

## Solvay Specialty Polymers AvaSpire® AV-651 CF30 Polyaryletherketone (PAEK), 30% Carbon Fiber

Category : Polymer , Thermoplastic , Polyketone , Polyaryletherketone (PAEK), Carbon Fiber Filled

### Material Notes:

AvaSpire® AV-651 CF30 is a 30% carbon fiber reinforced version of AvaSpire® AV-651. This formulation offers some advantages relative to 30% carbon fiber reinforced PEEK which include better dimensional stability and warp resistance during injection molding. The AV-651 CF30 grade offers the highest strength, stiffness, and fatigue resistance of any AV-651-based grade. Furthermore, this resin generally retains most of the desirable ultra-performance attributes of carbon fiber reinforced PEEK. Those attributes include chemical resistance, fatigue resistance, and long term thermal oxidative stability. Features: Autoclave Sterilizable; E-beam Sterilizable; Ethylene Oxide Sterilizable; Fatigue Resistant; Flame Retardant; Good Chemical Resistance; Good Dimensional Stability; Good Sterilizability; Heat Sterilizable; High Heat Resistance; High Stiffness; High Strength; Radiation (Gamma) Resistant; Radiation Sterilizable; Radiotranslucent; Steam Resistant; Steam Sterilizable Uses: Dental Applications; Hospital Goods; Medical Devices; Medical/Healthcare Applications; Pump Parts; Seals; Surgical Instruments Injection Molding Notes: Back Pressure: Minimum Information provided by Solvay Specialty Polymers.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Solvay-Specialty-Polymers-AvaSpire-AV-651-CF30-Polyaryletherketone-PAEK-30-Carbon-Fiber.php](http://www.lookpolymers.com/polymer_Solvay-Specialty-Polymers-AvaSpire-AV-651-CF30-Polyaryletherketone-PAEK-30-Carbon-Fiber.php)

| Physical Properties               | Metric  | English   | Comments                   |
|-----------------------------------|---|---|----------------------------|
| Density                           | 1.42 g/cc   | 0.0513 lb/in <sup>3</sup>                                 | ASTM D792                  |
| Filler Content                    | 30 %  | 30 %  | Carbon Fiber               |
| Water Absorption                  | 0.20 %<br>@Time 86400 sec                                 | 0.20 %<br>@Time 24.0 hour                                 | ISO 62                     |
| Viscosity                         | 540000 cP<br>@Shear Rate 1000 1/s,<br>Temperature 400 Å°C | 540000 cP<br>@Shear Rate 1000 1/s,<br>Temperature 752 Å°F | Melt Viscosity; ASTM D3835 |
| Linear Mold Shrinkage, Flow       | 0.00 - 0.0020 cm/cm<br>@Thickness 3.18 mm                 | 0.00 - 0.0020 in/in<br>@Thickness 0.125 in                |                            |
| Linear Mold Shrinkage, Transverse | 0.0090 - 0.011 cm/cm<br>@Thickness 3.18 mm                | 0.0090 - 0.011 in/in<br>@Thickness 0.125 in               | ASTM D955                  |
| Melt Flow                         | 4.5 g/10 min<br>@Load 2.16 kg,<br>Temperature 400 Å°C     | 4.5 g/10 min<br>@Load 4.76 lb,<br>Temperature 752 Å°F     | ASTM D1238                 |

| Mechanical Properties | Metric  | English   | Comments            |
|-----------------------|---------|-----------|---------------------|
| Hardness, Rockwell M  | 104     | 104       | ASTM D785           |
| Tensile Strength      | 184 MPa | 26700 psi | 5 mm/min; ASTM D638 |

| Mechanical Properties        | Metric                 | English                    | Comments                     |
|------------------------------|------------------------|----------------------------|------------------------------|
| Elongation at Break          | 1.5 %                  | 1.5 %                      | Type 1A, 5 mm/min; ISO 527-2 |
|                              | 1.5 %                  | 1.5 %                      | 5 mm/min; ASTM D638          |
| Tensile Modulus              | 20.7 GPa               | 3000 ksi                   | 5 mm/min; ASTM D638          |
|                              | 21.1 GPa               | 3060 ksi                   | 1 mm/min, Type 1A; ISO 527-2 |
| Flexural Strength            | 262 MPa                | 38000 psi                  | ASTM D790                    |
|                              | 280 MPa                | 40600 psi                  | ISO 178                      |
| Flexural Modulus             | 17.2 GPa               | 2490 ksi                   | ASTM D790                    |
|                              | 19.1 GPa               | 2770 ksi                   | ISO 178                      |
| Compressive Strength         | 168 MPa                | 24400 psi                  | ASTM D695                    |
| Shear Strength               | 94.0 MPa               | 13600 psi                  | ASTM D732                    |
| Izod Impact, Notched         | 0.590 J/cm             | 1.11 ft-lb/in              | ASTM D256                    |
| Izod Impact, Unnotched       | 5.90 J/cm              | 11.1 ft-lb/in              | ASTM D256                    |
| Izod Impact, Notched (ISO)   | 8.40 kJ/m <sup>2</sup> | 4.00 ft-lb/in <sup>2</sup> | ISO 180                      |
| Izod Impact, Unnotched (ISO) | 37.0 kJ/m <sup>2</sup> | 17.6 ft-lb/in <sup>2</sup> | ISO 180                      |

| Thermal Properties                          | Metric   | English   | Comments            |
|---|--|---|---------------------|
| CTE, linear, Parallel to Flow               | 8.20 $\mu\text{m}/\text{m}\cdot\text{Å}^\circ\text{C}$ | 4.56 $\mu\text{in}/\text{in}\cdot\text{Å}^\circ\text{F}$  | 1                   |
|   | @Temperature -50.0 - 50.0 $\text{Å}^\circ\text{C}$     | @Temperature -58.0 - 122 $\text{Å}^\circ\text{F}$         |                     |
| Specific Heat Capacity                      | 1.32 J/g- $\text{Å}^\circ\text{C}$                     | 0.315 BTU/lb- $\text{Å}^\circ\text{F}$                    | ASTM C351           |
|   | @Temperature 50.0 $\text{Å}^\circ\text{C}$             | @Temperature 122 $\text{Å}^\circ\text{F}$                 |                     |
| Thermal Conductivity                        | 1.77 J/g- $\text{Å}^\circ\text{C}$                     | 0.423 BTU/lb- $\text{Å}^\circ\text{F}$                    | ASTM C351           |
|   | @Temperature 200 $\text{Å}^\circ\text{C}$              | @Temperature 392 $\text{Å}^\circ\text{F}$                 |                     |
| Thermal Conductivity                        | 0.360 W/m-K  | 2.50 BTU-in/hr-ft <sup>2</sup> - $\text{Å}^\circ\text{F}$ | ASTM C177           |
| Melting Point                               | 345 $\text{Å}^\circ\text{C}$                           | 653 $\text{Å}^\circ\text{F}$                              | ASTM D3418          |
| Deflection Temperature at 1.8 MPa (264 psi) | 212 $\text{Å}^\circ\text{C}$                           | 414 $\text{Å}^\circ\text{F}$                              | Annealed; ASTM D648 |
|   | @Thickness 3.20 mm                                     | @Thickness 0.126 in                                       |                     |
| Glass Transition Temp, Tg                   | 158 $\text{Å}^\circ\text{C}$                           | 316 $\text{Å}^\circ\text{F}$                              | DSC                 |

| Thermal Properties        | Metric                     | English                    | Comments |
|---------------------------|----------------------------|----------------------------|----------|
| Processing Properties     | Metric                     | English                    | Comments |
| Rear Barrel Temperature   | 366 Â°C                    | 691 Â°F                    |          |
| Middle Barrel Temperature | 371 Â°C                    | 700 Â°F                    |          |
| Front Barrel Temperature  | 377 Â°C                    | 711 Â°F                    |          |
| Nozzle Temperature        | 382 Â°C                    | 720 Â°F                    |          |
| Melt Temperature          | 366 - 388 Â°C              | 691 - 730 Â°F              |          |
| Mold Temperature          | 149 - 177 Â°C              | 300 - 351 Â°F              |          |
| Drying Temperature        | 149 Â°C<br>@Time 14400 sec | 300 Â°F<br>@Time 4.00 hour |          |

| Descriptive Properties  | Value  | Comments |
|-------------------------|--|----------|
| Availability            | Africa & Middle East<br>Asia Pacific<br>Europe<br>Latin America<br>North America |          |
| Color                   | Black  |          |
| Form                    | Pellets  |          |
| Injection Rate          | Fast   |          |
| Processing Technique    | Injection Molding; Machining; Profile Extrusion                                  |          |
| RoHS Compliance         | RoHS Compliant   |          |
| Screw Compression Ratio | 2.0:1.0 to 3.0:1.0   |          |

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