

# Amodel® A-1933 HSL

## polyphthalamide

Amodel® A-1933 HSL is a 33% glass reinforced grade of polyphthalamide (PPA) resin. This grade was developed specifically for improved performance in a 50/50 ethylene glycol and water environment. This material was tested using the aggressive automotive coolant system, ethylene glycol with organic acid stabilizer, at 130°C (266°F). It exceeds the performance required by the automotive industry for polymeric materials exposed to high-temperature antifreeze solutions.

Potential applications include a variety of automotive components such as thermostat housings, heater core endcaps, heater hose connectors, and water inlets, outlets, and valves.

- Black: A-1933 HSL BK 328

### 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	• Heat Stabilizer • Lubricant	• Mold Release
Features	• Antifreeze Resistant • Chemical Resistant • Creep Resistant • Good Dimensional Stability • Good Glycol Resistance	• Good Stiffness • High Heat Resistance • High Strength • Lubricated
Uses	• Automotive Applications • Automotive Under the Hood	• Housings • Valves/Valve Parts
RoHS Compliance	• RoHS Compliant	
Automotive Specifications	• ASTM D6779 PA131G35 Color: BK328 Black • CHRYSLER MS-DB-478 CPN4771 Color: BK328 Black • GM GMP.PPA.019 Color: BK328 Black • GM GMW16360P-PPA-GF35 Color: BK328 Black • ISO 1874-PA6T/6I, MH, 11-120, GF33 Color: BK-328 Black • ISO 1874-PA6T/6I, MH, 11-120, GF33 Color: NT-07 Natural	
Appearance	• Black	
Forms	• Pellets	
Processing Method	• Injection Molding	

Physical	Typical Value	Unit	Test method
Density	1.49	g/cm <sup>3</sup>	ISO 1183/A
Molding Shrinkage			
Flow <sup>1</sup>	0.20	%	ASTM D955
Across Flow <sup>1</sup>	1.0	%	ASTM D955
Across Flow	1.0	%	ISO 294-4
Flow	0.20	%	ISO 294-4
Water Absorption (24 hr)	0.19	%	ASTM D570

# Amodel® A-1933 HSL

polyphthalamide

---

Mechanical	Typical Value	Unit	Test method
Tensile Modulus	11500	MPa	ISO 527-2
Tensile Stress (Yield)	195	MPa	ISO 527-2
Tensile Strain (Break)	1.8	%	ISO 527-2
Flexural Modulus	10300	MPa	ISO 178
Flexural Stress	280	MPa	ISO 178

Impact	Typical Value	Unit	Test method
Charpy Notched Impact Strength	8.2	kJ/m <sup>2</sup>	ISO 179/1eA
Notched Izod Impact Strength	8.1	kJ/m <sup>2</sup>	ISO 180/1A

Thermal	Typical Value	Unit	Test method
Heat Deflection Temperature 1.8 MPa, Unannealed	295	°C	ISO 75-2/A
Melting Temperature	323	°C	ISO 11357-3

Aging	Typical Value	Unit	Test method
Retention of Flexural Modulus - 1000 hr, in Glycol (130°C)	76	%	ISO 178
Retention of Flexural Strength - 1000 hr, in Glycol (130°C)	71	%	ISO 178
Retention of Tensile Modulus - 1000 hr, in Glycol (130°C)	75	%	ISO 527-2
Retention of Tensile Strength - 1000 hr, in Glycol (130°C)	69	%	ISO 527-2

Flammability	Typical Value	Unit	Test method
Flame Rating (> 0.8 mm, Black)	HB		UL 94

# Amodel® A-1933 HSL

polyphthalamide

---

Injection	Typical Value	Unit
Drying Temperature	120	°C
Drying Time	4.0	hr
Suggested Max Moisture	0.030 to 0.060	%
Rear Temperature	313 to 330	°C
Front Temperature	326 to 339	°C
Processing (Melt) Temp	331 to 352	°C
Mold Temperature	150	°C

---

## Injection Notes

---

### Mold Temperature:

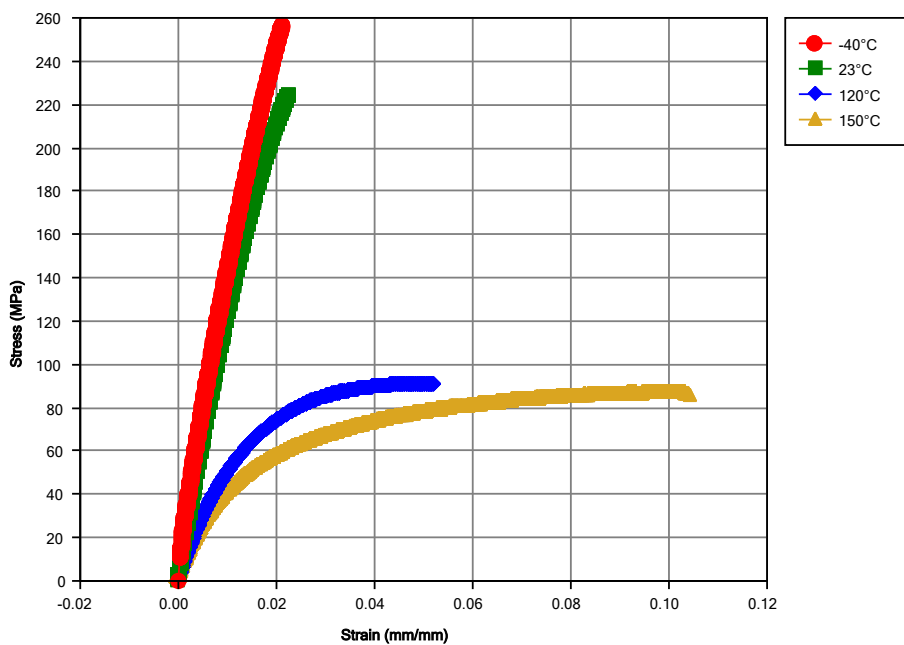
- Higher tool temperatures might be required for thin wall sections

### 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.
-

# Amodel® A-1933 HSL polyphthalamide

## Isothermal Stress vs. Strain (ISO 11403-1)



# Amodel® A-1933 HSL

polyphthalamide

---

## Notes

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

<sup>1</sup> Type D2

---

**[www.solvay.com](http://www.solvay.com)**

[SpecialtyPolymers.EMEA@solvay.com](mailto:SpecialtyPolymers.EMEA@solvay.com) | Europe, Middle East and Africa

[SpecialtyPolymers.Americas@solvay.com](mailto:SpecialtyPolymers.Americas@solvay.com) | Americas

[SpecialtyPolymers.Asia@solvay.com](mailto:SpecialtyPolymers.Asia@solvay.com) | Asia and Australia

Safety Data Sheets (SDS) are available by emailing us or contacting your sales representative. Always consult the appropriate SDS before using any of our products.

Neither Solvay Specialty Polymers nor any of its affiliates makes any warranty, express or implied, including merchantability or fitness for use, or accepts any liability in connection with this product, related information or its use. Some applications of which Solvay's products may be proposed to be used are regulated or restricted by applicable laws and regulations or by national or international standards and in some cases by Solvay's recommendation, including applications of food/feed, water treatment, medical, pharmaceuticals, and personal care. Only products designated as part of the Solviva® family of biomaterials may be considered as candidates for use in implantable medical devices. The user alone must finally determine suitability of any information or products for any contemplated use in compliance with applicable law, the manner of use and whether any patents are infringed. The information and the products are for use by technically skilled persons at their own discretion and risk and does not relate to the use of this product in combination with any other substance or any other process. This is not a license under any patent or other proprietary right.

All trademarks and registered trademarks are property of the companies that comprise the Solvay Group or their respective owners.

© 2019 Solvay Specialty Polymers. All rights reserved.

