

Amodel® HFZ A-4133L polyphthalamide

Amodel® HFZ A-4133 L polyphthalamide (PPA) is a 33% glass-reinforced, hot water moldable resin. Key properties include heat resistance, reduced outgassing and high strength and stiffness over a broad temperature range. It also displays low moisture absorption, excellent chemical resistance and excellent electrical properties.

Amodel® HFZ A-4133 L resin is ideal for automotive electrical and electronic applications, including

connectors, sockets, switches and sensors. It is also a good choice for under-hood enclosures that protect critical control systems such as anti-lock brakes, traction control, steering, electronic engine control, transmission and chassis control units.

- Black: HFZ A-4133 L BK 324
- Natural: HFZ A-4133 L NT

General

| | | |
|------------------------|--|--|
| Material Status | • Commercial: Active | |
| Availability | • Africa & Middle East • Asia Pacific • Europe | • Latin America • North America |
| Filler / Reinforcement | • Glass Fiber, 33% Filler by Weight | |
| Additive | • Lubricant | • Mold Release |
| Features | • Chemical Resistant • Creep Resistant • Fast Molding Cycle • Good Dimensional Stability • Good Stiffness • High Flow | • High Stiffness • High Strength • Hot Water Moldability • Low Moisture Absorption • Lubricated |
| Uses | • Automotive Applications • Automotive Electronics • Automotive Under the Hood • Bobbins/Spools • Camera Applications • Cell Phones • Connectors | • Electrical/Electronic Applications • General Purpose • Industrial Applications • Industrial Parts • Lawn & Garden Equipment • Machine/Mechanical Parts • Metal Replacement |
| RoHS Compliance | • RoHS Compliant | |
| Appearance | • Black | • Natural Color |
| Forms | • Pellets | |
| Processing Method | • Water-Heated Mold Injection Molding | |

| Physical | Typical Value | Unit | Test method |
|--------------------------|---------------|-------------------|-------------|
| Density | 1.46 | g/cm ³ | ISO 1183/A |
| Molding Shrinkage | | | ASTM D955 |
| Flow | 0.50 | % | |
| Across Flow | 1.0 | % | |
| Water Absorption (24 hr) | 0.26 | % | ASTM D570 |



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| Mechanical | Typical Value | Unit | Test method |
|------------------------|---------------|------|-------------|
| Tensile Modulus | 12000 | MPa | ISO 527-1 |
| Tensile Stress (Break) | 180 | MPa | ISO 527-2 |
| Tensile Strain (Break) | 1.8 | % | ISO 527-2 |
| Flexural Modulus | 11000 | MPa | ISO 178 |
| Flexural Stress | 255 | MPa | ISO 178 |

| Impact | Typical Value | Unit | Test method |
|--------------------------------|---------------|-------------------|-------------|
| Charpy Notched Impact Strength | 8.2 | kJ/m ² | ISO 179/1eA |
| Notched Izod Impact Strength | 8.4 | kJ/m ² | ISO 180/1A |
| Unnotched Izod Impact Strength | 40 | kJ/m ² | ISO 180/1U |

| Thermal | Typical Value | Unit | Test method |
|--|---------------|----------|-------------|
| Deflection Temperature Under Load 1.8 MPa, Unannealed | 310 | °C | ISO 75-2/A |
| Melting Temperature (DSC) | 327 | °C | ISO 3146 |
| CLTE | | | ASTM E831 |
| Flow : 0 to 90°C | 2.0E-5 | cm/cm/°C | |
| Flow : 150 to 250°C | 1.4E-5 | cm/cm/°C | |
| Transverse : 0 to 90°C | 6.3E-5 | cm/cm/°C | |
| Transverse : 150 to 250°C | 1.5E-4 | cm/cm/°C | |

| Electrical | Typical Value | Unit | Test method |
|--|---------------|---------|-------------|
| Surface Resistivity | 1.0E+16 | ohms | ASTM D257 |
| Volume Resistivity | 1.0E+15 | ohms·cm | ASTM D257 |
| Dielectric Strength | 19 | kV/mm | ASTM D149 |
| Dielectric Constant | | | ASTM D150 |
| 60 Hz | 3.90 | | |
| 1 MHz | 3.70 | | |
| Dissipation Factor | | | ASTM D150 |
| 60 Hz | 6.0E-3 | | |
| 1 MHz | 0.016 | | |
| High Amp Arc Ignition (HAI) | PLC 0 | | UL 746A |
| High Voltage Arc Resistance to Ignition (HVAR) | PLC 0 | | UL 746A |
| High Voltage Arc Tracking Rate (HVTR) | PLC 0 | | UL 746A |
| Hot-wire Ignition (HWI) | PLC 1 | | UL 746A |

| Flammability | Typical Value | Unit | Test method |
|------------------------------------|---------------|------|----------------|
| Flame Rating ¹ (0.8 mm) | HB | | UL 94 |
| Glow Wire Flammability Index | 800 | °C | IEC 60695-2-12 |
| Glow Wire Ignition Temperature | 800 | °C | IEC 60695-2-13 |



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| Injection | Typical Value | Unit |
|------------------------|----------------|------|
| Drying Temperature | 120 | °C |
| Drying Time | 4.0 | hr |
| Suggested Max Moisture | 0.030 to 0.060 | % |
| Rear Temperature | 318 to 324 | °C |
| Front Temperature | 327 to 332 | °C |
| Processing (Melt) Temp | 329 to 343 | °C |
| Mold Temperature | 66 to 93 | °C |

Injection Notes

Injection Pressure: 3 to 4 in/sec

Storage:

- 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 following the recommendations found in this datasheet and/or in the Amodel® processing guide.

Notes

Typical properties: these are not to be construed as specifications.

¹ These flammability ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions.

