

VALOX™ FR Resin 420SE0 - Americas

Polybutylene Terephthalate
SABIC

Technical Data

Product Description

VALOX 420SE0 Polybutylene Terephthalate (PBT) resin is a 30% glass fiber reinforced, injection moldable grade. This brominated flame retardant PBT has a UL V0 and 5VA rating. VALOX 420SE0 resin is a general purpose resin that is an excellent candidate for a wide variety of applications including electrical components, bobbins, switches, stators, commutators and cooling fans.

General

Material Status	• Commercial: Active
Literature ¹	• Technical Datasheet
UL Yellow Card ²	• E121562-101092083 • E121562-101513781
Search for UL Yellow Card	• SABIC
Availability	• Latin America • North America
Filler / Reinforcement	• Glass Fiber, 30% Filler by Weight
Uses	<ul style="list-style-type: none"> • Aerospace Applications • Appliances • Automotive Exterior Parts • Automotive Interior Parts • Automotive Lighting • Automotive Under the Hood • Construction Applications • Electrical/Electronic Applications • Electronic Displays • Industrial Applications • Lighting Applications • Medical/Healthcare Applications • Non-specific Food Applications • Sporting Goods
Automotive Specifications	• CHRYSLER MS-DB-400 CPN2253 Color: Black • GM GMP.PBT.005
Processing Method	• Injection Molding
Multi-Point Data	<ul style="list-style-type: none"> • Flexural DMA (ASTM D4065) • Instrumented Impact (Energy) (ASTM D3763) • Instrumented Impact (Load) (ASTM D3763) • Shear DMA (ASTM D4065) • Specific Heat vs. Temperature (ASTM D3417) • Tensile Creep (ASTM D2990) • Tensile Fatigue • Tensile Stress vs. Strain (ASTM D638) • Viscosity vs. Shear Rate (ASTM D3835)
Also Available In	• Asia Pacific • Europe

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Density / Specific Gravity			
--	1.63	1.63 g/cm ³	ASTM D792
--	1.63 g/cm ³	1.63 g/cm ³	ISO 1183
Specific Volume	16.9 in ³ /lb	0.610 cm ³ /g	ASTM D792
Melt Mass-Flow Rate (MFR) (250°C/5.0 kg)	42 g/10 min	42 g/10 min	ASTM D1238
Melt Volume-Flow Rate (MVR) (250°C/5.0 kg)	1.77 in ³ /10min	29.0 cm ³ /10min	ISO 1133
Molding Shrinkage			Internal Method
Flow ⁴	1.0E-3 to 5.0E-3 in/in	0.10 to 0.50 %	
Flow : 0.126 in (3.20 mm)	5.0E-3 to 7.0E-3 in/in	0.50 to 0.70 %	
Across Flow ⁴	4.0E-3 to 8.0E-3 in/in	0.40 to 0.80 %	
Across Flow : 0.126 in (3.20 mm)	5.0E-3 to 0.010 in/in	0.50 to 1.0 %	
Water Absorption			ISO 62
Saturation, 73°F (23°C)	0.090 %	0.090 %	
Equilibrium, 73°F (23°C), 50% RH	0.070 %	0.070 %	
Outdoor Suitability	f2	f2	UL 746C

Mechanical	Nominal Value (English)	Nominal Value (SI)	Test Method
Tensile Modulus			
-- ⁵	1.74E+6 psi	12000 MPa	ASTM D638
--	1.45E+6 psi	10000 MPa	ISO 527-2/1
Tensile Strength			
Yield ⁶	17400 psi	120 MPa	ASTM D638
Yield	17400 psi	120 MPa	ISO 527-2/5
Break ⁶	17400 psi	120 MPa	ASTM D638
Break	17400 psi	120 MPa	ISO 527-2/5



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Mechanical	Nominal Value (English)	Nominal Value (SI)	Test Method
Tensile Elongation			
Yield ⁶	2.0 %	2.0 %	ASTM D638
Yield	1.9 %	1.9 %	ISO 527-2/5
Break ⁶	2.0 %	2.0 %	ASTM D638
Break	1.9 %	1.9 %	ISO 527-2/5
Flexural Modulus			
1.97 in (50.0 mm) Span ⁷	1.42E+6 psi	9800 MPa	ASTM D790
-- ⁸	1.38E+6 psi	9500 MPa	ISO 178
Flexural Stress			
--	26100 psi	180 MPa	ISO 178
Break, 1.97 in (50.0 mm) Span ⁷	27000 psi	186 MPa	ASTM D790
Taber Abrasion Resistance			
1000 Cycles, 1000 g, CS-17 Wheel	22.0 mg	22.0 mg	Internal Method
Impact			
Charpy Notched Impact Strength⁹			ISO 179/1eA
-22°F (-30°C)	2.9 ft·lb/in ²	6.0 kJ/m ²	
73°F (23°C)	3.3 ft·lb/in ²	7.0 kJ/m ²	
Charpy Unnotched Impact Strength⁹			ISO 179/1eU
-22°F (-30°C)	24 ft·lb/in ²	50 kJ/m ²	
73°F (23°C)	24 ft·lb/in ²	50 kJ/m ²	
Notched Izod Impact			
-22°F (-30°C)	1.1 ft·lb/in	57 J/m	ASTM D256
73°F (23°C)	1.1 ft·lb/in	60 J/m	ASTM D256
-22°F (-30°C) ¹⁰	2.9 ft·lb/in ²	6.0 kJ/m ²	ISO 180/1A
73°F (23°C) ¹⁰	3.3 ft·lb/in ²	7.0 kJ/m ²	ISO 180/1A
Unnotched Izod Impact			
73°F (23°C)	12 ft·lb/in	620 J/m	ASTM D4812
-22°F (-30°C) ¹⁰	21 ft·lb/in ²	45 kJ/m ²	ISO 180/1U
73°F (23°C) ¹⁰	21 ft·lb/in ²	45 kJ/m ²	ISO 180/1U
Instrumented Dart Impact			
73°F (23°C), Total Energy	44.3 in·lb	5.00 J	ASTM D3763
Hardness			
Rockwell Hardness (R-Scale)			ASTM D785
	119	119	ISO 2039-2
Ball Indentation Hardness (H 358/30)			ISO 2039-1
	17100 psi	118 MPa	
Thermal			
Deflection Temperature Under Load			
66 psi (0.45 MPa), Unannealed, 0.126 in (3.20 mm)	414 °F	212 °C	ASTM D648
66 psi (0.45 MPa), Unannealed, 0.157 in (4.00 mm), 3.94 in (100 mm) Span ¹¹	428 °F	220 °C	ISO 75-2/Be
264 psi (1.8 MPa), Unannealed, 0.126 in (3.20 mm)	392 °F	200 °C	ASTM D648
264 psi (1.8 MPa), Unannealed, 0.157 in (4.00 mm), 3.94 in (100 mm) Span ¹¹	383 °F	195 °C	ISO 75-2/Ae
264 psi (1.8 MPa), Unannealed, 0.157 in (4.00 mm), 2.52 in (64.0 mm) Span ¹⁰	392 °F	200 °C	ISO 75-2/Af
Vicat Softening Temperature			
--	392 °F	200 °C	ASTM D1525 ¹²
--	428 °F	220 °C	ISO 306/A50
Ball Pressure Test			
253 to 261°F (123 to 127°C)	Pass	Pass	IEC 60695-10-2



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Thermal	Nominal Value (English)	Nominal Value (SI)	Test Method
CLTE			
Flow : -40 to 104°F (-40 to 40°C)	1.4E-5 in/in/°F	2.5E-5 cm/cm/°C	ASTM E831 ISO 11359-2
Flow : 73 to 176°F (23 to 80°C)	1.4E-5 in/in/°F	2.5E-5 cm/cm/°C	ISO 11359-2
Transverse : -40 to 104°F (-40 to 40°C)	4.9E-5 in/in/°F	8.9E-5 cm/cm/°C	ASTM E831
Transverse : -40°F (-40°C)	4.9E-5 in/in/°F	8.9E-5 cm/cm/°C	ISO 11359-2
Transverse : 73 to 176°F (23 to 80°C)	6.7E-5 in/in/°F	1.2E-4 cm/cm/°C	ISO 11359-2
Thermal Conductivity	1.7 Btu·in/hr/ft²/°F	0.25 W/m/K	ISO 8302
RTI Elec	266 °F	130 °C	UL 746
RTI Imp	266 °F	130 °C	UL 746
RTI Str	284 °F	140 °C	UL 746
Electrical	Nominal Value (English)	Nominal Value (SI)	Test Method
Surface Resistivity	> 1.0E+15 ohms	> 1.0E+15 ohms	IEC 60093
Volume Resistivity	> 1.0E+15 ohms·cm	> 1.0E+15 ohms·cm	ASTM D257 IEC 60093
Dielectric Strength			
0.0630 in (1.60 mm), in Oil	610 V/mil	24 kV/mm	ASTM D149
0.126 in (3.20 mm), in Air	480 V/mil	19 kV/mm	ASTM D149
0.0315 in (0.800 mm), in Oil	580 V/mil	23 kV/mm	IEC 60243-1
0.0630 in (1.60 mm), in Oil	560 V/mil	22 kV/mm	IEC 60243-1
0.126 in (3.20 mm), in Oil	410 V/mil	16 kV/mm	IEC 60243-1
Dielectric Constant			
100 Hz	3.80	3.80	ASTM D150 IEC 60250
1 MHz	3.70	3.70	ASTM D150
50 Hz	3.30	3.30	IEC 60250
60 Hz	3.30	3.30	IEC 60250
1 MHz	3.30	3.30	IEC 60250
Dissipation Factor			
100 Hz	2.0E-3	2.0E-3	ASTM D150 IEC 60250
1 MHz	0.020	0.020	ASTM D150
50 Hz	1.0E-3	1.0E-3	IEC 60250
60 Hz	1.0E-3	1.0E-3	IEC 60250
1 MHz	0.010	0.010	IEC 60250
Arc Resistance ¹³	PLC 6	PLC 6	ASTM D495
Comparative Tracking Index (CTI)	PLC 3	PLC 3	UL 746
Comparative Tracking Index			IEC 60112
--	175 V	175 V	
Solution B	125 V	125 V	
High Amp Arc Ignition (HAI) ¹⁴	PLC 0	PLC 0	UL 746
High Voltage Arc Tracking Rate (HVTR)	PLC 4	PLC 4	UL 746
Hot-wire Ignition (HWI)	PLC 2	PLC 2	UL 746
Flammability	Nominal Value (English)	Nominal Value (SI)	Test Method
Flame Rating			
0.016 in (0.40 mm)	V-2	V-2	UL 94
0.028 in (0.71 mm)	V-0	V-0	
0.08 in (2.0 mm)	5VA	5VA	
Glow Wire Flammability Index			
0.04 in (1.0 mm)	1760 °F	960 °C	IEC 60695-2-12
Oxygen Index	32 %	32 %	ISO 4589-2



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Injection	Nominal Value (English)	Nominal Value (SI)
Drying Temperature	248 °F	120 °C
Drying Time	3.0 to 4.0 hr	3.0 to 4.0 hr
Suggested Max Moisture	0.020 %	0.020 %
Suggested Shot Size	40 to 80 %	40 to 80 %
Rear Temperature	473 to 509 °F	245 to 265 °C
Middle Temperature	482 to 518 °F	250 to 270 °C
Front Temperature	491 to 527 °F	255 to 275 °C
Nozzle Temperature	482 to 518 °F	250 to 270 °C
Processing (Melt) Temp	491 to 527 °F	255 to 275 °C
Mold Temperature	149 to 194 °F	65 to 90 °C
Back Pressure	43.5 to 102 psi	0.300 to 0.700 MPa
Screw Speed	50 to 80 rpm	50 to 80 rpm
Vent Depth	9.8E-4 to 1.5E-3 in	0.025 to 0.038 mm

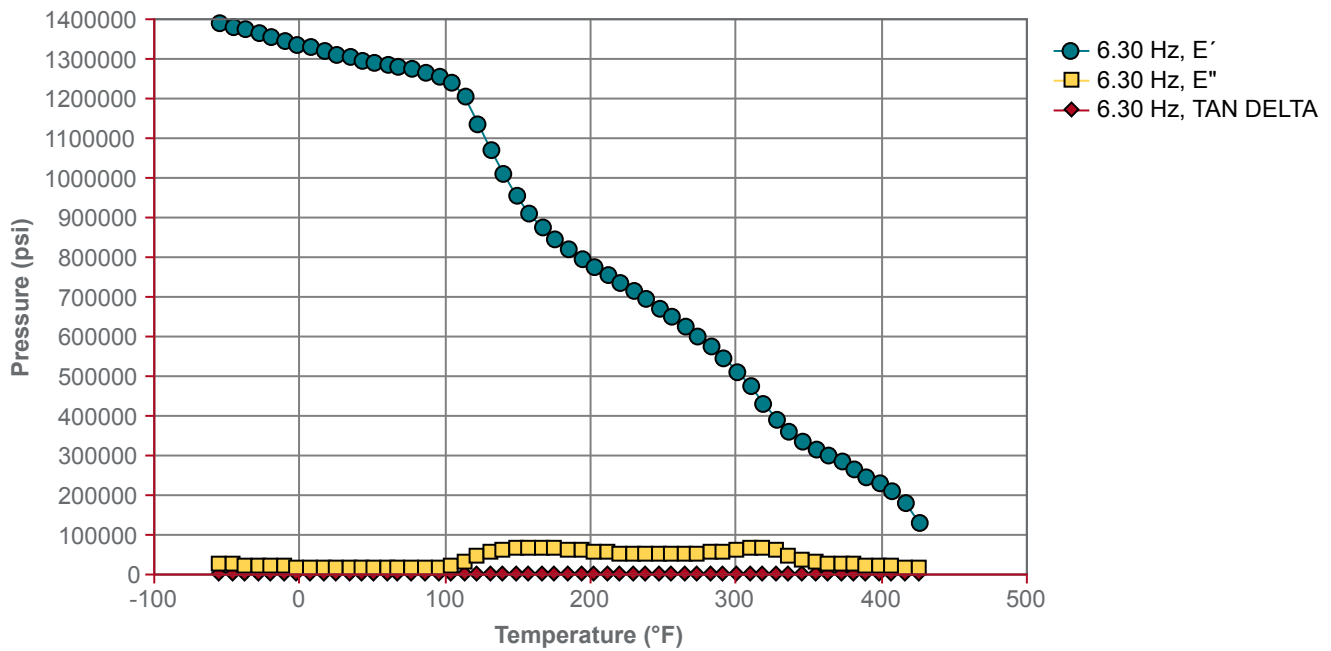
Injection Notes

Injection Molding Parameters

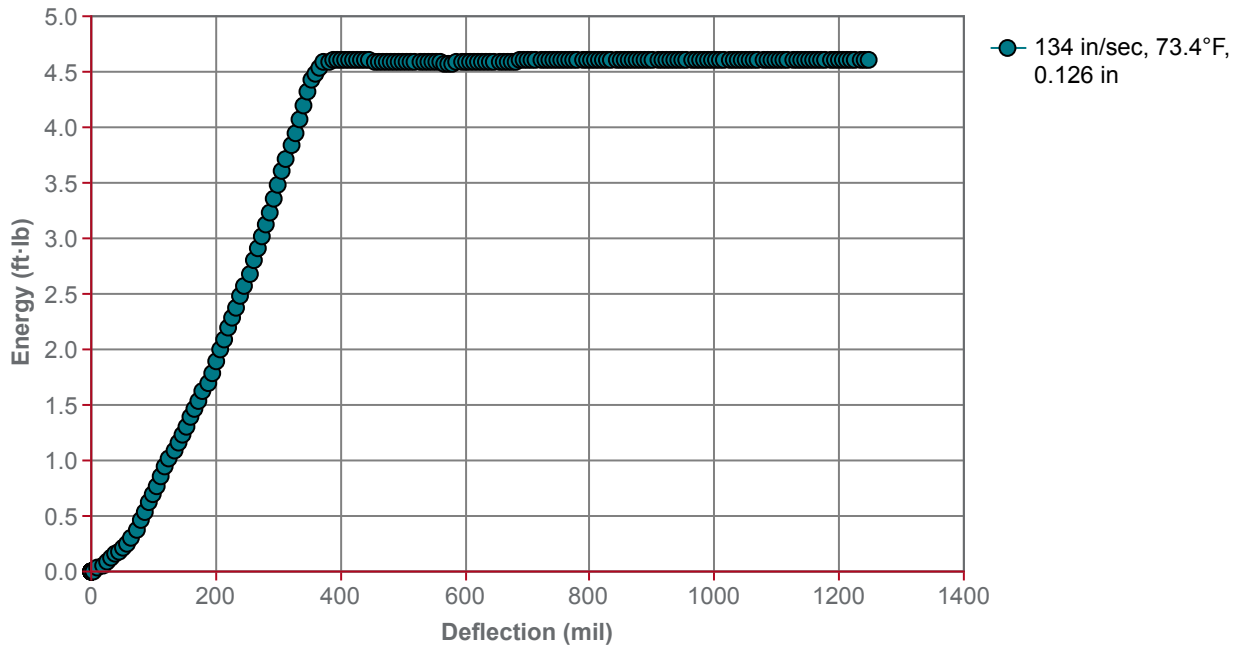
- Drying Time (Cumulative): 12 hrs



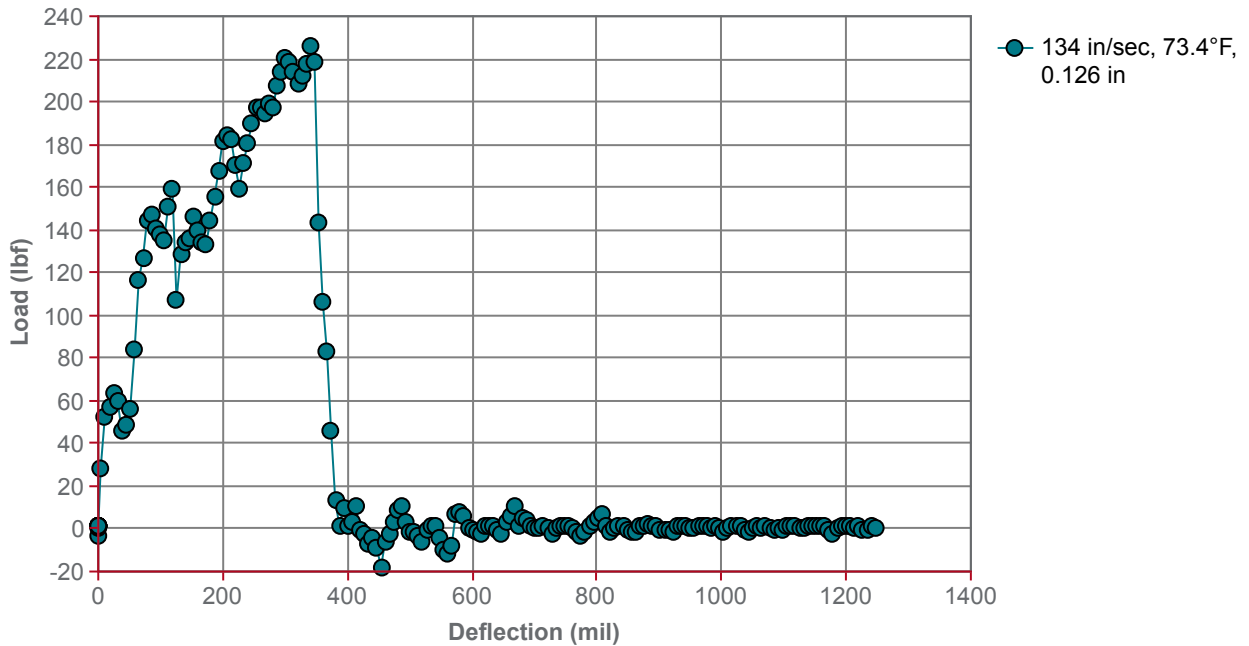
Flexural DMA (ASTM D4065)



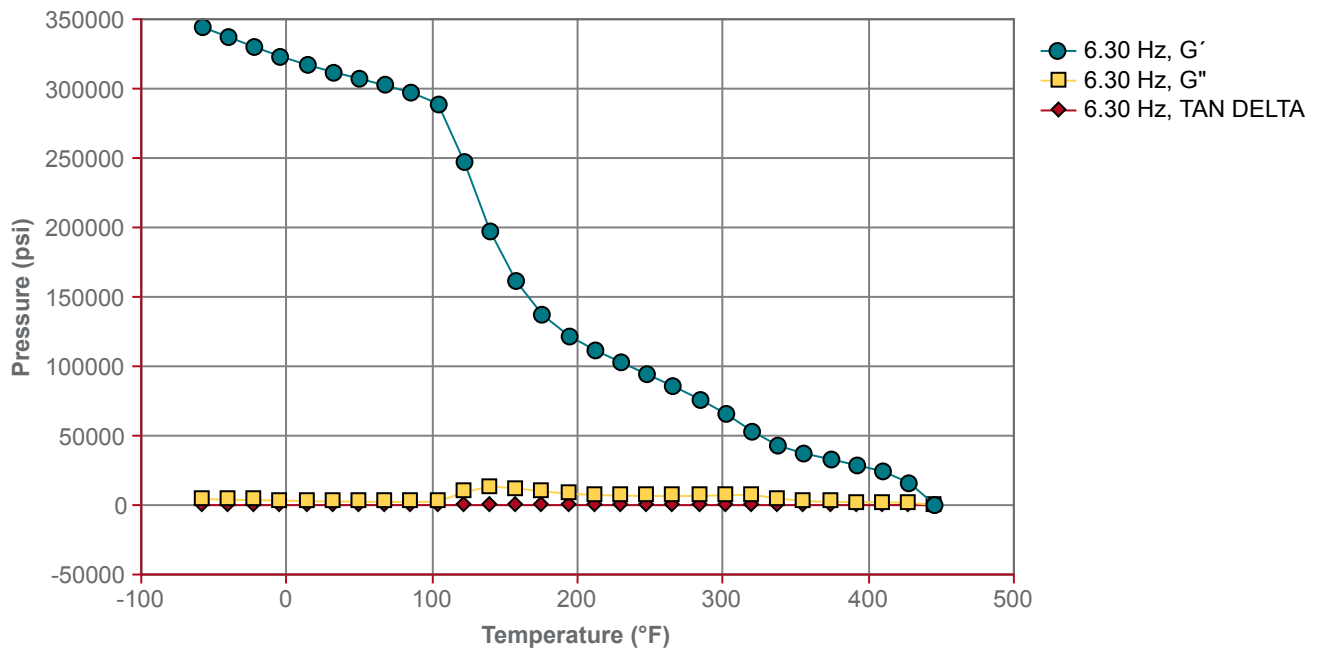
Instrumented Impact (Energy) (ASTM D3763)



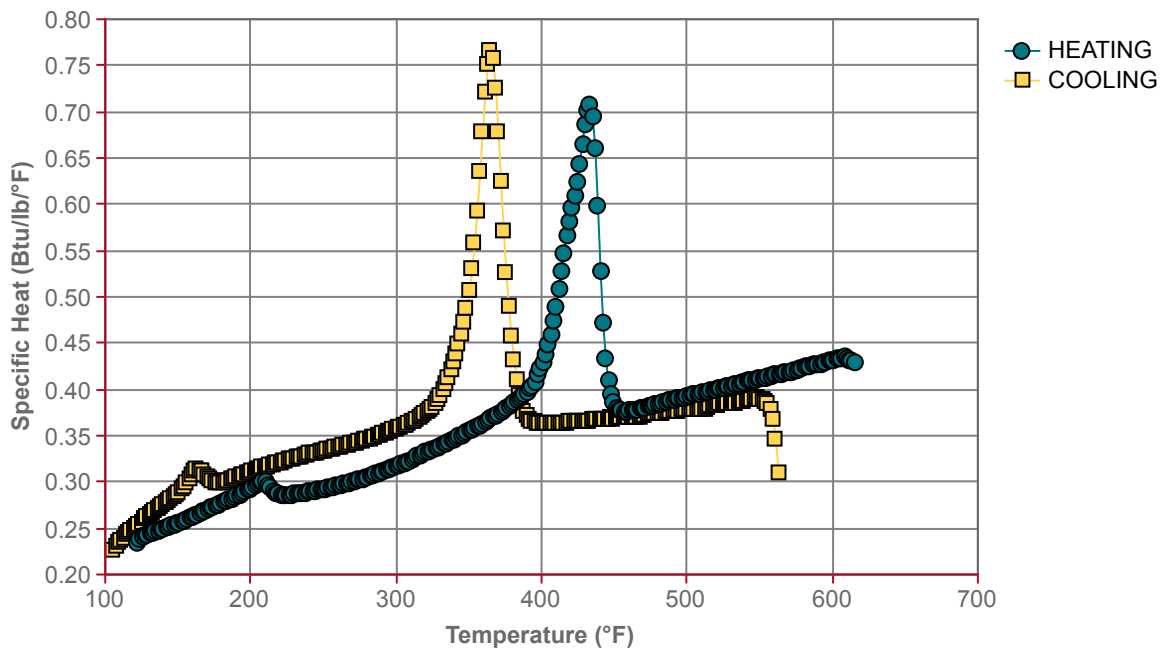
Instrumented Impact (Load) (ASTM D3763)



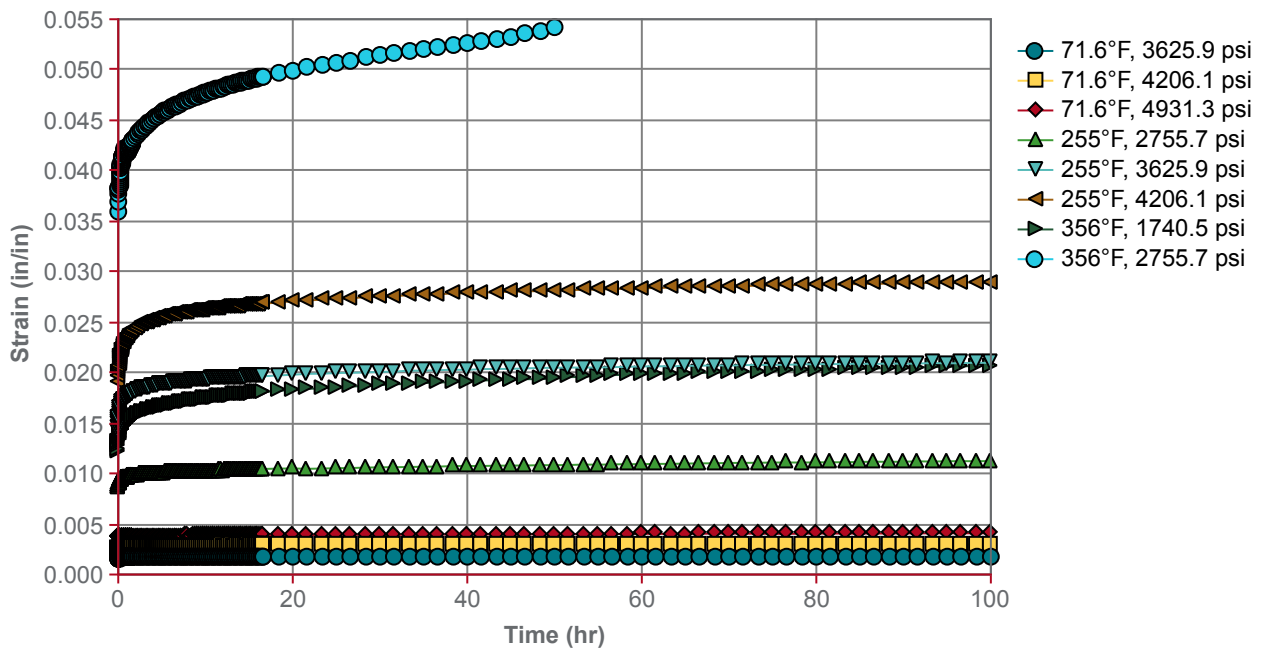
Shear DMA (ASTM D4065)



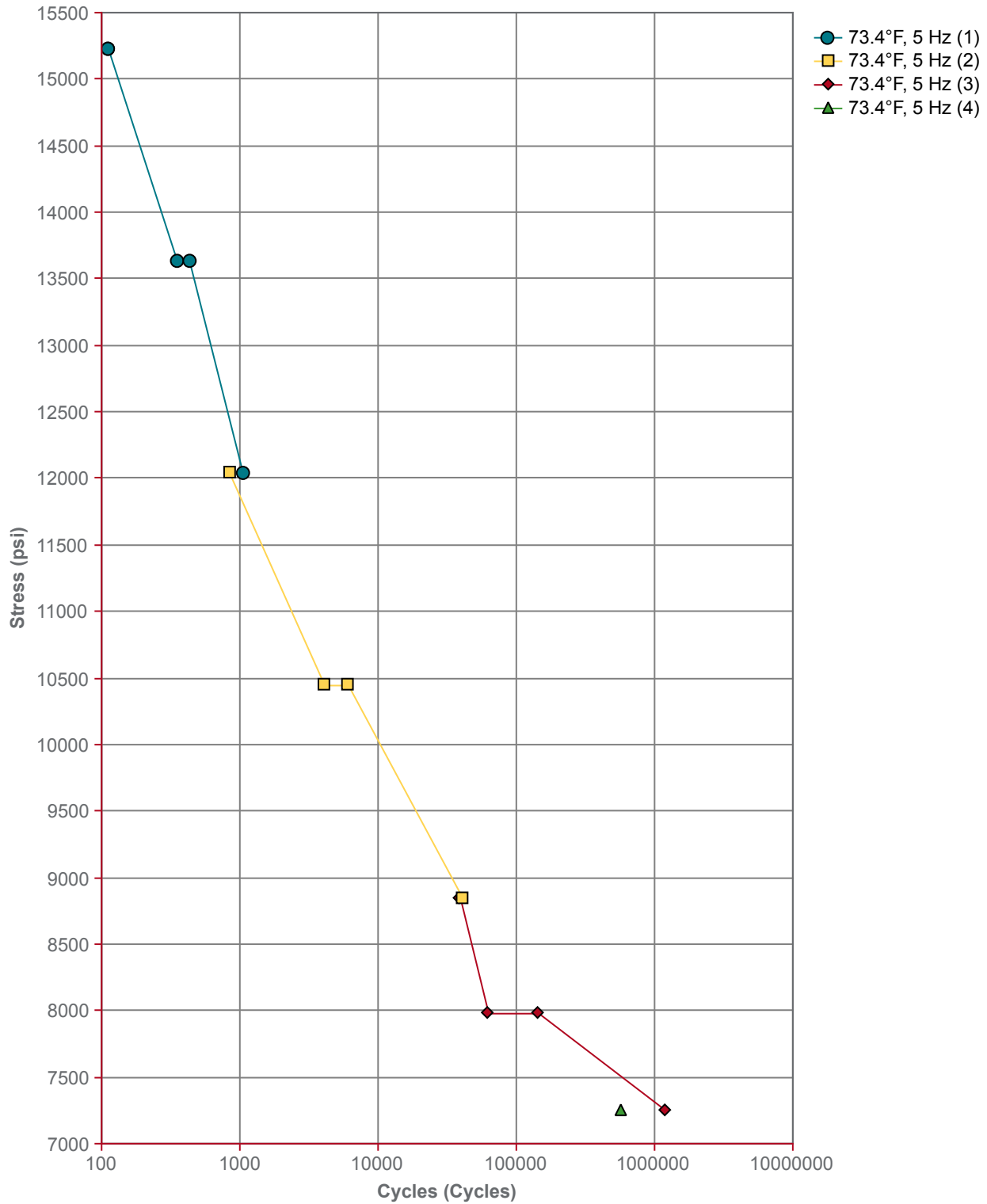
Specific Heat vs. Temperature (ASTM D3417)



Tensile Creep (ASTM D2990)



Tensile Fatigue



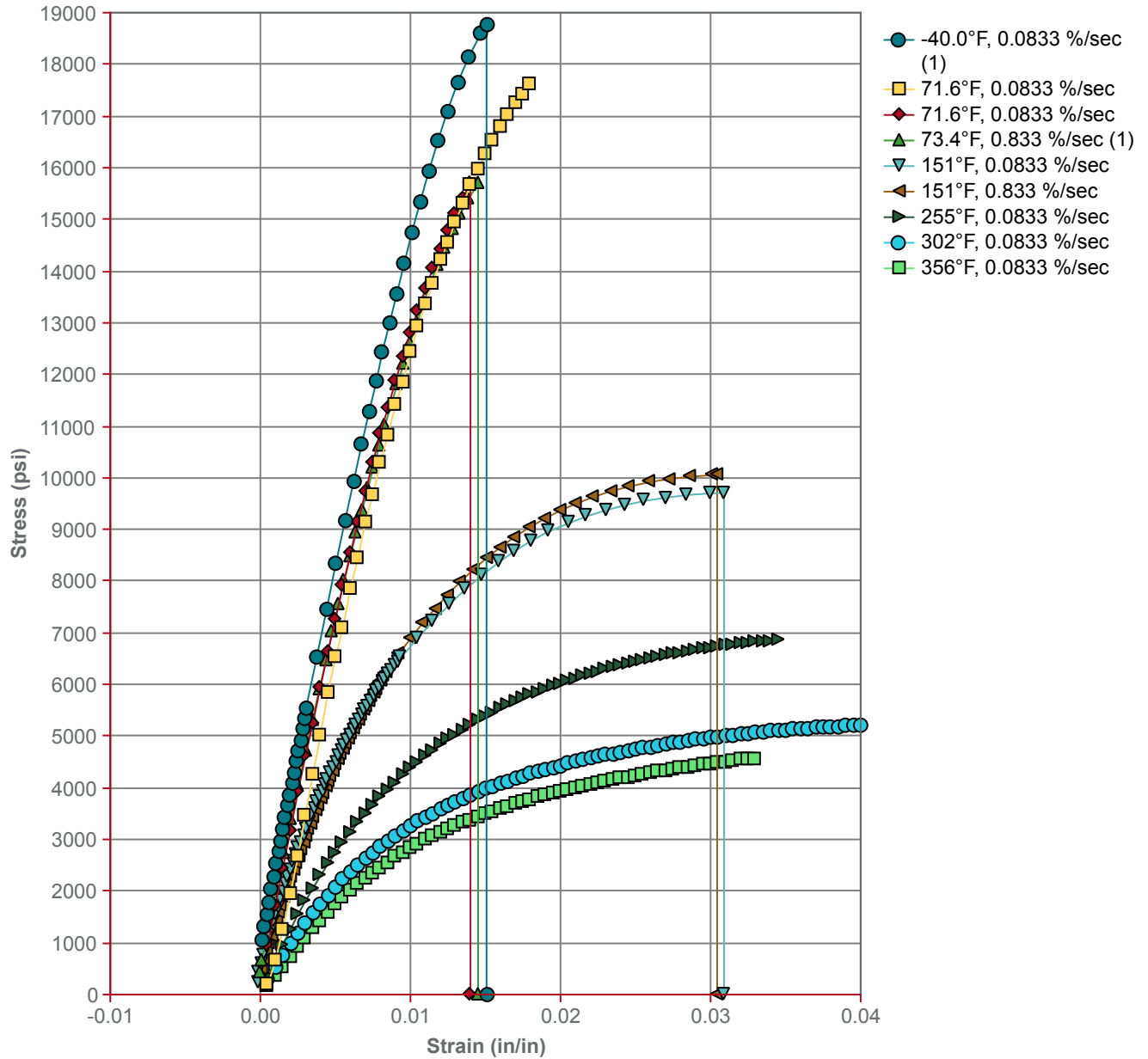
Data Notes

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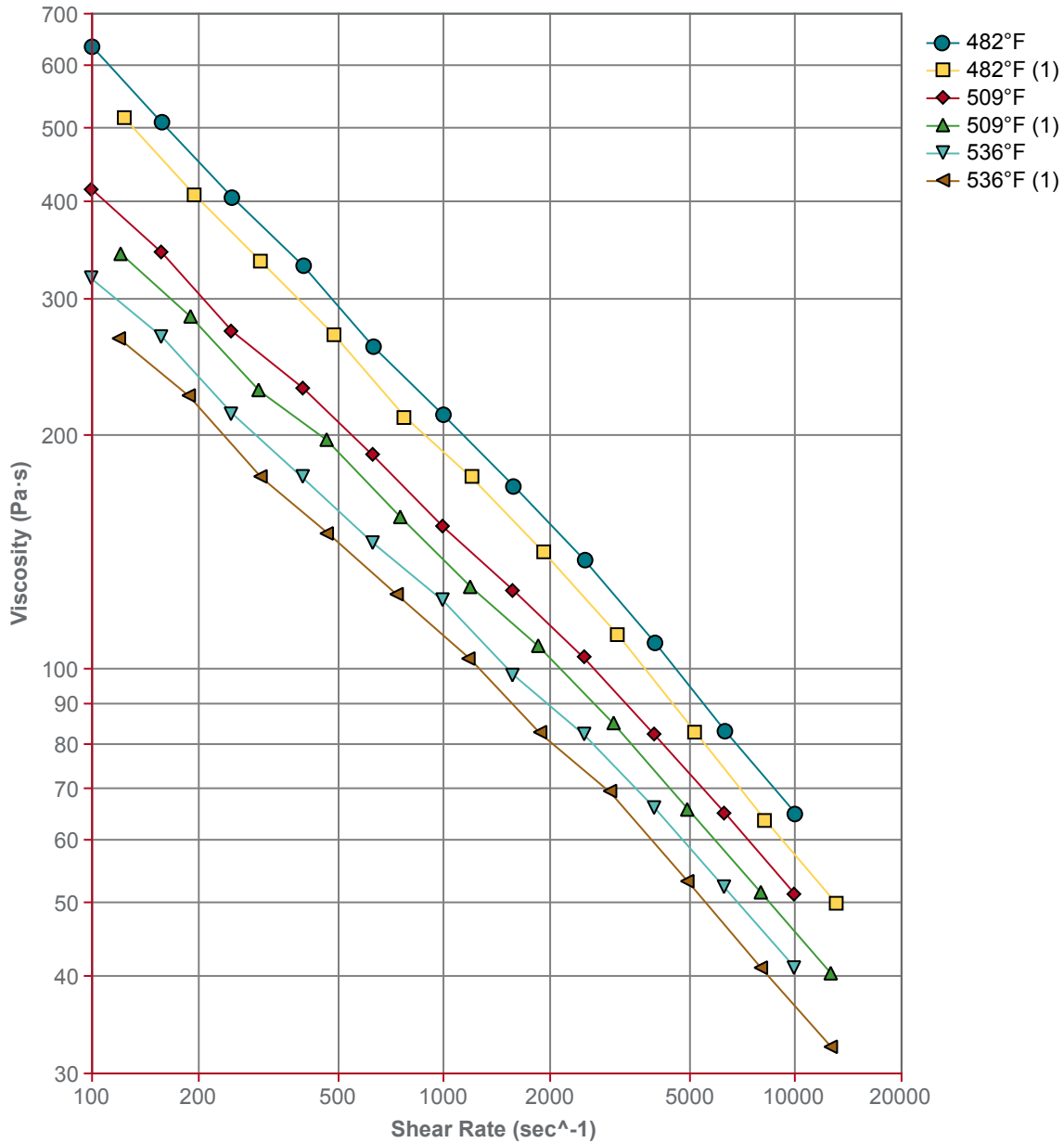
Tensile Stress vs. Strain (ASTM D638)



Data Notes
(1) - BREAK



Viscosity vs. Shear Rate (ASTM D3835)



Data Notes

(1) - Rab. Corrected Data



Notes

¹ These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

² A UL Yellow Card contains UL-verified flammability and electrical characteristics. UL Prospector continually works to link Yellow Cards to individual plastic materials in Prospector, however this list may not include all of the appropriate links. It is important that you verify the association between these Yellow Cards and the plastic material found in Prospector. For a complete listing of Yellow Cards, visit the UL Yellow Card Search.

³ Typical properties: these are not to be construed as specifications.

⁴ Tensile Bar

⁵ 0.20 in/min (5.0 mm/min)

⁶ Type I, 0.20 in/min (5.0 mm/min)

⁷ 0.051 in/min (1.3 mm/min)

⁸ 0.079 in/min (2.0 mm/min)

⁹ 80*10*4 sp=62mm

¹⁰ 80*10*4 mm

¹¹ 120*10*4 mm

¹² Rate A (50°C/h), Loading 2 (50 N)

¹³ Tungsten Electrode

¹⁴ Surface

