Technical Data Sheet

Amodel® A-1145 HS
polyphthalamide

Amodel® A-1145 HS is a 45% glass reinforced, heat stabilized polyphthalamide (PPA) with a high heat deflection temperature, very high flexural modulus and very high tensile strength. Excellent creep resistance and low moisture absorption are also characteristic of this resin.

- Black: A-1145 HS BK 324
- Natural: A-1145 HS NT

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	
Features	• Chemical Resistant • Creep Resistant • Good Dimensional Stability • Good Stiffness	• High Heat Resistance • High Strength • High Temperature Strength • Low Moisture Absorption
Uses	• Automotive Applications • Automotive Electronics • Automotive Under the Hood • Connectors • Housings • Industrial Applications	• Industrial Parts • Machine/Mechanical Parts • Metal Replacement • Power/Other Tools • Valves/Valve Parts
RoHS Compliance	• RoHS Compliant	
Automotive Specifications	• 3M 11-0003-5762-1 Color: BK324 Black • ASTM D4000 PA121 G45 Color: BK324 Black • ASTM D4000 PA121 G45 Color: NT Natural • ASTM D4000 PPA0120 G46 A95726 AA002 CD295 GB159 MF015Z Color: BN575 Brown • ASTM D6779 PA121G45 • BOSCH 9 916 365 011 Color: BK 324 Black • BOSCH 9 916 365 011 Color: NT Natural • FORD WSB-M4D861-A Color: BK324 Black • FORD WSB-M4D861-A Color: NT Natural • GM GMP.PPA.008 Color: BK324 Black • GM GMP.PPA.008 Color: NT Natural • GM GMW16356P-PPA-GF45 Color: BK-324 Black • GM GMW16356P-PPA-GF45 Color: NT Natural • ISO 1874 PA6T/6I/66, MH, 12-160, GF45 Color: NT Natural • STELLANTIS MS-DB-478 Type B CPN3567 Color: Black • TRW S-13301201 Color: BK324 Black	
Appearance	• Black	• Natural Color
Forms	• Pellets	
Processing Method	• Injection Molding	

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Physical	Dry	Conditioned	Unit	Test method
Density	1.59	--	g/cm³	ISO 1183/A
Molding Shrinkage				ASTM D955
Flow	0.20	0.10	%	
Across Flow	0.60	0.10	%	
Water Absorption (24 hr)	0.12	--	%	ASTM D570

Mechanical	Dry	Conditioned	Unit	Test method
Tensile Modulus				
--	17200	17200	MPa	ASTM D638
23°C	16800	--	MPa	ISO 527-1
100°C	11200	--	MPa	ISO 527-1
150°C	8000	--	MPa	ISO 527-1
175°C	5380	--	MPa	ISO 527-1
Tensile Stress				
Break, 23°C	263	--	MPa	ISO 527-2
Break, 100°C	173	--	MPa	ISO 527-2
Break, 150°C	84.8	--	MPa	ISO 527-2
Break, 175°C	75.8	--	MPa	ISO 527-2
--	259	228	MPa	ASTM D638
Tensile Elongation				
Break	2.6	2.1	%	ASTM D638
Break, 23°C	2.7	--	%	ISO 527-2
Break, 100°C	2.5	--	%	ISO 527-2
Break, 150°C	7.2	--	%	ISO 527-2
Break, 175°C	6.5	--	%	ISO 527-2
Flexural Modulus				
--	13800	13800	MPa	ASTM D790
23°C	15900	--	MPa	ISO 178
100°C	13000	--	MPa	ISO 178
150°C	5380	--	MPa	ISO 178
175°C	4900	--	MPa	ISO 178
Flexural Strength				
--	363	294	MPa	ASTM D790
23°C	377	--	MPa	ISO 178
100°C	267	--	MPa	ISO 178
150°C	111	--	MPa	ISO 178
175°C	94.5	--	MPa	ISO 178
Compressive Strength (25.4 mm)	194	--	MPa	ASTM D695
Shear Strength	108	91.7	MPa	ASTM D732
Poisson's Ratio	0.41	--		ASTM E132

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Impact	Dry	Conditioned	Unit	Test method
Charpy Notched Impact Strength (23°C)	10	--	kJ/m²	ISO 179/1eA
Charpy Unnotched Impact Strength (23°C)	92	--	kJ/m²	ISO 179/1eU
Notched Izod Impact				
--	110	100	J/m	ASTM D256
23°C	10	--	kJ/m²	ISO 180/1A
Unnotched Izod Impact				
--	1100	--	J/m	ASTM D4812
23°C	61	--	kJ/m²	ISO 180/1U

Hardness	Dry	Conditioned	Unit	Test method
Rockwell Hardness (R-Scale)	125	--		ASTM D785

Thermal	Dry	Conditioned	Unit	Test method
Deflection Temperature Under Load				
0.45 MPa, Annealed, 3.20 mm	301	--	°C	ASTM D648
1.8 MPa, Unannealed	281	--	°C	ISO 75-2/A
1.8 MPa, Annealed, 3.20 mm	287	--	°C	ASTM D648
Continuous Use Temperature				ASTM D3045
-- [1]	165	--	°C	
-- [2]	185	--	°C	
Melting Temperature	310	--	°C	ISO 11357-3 ASTM D3418
CLTE				ASTM E831
Flow : 0 to 100°C	1.4E-5	--	cm/cm/°C	
Flow : 100 to 200°C	3.5E-5	--	cm/cm/°C	
Transverse : 0 to 100°C	5.0E-5	--	cm/cm/°C	
Transverse : 100 to 200°C	1.5E-4	--	cm/cm/°C	

Electrical	Dry	Conditioned	Unit	Test method
Volume Resistivity	1.0E+16	2.0E+15	ohms·cm	ASTM D257
Dielectric Strength (3.20 mm)	23	23	kV/mm	ASTM D149
Dielectric Constant				ASTM D150
60 Hz	4.60	4.90		
1 MHz	4.40	4.50		
Dissipation Factor				ASTM D150
60 Hz	5.0E-3	9.0E-3		
1 MHz	0.016	0.021		
Arc Resistance	145	125	sec	ASTM D495
Comparative Tracking Index (CTI)	550	550	V	UL 746A

Flammability	Dry	Conditioned	Unit	Test method
Flame Rating [3] (3.2 mm)	HB	--		UL 94

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Injection	Dry	Unit
Drying Temperature	120	°C
Drying Time	4.5	hr
Suggested Max Moisture	0.030 to 0.060	%
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.

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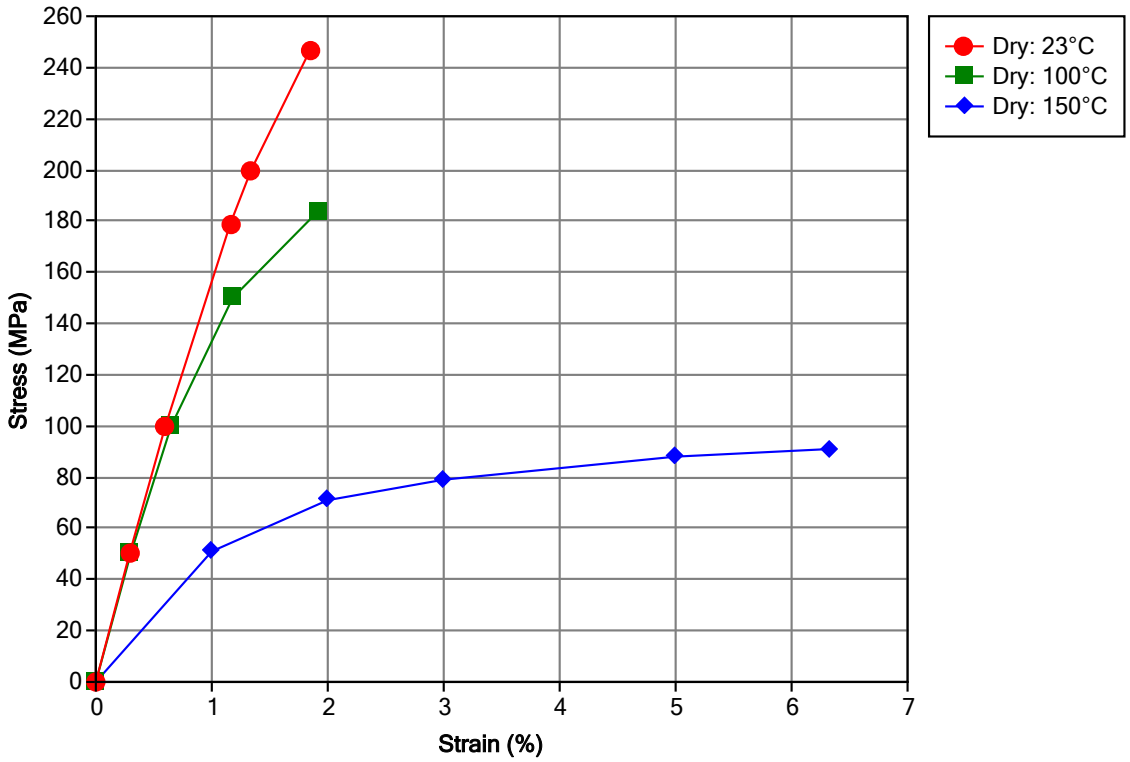
Isothermal Stress vs. Strain (ISO 11403)



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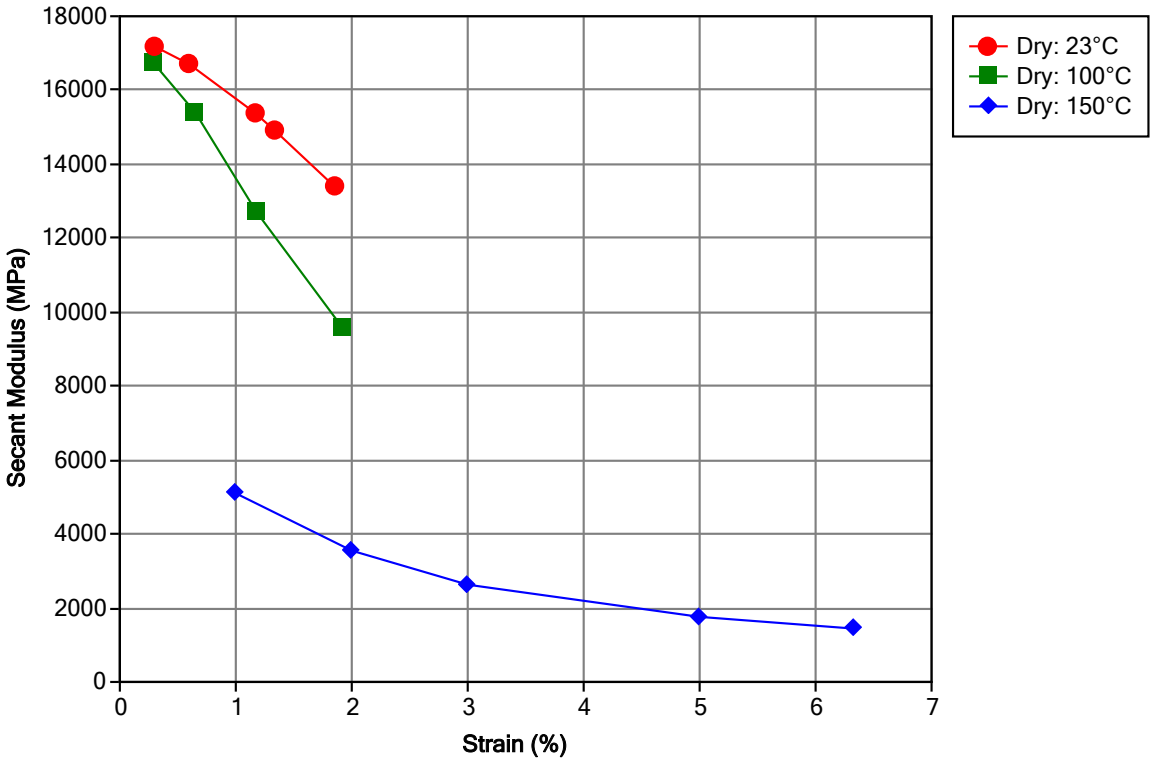
Secant Modulus vs. Strain (ISO 11403)



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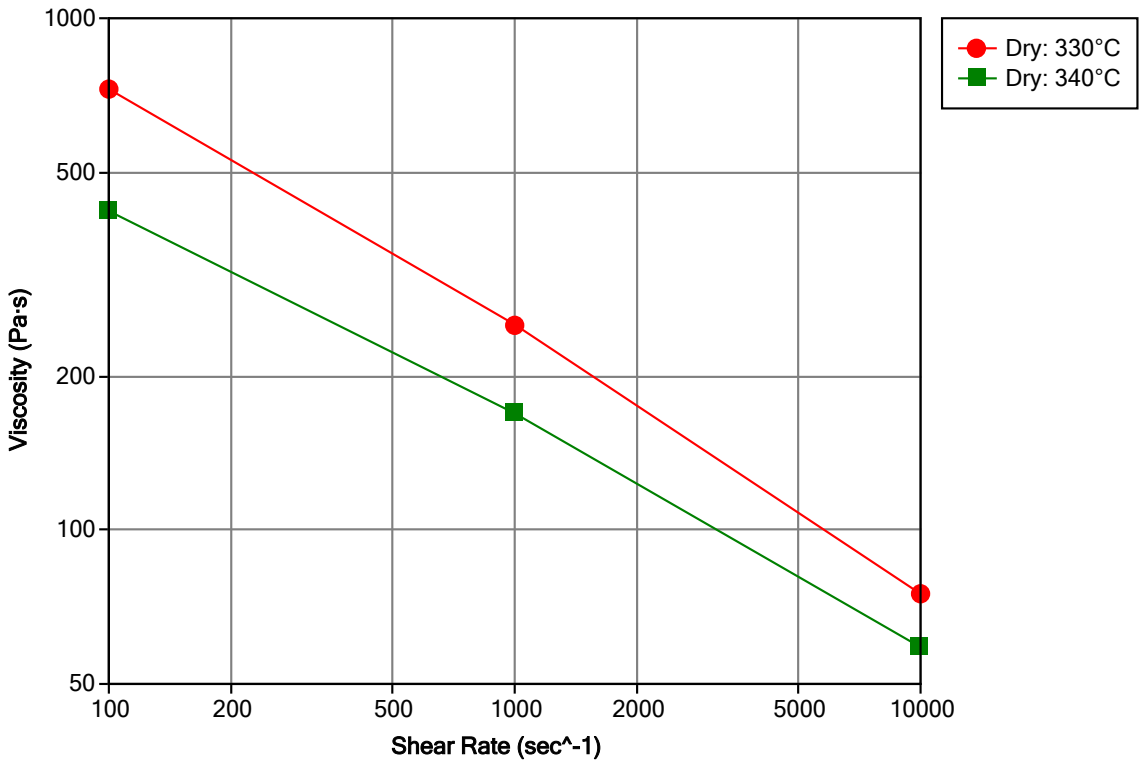
Viscosity vs. Shear Rate (ISO 11403)



Notes

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

[1] 20000 hr

[2] 5000 hr

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