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Advanced Materials

Araldite® 2081-10

Structural Adhesive

Technical Data Sheet

Araldite® 2081-10

Low odour acrylic adhesive system for plastics*

Key properties

- **Low odour**
- **Non-flammable**
- **High adhesion to various plastics*, composites and metals**
- **Snap-curing**
- **10-minute open time**

Description

Araldite® 2081-10 is a fast curing, non-flammable two-part acrylic adhesive for bonding a range of plastics and other substrates *with the exception of polyolefins and low surface energy materials. It has high strength and good flexibility with low odour. The multipurpose adhesive has an open time of 10 minutes for rapid assembly operations on a wide range of substrates.

Product data

Properties	Resin	Hardener	Mixed adhesive
Colour (visual)	white	Light grey	Off-white
Specific gravity	1.04	1.38	Ca1.1
Viscosity at 25°C (Pa.s)	70 - 80	60 - 90	70 - 90 Pa.s
Pot life (20 gr. at 25°C)	-	-	10 -11 minutes
Time to peak exotherm (20gr)	-	-	14 -18 minutes

Processing

Pretreatment

The strength and durability of a bonded joint are dependent on proper pretreatment of the surfaces to be bonded; however acrylic 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
Resin	100	100
Hardener	13.0	10

Application of adhesive

This system 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.

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 0.25 mm thick will normally impart the greatest lap shear strength to the joint. The joint components should be assembled and secured in a fixed position as soon as the adhesive has been applied.

Warning: the cure reaction can generate a high amount of heat; it is not recommended to mix large amounts of material at room temperature.

For more detailed explanations regarding surface preparation and pretreatment, adhesive joint design, and the dual cartridge dispensing system, visit www.aralditeadhesives.com.

Curing of adhesive

Curing of acrylic polymers and adhesives are inhibited by the presence of atmospheric oxygen. In such cases while the bulk material is cured, any exposed surfaces of the adhesive will therefore cure slower than the material in the bondline.

While acrylic adhesives based on methyl methacrylate rapidly flash off the monomer, to leave a surface that is touch dry; with low odour acrylic adhesives uncured adhesive on exposed surfaces such as on fillets does not evaporate so quickly, this results in a tacky surface.

This behaviour does not affect the performance of the bonding however where the requirement for a tack free surface is paramount for example prior to sanding or painting, a standard methyl methacrylate based acrylic adhesive, such as Araldite 2053 could be used.

Alternatively, the surface exposed to the air can be wiped with MEK. The cured tacky adhesive surface should be wiped with a MEK impregnated tissue; the MEK allowed to evaporate to give a dry adhesive surface.

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 MEK are used for cleaning, operatives should take the appropriate precautions and, in addition, avoid skin and eye contact.

Typical times to minimum shear strength on sandblasted aluminium / contact pressure

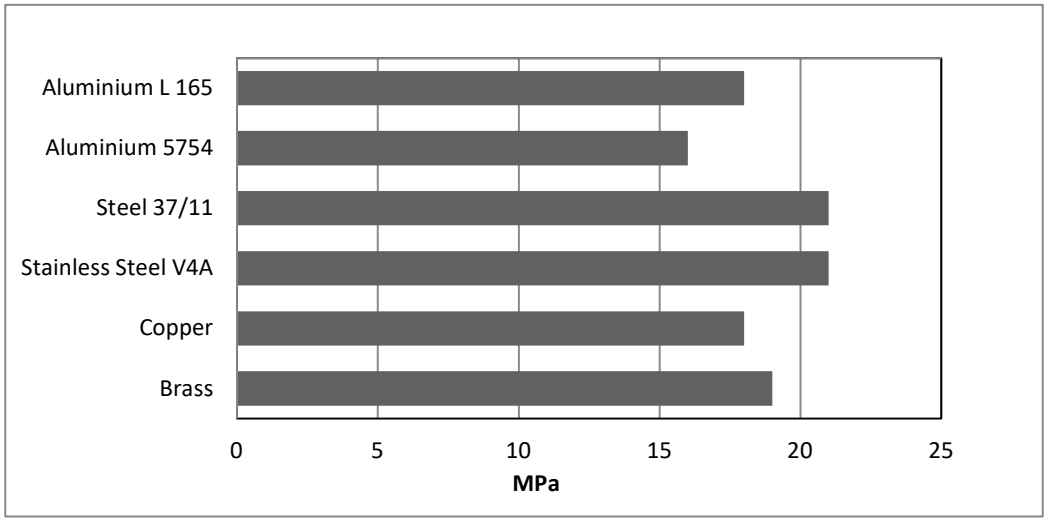
Temperature	°C	23°C
Cure time to reach	hours	
LSS > 1MPa	minutes	< 20
Cure time to reach	hours	
LSS > 10MPa	minutes	<23

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. 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.

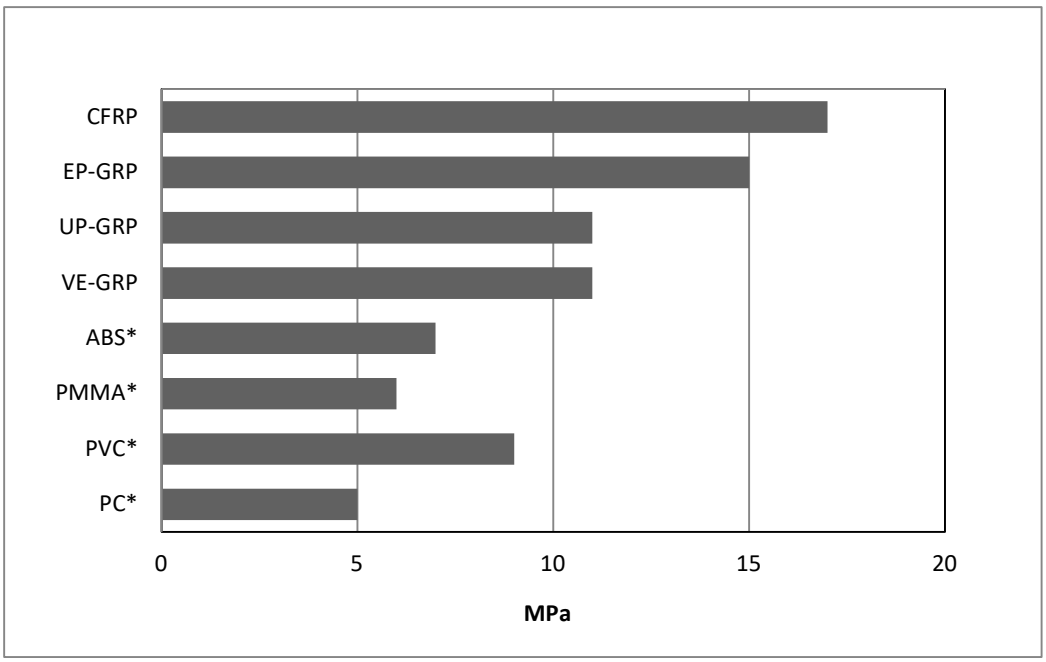
Average lap shear strengths of typical metal-to-metal joints (ISO 4587) (typical average values)

Cured for 24 hours at RT and tested at 23°C, metals sandblasted and degreased with acetone.



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

Cured for 24 hours at RT and tested at 23°C. Plastics abraded and degreased with isopropanol.



(*): PMMA, PVC, ABS, PC substrate failure observed.

Glass Transition Temperature (DMA) (Typical average values) Cure 7 days at RT

Onset	35°C
Peak	65°C

Tensile Properties (ISO 527) (Typical average values) Cure 7 days at RT and test at 23°C

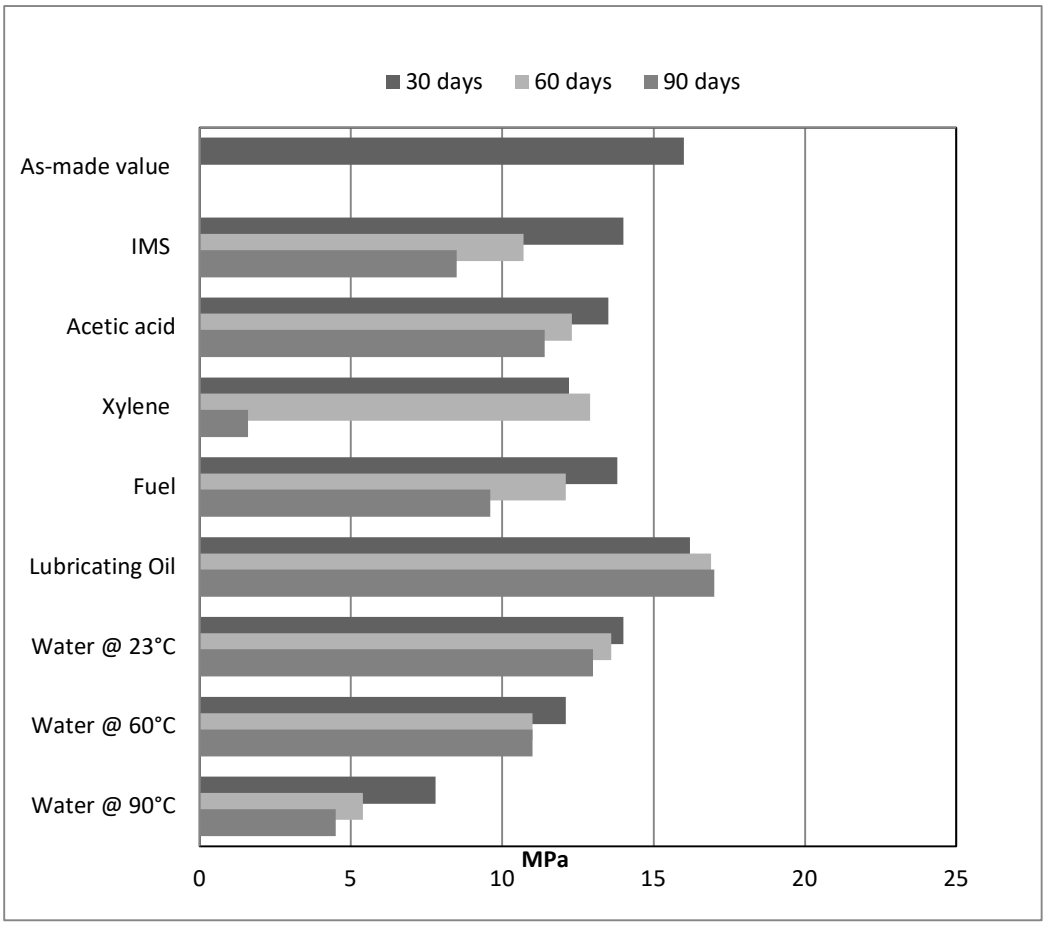
Tensile Strength	17-20 MPa
Tensile Modulus	700-900 MPa
Elongation at break	ca. 60-80%

T- Peel Strength (**Typical average values)** Cure 7 days at RT

Sandblasted Steel DC04	4 N/m

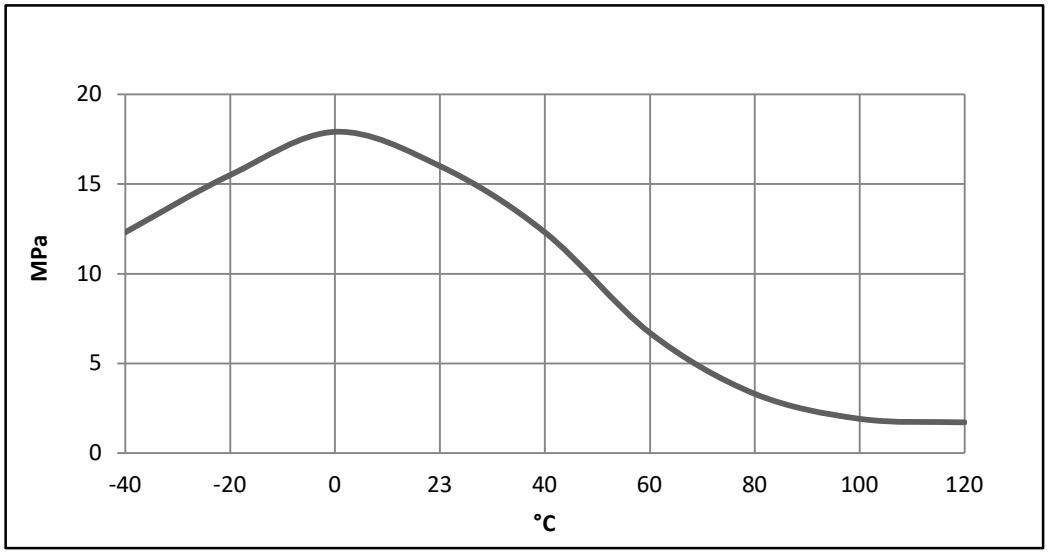
Lap shear strength versus immersion in various media (ISO4587) (typical average values)

On aluminium, pretreatment: sandblasting and degreased with acetone. Cure: 7 days at RT. Tested at 23°C.LSS was determined after immersion for 30, 60 days at 90 days at 23°C.



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

L165 Aluminium, sandblasted and degreased with acetone. Cure: 7 days at RT.

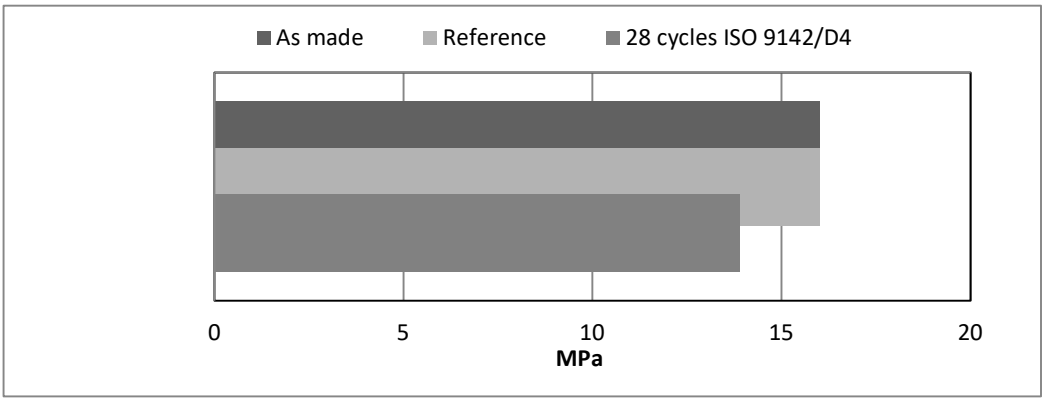


Lap shear after cycling ageing (typical average values)

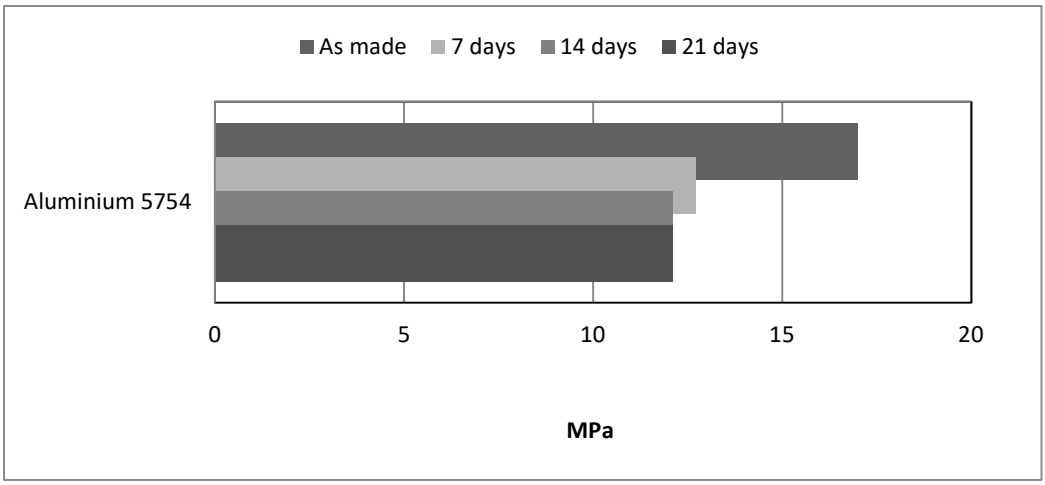
Cure: 7 days at RT. Test at 23°C. Substrates sandblasted and degreased with acetone.

Reference sample: 28 days at 23°C / 50% relative humidity.

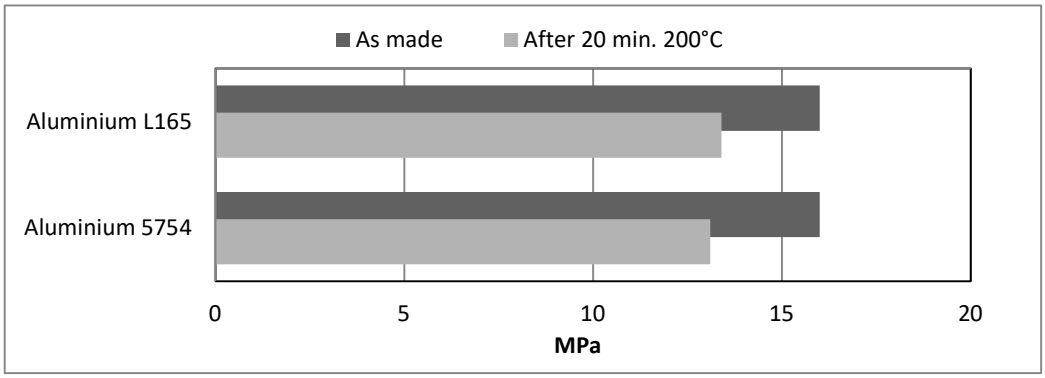
Humid-heat and cold cycle (-40°C / 70°C 90% RH) 28 cycles (14 days) according to ISO 9142/D4



Lap shear strength versus cataplasma ageing (typical average values)
Cure: 7 days at RT. Test at 23°C. Substrates sandblasted and degreased with acetone.
Cataplasma ageing according to ISO 9142/E2 (x days 70°C in soaked cotton / 15 hours -20°C / 24 hours recovery).
Test: at 23°C.



Lap shear strength after coating post-cure cycle at 200°C (typical average values)
Cure: 24 hours at RT. Test at 23°C. Substrates sandblasted and degreased with acetone.
Ageing with a simulated coating post-cure cycle of 20 minutes at 200°C in an oven. Test performed at 23°C.



Storage

Araldite® 2081-10 may be stored during 24 months at 2–8°C provided the components are stored in the original sealed containers. The expiry date is indicated on the packaging.
The product may be placed at room temperature before use, the total time at room temperature should not exceed 9 months. Long term exposure above 25°C will reduce the shelf life of the product.

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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