

Amodel® AS-4145 HS

polyphthalamide

Amodel® AS-4145 HS polyphthalamide (PPA) is a 45% glass reinforced resin that is hot-water moldable. Key properties include high heat resistance, high strength and stiffness over a broad temperature range, low moisture absorption, excellent chemical resistance and excellent electrical properties.

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. Its rapid crystallization rate and high flow can result in shorter cycles, thereby enhancing molding productivity and lowering costs.

This resin is ideal for automotive electrical and electronic applications, including connectors, sockets, switches and

- Black: AS-4145 HS BK 324

General

Material Status	• Commercial: Active	
Availability	• Africa & Middle East • Asia Pacific • Europe	• Latin America • North America
Filler / Reinforcement	• Glass Fiber, 45% Filler by Weight	
Additive	• Heat Stabilizer • Lubricant	• Mold Release
Features	• Chemical Resistant • Creep Resistant • Fast Molding Cycle • Good Dimensional Stability • Good Stiffness • Heat Stabilized	• High Heat Resistance • High Strength • Hot Water Moldability • Low Moisture Absorption • Lubricated
Uses	• Abrasive Cleaning Material • Automotive Applications • Automotive Electronics • Automotive Under the Hood • Connectors • General Purpose • Housings	• Industrial Applications • Industrial Parts • Lawn and Garden Equipment • Machine/Mechanical Parts • Metal Replacement • Thick-walled Parts • Valves/Valve Parts
RoHS Compliance	• RoHS Compliant	
Automotive Specifications	• ASTM D6779 PA102G45	• TYCO 100-1632 Color: BK-324 Black
Appearance	• Black	
Forms	• Pellets	
Processing Method	• Water-Heated Mold Injection Molding	

Physical	Dry	Conditioned Unit	Test method
Density	1.55	-- g/cm ³	ISO 1183/A
Molding Shrinkage			ASTM D955
Flow	0.50	-- %	
Across Flow	1.0	-- %	
Water Absorption (24 hr)	0.21	-- %	ASTM D570

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Mechanical	Dry	Conditioned	Unit	Test method
Tensile Modulus				
--	15200	15200	MPa	ASTM D638
--	16100	--	MPa	ISO 527-2
Tensile Strength				
Break	228	186	MPa	ASTM D638
Break	224	--	MPa	ISO 527-2
Tensile Elongation				
Break	2.4	2.1	%	ASTM D638
Break	2.2	--	%	ISO 527-2
Flexural Modulus				
--	13100	13100	MPa	ASTM D790
--	13400	--	MPa	ISO 178
Flexural Stress				
--	327	--	MPa	ISO 178
Yield	328	269	MPa	ASTM D790
Compressive Strength	172	159	MPa	ASTM D695
Shear Strength	89.6	75.8	MPa	ASTM D732
Poisson's Ratio	0.40	--		ASTM E132
Impact	Dry	Conditioned	Unit	Test method
Charpy Notched Impact Strength	10	--	kJ/m ²	ISO 179/1eA
Charpy Unnotched Impact Strength	63	--	kJ/m ²	ISO 179/1eU
Notched Izod Impact				
--	100	96	J/m	ASTM D256
--	10	--	kJ/m ²	ISO 180/1A
Thermal	Dry	Conditioned	Unit	Test method
Deflection Temperature Under Load				
0.45 MPa, Annealed, 3.18 mm	320	--	°C	ASTM D648
1.8 MPa, Unannealed	298	--	°C	ISO 75-2/A
1.8 MPa, Annealed, 3.18 mm	300	--	°C	ASTM D648
Continuous Use Temperature ¹	210	--	°C	ASTM D3045
Melting Temperature	320	--	°C	ASTM D570 ISO 11357-3
CLTE				ASTM E831
Flow : 0 to 90°C	1.6E-5	--	cm/cm/°C	
Flow : 149 to 249°C	1.3E-5	--	cm/cm/°C	
Transverse : 0 to 90°C	5.9E-5	--	cm/cm/°C	
Transverse : 149 to 249°C	1.1E-4	--	cm/cm/°C	
Electrical	Dry	Conditioned	Unit	Test method
Volume Resistivity	8.0E+15	6.0E+14	ohms-cm	ASTM D257
Dielectric Strength (1.59 mm)	24	25	kV/mm	ASTM D149
Dielectric Constant				ASTM D150
60 Hz	4.00	4.90		
1 MHz	3.70	4.00		

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Electrical	Dry	Conditioned Unit	Test method
Dissipation Factor			ASTM D150
60 Hz	4.0E-3	0.024	
1 MHz	0.011	0.037	
Comparative Tracking Index (CTI)	600	600 V	UL 746
High Voltage Arc Tracking Rate (HVTR)	13.0	14.0 mm/min	UL 746

Flammability	Dry	Conditioned Unit	Test method
Flame Rating ² (3.2 mm)	HB	--	UL 94

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Injection

Dry Unit

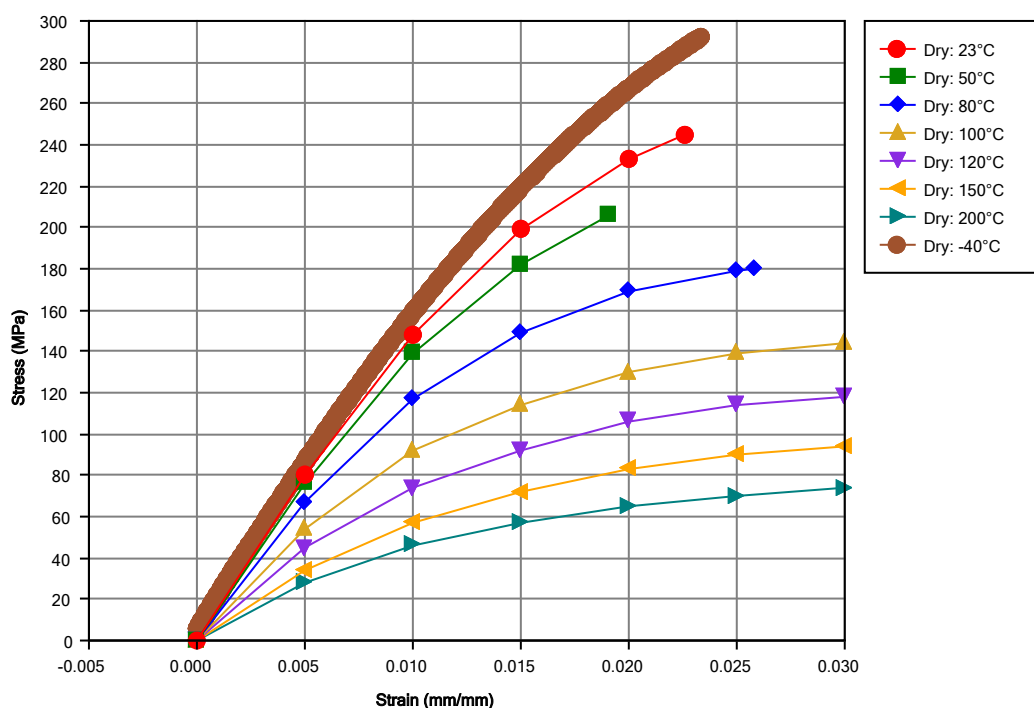
Drying Temperature	121 °C
Drying Time	4.0 hr
Suggested Max Moisture	0.10 %
Hopper Temperature	79 °C
Rear Temperature	318 to 324 °C
Front Temperature	327 to 332 °C
Processing (Melt) Temp	329 to 343 °C
Mold Temperature	66 to 93 °C

Injection Notes

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.

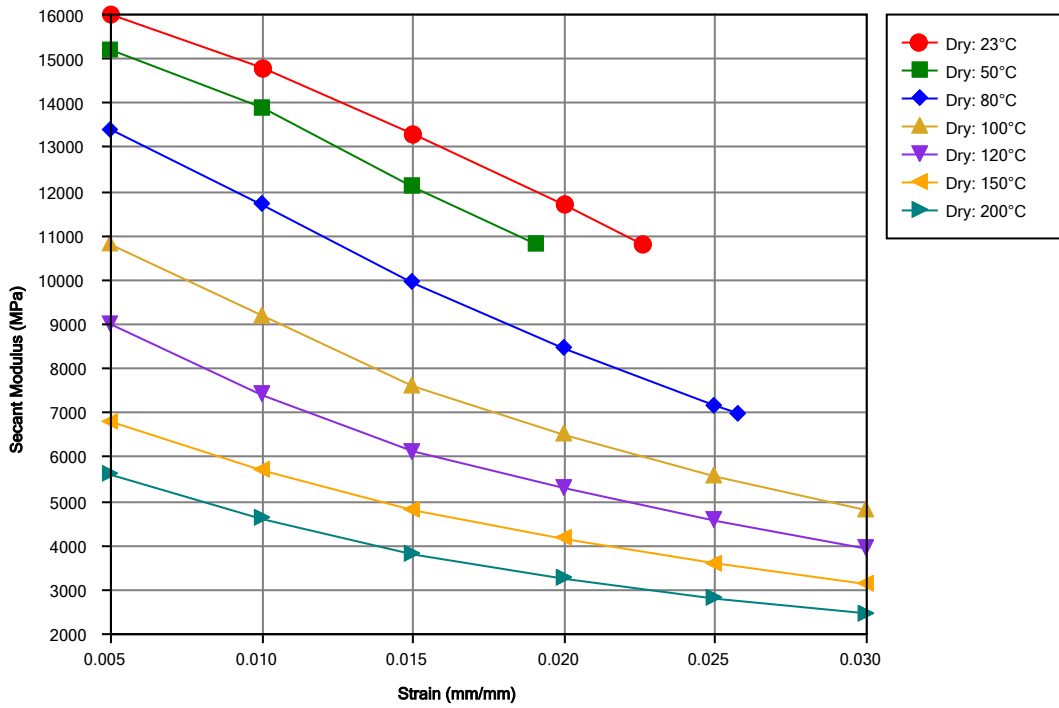
Isothermal Stress vs. Strain (ISO 11403-1)



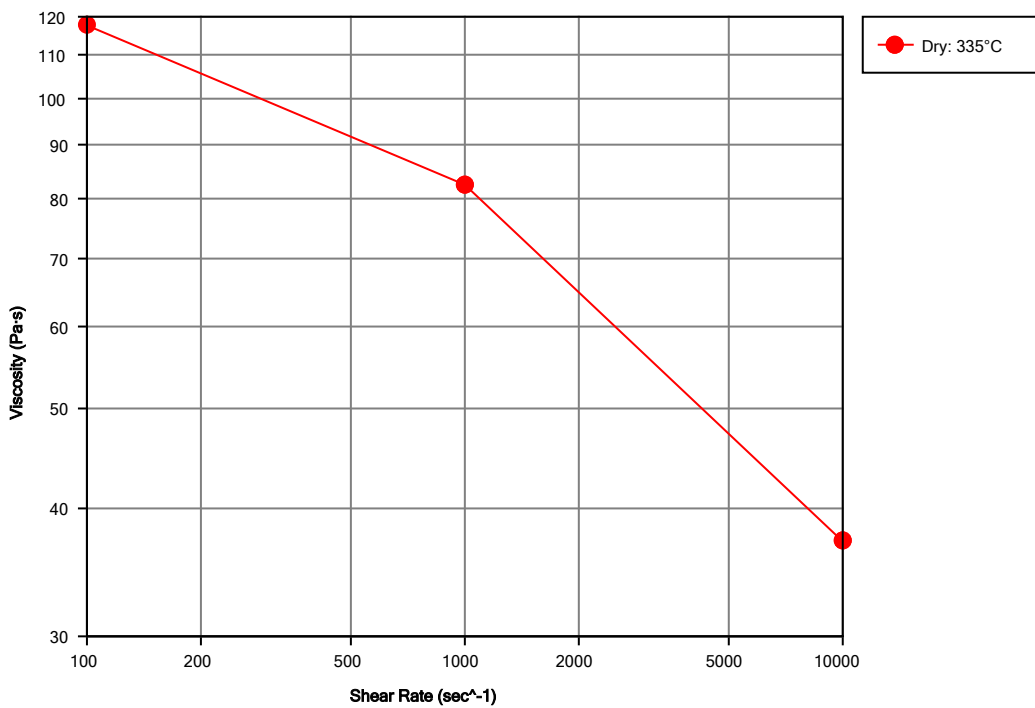
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Secant Modulus vs. Strain (ISO 11403-1)



Viscosity vs. Shear Rate (ISO 11403-2)



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Notes

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

¹ 1200 hr

² These flammability ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions.

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