

**Advanced Materials****EPOCAST® 1645 FR A/B Ultra-Low Density Epoxy Void and Edge Filler**

- Meets BMS 5-28 Type 9 Requirements
- 1 Year Shelf Life
- 1-to-1 Mix Ratio by Weight and Volume
- Excellent Tolerance with Off Ratio
- Flame Retardant: Meets FAR 25.853a Requirements
- 0.48g/cc Density
- High Strength and High Modulus
- Easy to Process with Color Mix Indicator and Rapid Sanding
- “Wet-Finger” Smoothable (with Glove)
- Service Temperature up to 350°F
- No SVHC as Defined by REACH\*

**PRODUCT DESCRIPTION:**

EPOCAST® 1645 FR A/B is a two-component, ultra-low density, flame-retardant epoxy void filler designed for edge filling/reinforcing of honeycomb structures used in aerospace interior applications. Both EPOCAST® 1645 FR A and B are non-sticky, very soft pastes which can be easily mixed and applied manually and are water cleanable after application. EPOCAST® 1645 FR A/B sets quickly at room temperature and is sandable shortly after application. It is well suited for aerospace applications requiring low density, high strength, and a rapid component assembly.

**TYPICAL PROPERTIES AS RECEIVED:**

| Property                  | 1645 FR A   | 1645 FR B   | A/B         | Test Method |
|---------------------------|-------------|-------------|-------------|-------------|
| Color                     | Brown       | Off-white   | Brown       | Visual      |
| Specific gravity          | 0.45 - 0.48 | 0.45 - 0.48 | 0.45 - 0.48 | ASTM D-1622 |
| Viscosity, @77°F          | Paste       | Paste       | Paste       | --          |
| Gel time, 100g @77°F, min | --          | --          | 65          | ASTM D-2471 |
| Shelf life, month         | 12          | 12          | --          | --          |

\* Does not intentionally contain any Substances of Very High Concern (SVHC) for authorization as published by the European Chemicals Agency (ECHA) pursuant to Article 59 REACH as of December, 2013

**MIX RATIO:**

To 100 parts by weight or volume of EPOCAST® 1645 FR A resin, add 100 parts by weight or volume of EPOCAST® 1645 FR B hardener. Mix both components thoroughly for several minutes to ensure complete mixing.

**GEL TIME:**

**CAUTION!** Gel time and work life varies greatly with the mass of the material being mixed at one time. Too large a quantity of mixed material will reduce the work life/gel time and produce a significant and undesirable heat release unless it is spread rapidly.

| 1645 FR A | 1645 FR B           | Gel Time @73°F/23°C, min | Peak Exotherm Temperature, °F (°C) |
|-----------|---------------------|--------------------------|------------------------------------|
| 5g        | 5g                  | 185                      | Not measured                       |
| 10g       | 10g                 | 150                      | Not measured                       |
| 25g       | 25g                 | 85                       | Not measured                       |
| 50g       | 50g                 | 65                       | 121 (49)                           |
| 100g      | 100g                | 45                       | 130 (54)                           |
| 200g      | 200g                | 40                       | 160 (71)                           |
| 55g       | 50g (10% off ratio) | 85                       | Not measured                       |
| 60g       | 50g (20% off ratio) | 90                       | Not measured                       |
| 65g       | 50g (30% off ratio) | 95                       | Not measured                       |
| 70g       | 50g (40% off ratio) | 95                       | Not measured                       |
| 50g       | 55g(10% off ratio)  | 75                       | Not measured                       |
| 50g       | 60g(20% off ratio)  | 80                       | Not measured                       |
| 50g       | 65g(30% off ratio)  | 80                       | Not measured                       |
| 50g       | 70g(40% off ratio)  | 80                       | Not measured                       |

**CURE SCHEDULE:**

1 to 3 days at 73°F/23°C or gel at room temperature plus 1 to 3 hours at 125°F (52°C).

**SANDABILITY:**

EPOCAST® 1645 FR A/B provides an excellent sandability once hardened. The minimum cure time prior to sanding will depend on the mass of Epocast® 1645 FR A/B being used and on the actual ambient temperature. The table below provides some general guidelines for various mass of EPOCAST® 1645 FR A/B cured at 73°F (23°C). At elevated temperature (e.g. with hot air) the minimum sandable time can be significantly reduced in order to save processing time.

| EPOCAST® 1645 FR A/B | Sandable time   |
|----------------------|-----------------|
| 10g                  | 4 - 5 hours     |
| 30g                  | 3 - 4 hours     |
| 50g                  | 2 - 2.5 hours   |
| 100g                 | 70 - 80 minutes |

**RECOATABILITY:**

Cured EPOCAST® 1645 FR A/B has a high surface tension of > 72dyne/cm. It can be coated with various types of organic and water-borne adhesives, paints, inks, etc. with excellent results.

**TYPICAL CURED PROPERTIES** (Not for specification purposes)**General performance at 73°F (23°C) (cured 3 hours at 125°F/52°C)**

| Properties                                 | Results     | Test method |
|--------------------------------------------|-------------|-------------|
| Compressive strength, psi (MPa)            | 2850 (19.7) | ASTM D-695  |
| Compressive modulus, Ksi (KPa)             | 190 (1.31)  | ASTM D-695  |
| Lap shear strength, Al/Al, psi (MPa)       | 1100 (7.6)  | ASTM D-1002 |
| Shore D hardness                           | 58          | ASTM D-2240 |
| Glass Transition temperature, °C (°F)      | 50 (122)    | ASTM E-1824 |
| CTE, $\mu\text{m/m}\times^{\circ}\text{C}$ | 41.5        | ASTM E-831  |
| Flammability (12-second vertical burn)     |             | FAR 25.853a |
| Extinguishing time, second                 | <2          |             |
| Burn length, inch                          | <2          |             |

**Compressive strength at 73°F (23°C) (cured at 73°F/23°C)**

| Cure time, day | Compressive strength, psi (MPa) | Test method |
|----------------|---------------------------------|-------------|
| 1              | 2600 (17.9)                     | ASTM D-695  |
| 2              | 2700 (18.6)                     | ASTM D-695  |
| 3              | 2800 (19.3)                     | ASTM D-695  |
| 7              | 2850 (19.7)                     | ASTM D-695  |

**Compressive strength at 73°F/23°C (cured at 125°F (52°C))**

| Cure time, hour | Compressive strength, psi (MPa) | Test method |
|-----------------|---------------------------------|-------------|
| 1               | 2700 (18.6)                     | ASTM D-695  |
| 3               | 2850 (19.7)                     | ASTM D-695  |
| 5               | 2850 (19.7)                     | ASTM D-695  |

**Compressive strength at elevated temperatures (cured 3 days at 73°F/23°C)**

| Test temperature, °F (°C) | Compressive strength, psi (MPa) | Test method |
|---------------------------|---------------------------------|-------------|
| 73 (23)                   | 2800 (19.3)                     | ASTM D-695  |
| 250 (121)                 | 560 (3.9)                       | ASTM D-695  |
| 300 (149)                 | 500 (3.4)                       | ASTM D-695  |
| 350 (177)                 | 350 (2.4)                       | ASTM D-695  |

**Compressive strength with off ratio (cured 3 hours at 125°F/52°C)**

| Off ratio (resin or hardener), % | Compressive strength, psi (MPa) | Test method |
|----------------------------------|---------------------------------|-------------|
| 0                                | 2850 (19.7)                     | ASTM D-695  |
| 10                               | 2700 (18.6)                     | ASTM D-695  |
| 20                               | 2700 (18.6)                     | ASTM D-695  |
| 30                               | 2700 (18.6)                     | ASTM D-695  |
| 40                               | 2600 (17.9)                     | ASTM D-695  |

**Flammability (12-second vertical burn) with off ratio (cured 3 hours at 125°F/52°C)**

| 1645 A/1645 B (wt/wt) | Extinguishing time, second | Test method |
|-----------------------|----------------------------|-------------|
| 120/100               | <2                         | FAR 25.853a |
| 130/100               | <2                         | FAR 25.853a |
| 140/100               | <2                         | FAR 25.853a |
| 100/120               | 14                         | FAR 25.853a |
| 100/130               | 30                         | FAR 25.853a |

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**STORAGE:** EPOCAST<sup>®</sup> 1645 FR A/B epoxy syntactic adhesive should be stored in a dry place, in its sealed original container, at temperatures between +2°C to +40°C (+35.6°F and 104°F). Under these storage conditions the shelf life is 12 months. The product should not be exposed to direct sunlight.

Material temperatures should be above 65°F (18°C) when mixing. After use, tightly reseal containers.

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**PRECAUTIONARY STATEMENT:**

Huntsman Advanced Materials Americas LLC maintains up-to-date Material Safety Data Sheets (MSDS) on all of its products. These sheets contain pertinent information that you may need to protect your employees and customers against any known health or safety hazards associated with our products. Users should review the latest MSDS to determine possible health hazards and appropriate precautions to implement prior to using this material.

**First Aid!**

Refer to MSDS as mentioned above.

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