

Structural Adhesives

XB 5047 / XB 5067

Two component epoxy adhesive

Key properties

- Fulfills MMM-A-134, type I and II and MIL-A-8623 A, type 1 and 2
- Optimum curing 1 hr / 80°C
- Minimum curing temperature 40°C
- Outstanding chemical resistance
- Outstanding ageing properties

Description

Two component, white coloured liquid epoxy adhesive for metal and composite bonding, giving high chemical and environmental resistance.

Typical product data

| | XB 5047 | XB 5067 | Mixed adhesive |
|---------------------------|----------------|----------------|-----------------------|
| Colour (visual) | White liquid | Brown liquid | White liquid |
| Viscosity at 25°C (Pas) | 12 - 20 | 1.3 – 2.1 | ca. 16 |
| Specific gravity | ca. 1.4 | 0.95 | ca. 1.3 |
| Pot Life (100 gm at 23°C) | - | - | ca. 70 minutes |
| Flash point (°C) | 179 | 107 | - |

Processing

Pretreatment

The strength and durability of a bonded joint are dependant 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 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 |
|------------------|------------------------|------------------------|
| XB 5047 | 100 | 100 |
| XB 5067 | 30 | 45 |

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 0.15mm thick will normally impart the greatest lap shear strength to the joint.

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.

| Cure requirements | | | |
|---------------------------|----|----|----|
| Temperature (°C) | 40 | 60 | 80 |
| Cure time (hours) | 5 | 1 | - |
| (minutes) | - | - | 30 |
| Lap Shear Strength (23°C) | 22 | 25 | 22 |

Curing temperatures above 60°C are recommended in order to ensure optimum performance of the adhesive.

Typical cured properties

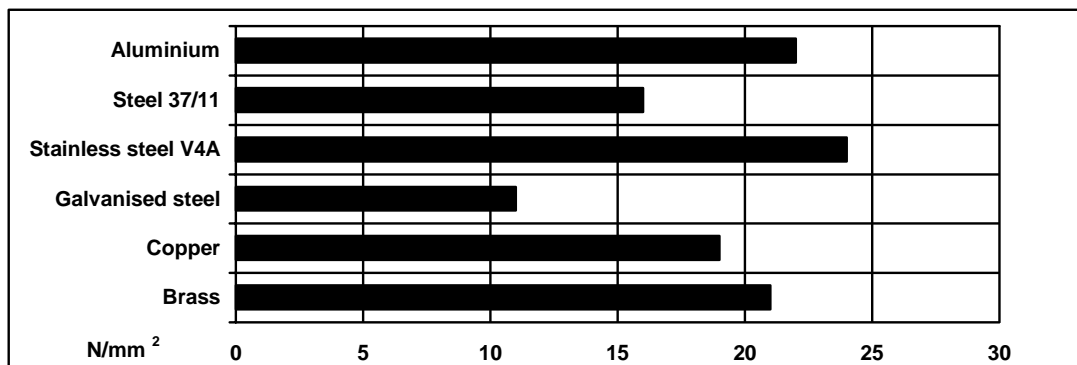
Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-jointing 170 x 25 x 1.5 mm strips of aluminium alloy. The joint area was 12.5 x 25 mm in each case.

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)

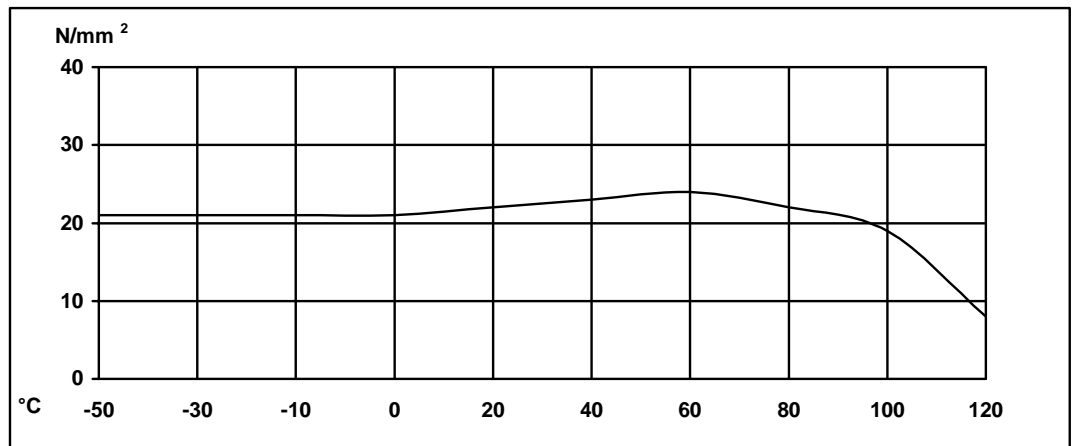
Cure: 16 hours at 40°C and tested at 23°C

Pretreatment - Sand blasting



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

Cure: 1 hour at 80°C



Roller peel test (ISO 4578)

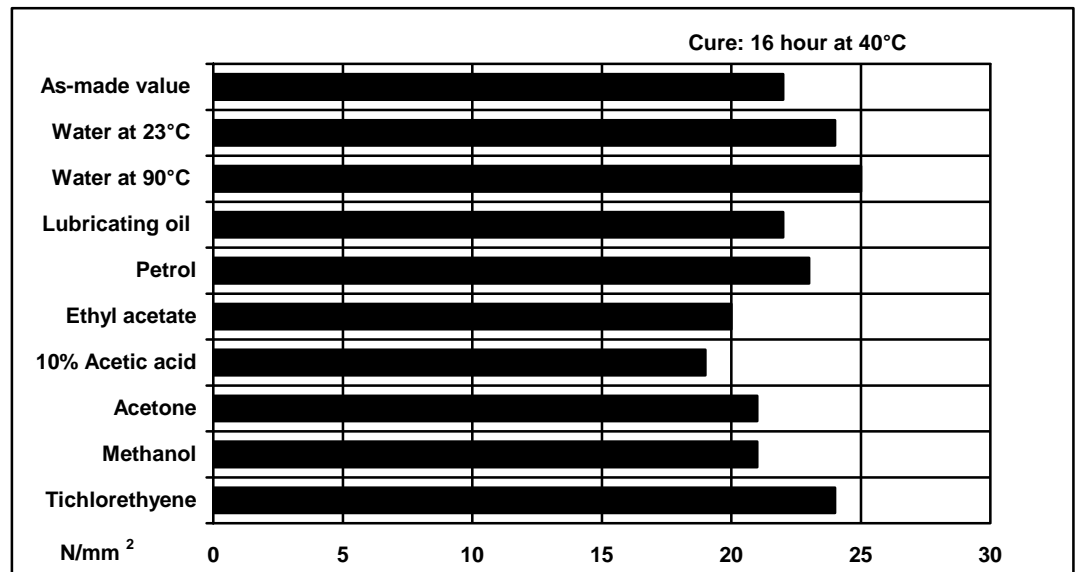
Cure: 16 hours at 40°C 4.5N/mm

Impact peel strength 4.1 N/mm at 23°C

2.8 N/mm at -40°C

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

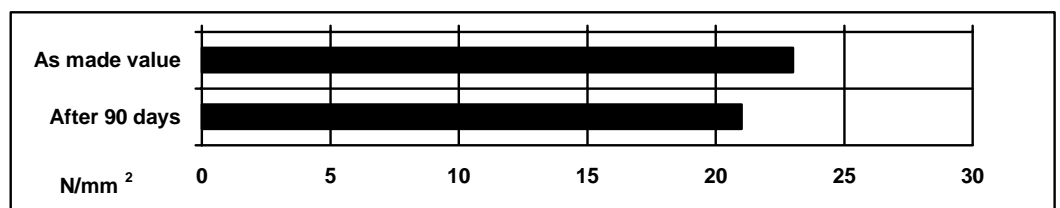
Unless otherwise stated, L.S.S. was determined after immersion for 60 days at 23°C



Lap shear strength versus tropical weathering

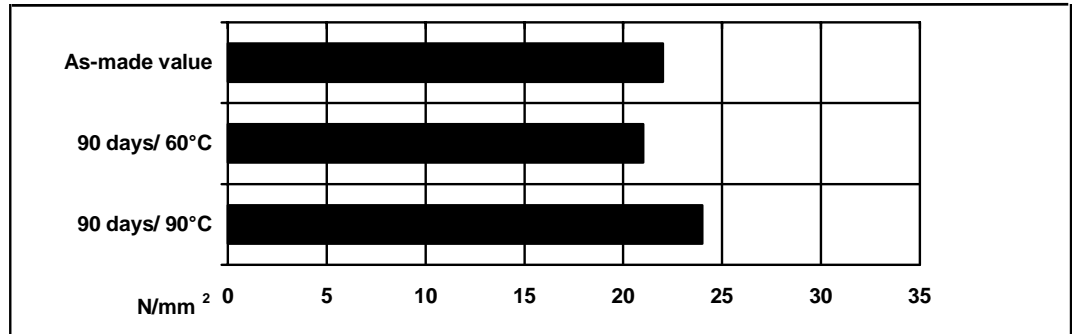
(40/92, DIN 50015; typical average values)

Cure:16 hours at 40°C



Lap shear strength versus heat ageing

Cure: 16 hours at 40°C



Fatigue testing at 23°C, 40Hz

Sandblasted aluminium, >10⁷ cycles at 31% of static failing load
4 x 10⁶ cycles at 39% of static failing load

Chromate etched aluminium, >10⁷ cycles at 37% of static failing load
6 x 10⁶ cycles at 40% of static failing load

Shear Modulus DIN 53445 Cure 1 hour at 80°C

| | |
|-------|--------------|
| 0°C | G' = 1.8 GPa |
| 50°C | G' = 1.2 GPa |
| 75°C | G' = 500 MPa |
| 100°C | G' = 120 MPa |
| 125°C | G' = 12 MPa |
| 150°C | G' = 11 MPa |

Storage

XB 5047 and XB 5067 may be stored for up to 6 years and 3 years respectively. 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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All recommendations for the use of our products, whether given by us in writing, verbally, or to be implied from the results of tests carried out by us, are based on the current state of our knowledge. Notwithstanding any such recommendations the Buyer shall remain responsible for satisfying himself that the products as supplied by us are suitable for his intended process or purpose. Since we cannot control the application, use or processing of the products, we cannot accept responsibility therefor. The Buyer shall ensure that the intended use of the products will not infringe any third party's intellectual property rights. We warrant that our products are free from defects in accordance with and subject to our general conditions of supply.

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