Aerospace Adhesives
Araldite® 403 A/B
Two component epoxy paste adhesive

Key properties

- **Two part cold cured system**
- **Can be used in conjunction with riveting**
- **Good strength retention up to 120°C**

Description

Araldite 403 A/B is a two pack cold curing structural adhesive system developed primarily for use in riveted joints to give improved fatigue resistance. It also gives other benefits of bonded assembly to structural joints which cannot be bonded with hot cured adhesives because of their size or other physical limitations. It is also suitable for honeycomb-to-skin bonding. For evaluation purposes Araldite 403 (cold cured) has been tested in unriveted metal-to-metal joints and has been found to meet all the requirements of U.S Federal Specification MMM-A-132 as a Type 1, Class 3 adhesive.

Typical product data

Property	Araldite 403 A	Araldite 403 B	Mixed
Colour (visual)	grey	blue	grey
Specific gravity	1.3 - 1.4	0.8 - 0.9	1.5 - 1.6
Viscosity at 25°C (Pas)	1200 - 1700	0.01 - 0.02	ca. 150
Pot life (100 gm at 25°C) mins	-	-	60 - 90

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. 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
Araldite 403 A	100	-
Araldite 403 B	7.5	-

The resin and hardener should be blended until they form a homogeneous mix.

Pot life

To obtain the maximum workable life after mixing, pour the adhesive into a shallow tray to a maximum depth of about 6mm. This will assist rapid dissipation of heat generation by exothermic reaction. The workable life will then be approximately 1½ hours at 25°C. This will be reduced at higher temperatures, or may be increased by maintaining a lower temperature.

Application of adhesive

Araldite 403 may be applied by extrusion or by spreading with a roller or serrated comb spreader. Apply a thin coating of the adhesive to each surface of the joint; for honeycomb-to-skin bonds apply the adhesive to the honeycomb surface and to the skins.

Assembly

The joint assembly must be completed and securely clamped or tack riveted within 2 hours of mixing the adhesive. Araldite 403 has excellent gap-filling properties and is tolerant of glue-line thickness variations over the range 0.08 - 0.80mm.

Riveting

Araldite 403 does not appear to be sensitive to riveting operations, but there is a risk that the joint may be disturbed if the assembly is moved during the most critical part of the adhesive curing period. All riveting should be done before the adhesive has set or after it has hardened sufficiently to withstand normal handling. Unless the assembly is rigidly clamped in a jig to prevent movement, riveting should only be done during the 6 hours immediately following adhesive application; alternatively, the assembly should be left undisturbed for at least 24 hours after clamping or tack riveting before further work is carried out on it.

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

At 22°C Araldite 403 will attain 50% of its ultimate strength approximately 2 days after mixing, 80-90% of its full strength after 1 week, and full strength after about 8 weeks.

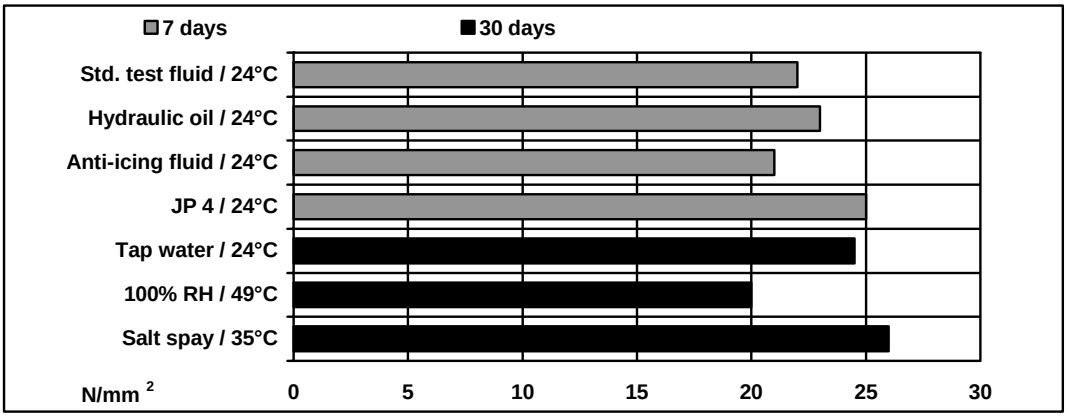
Where circumstances permit, curing time can be reduced to 16 hours by warming the assembly to 45 ± 5°C.

Typical cured properties

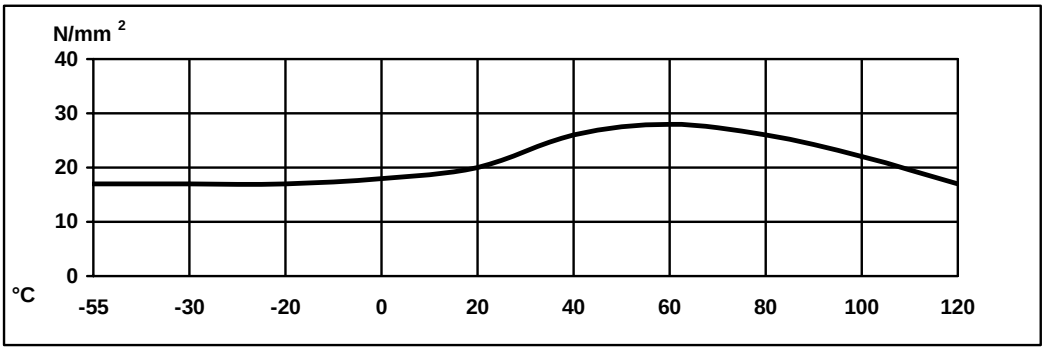
The following data has been obtained for Araldite 403 on tensile lap shear specimens made and tested in the manner described in the U.S. specification MMM-A-132.

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.

Tensile shear strength: effect on fluid immersions
Cure: 42 days at 22°C, test specification MMM-A-132



Lap shear strength versus temperature (ISO 4587) (typical average values)
Cure: 42 days at 22°C



Storage

Araldite 403 A/B may be stored for up to 3 years at 2-40°C, provided the components are stored in their original 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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