

## FR-6145

AMODEL FR-6145 is a 45% glass-reinforced polyphthalamide (PPA) resin which offers high strength and stiffness as well as good processability for electrical and electronic applications. This UL94-V0 resin is moldable in water-cooled molds and mold temperatures as low as 150°F (65°C) can be used.

### Typical Properties of AMODEL FR-6145 Resin

| Property                                       | ASTM<br>Test<br>Method | Typical Values <sup>(1)</sup> |                       |                      |                  |
|--|------------------------|-------------------------------|-----------------------|----------------------|------------------|
|  |                        | U.S. Customary Units          |                       | SI Units             |                  |
|  |                        | DAM <sup>(2)</sup>            | Units                 | DAM <sup>(2)</sup>   | Units            |
| <b>Mechanical</b>                              |                        |                               |                       |                      |                  |
| Tensile Strength                               | ASTM D 638             | 22.5                          | kpsi                  | 155                  | MPa              |
| Tensile Strength                               | ISO 527                | 22.5                          | kpsi                  | 155                  | MPa              |
| Tensile Modulus                                | ASTM D 638             | 2,940                         | kpsi                  | 20.3                 | GPa              |
| Tensile Modulus                                | ISO 527                | 2,860                         | kpsi                  | 19.7                 | GPa              |
| Tensile Elongation                             | ASTM D 638             | 1.6                           | %                     | 1.6                  | %                |
| Tensile Elongation                             | ISO 527                | 1.5                           | %                     | 1.5                  | %                |
| Flexural Strain                                | ISO 178                | 2.0                           | %                     | 2.0                  | %                |
| Flexural Strength                              | ASTM D 790             | 41.9                          | kpsi                  | 289                  | MPa              |
| Flexural Strength                              | ISO 178                | 43.5                          | kpsi                  | 300                  | MPa              |
| Flexural Modulus                               | ASTM D 790             | 2,520                         | kpsi                  | 17.4                 | GPa              |
| Flexural Modulus                               | ISO 178                | 2,320                         | kpsi                  | 16.0                 | GPa              |
| Izod Impact, Notched                           | ASTM D 256             | 2.1                           | ft-lb/in              | 112                  | J/m              |
| Izod Impact, Notched                           | ISO 180/1A             | 5.5                           | ft-lb/in <sup>2</sup> | 11.5                 | J/m <sup>2</sup> |
| Izod Impact, Unnotched                         | ASTM D 256             | 8.8                           | ft-lb/in              | 470                  | J/m              |
| <b>Electrical</b>                              |                        |                               |                       |                      |                  |
| Volume Resistivity                             | ASTM D 257             | 8 x 10 <sup>15</sup>          | ohm-cm                | 8 x 10 <sup>15</sup> | ohm-cm           |
| Surface Resistivity                            | ASTM D 257             | 6 x 10 <sup>15</sup>          | ohm                   | 6 x 10 <sup>15</sup> | ohm              |
| Dielectric Strength at 0.031 in. (0.8 mm)      | ASTM D 149             | 710                           | V/mil                 | 28                   | kV/mm            |
| Dielectric Strength at 0.062 in. (1.6 mm)      | ASTM D 149             | 585                           | V/mil                 | 23                   | kV/mm            |
| HWI, Performance Level Class (PLC)             | UL 746A -29            | 0                             |                       | 0                    |                  |
| HAI, Performance Level Class (PLC)             | UL 746A -30            | 0                             |                       | 0                    |                  |
| <b>Thermal</b>                                 |                        |                               |                       |                      |                  |
| Deflection Temperature at 264 psi (1.8 MPa)    | ASTM D 648             | 543                           | °F                    | 284                  | °C               |
| Flammability <sup>(3)</sup> 1/32" (0.8 mm) bar | UL-94                  | V0                            |                       | V0                   |                  |
| <b>General</b>                                 |                        |                               |                       |                      |                  |
| Specific Gravity                               | ASTM D 792             | 1.80                          |                       | 1.80                 |                  |
| Mold Shrinkage, Flow Direction                 | ASTM D 955             | 0.2                           | %                     | 0.2                  | %                |
| Mold Shrinkage, Transverse Direction           | ASTM D 955             | 0.4                           | %                     | 0.4                  | %                |

<sup>(1)</sup> Values are typical of limited production. Actual properties of individual batches will vary within specification limits. Values are typical of uncolored resin, addition of colorants or other additives may alter properties.

<sup>(2)</sup> "dry, as molded".

<sup>(3)</sup> This flammability rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

## Drying

Resin should be dried before molding because excessive moisture will result in nozzle drool, reduced mechanical properties, poor surface appearance, and sprue sticking. Extremely wet resin will result in a foamy extrudate. The target moisture level is 0.03 to 0.06% (300 to 600 ppm) and the maximum recommended drying temperature is 135°C (275°F).

Although AMODEL resins are shipped with less than 0.15% moisture and packaged in moisture-proof foil-lined bags or boxes, the resin should be dried for optimum molding results. The preferred drying condition is 4 hours at 120°C (248°F). Alternatively, the resins can be dried for 8 hours at 90°C (194°F). In either case, a desiccant bed dryer with a dew point below -30°C (-22°F) should be used.

### Drying Tips:

- Do not open containers until ready to process.
- Drying at temperatures higher than 125°C (257°F) may result in the darkening of natural colored pellets.
- If a thermogravimetric moisture analyzer is used, it should be set to 170°C (338°F)
- AMODEL resin in an open container needs to be dried as shown in the following table. The recommended drying time depends on how long the container has been open and the estimated relative humidity.

### Drying Time at 120°C (248°F), hours

| Relative Humidity, % | Elapsed Time From Container Opening, hours |     |     |     |     |
|----------------------|--|-----|-----|-----|-----|
|                      | 0.25                                       | 0.5 | 1   | 2   | 3   |
| 30                   | 4.5  | 5.0 | 5.5 | 6.0 | 6.5 |
| 50                   | 5.0  | 5.5 | 6.0 | 7.0 | 7.5 |
| 75                   | 5.0  | 5.5 | 6.5 | 7.5 | 8.0 |
| 100                  | 5.5  | 6.5 | 7.5 | 8.5 | 9.0 |

## Injection Molding

AMODEL FR-6145 resin can be readily injection molded in most screw injection molding machines. A general purpose screw is recommended, with minimum back pressure.

The melt temperature should be between 610°F and 640°F (321°C and 338°C). Generally this can be achieved with barrel temperatures from 600° to 615°F (315° to 324°C) in the rear zone gradually increasing to 620° to 630°F (327° to 332°C) in the front zone.

Set injection pressure to give rapid injection, 3 to 4 in./sec (7.6 to 10 cm/sec). Adjust holding pressure to one-half injection pressure. Set hold time to maximize part weight. Transfer from injection to hold pressure at the screw position just before the part is completely filled. A mold temperature between 150°F and 200°F (65°C and 93°C) is generally high enough to achieve full crystallinity in the typical molded part with this resin.

## Standard Packaging and Labeling

AMODEL FR-6145 resin is packaged in foil lined multiwall paper bags containing 25 kg (55.115 pounds) of material. Special packaging can be supplied upon request.

Individual packages will be plainly marked with the product number, the color, the lot number, and the net weight.

## Product Safety and Emergency Service

For product safety information or a Material Safety Data Sheet on a product of Solvay Advanced Polymers

**1 (800) 621-4557**

**1 (770) 772-8880 outside of U.S.**

For information or help in an emergency such as a spill, leak, fire or explosion, call day or night:

Emergency Health Information

**1 (800) 621-4590**

**1 (770) 772-5177 outside of U.S.**

Emergency Spill Information

**CHEMTREC 1 (800) 424-9300**

**1 (703) 527-3887 outside of U.S.  
collect calls accepted**

## For Additional Information

Technical Service

**1 (800) 621-4557**

Customer Service

**1 (800) 848-9744**

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