

Advanced Materials

Agomet® F305 A with F305 B and hardener powder/paste

Araldite® Structural Adhesives

Agomet® F305 A with F305 B and hardener powder/paste Methacrylate adhesive for “No-mix” application

Key properties

- “No mix” adhesive – components can be applied to separate surfaces or bead-on-bead
- 2 minute work-life, 5 minute handling strength
- Ideal for ferrite bonding
- Low viscosity - ideally suited to rapid production line bonding.
- Good thermal stability and moisture resistance

Description

Agomet® F305 A/B is a low viscosity two component, room temperature curing, “No-mix” methacrylate adhesive suitable for bonding metals and plastics. Its high setting rate at room temperature allows handling of the bonded parts within a very short time. The adhesive has an assembly time of 1 - 2 minutes. As early as 5 minutes after joining (curing at room temperature), the parts can be handled. The final strength is attained within 2 hours. Bonds produced with Agomet® F305 A/B show good tensile shear and peel strengths as well as good resistance to moisture.

Product data as supplied

Properties	F305 A	F305 B	Hardener Powder
Colour - visual (A112)*	Purple / Brown	Purple / Brown	White Powder
Specific gravity	ca. 1.0	ca. 1.0	-
Viscosity (Pas)	ca. 2.5	ca. 4.5	-
Lap shear strength at 23°C (A518)*	> 25 MPa		
Gelation time (mins) at 23°C	ca. 2 minutes after parts are in contact		

* 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 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, isopropanol, or proprietary degreasing agent 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.

Application of adhesive

The two components are applied directly to the prepared and dry joint surfaces.

A layer of adhesive 0.15 to 0.25 mm thick will normally impart the greatest lap shear strength to a joint, although joints of up to 0.8mm gap can be assembled.

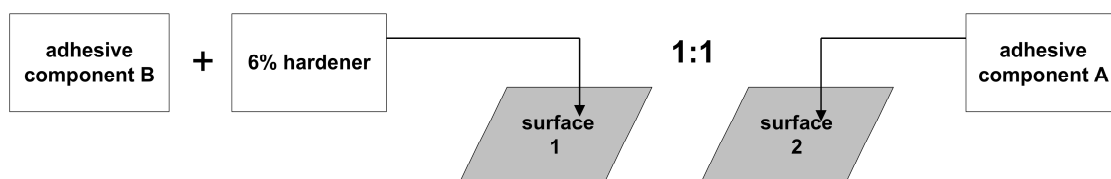
The joint components should be assembled and clamped as soon as the adhesive has been applied. An even

contact pressure throughout the joint area will ensure optimum cure.

Add 4 to 10 % (preferably 6 %) of hardener powder or hardener paste to component B and mix homogeneously, then apply together with the ready-to-use component A in a 1:1 ratio.

Apply component A to one of the surfaces to be joined, then coat the second surface with an equal layer of (hardener containing) component B. Then join the parts and clamp under contact pressure. Since the setting of the adhesive starts only after the two surfaces have been mated, this method of separate processing allows bonding operations practically independent of the pot life.

Caution: Never mix hardener into Component A!



As an alternative to the separate processing method (A/B procedure), the two components A and B (without hardener) can be mixed in a 1:1 ratio in advance. In this case, a "normal" Agomet F 305 reaction adhesive is created, which will cure only after adding 2 - 5 % Hardener powder or paste immediately before the actual bonding process.

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 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.

Curing speed

Typical times to minimum shear strength

Temperature	°C	10	15	23	40
Cure time to reach	hours	-	-	-	-
LSS > 1N/mm ²	minutes	5	4	3	2
Cure time to reach	hours	-	-	-	-
LSS > 10N/mm ²	minutes	8	7	5	3

LSS = Lap shear strength.

Typical cured properties

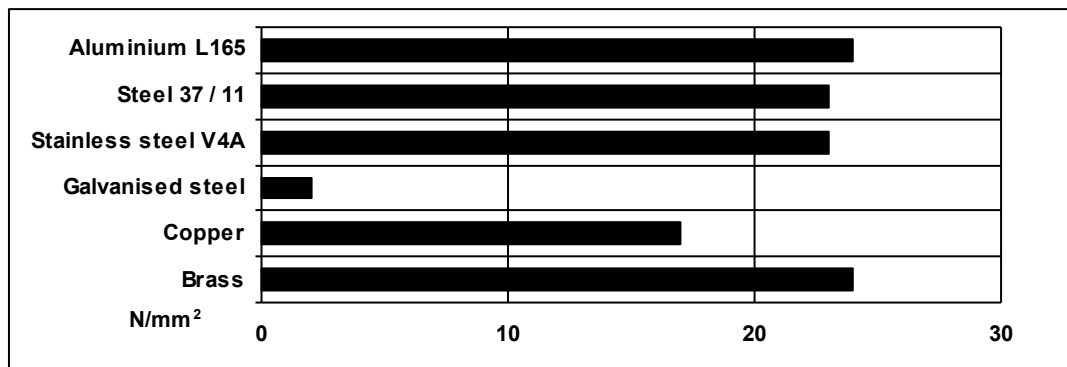
Unless otherwise stated, the figures given below were all determined by testing standard specimens made by lap-jointing 170 x 25 x 1.5 mm strips of aluminium alloy. The joint area was 12.5 x 25 mm in each case.

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) (typical average values)

Cured for 7 days at 23°C and tested at 23°C

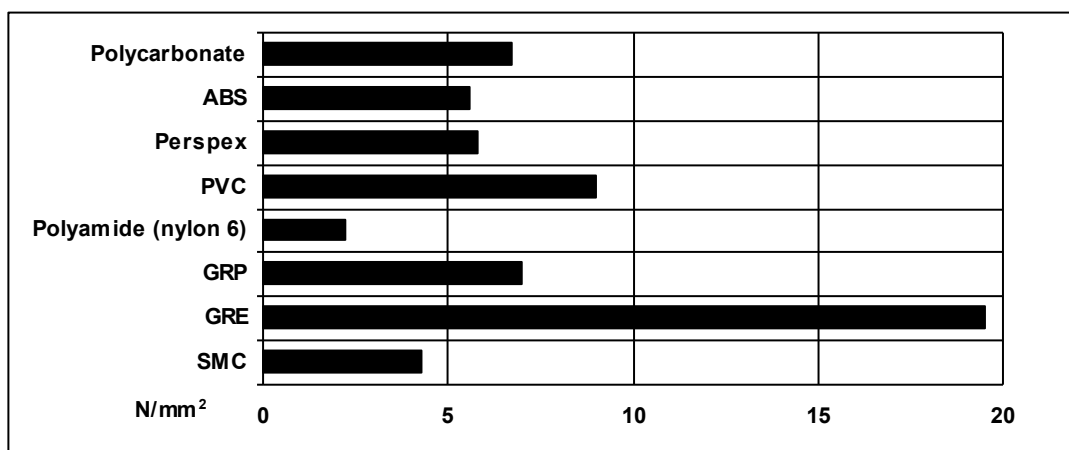
Pretreatment - Sand blasting



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

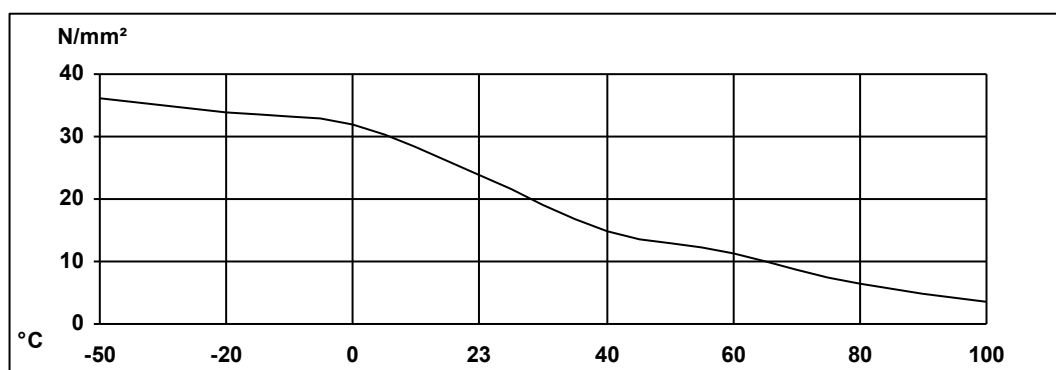
Cured for 7 days at 23°C and tested at 23°C

Pretreatment - Lightly abrade and isopropanol degrease. Note failures are mainly in the substrates



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

Cure: = 7 days at 23°C



Roller peel test (ISO 4578) at 23°C (typical value)

6 N/mm (cured 7 days at 23°C)

Glass transition temperature (Tg)

No clear transition – refer to LSS/temp and G'/temp

Tensile strength (ISO 527) (typical value)

18 MPa (cured 24 hours at 23°C)

Elongation at break

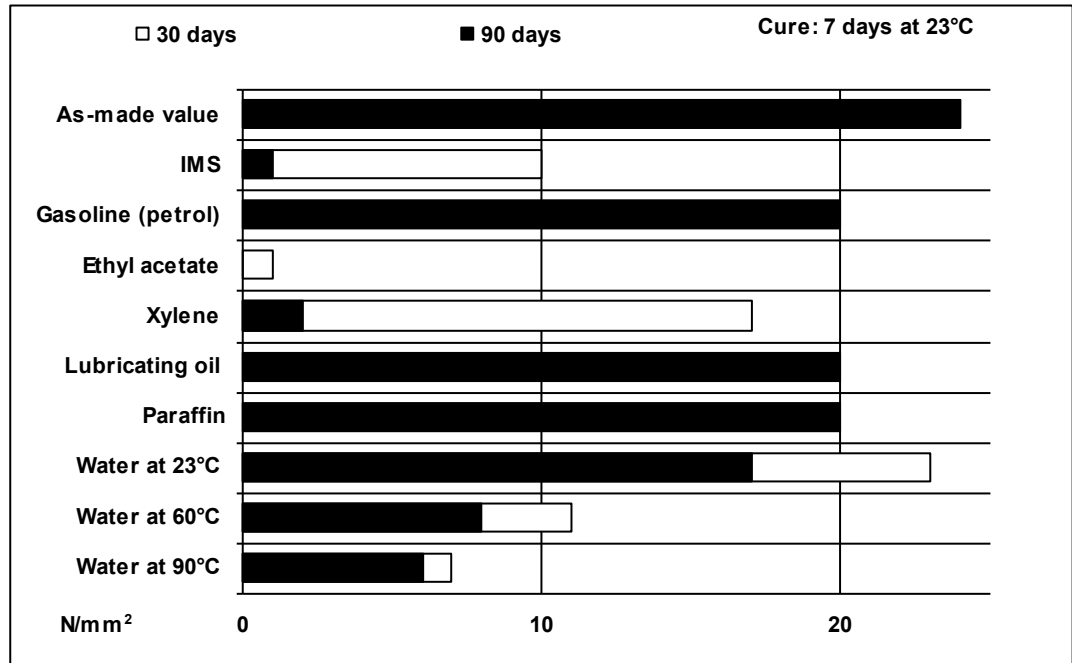
23 %

Coefficient of thermal expansion (-30°C/+30°C)

$80 \times 10^{-6} / ^\circ\text{K}$ (cured 7 days at 23°C)

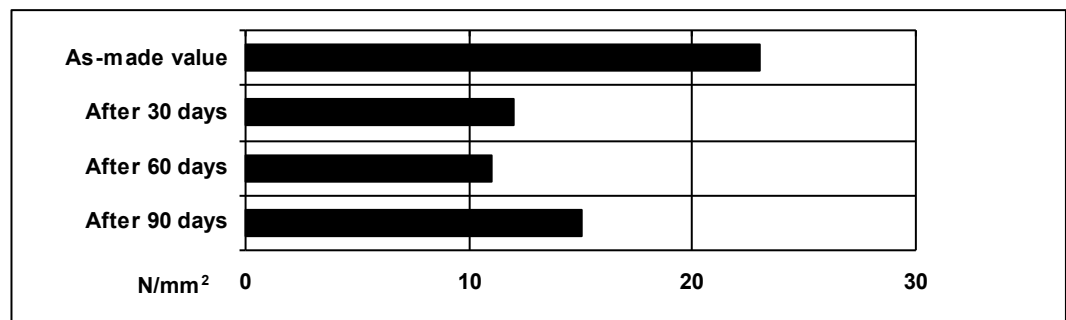
Lap shear strength versus immersion in various media at 23°C (typical average values)

Substrate – sandblasted aluminium



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

Cure: 7 days at 23°C



Shear modulus (DIN 53345)

cured 7 days at 23°C

Temperature	G' modulus	Tan delta
-40°C	1.4 GPa	4.4 E-2
-20°C	1.1 GPa	7.2 E-2
0°C	0.8 GPa	1.05 E-1
20°C	0.5 GPa	1.43 E-1
40°C	0.32 GPa	1.8 E-1
60°C	0.15 GPa	2.6 E-1
80°C	55 MPa	4.2 E-1
100°C	8 MPa	6.6 E-1
120°C	2 MPa	5.4 E-1

Storage

Agomet® F305 A and B must be stored at 2-8°C in sealed containers. Hardener powder must be stored at 2-18°C. When stored at 23°C the life is a maximum of 6 months. The expiry date, following the above mentioned recommended storage conditions 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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