	72	32	15	3	-	-
LSS > 10 MPa	minutes	-	-	-	-	45	5

LSS = Lap shear strength.

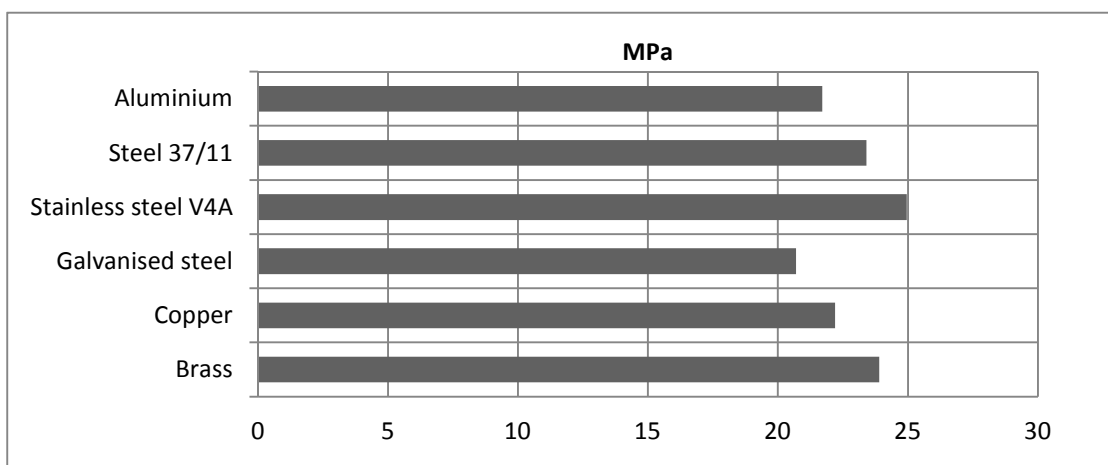
Typical cured properties

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.

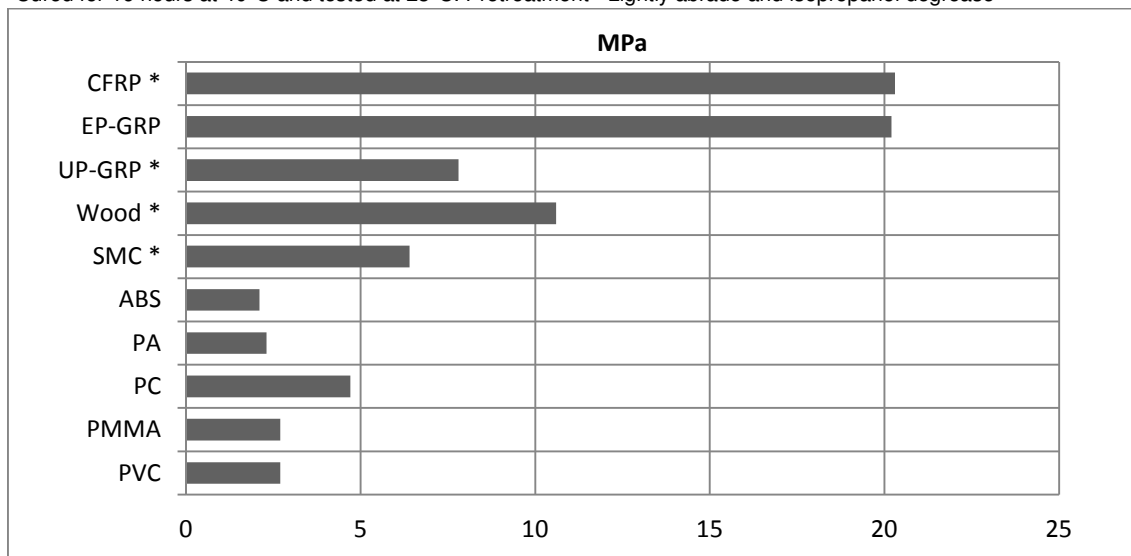
Average lap shear strengths of typical metal-to-metal joints (ISO 4587) (typical average values)

Cured for 16 hours at 40°C and tested at 23°C, Pretreatment - Sand blasting



Average lap shear strengths of typical non-metallic substrates joints (ISO 4587) (typical average values)

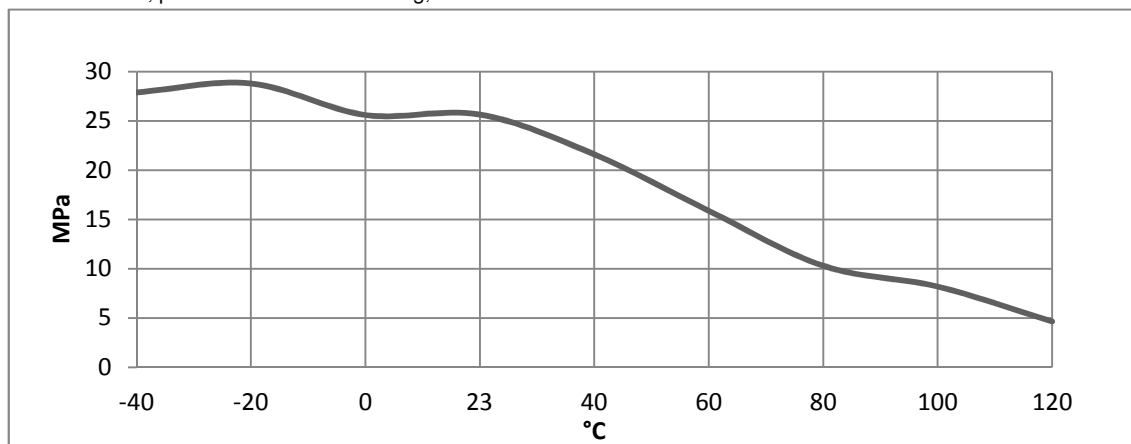
Cured for 16 hours at 40°C and tested at 23°C. Pretreatment - Lightly abrade and isopropanol degrease



*: Substrates failures

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

On aluminium, pretreatment - sand blasting, cure: 16 hours at 40°C



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

On aluminium, pretreatment - sand blasting - Cured: 16 hours at 40°C

5 N/mm

Glass transition temperature DMA (typical average values) (ISO 6721)

Cure: 16 hours at 40°C

75°C

Tensile properties (ISO 527). (typical average values)

Cure 16hrs at 40°C, tested at 23°C

Tensile strength	23 MPa
E-Modulus	1 GPa
Elongation at break	12%

Flexural properties (ISO 527). (typical average values)

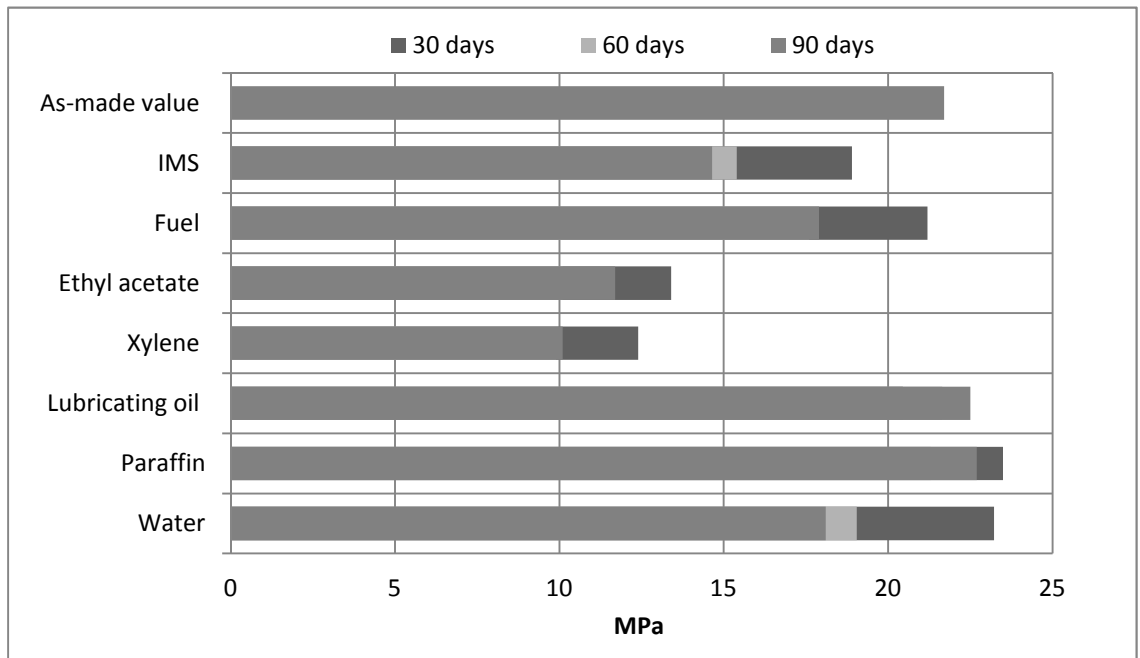
Cure 16hrs at 40 °C, tested at 23 °C

Flexural strength	37 MPa
E-Modulus	1.2 GPa
Elongation at break	11%

Lap shear strength versus immersion in various media (ISO4587) (typical average values)

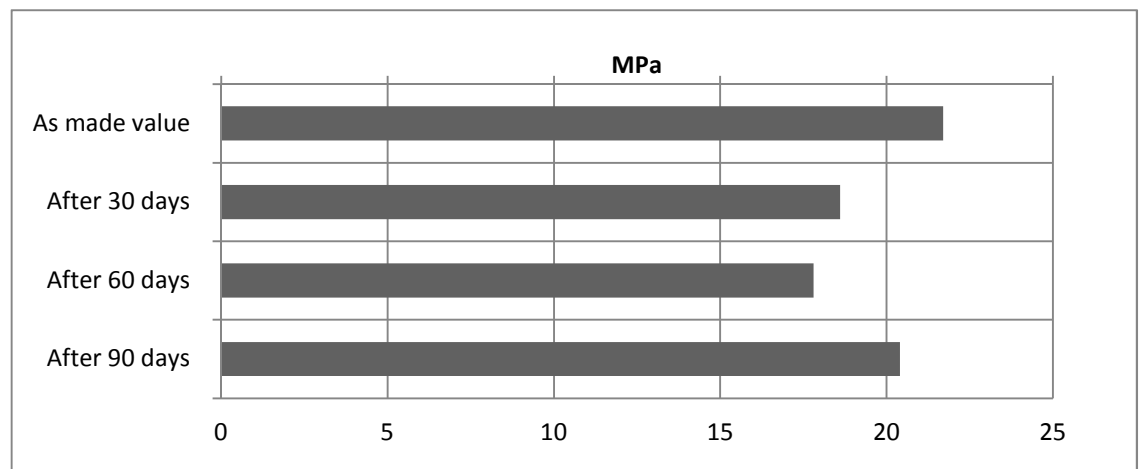
On aluminium, pretreatment - sand blasting, cured: 16 hours at 40 °C, tested at 23 °C

LSS. was determined after immersion for 30, 60 and 90 days at 23 °C



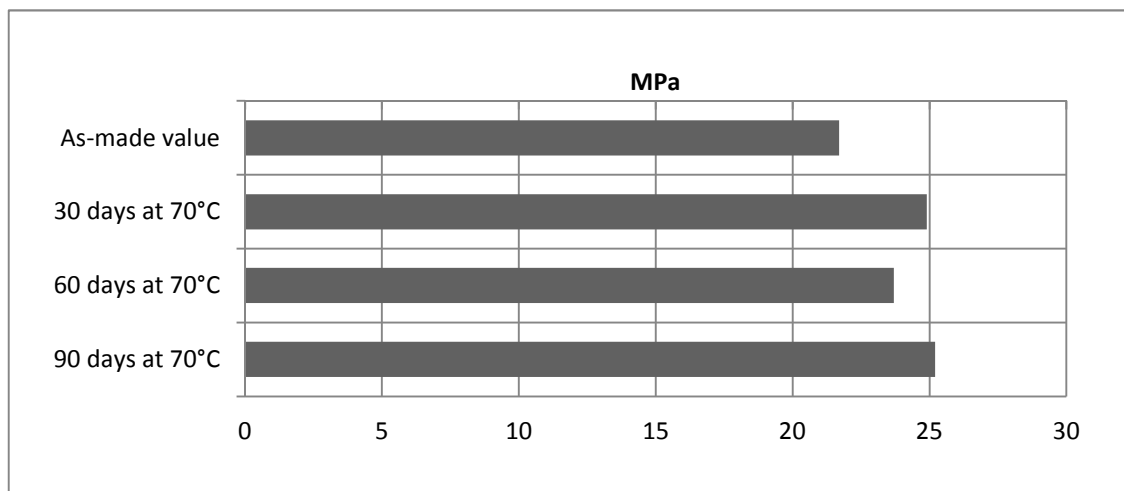
Lap shear strength versus tropical weathering (ISO 4587) (typical average values)

(40 °C/92% RH) On aluminium, cured for 16 hours at 40 °C and tested at 23 °C. Pretreatment - Sand blasting

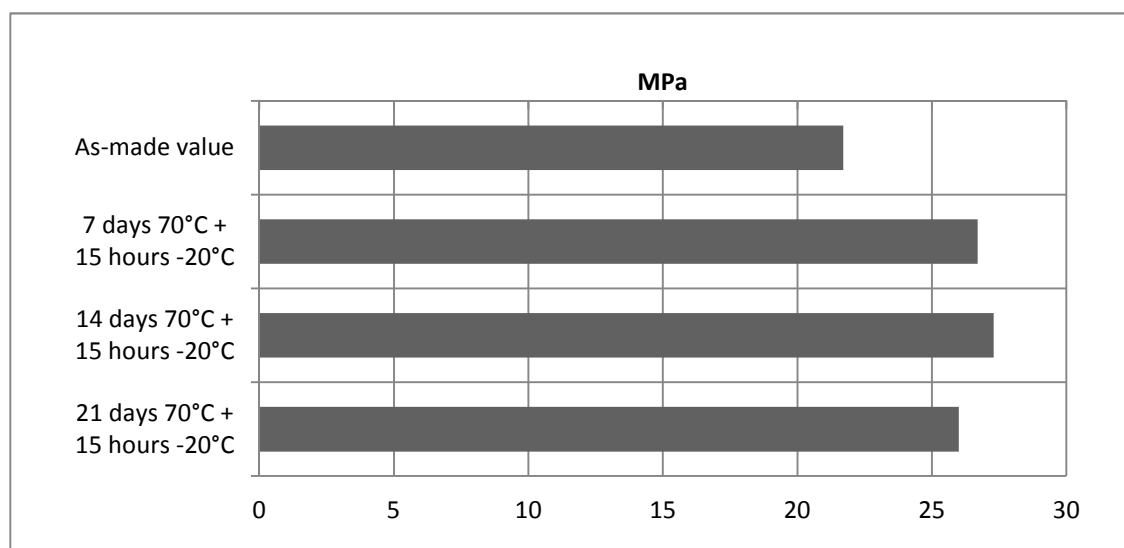


Lap shear strength versus heat ageing (typical average values)

Cure: 16 hours/40°C - Test: at 23°C

**Lap shear strength versus Cataplasma ageing (typical average values)**

Cure 7 days at RT – Cataplasma according to ISO 9142/E2 - Test: at 23°C



Storage

Araldite[®] 2031-1 must be stored 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.



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