HUNTSMAN
Enriching lives through innovation

Advanced Materials

LME 11899 / Hardener HW 5323-1 (ARALDITE® 2014-3)

Structural Adhesives

PROVISIONAL TECHNICAL DATA SHEET

Two-component epoxy paste adhesive

Key properties

- **Dark grey paste**
- **High temperature and chemical resistance**
- **Very resistant to water and to a wide variety of chemicals**
- **Gap filling, non-sagging up to 5mm thickness**

Description

LME 11899 / Hardener HW 5323-1 is a two-component, room temperature curing, sag-resistant paste adhesive with high strength and good environmental and chemical resistance. It can be used for bonding metals, electronic components, composite materials and many other applications where higher temperatures or aggressive environmental conditions are encountered in service.

Product data

Property	LME 11899	HW 5323-1	Mixed Adhesive
Appearance (visual)	*beige paste*	*dark grey paste*	dark grey paste
Specific gravity	ca. 1.6	ca. 1.5	ca. 1.6
Viscosity at 25°C	50 – 80 Pa.s	thixotropic	thixotropic
Working time (10g) 23°C	-	-	ca. 120 min

Data in this document shows 'typical' values 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 pretreatment of the surfaces to be bonded. At the very least, joint surfaces should be cleaned with a good degreasing agent such as methoxy propanol, acetone or other proprietary degreasing agents 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 prior to bonding.

Mix ratio	Parts by weight	Parts by volume
LME 11899	100	100
Hardener HW 5323-1	50	50

Application of adhesive

The resin/hardener mix may be applied manually or using automated application to pretreated surfaces ready for bonding. Huntsman's technical support group can advise further on surface pre-treatments as well as suitable application methods and dispensing equipment.

An adhesive bond thickness of 0.1 to 0.30 mm will typically impart the greatest lap shear strength to a joint. Proper adhesive joint design and surface preparation is critical to produce a durable bond. The bonded components should be assembled and held in a fixed position as soon as the adhesive has been applied, at least until the handling strength is reached (handling strength considered as 1MPa lap shear strength – see table below).

For more information regarding surface preparation and pretreatment, adhesive joint design, dispensing systems and adhesive properties, visit www.araldite adhesives.com and download the Technical Guide for ARALDITE® Adhesives.

Equipment maintenance

Tools should be cleaned using a suitable solvent, such as methoxy propanol or acetone, before adhesive residues have had time to cure. Removal of cured residues with solvents is not possible, and mechanical abrasion must be used.

If solvents 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	13	9	4	-	-	-
LSS > 1MPa	minutes	-	-	-	70	13	1
Cure time to reach	hours	21	12	6	-	-	-
LSS > 10MPa	minutes	-	-	-	95	21	2

LSS = Lap shear strength.

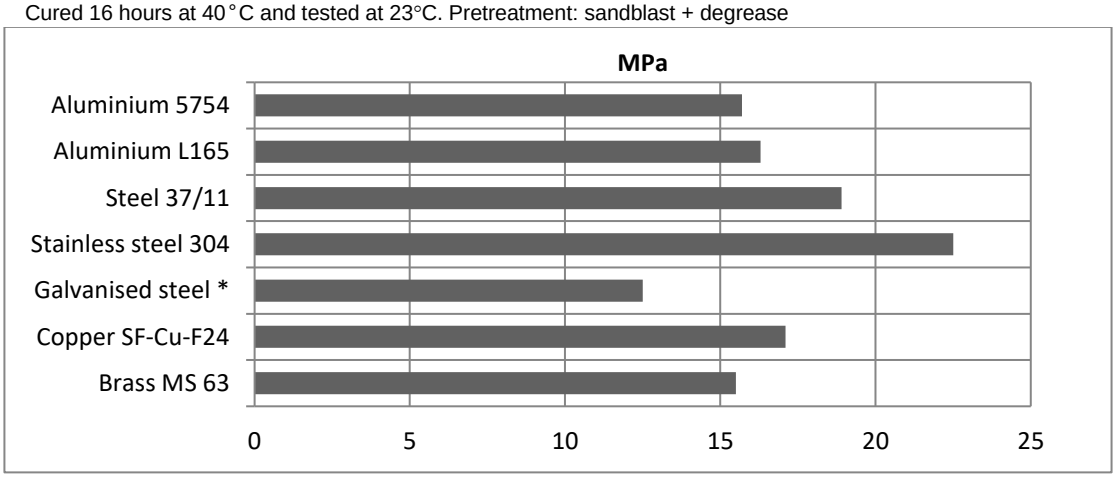
Typical cured properties

The data shown below is provided solely as technical information and does not constitute a product specification.

Unless otherwise stated, the figures given below were determined by testing standard specimens made by lap-jointing 100 x 25 x 1.6 mm strips of sandblasted aluminium alloy. The bond area was 12.5 x 25 mm, with bonded specimens cured under light clamping pressure. Lap shear testing was carried out at 23°C at 10mm/min unless otherwise stated.

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

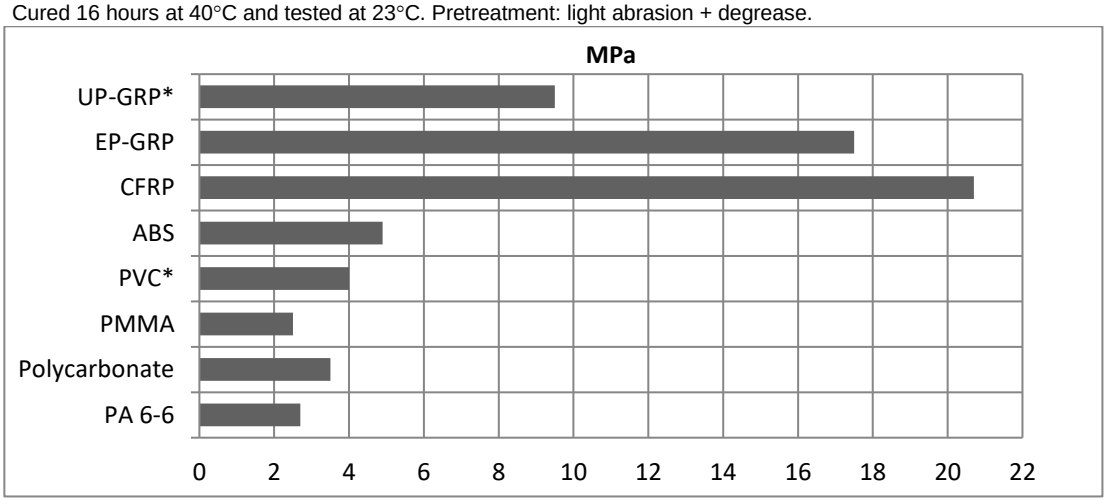
Cured 16 hours at 40 °C and tested at 23°C. Pretreatment: sandblast + degrease



** galvanised steel: degrease only*

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

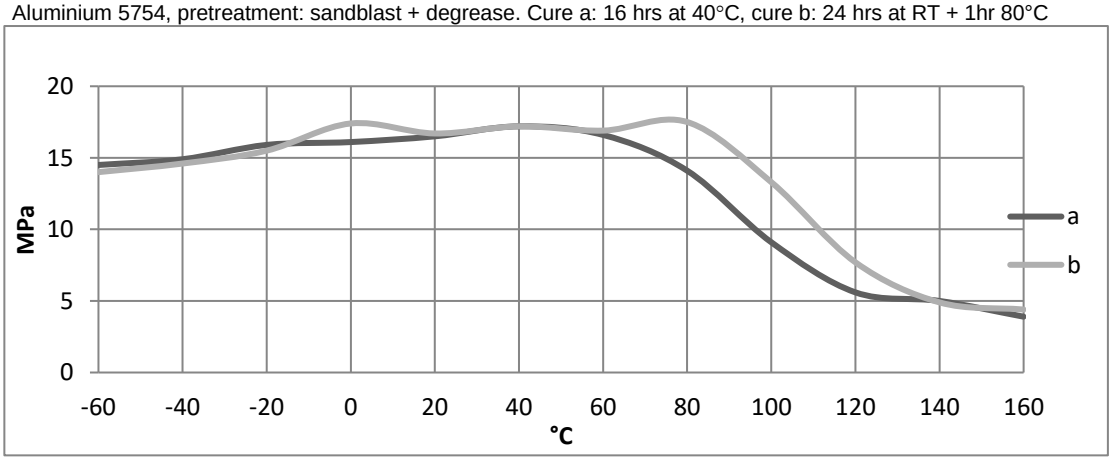
Cured 16 hours at 40°C and tested at 23°C. Pretreatment: light abrasion + degrease.



* *substrate failure*

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

Aluminium 5754, pretreatment: sandblast + degrease. Cure a: 16 hrs at 40°C, cure b: 24 hrs at RT + 1hr 80°C



DMA (Dynamic Mechanical Analysis ISO 6721; typical average values)

Cure a: 16 hours 40°C		**Cure b: 24 hours at RT + 1 hour 80°C**	
Tg midpoint	69°C	Tg midpoint	96°C
Shear modulus -40°C	2199 MPa	Shear modulus -40°C	2097 MPa
Shear Modulus 23°C	1667 MPa	Shear Modulus 23°C	1544 MPa
Shear Modulus 50°C	1241 MPa	Shear Modulus 50°C	917 MPa
Shear Modulus 75°C	31 MPa	Shear Modulus 75°C	282 MPa
Shear Modulus 100°C	22 MPa	Shear Modulus 100°C	41 MPa
Shear Modulus 125°C	23 MPa	Shear Modulus 125°C	22 MPa

Tensile Properties (ISO 527; typical average values) Cure 16 hours at 40ºC, tested at 23°C

Tensile modulus	3700 MPa
Tensile strength	45 MPa
Elongation at break	1.6 %

Compressive Properties (ISO 604; typical average values) Cure 16 hours at 40ºC, tested at 23°C

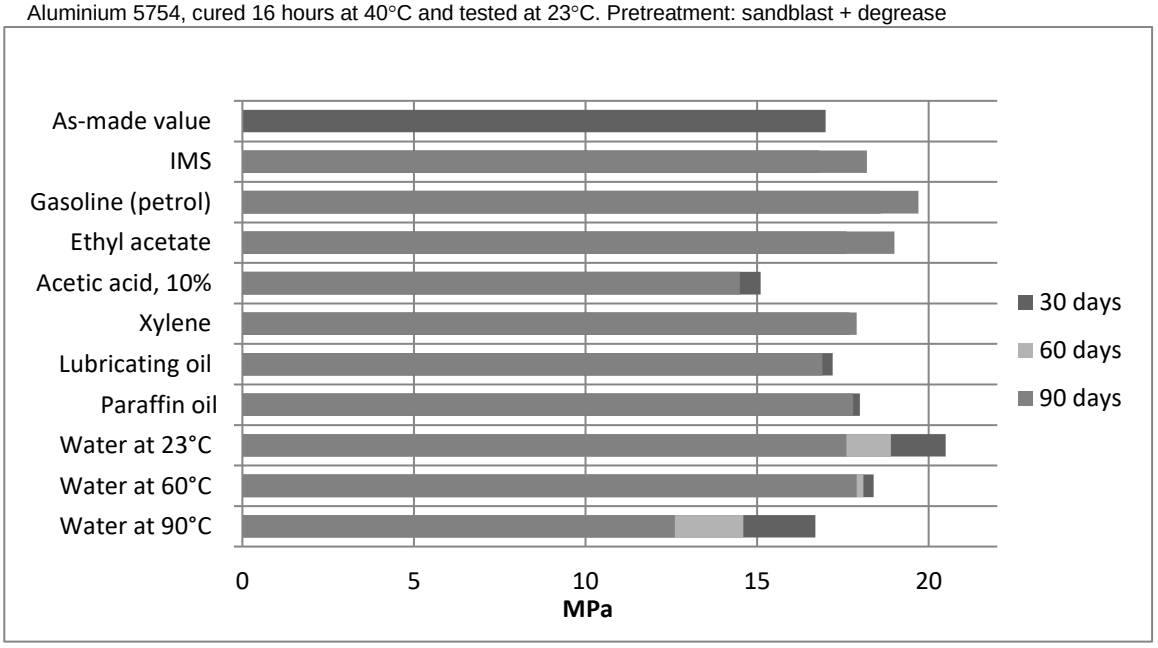
Compressive **m**odulus	3285 MPa
Maximum compressive strength	104 MPa
Strength at break	88 MPa

Hardness (ISO 868; typical average values) Cure 16 hours at 40ºC, tested at 23°C

Shore D hardness	81

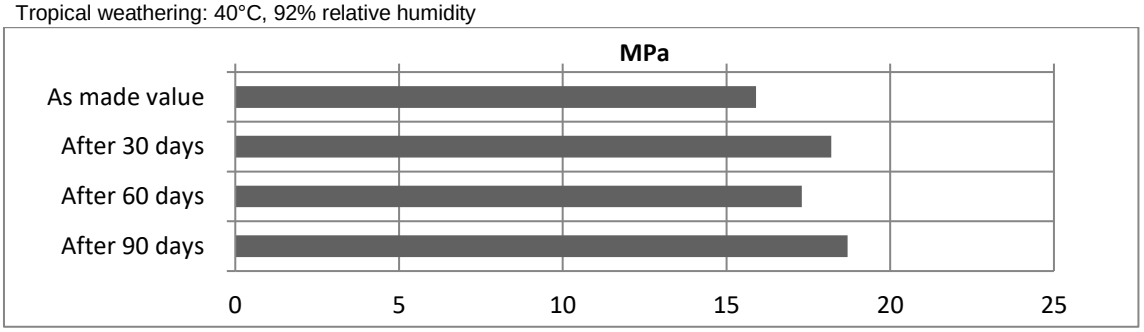
Lap shear strength versus immersion in various media (ISO 4587; typical average values)

Aluminium 5754, cured 16 hours at 40°C and tested at 23°C. Pretreatment: sandblast + degrease



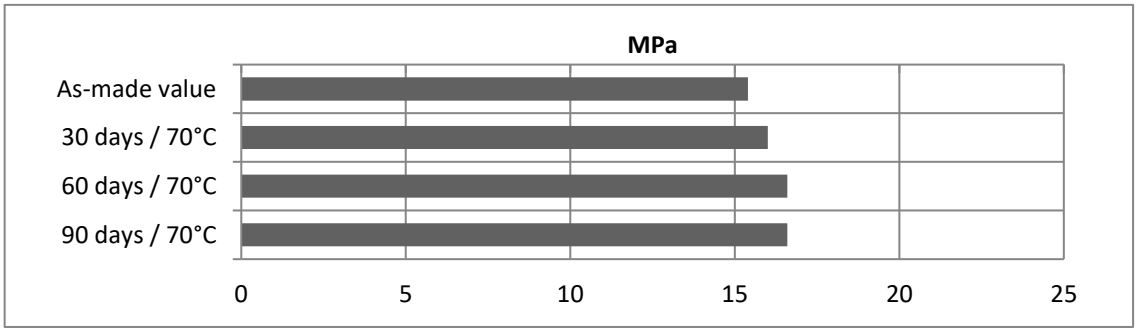
Lap shear strength versus tropical weathering (DIN 50015; typical average values)

Aluminium 5754, cured 16 hours at 40°C and tested at 23°C. Pretreatment: sandblast + degrease
Tropical weathering: 40°C, 92% relative humidity



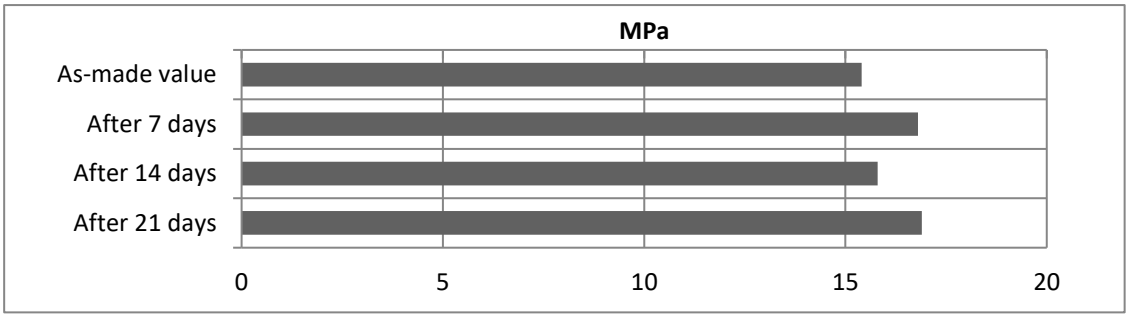
Lap shear strength versus heat ageing at 70°C (ISO 4587; typical average values)

Aluminium 5754, cured 16 hours at 40°C and tested at 23°C. Pretreatment: sandblast + degrease
Heat aging at 70°C



Lap shear strength versus cataplasma ageing (ISO 9142 E2; typical average values)

Aluminium 5754, cured 16 hours at 40°C and tested at 23°C. Pretreatment: sandblast + degrease



Storage

LME 11899 / HW 5323-1 should be stored at room temperature in the original sealed containers, kept in a dry place protected from extremes of temperature and strong sunlight. The expiry date is indicated on the individual container labels.

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 (Switzerland) GmbH
Klybeckstrasse 200
CH - 4057 Basel
Switzerland

Tel: +41 (0)61 299 11 11
Fax: +41 (0)61 299 11 12

www.araldite adhesives.com