# Aerospace Adhesives
# Epocast® 52 A/B
# High strength laminating system

**Key properties**

- **Excellent performance at elevated temperatures**
- **Variable temperature cure**
- **Excellent hot-wet strength**
- **Easy handling**

**Description**

Epocast 52 A/B is a two part, epoxy laminating resin for service up to 175°C. It is an excellent general purpose composite fabrication / repair material that combines low temperature vacuum bag cures with good hot-wet capability.

**Typical product data**

| Property | Epocast 52 A | Epocast 52 B | Mixed adhesive | Test Method |
|---|---|---|---|---|
| Colour (visual) | amber | blue | blue | visual |
| Specific gravity | ca.1.2 | ca.1.0 | ca.1.1 | ASTM-D-792 |
| Viscosity at 25ºC (Pas) | ca.5 | ca.3 | ca.4 | ASTM-D-2196 |
| Gel time (100 gm at 25°C) mins | - | - | 60 | ASTM-D-2471 |

**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 |
|---|---|---|
| Epocast 52 A | 100 | 2 |
| Epocast 52 B | 41 | 1 |

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

**Application of adhesive**

Impregnate the dry, repair fabric with Epocast 52 A/B using a brush or spreader bar on a release-covered surface. Cut layers of the wet fabric to shape and position on the prepared damaged area. After consolidating with a roller, cover the assembly with a vacuum bag lay-up and apply vacuum throughout the cure cycle. A heater mat placed between the release film and breather layer will reduce cure time.

If the honeycomb is exposed in the damaged area, it should first be filled with one of Huntsman Advanced Materials' extensive range of syntactic filler pastes, and cured before application of Epocast 52 A/B and fabric.

**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.

**Typical cure schedules**

The product may be initially cured at temperatures between 20ºC and 100ºC. An elevated temperature post cure is required to cure the adhesive to the optimal Tg value. Typical curing schedules are 65ºC for 3 hours, or 95ºC for 2 hours. For optimal Tg values a post cure for 1 hour at 130-180ºC is suggested.

## Typical cured properties

The figures below were determined with typical production batches using standard testing methods. They are provided solely as technical information and do not constitute a product specification.

| Properties | Test conditions | Result | | Test method |
|---|---|---|---|---|
| | | 65°C cure | 93°C cure | |
| Short beam shear strength | at RT<br>at 80°C/wet | -<br>- | 53 N/mm$^2$<br>51 N/mm$^2$ | ASTM-D-2344 |
| ± 45 Tensile strength | at -18°C<br>at 71°C/wet | 193 N/mm$^2$<br>117 N/mm$^2$ | 186 N/mm$^2$<br>124 N/mm$^2$ | BMS-8-301F |
| Compressive interlaminar shear strength | at -18°C<br>at RT | 67 N/mm$^2$<br>53 N/mm$^2$ | 72 N/mm$^2$<br>59 N/mm$^2$ | ASTM-D-695 |

**Inplane shear strength/modulus** AIMS 50800-3
EN 6031[(45/-45)] 2s 8 ply

| Test | Result | |
|---|---|---|
| | **Ultimate strength (MPa)** | **Shear modulus (GPa)** |
| **Tested at 80°C** | | |
| After water soak 2 weeks at 70°C | 70 | 5.8 |
| After 1000 hours jet A soak at RT | 80 | 2.5 |
| After 1000 hours Skydrol soak at 70°C | 85 | 2.6 |
| (No immersion) 23°C/50% RH | 70 | 2.5 |
| **Tested at 120°C** | | |
| After water soak 2 weeks at 70°C | 55 | 5.4 |
| (No immersion) 23°C/50% RH | 55 | 2.0 |
| **Tested at room temperature** | | |
| After water soak 2 weeks at 70°C | 85 | 3.2 |
| After MEK soak 1 hour | 100 | 3.5 |
| (No immersion) 23°C/50% RH | 90 | 3.2 |
| **Tested at 23°C** | | |
| After 40 hours at 23°C/50% RH | 80 | 5.0 |
| **Tested at 80°C wet** | | |
| After 96 hours water boil | 60 | 3.1 |
| **Glass transition** | | |
| Tg-cure 3 hours at 65°C + 1 hour at 176°C | 155°C | - |
| Tg-cure 3 hours at 65°C | 130°C | - |

## Storage

Epocast 52 A and Epocast 52 B may be stored for up to 12 months at 2-40°C, provided that 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.

**Huntsman Advanced Materials**

**Duxford, Cambridge**
**England CB2 4QA**

**Tel: +44 (0) 1223 832121**
**Fax: +44 (0) 1223 493322**
**www.araldite.com**