

VALOX™ FR Resin 357 - Americas

Polycarbonate + PBT

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Technical Data

Product Description

VALOX 357 Polycarbonate/Polybutylene Terephthalate (PC/PBT) resin is a non-reinforced, impact modified, injection moldable grade. This brominated flame retardant PC/PBT has a UL V0 rating. VALOX 357 resin is a general purpose resin that is an excellent candidate for a wide variety of applications including bobbins, switches and enclosures.

General

Material Status	• Commercial: Active		
Literature ¹	• Technical Datasheet		
UL Yellow Card ²	• E121562-100036617 • E121562-220786		
Search for UL Yellow Card	• SABIC		
Availability	• Latin America	• North America	
Additive	• Impact Modifier		
Features	• Impact Modified		
Uses	• Appliances • Automotive Under the Hood • Construction Applications • Electrical/Electronic Applications • Electronic Displays	• Fluid Handling • Household Goods • Industrial Applications • Lawn and Garden Equipment • Lighting Applications	• Medical/Healthcare Applications • Oil/Gas Applications • Outdoor Applications
Automotive Specifications	• FORD WSS-M4D929-A2		
Appearance	• Opaque		
Processing Method	• Injection Molding		
Multi-Point Data	• Compressive Stress vs. Strain (ASTM D695) • Elastic Modulus vs Temperature (ASTM D4065) • Flexural DMA (ASTM D4065) • Pressure-Volume-Temperature (PVT - Zoller Method)	• Shear DMA (ASTM D4065) • Specific Heat vs. Temperature (ASTM D3417) • Tensile Creep (ASTM D2990) • Tensile Fatigue	• Tensile Stress vs. Strain (ASTM D638) • Thermal Conductivity vs. Temperature (ASTM E1530) • Viscosity vs. Shear Rate (ASTM D3835)
Also Available In	• Asia Pacific		

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Density / Specific Gravity			
--	1.34	1.34 g/cm ³	ASTM D792
--	1.34 g/cm ³	1.34 g/cm ³	ISO 1183
Specific Volume	20.8 in ³ /lb	0.750 cm ³ /g	ASTM D792
Melt Mass-Flow Rate (MFR) (250°C/5.0 kg)	9.6 g/10 min	9.6 g/10 min	ASTM D1238
Melt Volume-Flow Rate (MVR) (250°C/5.0 kg)	0.488 in ³ /10min	8.00 cm ³ /10min	ISO 1133
Molding Shrinkage			Internal Method
Flow : 0.0295 to 0.0906 in (0.750 to 2.30 mm)	8.0E-3 to 0.011 in/in	0.80 to 1.1 %	
Flow : 0.126 in (3.20 mm)	0.010 to 0.014 in/in	1.0 to 1.4 %	
Flow : 0.0906 to 0.181 in (2.30 to 4.60 mm)	0.010 to 0.014 in/in	1.0 to 1.4 %	
Across Flow : 0.0295 to 0.0906 in (0.750 to 2.30 mm)	9.0E-3 to 0.013 in/in	0.90 to 1.3 %	
Across Flow : 0.0906 to 0.181 in (2.30 to 4.60 mm)	0.012 to 0.016 in/in	1.2 to 1.6 %	
Water Absorption			
24 hr	0.080 %	0.080 %	ASTM D570
Saturation, 73°F (23°C)	0.50 %	0.50 %	ISO 62
Equilibrium, 73°F (23°C), 50% RH	0.15 %	0.15 %	ISO 62
Outdoor Suitability	f2	f2	UL 746C



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Mechanical	Nominal Value (English)	Nominal Value (SI)	Test Method
Tensile Modulus			
-- ⁴	293000 psi	2020 MPa	ASTM D638
--	319000 psi	2200 MPa	ISO 527-2/1
Tensile Strength			
Yield ⁵	6960 psi	48.0 MPa	ASTM D638
Yield	7250 psi	50.0 MPa	ISO 527-2/50
Break ⁵	6090 psi	42.0 MPa	ASTM D638
Break	5800 psi	40.0 MPa	ISO 527-2/50
Tensile Elongation			
Yield ⁵	5.0 %	5.0 %	ASTM D638
Yield	5.0 %	5.0 %	ISO 527-2/50
Break ⁵	54 %	54 %	ASTM D638
Break	30 %	30 %	ISO 527-2/50
Flexural Modulus			
1.97 in (50.0 mm) Span ⁶	299000 psi	2060 MPa	ASTM D790
-- ⁷	290000 psi	2000 MPa	ISO 178
Flexural Stress			
-- ^{7,8}	10600 psi	73.0 MPa	ISO 178
Yield, 1.97 in (50.0 mm) Span ⁶	12000 psi	83.0 MPa	ASTM D790
Break, 1.97 in (50.0 mm) Span ⁶	12000 psi	83.0 MPa	ASTM D790
Impact	Nominal Value (English)	Nominal Value (SI)	Test Method
Charpy Notched Impact Strength⁹ (73°F (23°C))			
	21 ft·lb/in ²	45 kJ/m ²	ISO 179/1eA
Notched Izod Impact			
-22°F (-30°C)	2.9 ft·lb/in	150 J/m	ASTM D256
73°F (23°C)	6.0 ft·lb/in	320 J/m	ASTM D256
-22°F (-30°C) ¹⁰	4.8 ft·lb/in ²	10 kJ/m ²	ISO 180/1A
73°F (23°C) ¹⁰	21 ft·lb/in ²	45 kJ/m ²	ISO 180/1A
Unnotched Izod Impact (73°F (23°C))			
	No Break	No Break	ASTM D4812
Instrumented Dart Impact			
73°F (23°C), Total Energy	310 in·lb	35.0 J	ASTM D3763
Gardner Impact (73°F (23°C))	• 381 in·lb • 381 in·lb	• 43.0 J • 43.0 J	ASTM D3029
Hardness	Nominal Value (English)	Nominal Value (SI)	Test Method
Rockwell Hardness (R-Scale)			
	117	117	ASTM D785
Thermal	Nominal Value (English)	Nominal Value (SI)	Test Method
Deflection Temperature Under Load			
66 psi (0.45 MPa), Unannealed, 0.126 in (3.20 mm)	275 °F	135 °C	ASTM D648
66 psi (0.45 MPa), Unannealed, 0.252 in (6.40 mm)	280 °F	138 °C	ASTM D648
264 psi (1.8 MPa), Unannealed, 0.126 in (3.20 mm)	208 °F	98.0 °C	ASTM D648
264 psi (1.8 MPa), Unannealed, 0.252 in (6.40 mm)	210 °F	99.0 °C	ASTM D648
264 psi (1.8 MPa), Unannealed, 0.157 in (4.00 mm), 2.52 in (64.0 mm) Span ¹⁰	183 °F	84.0 °C	ISO 75-2/Af
Vicat Softening Temperature			
--	273 °F	134 °C	ASTM D1525 ¹¹
--	293 °F	145 °C	ISO 306/B50
--	302 °F	150 °C	ISO 306/B120
Ball Pressure Test¹²			
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)	5.1E-5 in/in/°F	9.2E-5 cm/cm/°C	ASTM E831
Flow : 140 to 280°F (60 to 138°C)	6.9E-5 in/in/°F	1.2E-4 cm/cm/°C	ASTM E831
Flow : -40 to 104°F (-40 to 40°C)	4.0E-5 in/in/°F	7.2E-5 cm/cm/°C	ISO 11359-2
Transverse : -40 to 104°F (-40 to 40°C)	4.7E-5 in/in/°F	8.4E-5 cm/cm/°C	ASTM E831
Transverse : -40°F (-40°C)	4.7E-5 in/in/°F	8.4E-5 cm/cm/°C	ISO 11359-2
RTI Elec	248 °F	120 °C	UL 746
RTI Imp	248 °F	120 °C	UL 746
RTI Str	284 °F	140 °C	UL 746
Electrical	Nominal Value (English)	Nominal Value (SI)	Test Method
Volume Resistivity	> 1.2E+16 ohms·cm	> 1.2E+16 ohms·cm	ASTM D257
Dielectric Strength			ASTM D149
0.0630 in (1.60 mm), in Oil	640 V/mil	25 kV/mm	
0.126 in (3.20 mm), in Air	470 V/mil	19 kV/mm	
0.126 in (3.20 mm), in Oil	470 V/mil	19 kV/mm	
Dielectric Constant			ASTM D150
100 Hz	3.20	3.20	
1 MHz	3.20	3.20	
Dissipation Factor			ASTM D150
100 Hz	3.0E-3	3.0E-3	
1 MHz	0.030	0.030	
Arc Resistance ¹³	PLC 6	PLC 6	ASTM D495
Comparative Tracking Index (CTI)	PLC 2	PLC 2	UL 746
High Amp Arc Ignition (HAI) ¹⁴	PLC 3	PLC 3	UL 746
High Voltage Arc Tracking Rate (HVTR)	PLC 3	PLC 3	UL 746
Hot-wire Ignition (HWI)	PLC 2	PLC 2	UL 746
Flammability	Nominal Value (English)	Nominal Value (SI)	Test Method
Flame Rating			UL 94
0.018 in (0.46 mm)	HB	HB	
0.025 in (0.63 mm)	V-0	V-0	
0.12 in (3.0 mm)	5VA	5VA	
Glow Wire Flammability Index			IEC 60695-2-12
0.04 in (1.0 mm)	1760 °F	960 °C	
Glow Wire Ignition Temperature			IEC 60695-2-13
0.04 in (1.0 mm)	1430 °F	775 °C	
0.08 in (2.0 mm)	1380 °F	750 °C	
0.12 in (3.0 mm)	1340 °F	725 °C	
Oxygen Index	30 %	30 %	ASTM D2863
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	464 to 491 °F	240 to 255 °C	
Middle Temperature	473 to 500 °F	245 to 260 °C	
Front Temperature	482 to 509 °F	250 to 265 °C	
Nozzle Temperature	473 to 500 °F	245 to 260 °C	
Processing (Melt) Temp	482 to 509 °F	250 to 265 °C	
Mold Temperature	122 to 167 °F	50 to 75 °C	
Back Pressure	43.5 to 102 psi	0.300 to 0.700 MPa	
Screw Speed	50 to 100 rpm	50 to 100 rpm	



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Injection	Nominal Value (English)	Nominal Value (SI)
Vent Depth	9.8E-4 to 1.5E-3 in	0.025 to 0.038 mm

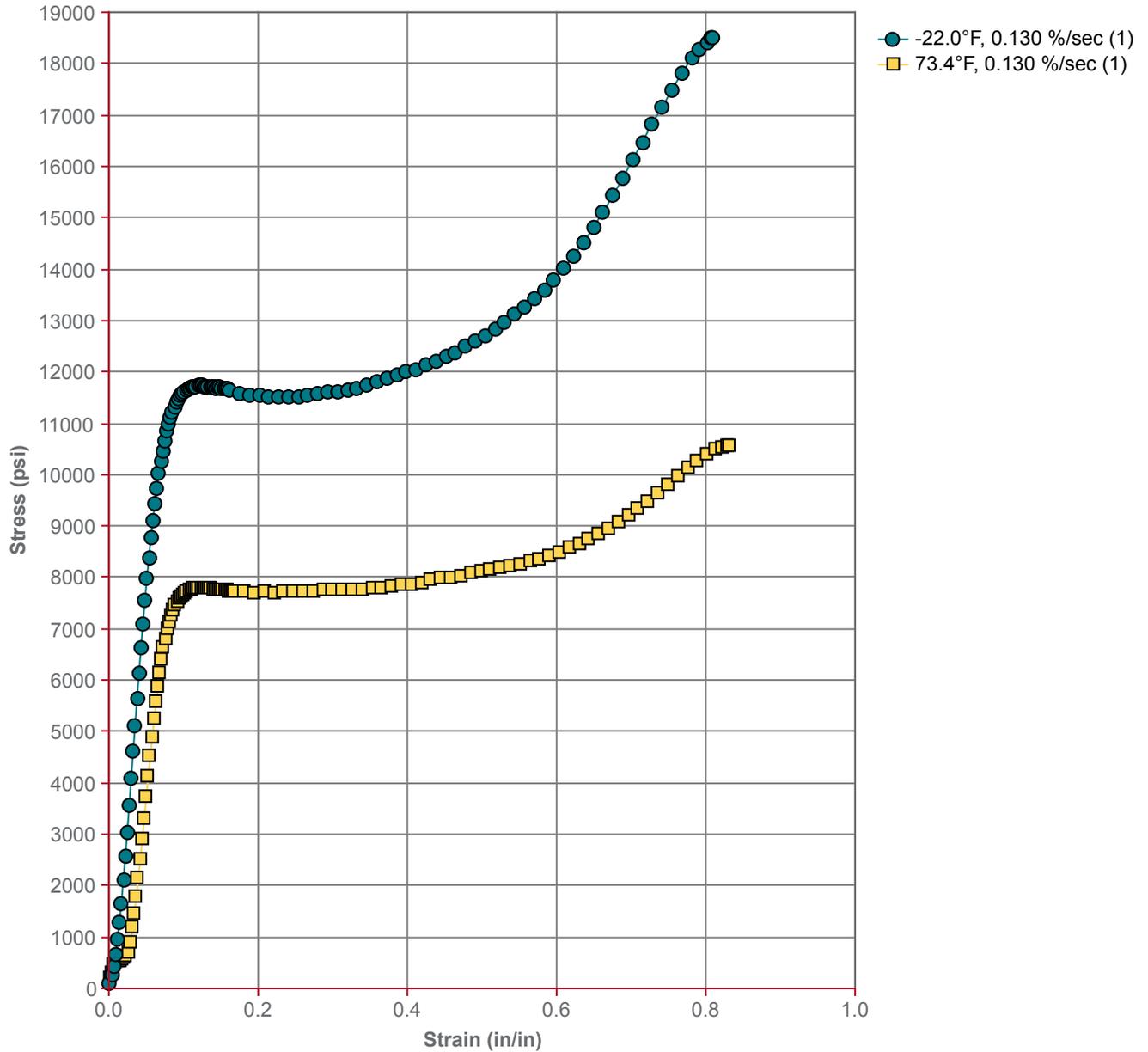
Injection Notes

Injection Molding Parameters

- Drying Time (Cumulative): 12 hrs



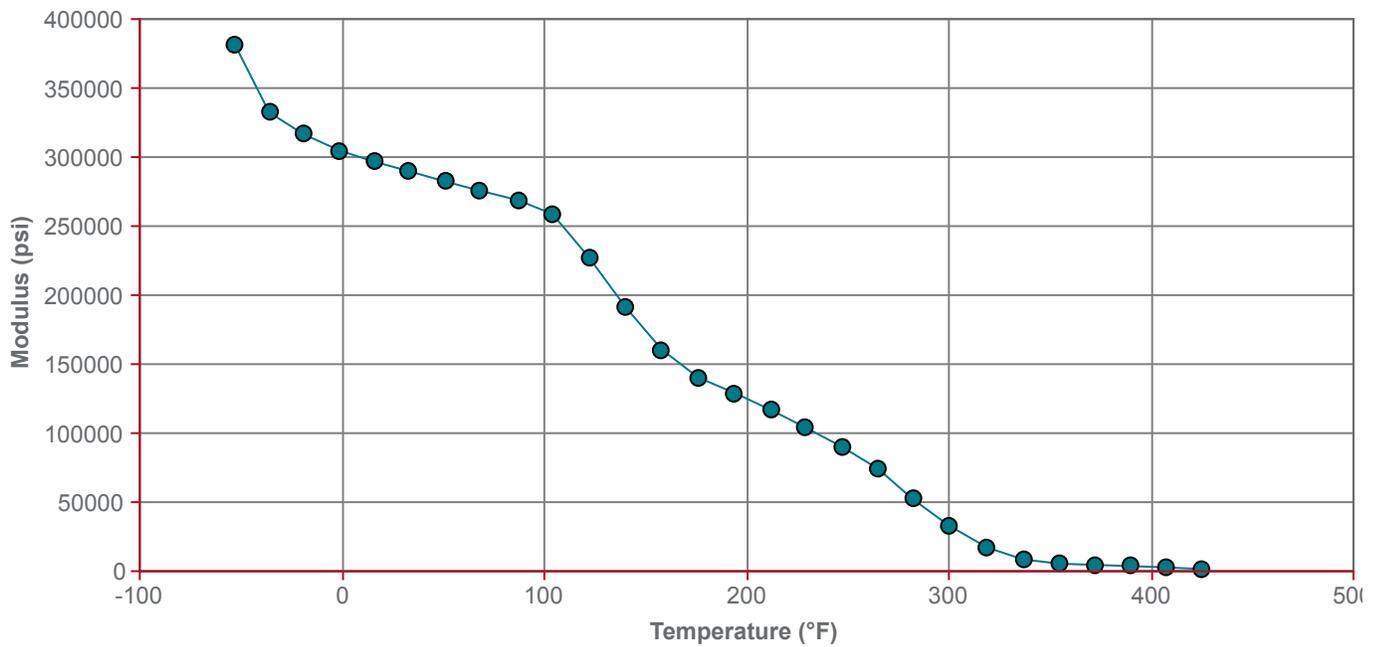
Compressive Stress vs. Strain (ASTM D695)



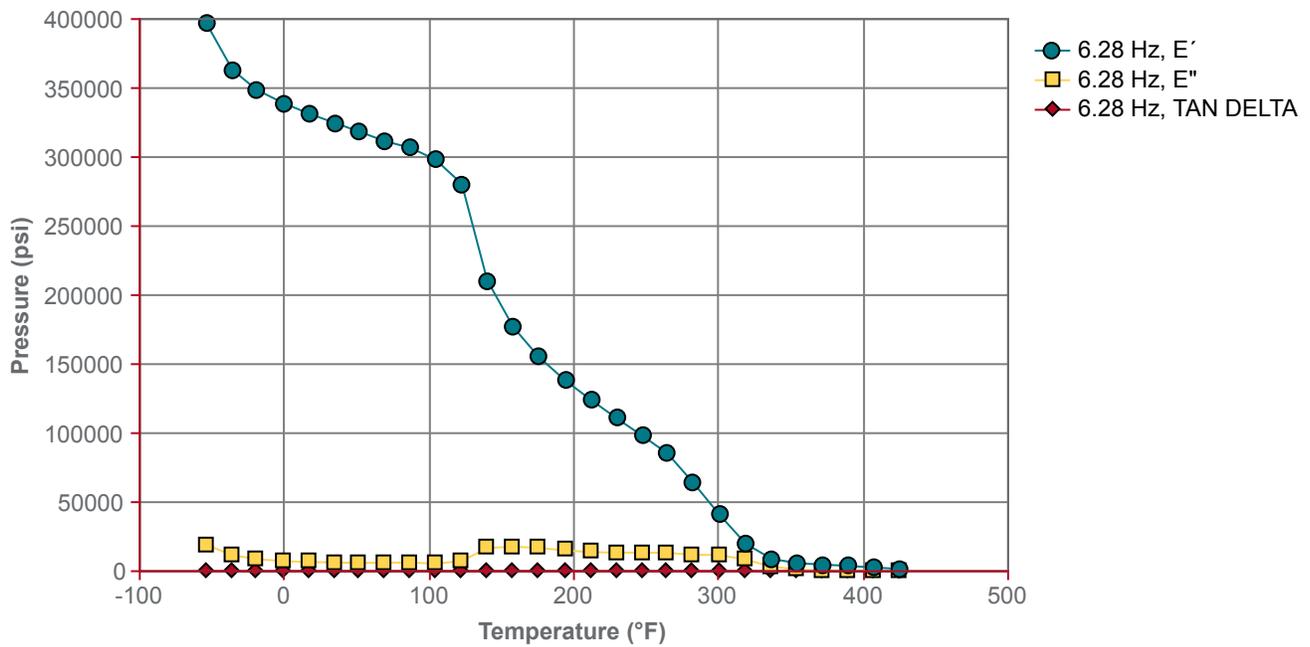
Data Notes
(1) - .02"/MIN



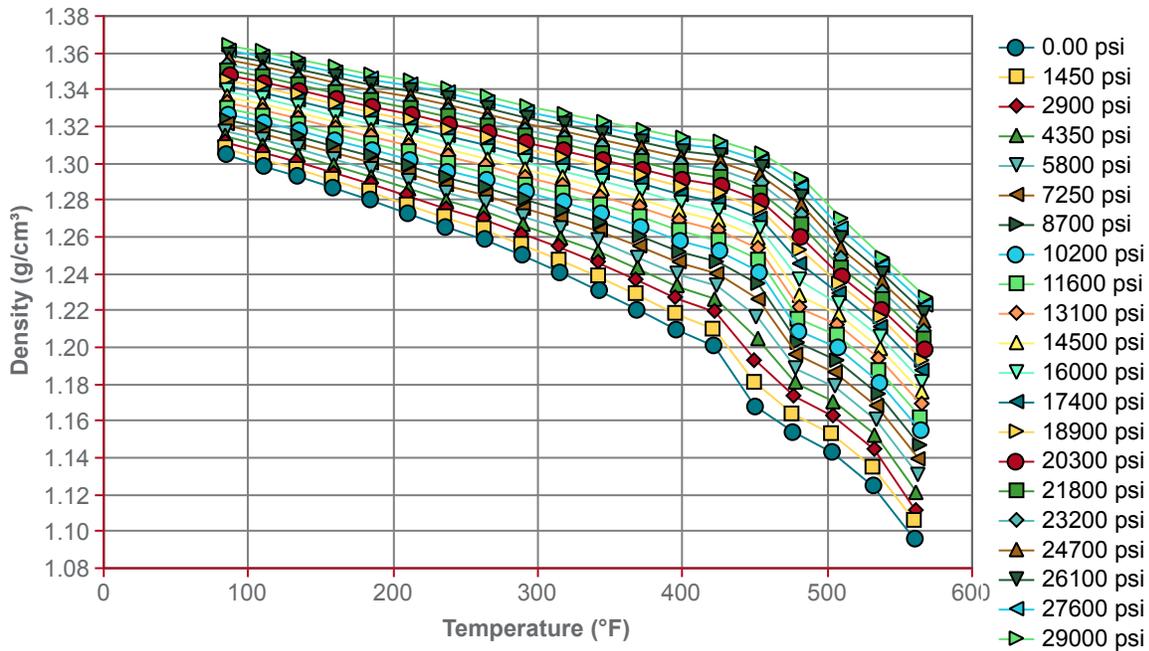
Elastic Modulus vs Temperature (ASTM D4065)



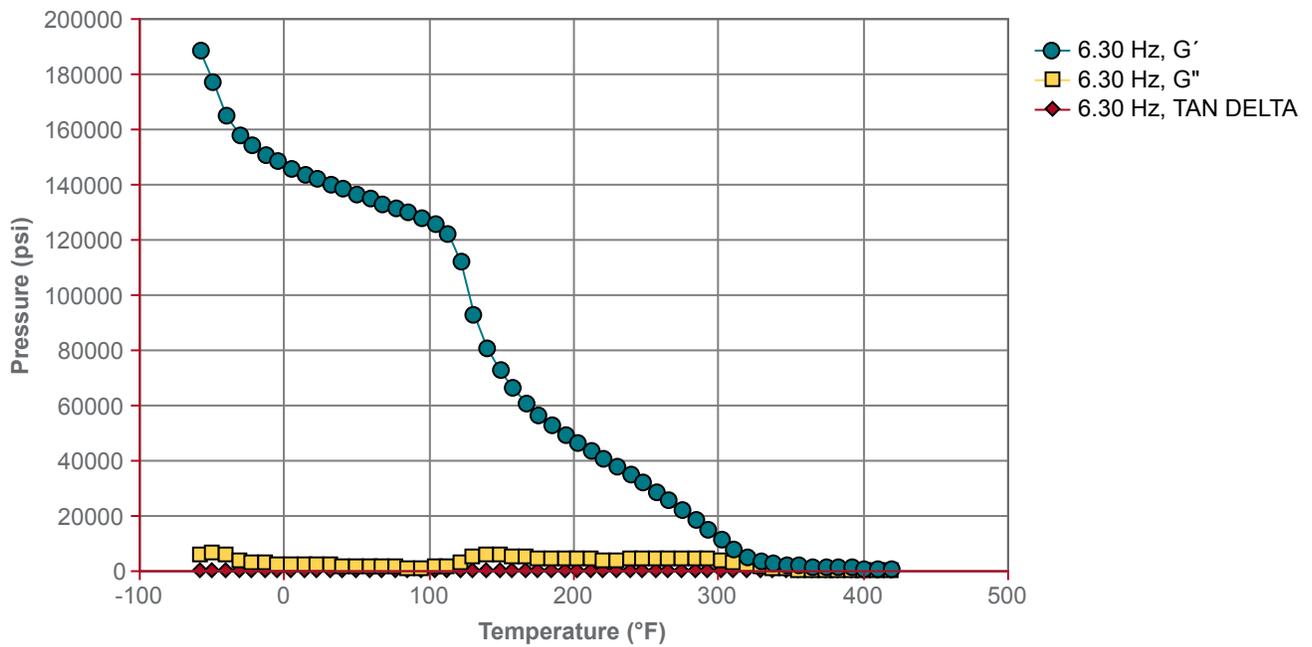
Flexural DMA (ASTM D4065)



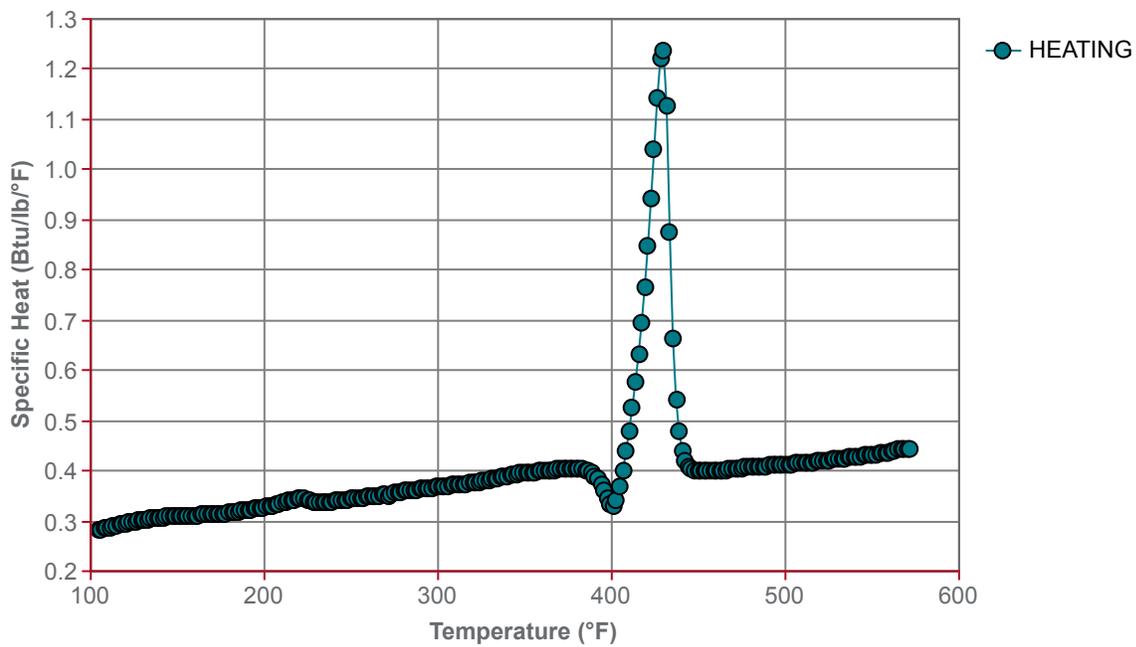
Pressure-Volume-Temperature (PVT - Zoller Method)



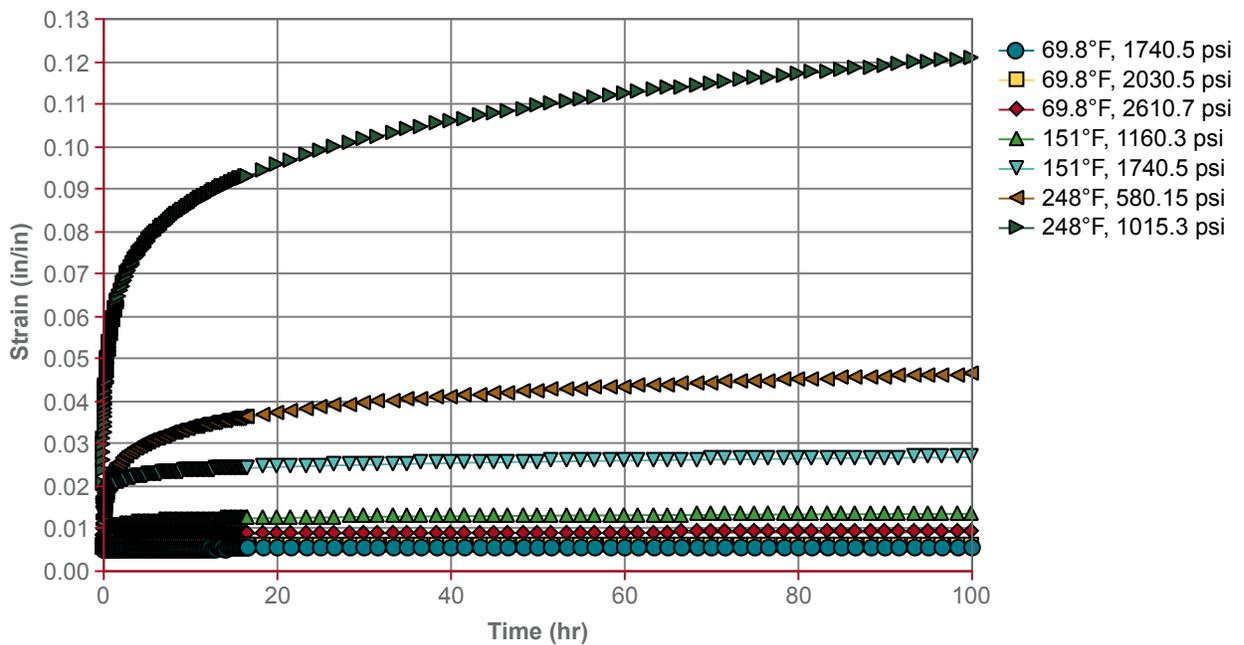
Shear DMA (ASTM D4065)



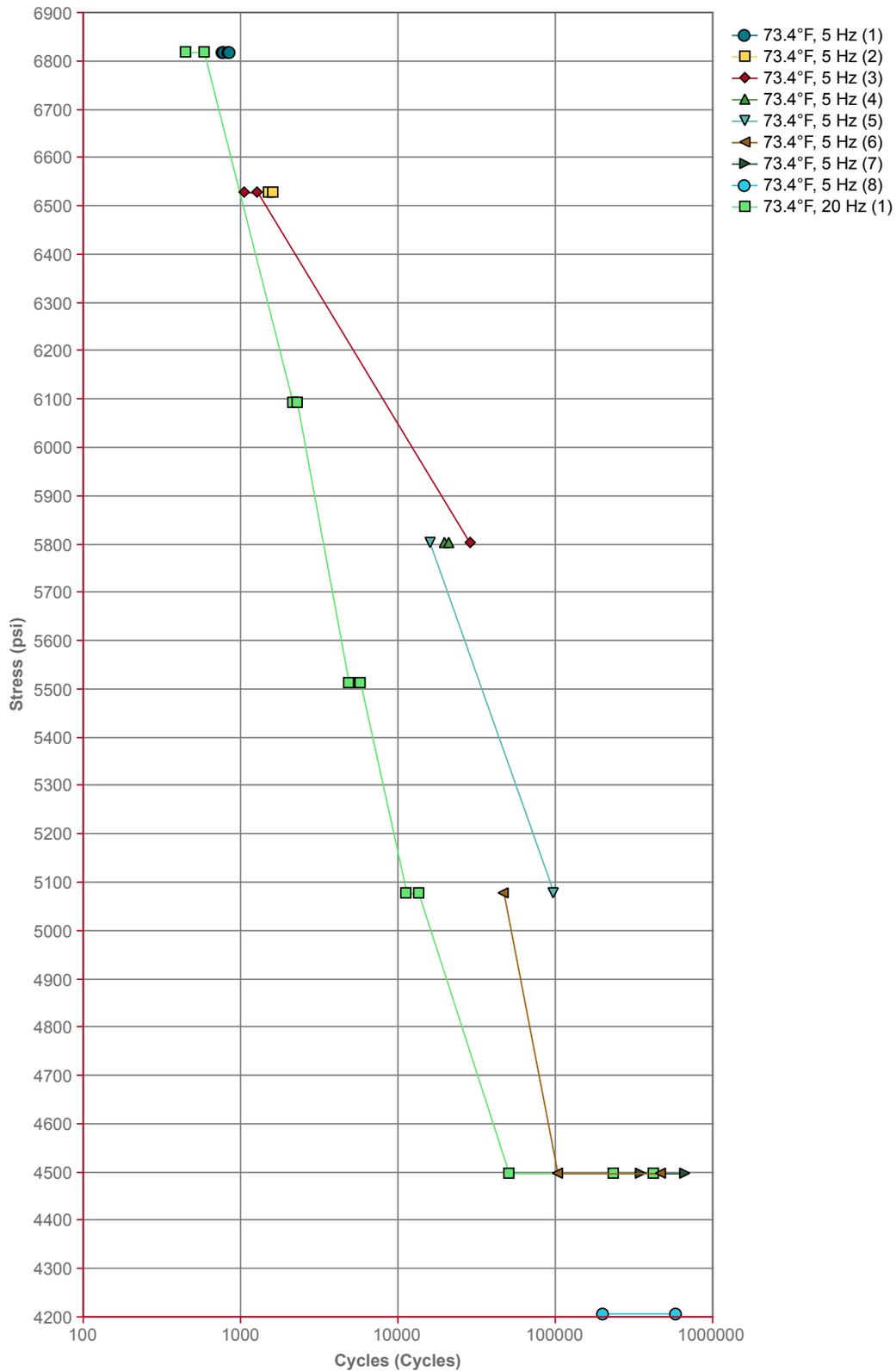
Specific Heat vs. Temperature (ASTM D3417)



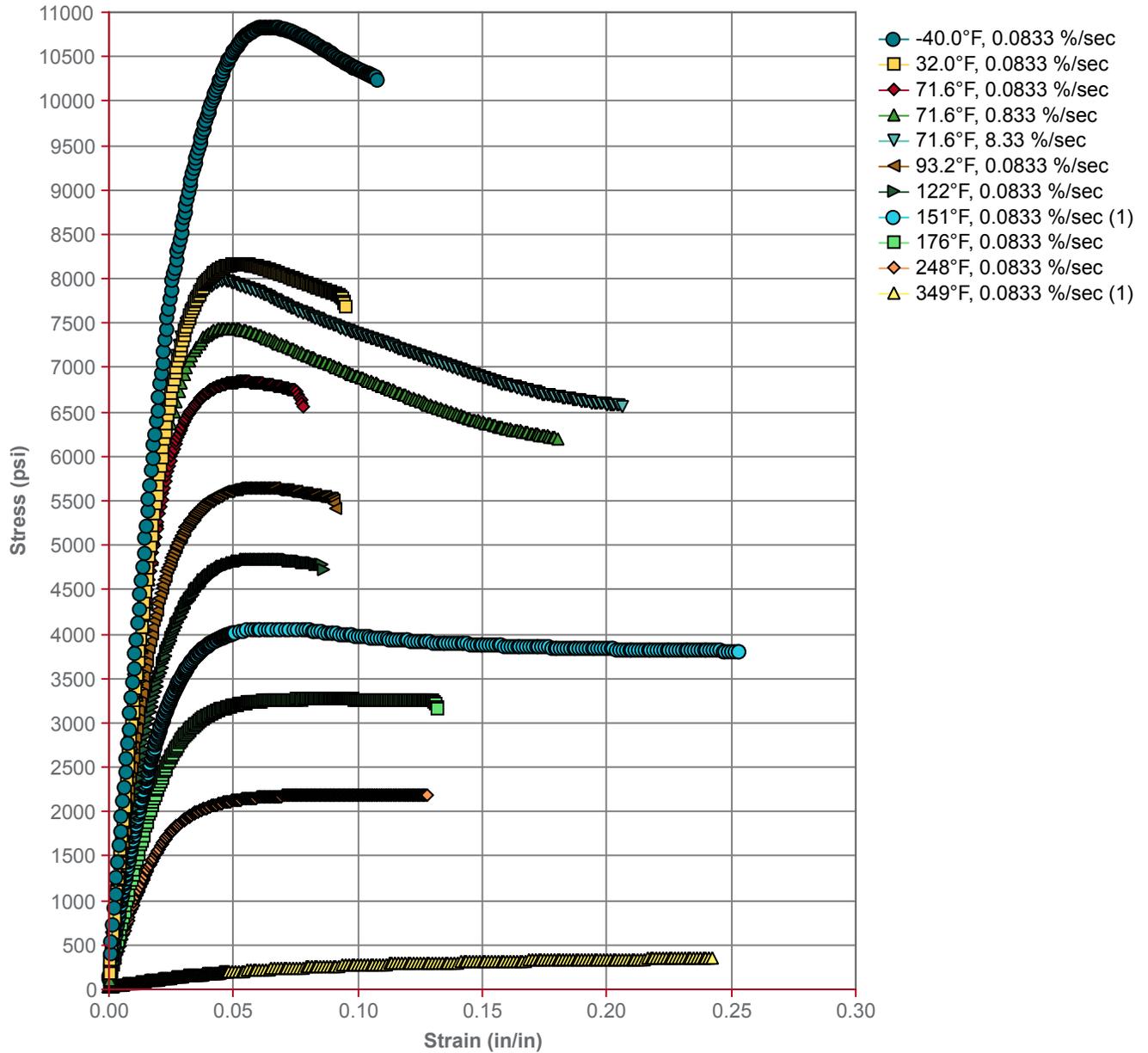
Tensile Creep (ASTM D2990)



Tensile Fatigue



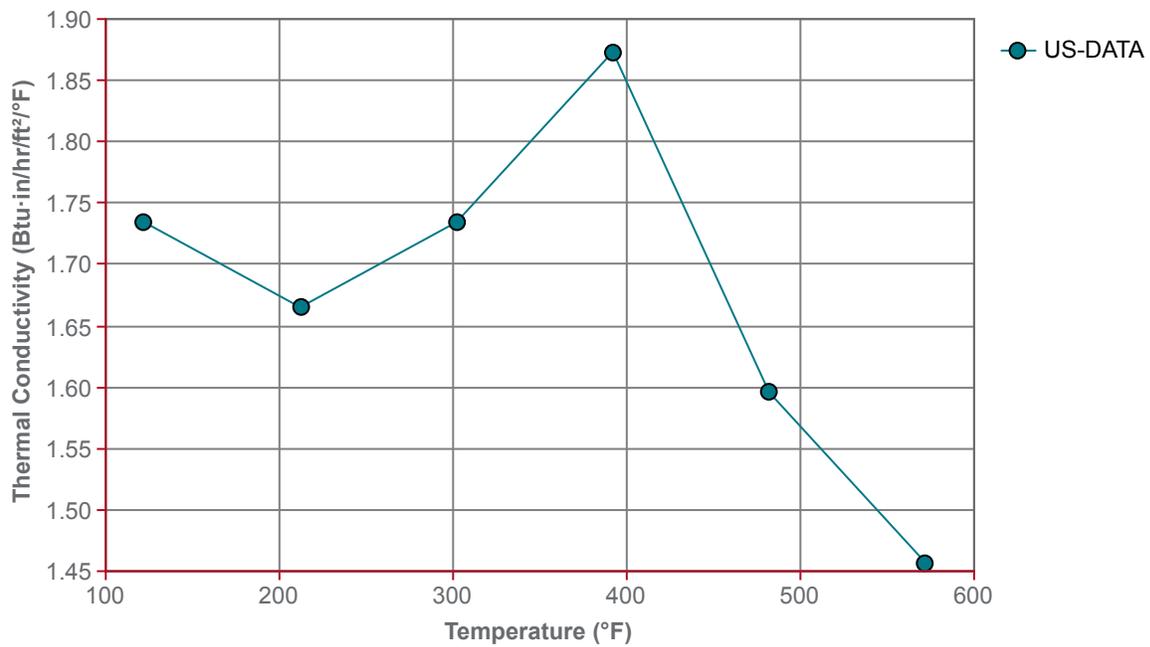
Tensile Stress vs. Strain (ASTM D638)



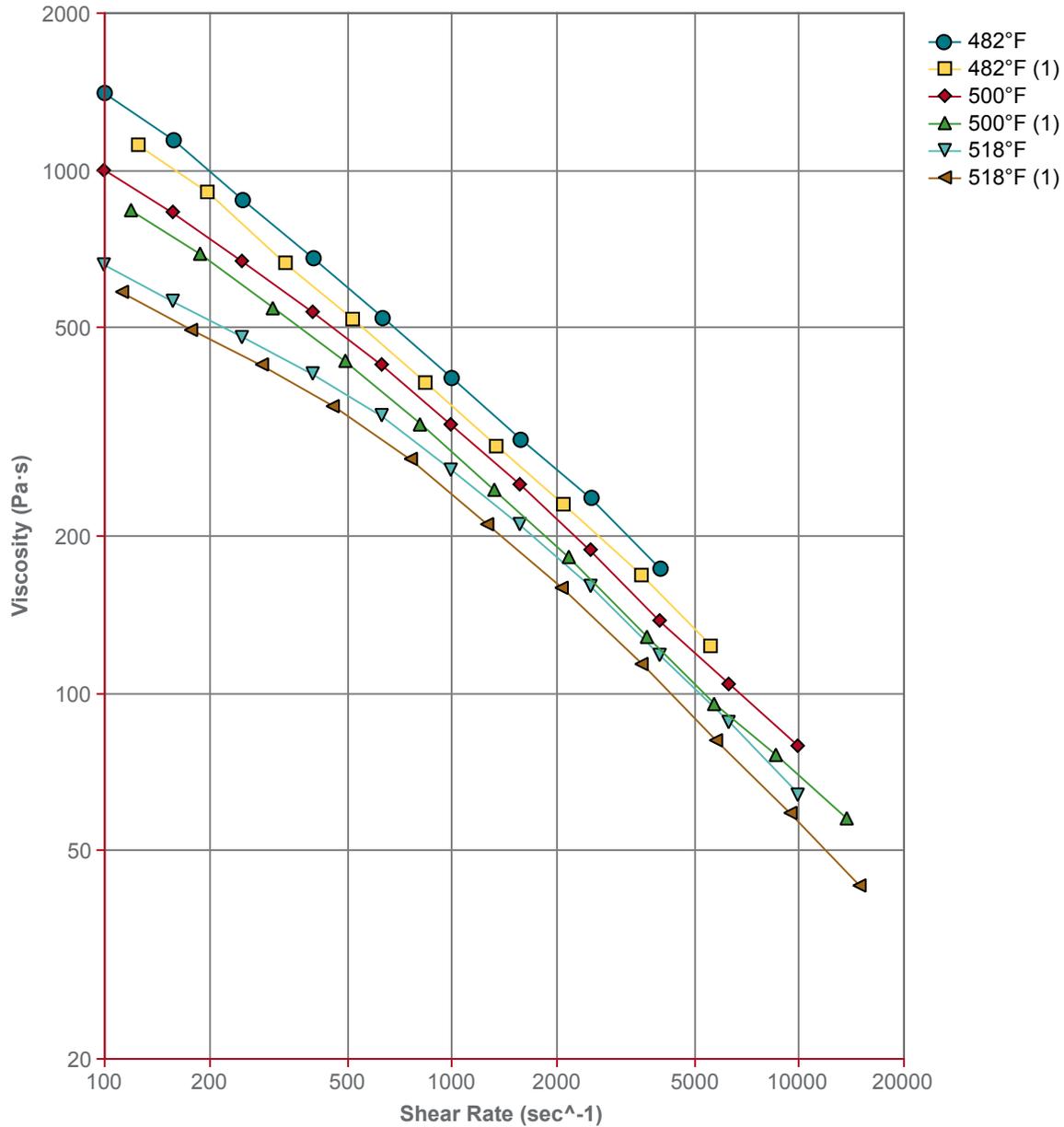
Data Notes
(1) - STOPPED



Thermal Conductivity vs. Temperature (ASTM E1530)



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 0.20 in/min (5.0 mm/min)

⁵ Type I, 2.0 in/min (50 mm/min)

⁶ 0.051 in/min (1.3 mm/min)

⁷ 0.079 in/min (2.0 mm/min)

⁸ at Yield

⁹ 80*10*4 sp=62mm

¹⁰ 80*10*4 mm

¹¹ Rate A (50°C/h), Loading 2 (50 N)

¹² by VDE

¹³ Tungsten Electrode

¹⁴ Surface

