# Hetron™ FR 992

### Vinyl Ester

#### **Ashland Performance Materials**

## Message:

HETRON FR992 resin is a low viscosity, unpromoted, flame retardant") patented epoxy vinyl ester with F-Cat technology. This patented technology results in a resin that exhibits no foaming, excellent exotherm control, and industry-leading storage stability. Laminates made with HETRON FR992 resin have achieved a flame spread of <25 (ASTM E-84) when 3% antimony trioxide is added and a flame spread of <75 without antimony trioxide. HETRON FR992 resin gives final products with:

Excellent flame retardancy

High strength characteristics

Excellent impact strength and toughness

Fast wet-out and low drainage

Excellent corrosion resistance to acidic and alkaline environments

APPLICATIONS AND USE

HETRON FR992 resin can be used for corrosion resistant, reinforced thermosetting plastic equipment including filament wound, hand lay-up and spray-up tanks, pipes, ducts, stacks, scrubbers, linings or other equipment handling corrosive gases, vapors or liquids where a high degree of flame retardancy is required.

| General Information |   |      |             |  |  |      |               |  |  |
|---------------------|---|------|-------------|--|--|------|---------------|--|--|
| Features            | Acid Resistant  |      |             |  |  |      |               |  |  |
|                     | Alkali Resistant  |      |             |  |  |      |               |  |  |
|                     | Flame Retardant Good Corrosion Resistance Good Toughness High Impact Resistance High Strength |      |             |  |  |      |               |  |  |
|                     |   |      |             |  |  |      | Low Viscosity |  |  |
|                     |   |      |             |  |  |      |               |  |  |
|                     |   |      |             |  |  | Uses | Laminates     |  |  |
|                     |   |      |             |  |  |      | Liners        |  |  |
| Piping              |   |      |             |  |  |      |               |  |  |
| Tanks               |   |      |             |  |  |      |               |  |  |
|                     |   |      |             |  |  |      |               |  |  |
| Forms               | Liquid  |      |             |  |  |      |               |  |  |
| Processing Method   | Filament Winding  |      |             |  |  |      |               |  |  |
|                     | Hand Lay-up   |      |             |  |  |      |               |  |  |
|                     |   |      |             |  |  |      |               |  |  |
| Physical            | Nominal Value   | Unit | Test Method |  |  |      |               |  |  |

| Physical                        | Nominal Value | Unit  | Test Method |
|---------------------------------|---------------|-------|-------------|
| Solution Viscosity <sup>1</sup> | 425           | mPa∙s |             |
| Gardner Color                   | < 5.00        |       |             |
| Solids Content                  | 58            | %     |             |
| Peak Exotherm                   | 193           | °C    |             |
| Hardness                        | Nominal Value | Unit  | Test Method |
| Barcol Hardness                 | 35            |       | ASTM D2583  |

| Mechanical                             | Nominal Value | Unit | Test Method |
|--|---------------|------|-------------|
| Tensile Modulus                        | 3450          | MPa  | ASTM D638   |
| Tensile Strength                       | 89.6          | MPa  | ASTM D638   |
| Tensile Elongation                     |               |      | ASTM D638   |
| Yield                                  | 4.6           | %    |             |
| Break                                  | 5.0           | %    |             |
| Flexural Modulus                       | 3590          | MPa  | ASTM D790   |
| Flexural Strength                      | 145           | MPa  | ASTM D790   |
| Thermal                                | Nominal Value | Unit | Test Method |
| Deflection Temperature Under Load (1.8 |               |      |             |
| MPa, Unannealed)                       | 108           | °C   | ASTM D648   |
| Uncured Properties                     | Nominal Value | Unit |             |
| Gel Time                               | 17            | min  |             |
| NOTE                                   |               |      |             |

Brookfield #2 spindle @ 30 rpm

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