

## Solvay Specialty Polymers Amodel® AE-1133 Polyphthalamide (PPA), 33% Glass Fiber

Category : Polymer , Thermoplastic , Polyphthalamide (PPA) , Polyphthalamide (PPA), 30% Glass Fiber Reinforced

### Material Notes:

Amodel® AE-1133 is a 33% glass reinforced, heat stabilized polyphthalamide (PPA) designed to work in the modern automotive electrical environment. It has a high heat deflection temperature, high flexural modulus and high tensile strength. Excellent creep resistance and low moisture absorption are also characteristic of this resin. Features: Good Chemical Resistance; Good Creep Resistance; Good Dimensional Stability; Good Stiffness; High Heat Resistance; High Stiffness; High Strength; High Temperature Strength; Low Moisture Absorption Uses: Automotive Electronics; Connectors; Electrical Parts; Electrical/Electronic Applications Injection Molding Notes: Amodel® compounds are shipped in moisture-resistant packages at moisture levels according to specifications. Sealed, undamaged bags should be preferably stored in a dry room at a maximum temperature of 50°C (122°F) and should be protected from possible damage. If only a portion of a package is used, the remaining material should be transferred into a sealable container. It is recommended that Amodel® resins be dried prior to molding. Information provided by Solvay Specialty Polymers.

Order this product through the following link:

[http://www.lookpolymers.com/polymer\\_Solvay-Specialty-Polymers-Amodel-AE-1133-Polyphthalamide-PPA-33-Glass-Fiber.php](http://www.lookpolymers.com/polymer_Solvay-Specialty-Polymers-Amodel-AE-1133-Polyphthalamide-PPA-33-Glass-Fiber.php)

| Physical Properties               | Metric                    | English                   | Comments    |
|-----------------------------------|---------------------------|---------------------------|-------------|
| Density                           | 1.48 g/cc                 | 0.0535 lb/in <sup>3</sup> | ISO 1183    |
| Filler Content                    | 33 %                      | 33 %                      | Glass Fiber |
| Water Absorption                  | 0.21 %<br>@Time 86400 sec | 0.21 %<br>@Time 24.0 hour | ISO 62      |
| Linear Mold Shrinkage, Flow       | 0.0040 cm/cm              | 0.0040 in/in              |             |
| Linear Mold Shrinkage, Transverse | 0.0080 cm/cm              | 0.0080 in/in              | ASTM D955   |

| Mechanical Properties     | Metric                          | English                          | Comments     |
|---------------------------|---------------------------------|----------------------------------|--------------|
| Hardness, Rockwell R      | 125                             | 125                              | ASTM D785    |
| Tensile Strength at Break | 72.0 MPa<br>@Temperature 175 °C | 10400 psi<br>@Temperature 347 °F | 4; ISO 527-2 |
|                           | 80.0 MPa<br>@Temperature 150 °C | 11600 psi<br>@Temperature 302 °F | 4; ISO 527-2 |
|                           | 148 MPa<br>@Temperature 100 °C  | 21500 psi<br>@Temperature 212 °F | 4; ISO 527-2 |
|                           | 233 MPa<br>@Temperature 23.0    | 33800 psi                        | 4; ISO 527-2 |

| Mechanical Properties | °C<br>Metric         | @Temperature 73.4 °F<br>English | Comments     |
|-----------------------|----------------------|---------------------------------|--------------|
| Tensile Strength      | 221 MPa              | 32100 psi                       | ASTM D638    |
| Elongation at Break   | 2.5 %                | 2.5 %                           | ASTM D638    |
|                       | 2.5 %                | 2.5 %                           | ISO 527-2    |
|                       | @Temperature 23.0 °C | @Temperature 73.4 °F            |              |
|                       | 2.9 %                | 2.9 %                           | ISO 527-2    |
|                       | @Temperature 100 °C  | @Temperature 212 °F             |              |
|                       | 8.5 %                | 8.5 %                           | ISO 527-2    |
|                       | @Temperature 175 °C  | @Temperature 347 °F             |              |
|                       | 8.7 %                | 8.7 %                           | ISO 527-2    |
|                       | @Temperature 150 °C  | @Temperature 302 °F             |              |
| Tensile Modulus       | 13.1 GPa             | 1900 ksi                        | ASTM D638    |
|                       | 4.30 GPa             | 624 ksi                         | 4; ISO 527-2 |
|                       | @Temperature 175 °C  | @Temperature 347 °F             |              |
|                       | 6.70 GPa             | 972 ksi                         | 4; ISO 527-2 |
|                       | @Temperature 150 °C  | @Temperature 302 °F             |              |
|                       | 10.8 GPa             | 1570 ksi                        | 4; ISO 527-2 |
|                       | @Temperature 100 °C  | @Temperature 212 °F             |              |
|                       | 13.4 GPa             | 1940 ksi                        | 4; ISO 527-2 |
|                       | @Temperature 23.0 °C | @Temperature 73.4 °F            |              |
| Flexural Strength     | 317 MPa              | 46000 psi                       | ASTM D790    |
|                       | 80.0 MPa             | 11600 psi                       | 4; ISO 178   |
|                       | @Temperature 175 °C  | @Temperature 347 °F             |              |
|                       | 93.0 MPa             | 13500 psi                       | 4; ISO 178   |
|                       | @Temperature 150 °C  | @Temperature 302 °F             |              |
|                       | 227 MPa              | 32900 psi                       | 4; ISO 178   |
|                       | @Temperature 100 °C  | @Temperature 212 °F             |              |
|                       | 319 MPa              | 46300 psi                       | 4; ISO 178   |
|                       | @Temperature 23.0 °C | @Temperature 73.4 °F            |              |

| Flexural Modulus<br>Mechanical Properties | 11.4 GPa<br>Metric       | 1650 ksi<br>English   | ASTM D790<br>Comments     |
|-------------------------------------------|--------------------------|-----------------------|---------------------------|
|                                           | 3.60 GPa                 | 522 ksi               | ISO 178                   |
|                                           | @Temperature 175 Â°C     | @Temperature 347 Â°F  |                           |
|                                           | 4.00 GPa                 | 580 ksi               | ISO 178                   |
|                                           | @Temperature 150 Â°C     | @Temperature 302 Â°F  |                           |
|                                           | 9.80 GPa                 | 1420 ksi              | ISO 178                   |
|                                           | @Temperature 100 Â°C     | @Temperature 212 Â°F  |                           |
|                                           | 11.6 GPa                 | 1680 ksi              | ISO 178                   |
|                                           | @Temperature 23.0<br>Â°C | @Temperature 73.4 Â°F |                           |
| Compressive Strength                      | 185 MPa                  | 26800 psi             | ASTM D695                 |
| Poissons Ratio                            | 0.41                     | 0.41                  | ASTM E132                 |
| Shear Strength                            | 101 MPa                  | 14600 psi             | ASTM D732                 |
| Izod Impact, Notched                      | 0.800 J/cm               | 1.50 ft-lb/in         | ASTM D256                 |
| Izod Impact, Unnotched                    | 7.70 J/cm                | 14.4 ft-lb/in         | ASTM D256                 |
| Izod Impact, Notched (ISO)                | 8.80 kJ/mÂ²              | 4.19 ft-lb/inÂ²       | Type 1, Notch A; ISO 180  |
| Izod Impact, Unnotched (ISO)              | 49.0 kJ/mÂ²              | 23.3 ft-lb/inÂ²       | Type 1; ISO 180           |
| Charpy Impact Unnotched                   | 7.30 J/cmÂ²              | 34.7 ft-lb/inÂ²       | Type 1, Edgewise; ISO 179 |
| Charpy Impact, Notched                    | 0.950 J/cmÂ²             | 4.52 ft-lb/inÂ²       | Type 1, Edgewise; ISO 179 |

| Thermal Properties              | Metric                          | English                        | Comments       |
|---------------------------------|---------------------------------|--------------------------------|----------------|
| CTE, linear, Parallel to Flow   | 24.0 Âµm/m-Â°C                  | 13.3 Âµin/in-Â°F               | 2              |
|                                 | @Temperature 0.000 -<br>100 Â°C | @Temperature 32.0 -<br>212 Â°F |                |
|                                 | 27.0 Âµm/m-Â°C                  | 15.0 Âµin/in-Â°F               | 2              |
|                                 | @Temperature 100 -<br>200 Â°C   | @Temperature 212 -<br>392 Â°F  |                |
| CTE, linear, Transverse to Flow | 55.0 Âµm/m-Â°C                  | 30.6 Âµin/in-Â°F               | TMA; ASTM E831 |
|                                 | @Temperature 0.000 -<br>100 Â°C | @Temperature 32.0 -<br>212 Â°F |                |
|                                 | 110 Âµm/m-Â°C                   | 61.1 Âµin/in-Â°F               | TMA; ASTM E831 |
|                                 | @Temperature 100 -<br>200 Â°C   | @Temperature 212 -<br>392 Â°F  |                |

| Melting Point<br>Thermal Properties            | 313 Â°C<br>Metric             | 595 Â°F<br>English             | ISO 11357-3<br>Comments |
|------------------------------------------------|-------------------------------|--------------------------------|-------------------------|
|                                                | 313 Â°C                       | 595 Â°F                        | DSC                     |
| Maximum Service Temperature, Air               | 164 - 185 Â°C                 | 327 - 365 Â°F                  | Continuous Use          |
| Deflection Temperature at 0.46 MPa<br>(66 psi) | 297 Â°C<br>@Thickness 3.20 mm | 567 Â°F<br>@Thickness 0.126 in | Annealed; ASTM D648     |
| Deflection Temperature at 1.8 MPa<br>(264 psi) | 280 Â°C                       | 536 Â°F                        | Unannealed; ISO 75-2/A  |
|                                                | 285 Â°C<br>@Thickness 3.20 mm | 545 Â°F<br>@Thickness 0.126 in | Annealed; ASTM D648     |

| Electrical Properties      | Metric                           | English                          | Comments  |
|----------------------------|----------------------------------|----------------------------------|-----------|
| Volume Resistivity         | 1.00e+16 ohm-cm                  | 1.00e+16 ohm-cm                  | ASTM D257 |
| Dielectric Constant        | 4.2<br>@Frequency 1.00e+6 Hz     | 4.2<br>@Frequency 1.00e+6 Hz     | ASTM D150 |
|                            | 4.4<br>@Frequency 60.0 Hz        | 4.4<br>@Frequency 60.0 Hz        | ASTM D150 |
| Dielectric Strength        | 21.0 kV/mm<br>@Thickness 3.20 mm | 533 kV/in<br>@Thickness 0.126 in | ASTM D149 |
| Dissipation Factor         | 0.0050<br>@Frequency 60.0 Hz     | 0.0050<br>@Frequency 60.0 Hz     | ASTM D150 |
|                            | 0.017<br>@Frequency 1.00e+6 Hz   | 0.017<br>@Frequency 1.00e+6 Hz   | ASTM D150 |
| Arc Resistance             | 140 sec                          | 140 sec                          | ASTM D495 |
| Comparative Tracking Index | 550 V                            | 550 V                            | UL 746    |

| Processing Properties    | Metric        | English       | Comments |
|--------------------------|---------------|---------------|----------|
| Rear Barrel Temperature  | 304 - 318 Â°C | 579 - 604 Â°F |          |
| Front Barrel Temperature | 316 - 329 Â°C | 601 - 624 Â°F |          |
| Melt Temperature         | 321 - 343 Â°C | 610 - 649 Â°F |          |
| Mold Temperature         | 135 Â°C       | 275 Â°F       |          |
|                          |               |               |          |

| Processing Properties | 120 Å°C<br>Metric | 248 Å°F<br>English | Comments |
|-----------------------|-------------------|--------------------|----------|
|                       | @Time 14400 sec   | @Time 4.00 hour    |          |
| Moisture Content      | <= 0.045 %        | <= 0.045 %         |          |

| Descriptive Properties | Value                | Comments  |
|------------------------|----------------------|-----------|
| Additive               | Heat Stabilizer      |           |
| Availability           | Africa & Middle East |           |
|                        | Asia Pacific         |           |
|                        | Europe               |           |
|                        | Latin America        |           |
|                        | North America        |           |
| Color                  | Black; Natural       |           |
| Form                   | Pellets              |           |
| Part Marking Code      | >PA6T/6I/66-GF33<    | ISO 11469 |
| Processing Technique   | Injection Molding    |           |
| RoHS Compliance        | RoHS Compliant       |           |

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