

# Amodel® AS-1945 HS

## polyphthalamide

Amodel® AS-1945 HS is a 45% 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-1945 HS BK 324

### General

Material Status	<ul style="list-style-type: none"> <li>• Commercial: Active</li> </ul>
Availability	<ul style="list-style-type: none"> <li>• Africa &amp; Middle East</li> <li>• Asia Pacific</li> <li>• Europe</li> <li>• Latin America</li> <li>• North America</li> </ul>
Filler / Reinforcement	<ul style="list-style-type: none"> <li>• Glass Fiber, 45% Filler by Weight</li> </ul>
Additive	<ul style="list-style-type: none"> <li>• Heat Stabilizer</li> </ul>
Features	<ul style="list-style-type: none"> <li>• Antifreeze Resistant</li> <li>• Chemical Resistant</li> <li>• Creep Resistant</li> <li>• Good Dimensional Stability</li> <li>• Good Glycol Resistance</li> <li>• Good Stiffness</li> <li>• Heat Stabilized</li> <li>• High Heat Resistance</li> <li>• High Strength</li> </ul>
Uses	<ul style="list-style-type: none"> <li>• Automotive Applications</li> <li>• Automotive Under the Hood</li> <li>• Housings</li> <li>• Industrial Applications</li> <li>• Industrial Parts</li> <li>• Machine/Mechanical Parts</li> <li>• Metal Replacement</li> <li>• Power/Other Tools</li> <li>• Thick-walled Parts</li> <li>• Valves/Valve Parts</li> </ul>
RoHS Compliance	<ul style="list-style-type: none"> <li>• RoHS Compliant</li> </ul>
Automotive Specifications	<ul style="list-style-type: none"> <li>• ASTM D6779 PA121G45</li> <li>• CHRYSLER MS-DB-478 CPN 5101 Color: BK 324 Black<sup>1</sup></li> <li>• FORD WSS-M4D997-A Color: BK-324 Black</li> <li>• GM GMP.PPA.018 Color: BK-324 Black</li> <li>• GM GMW16360P-PPA-GF45 Color: BK-324 Black</li> <li>• IMDS ID 14880200 Color: BK-324 Black</li> </ul>
Appearance	<ul style="list-style-type: none"> <li>• Black</li> </ul>
Forms	<ul style="list-style-type: none"> <li>• Pellets</li> </ul>
Processing Method	<ul style="list-style-type: none"> <li>• Injection Molding</li> </ul>

Physical	Typical Value	Unit	Test method
Density	1.57	g/cm <sup>3</sup>	ISO 1183/A
Molding Shrinkage			
Flow <sup>2</sup>	0.20	%	ASTM D955
Across Flow <sup>2</sup>	0.60	%	ASTM D955
Across Flow	0.60	%	ISO 294-4
Flow	0.20	%	ISO 294-4

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<b>Mechanical</b>	<b>Typical Value</b>	<b>Unit</b>	<b>Test method</b>
Tensile Modulus			
--	15200	MPa	ASTM D638
-- <sup>3</sup>	10300	MPa	ASTM D638
--	15100	MPa	ISO 527-2
Tensile Strength			
Break	252	MPa	ASTM D638
Break <sup>3</sup>	107	MPa	ASTM D638
Break	244	MPa	ISO 527-2
Tensile Elongation (Break)	2.5	%	ASTM D638
Flexural Modulus			
--	13800	MPa	ASTM D790
--	12600	MPa	ISO 178
Flexural Stress			
--	335	MPa	ISO 178
Yield	359	MPa	ASTM D790
<b>Impact</b>	<b>Typical Value</b>	<b>Unit</b>	<b>Test method</b>
Charpy Notched Impact Strength	13	kJ/m <sup>2</sup>	ISO 179/1eA
Notched Izod Impact			
--	120	J/m	ASTM D256
-- <sup>3</sup>	69	J/m	ASTM D256
--	11	kJ/m <sup>2</sup>	ISO 180/1A
<b>Thermal</b>	<b>Typical Value</b>	<b>Unit</b>	<b>Test method</b>
Deflection Temperature Under Load			ASTM D648
1.8 MPa, Unannealed	282	°C	ISO 75-2/ Af
Melting Temperature	312	°C	ISO 11357-3

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## Injection

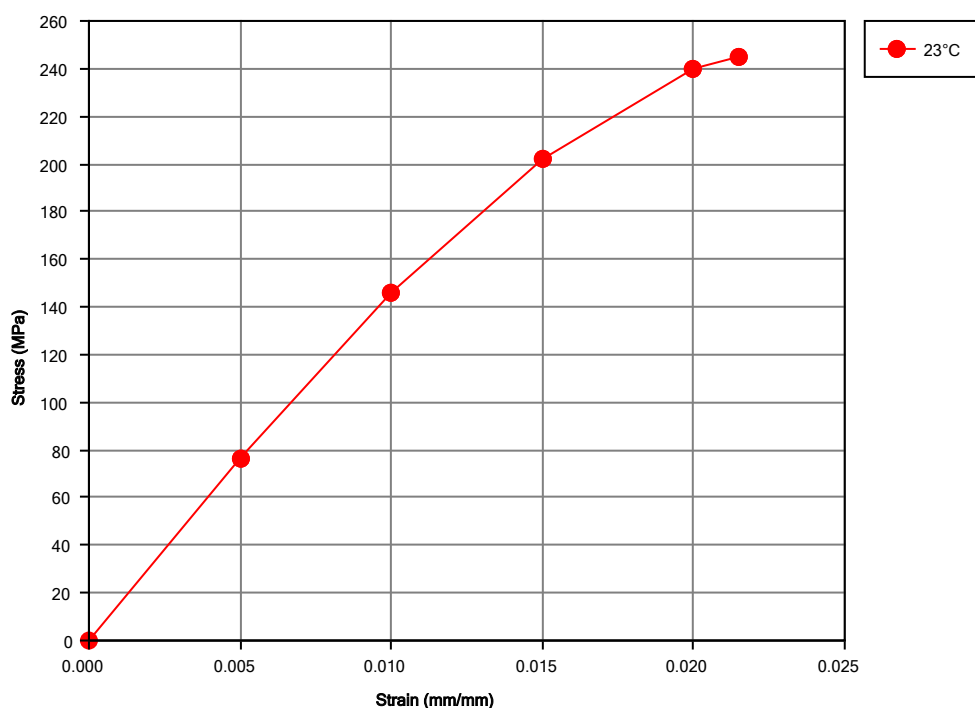
	Typical Value	Unit
Drying Temperature	121	°C
Drying Time	4.0	hr
Suggested Max Moisture	0.10	%
Hopper Temperature	79	°C
Rear Temperature	304 to 318	°C
Front Temperature	316 to 329	°C
Processing (Melt) Temp	321 to 343	°C
Mold Temperature	135	°C

## 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.

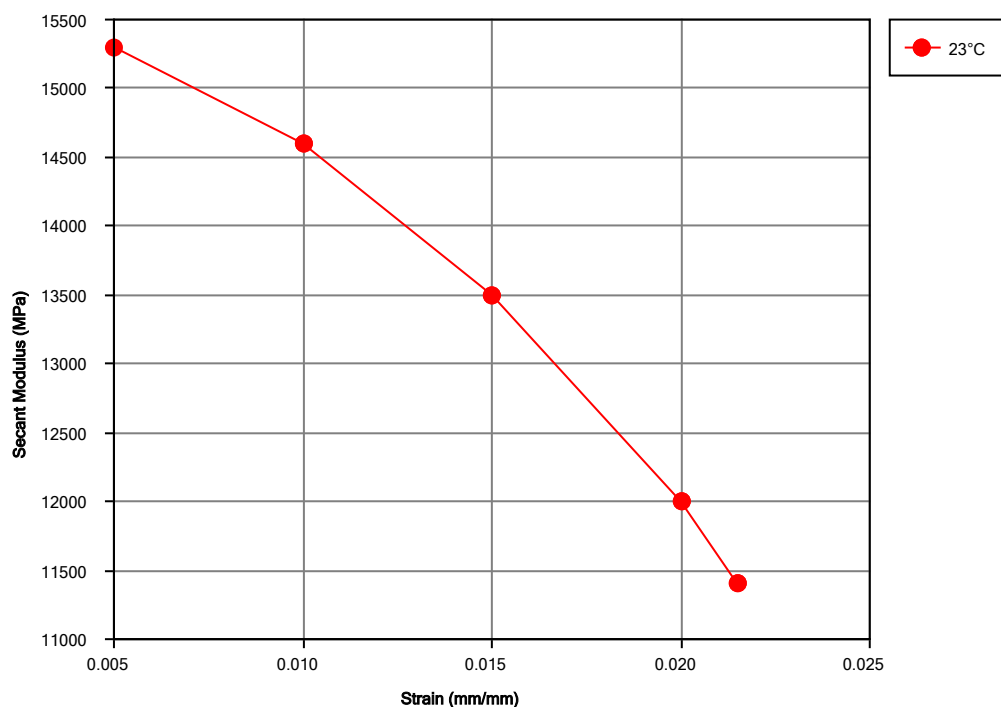
## Isothermal Stress vs. Strain (ISO 11403-1)



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## Secant Modulus vs. Strain (ISO 11403-1)



### Notes

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

<sup>1</sup> CPN 5101

<sup>2</sup> Type D2

<sup>3</sup> After Immersion in 50/50 Glycol/Water Mixture for 1,000 hours at 275°F (135°C)

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