Amodel® AS-1933 HS
polyphthalamide

Amodel® AS-1933 HS is a 33% glass reinforced grade of polyphthalamide (PPA) resin developed specifically for improved performance in a 50/50 ethylene glycol and water environment. This material exceeds the performance required by the automotive industry for polymeric materials exposed to antifreeze at 226°F (108°C), even when tested at 275°F (135°C).

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: AS-1933 HS BK 324

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	
Features	• Antifreeze Resistant • Chemical Resistant • Creep Resistant • Good Dimensional Stability • Good Glycol Resistance	• Good Stiffness • Heat Stabilized • High Heat Resistance • High Strength
Uses	• Automotive Applications • Automotive Under the Hood • Housings • Industrial Applications • Industrial Parts	• Machine/Mechanical Parts • Metal Replacement • Power/Other Tools • Thick-walled Parts • Valves/Valve Parts
RoHS Compliance	• RoHS Compliant	
Automotive Specifications	• ASTM D4000 PA121 G35 Color: BK324 Black • ASTM D6779 PA121G35 • BMW GS 93016 Color: BK 324 Black • BOSCH N28 BN05-OX1 BN0510-GF45-3Gsw01SO Color: BK324 Black • CHRYSLER MS-DB-478 CPN4116 Color: Black • FORD WSS-M4D861-A3 Color: BK324 Black • GM GMP.PPA.019 Color: Black • GM GMW16360P-PPA-GF35 Color: BK-324 Black • ISO 1874 PA6T/6I/66, MH, 12-120, GF33 Color: BK324 Black • PSA Peugeot-Citroën SPA X62 4203 • VALEO PDT NVB 10 057 Color: BK324 Black	
Appearance	• Black	
Forms	• Pellets	
Processing Method	• Injection Molding	

Physical	Typical Value	Unit	Test method
Density	1.45	g/cm³	ISO 1183/A
Molding Shrinkage			ASTM D955
Flow	0.20	%	
Across Flow	0.60	%	
Water Absorption (24 hr)	0.21	%	ASTM D570

Mechanical	Typical Value	Unit	Test method
Tensile Modulus			
--	11700	MPa	ASTM D638
-- [1]	7580	MPa	ASTM D638
--	12600	MPa	ISO 527-1
Tensile Strength			
Break	221	MPa	ASTM D638
Break [1]	75.8	MPa	ASTM D638
Break	212	MPa	ISO 527-2
Tensile Elongation (Break)	2.5	%	ASTM D638 ISO 527-2
Flexural Modulus			
--	10800	MPa	ASTM D790
--	10600	MPa	ISO 178
Flexural Stress			
--	309	MPa	ISO 178
Yield	313	MPa	ASTM D790

Impact	Typical Value	Unit	Test method
Charpy Notched Impact Strength	10	kJ/m²	ISO 179/1eA
Charpy Unnotched Impact Strength	76	kJ/m²	ISO 179/1eU
Notched Izod Impact			
--	91	J/m	ASTM D256
-- [1]	53	J/m	ASTM D256
--	9.5	kJ/m²	ISO 180/1A

Thermal	Typical Value	Unit	Test method
Deflection Temperature Under Load			
1.8 MPa, Unannealed	277	°C	ASTM D648
1.8 MPa, Unannealed	278	°C	ISO 75-2/Af
Melting Temperature	312	°C	ISO 11357-3

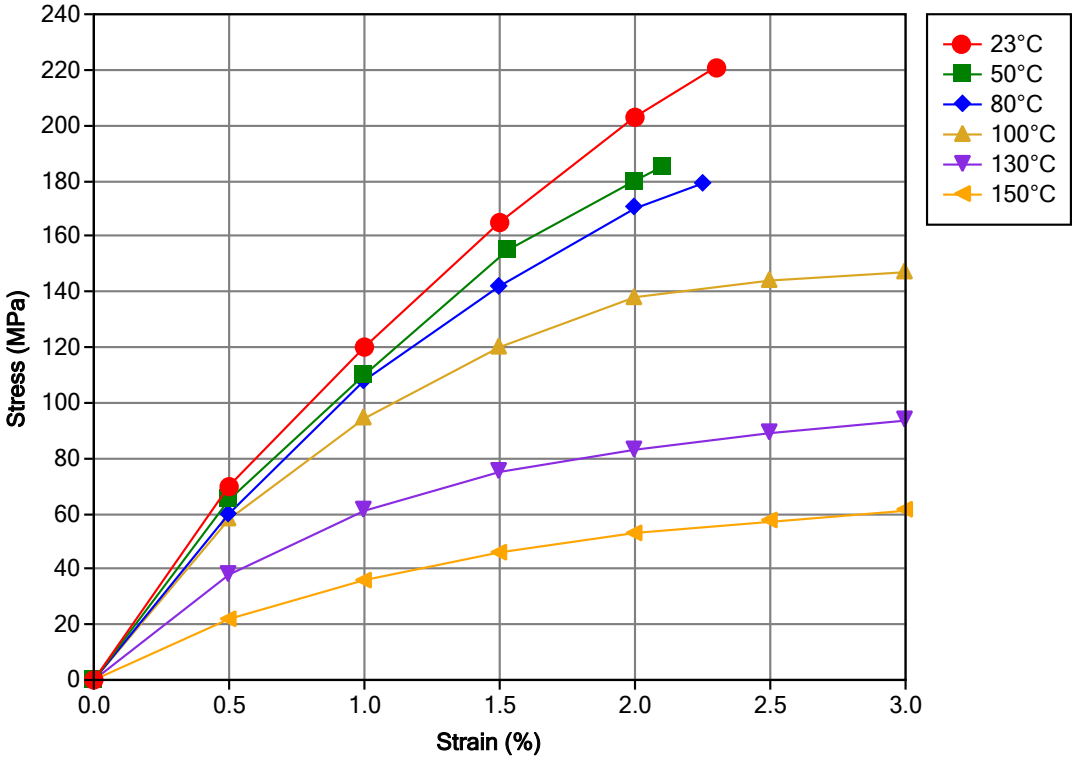
Injection	Typical Value	Unit
Drying Temperature	121	°C
Drying Time	4.0	hr
Suggested Max Moisture	0.030 to 0.060	%
Hopper Temperature	79	°C
Rear Temperature	304 to 318	°C
Front Temperature	316 to 329	°C
Processing (Melt) Temp	321 to 343	°C
Mold Temperature	135	°C

Injection Notes

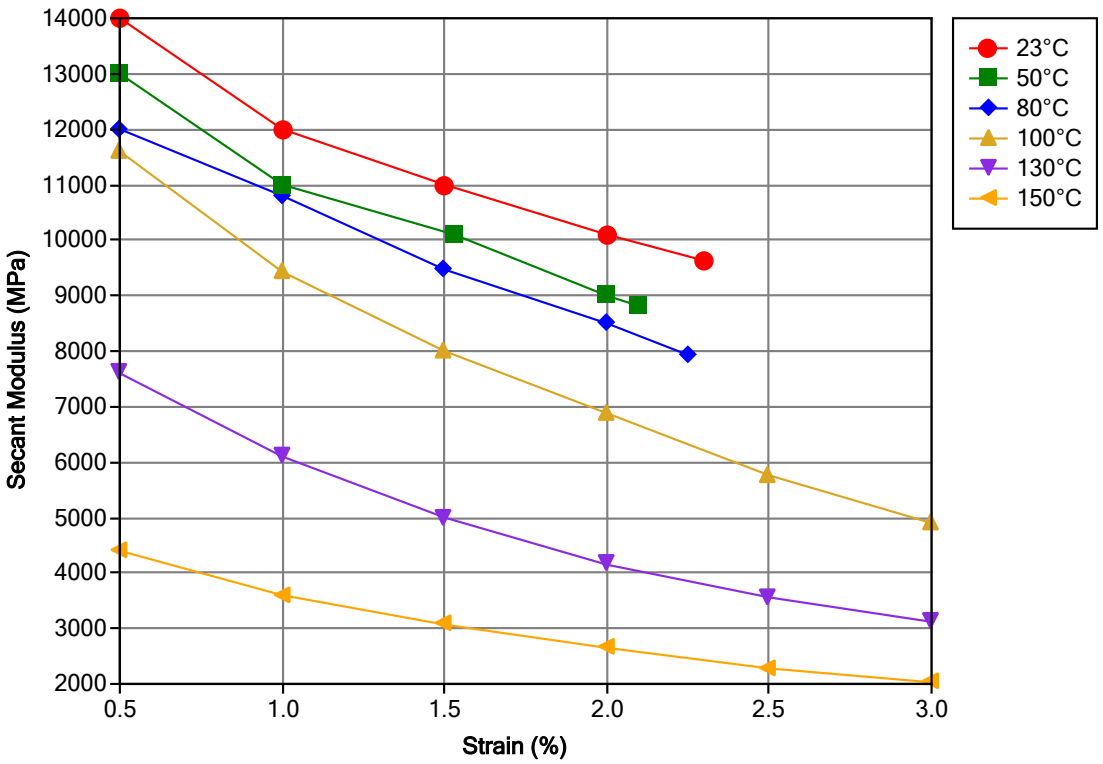
Storage:

- 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.

Isothermal Stress vs. Strain (ISO 11403)



Secant Modulus vs. Strain (ISO 11403)



Notes

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

[1] After Immersion in 50/50 Glycol/Water Mixture for 1,000 hours at 275°F (135°C)