

# VALOX\* 420 Resin

Polybutylene Terephthalate

SABIC Innovative Plastics



ides.com/prospector

## Technical Data

### Product Description

30% GR, excellent strength, stiffness and dimensional stability. High heat resistance. Appliance handles, spotlights, electric motors, connectors.

### General

Material Status	• Commercial: Active
Literature <sup>1</sup>	• <a href="#">Brochure - Chemical Compatibility Guide (English)</a> • <a href="#">Technical Datasheet</a>
UL Yellow Card <sup>2</sup>	• <a href="#">E121562-220792</a>
Search for UL Yellow Card	• <a href="#">SABIC Innovative Plastics</a> • <a href="#">VALOX*</a>
Availability	• North America
Filler / Reinforcement	• Glass Fiber Reinforcement, 30% Filler by Weight
Features	• Good Dimensional Stability • Good Stiffness • Good Strength • High Heat Resistance
Uses	• Appliance Components • Connectors • Handles
Automotive Specifications	• CHRYSLER MS-DB400 CPN2512 Color: Black • FORD ESE-M4D341-A1 • CHRYSLER MS-DB400 CPN3199 Color: Non-matched Color • GM GMP.PBTP.010
Processing Method	• Injection Molding
Multi-Point Data	• Coefficient of Thermal Expansion vs. Temperature (ASTM E831) • Elastic Modulus vs Temperature (ASTM D4065) • Flexural DMA (ASTM D4065) • Instrumented Impact (Energy) (ASTM D3763) • Instrumented Impact (Load) (ASTM D3763) • 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)

Physical	Nominal Value (English)	Nominal Value (SI)	Test Method
Specific Gravity			ASTM D792
--	1.53	1.53 g/cm <sup>3</sup>	
--	1.53 g/cm <sup>3</sup>	1.53 g/cm <sup>3</sup>	
Specific Volume	18.3 in <sup>3</sup> /lb	0.660 cm <sup>3</sup> /g	ASTM D792
Melt Mass-Flow Rate (MFR) (250°C/2.16 kg)	17 g/10 min	17 g/10 min	ISO 1133
Melt Volume-Flow Rate (MVR) (250°C/2.16 kg)	0.793 in <sup>3</sup> /10min	13.0 cm <sup>3</sup> /10min	ISO 1133
Molding Shrinkage			Internal Method
Flow <sup>4</sup>	0.0030 to 0.0070 in/in	0.30 to 0.70 %	
Flow <sup>5</sup>	0.0030 to 0.0050 in/in	0.30 to 0.50 %	
Flow <sup>6</sup>	0.0050 to 0.0080 in/in	0.50 to 0.80 %	
Flow: 0.126 in (3.20 mm)	0.0030 to 0.0080 in/in	0.30 to 0.80 %	
Across Flow <sup>4</sup>	0.0050 to 0.010 in/in	0.50 to 1.0 %	
Across Flow <sup>5</sup>	0.0040 to 0.0060 in/in	0.40 to 0.60 %	
Across Flow <sup>7</sup>	0.0060 to 0.0090 in/in	0.60 to 0.90 %	
Across Flow: 0.126 in (3.20 mm)	0.0050 to 0.010 in/in	0.50 to 1.0 %	
Water Absorption			
24 hr	0.090 %	0.090 %	ASTM D570
Equilibrium, 73°F (23°C), 50% RH	0.080 %	0.080 %	ISO 62

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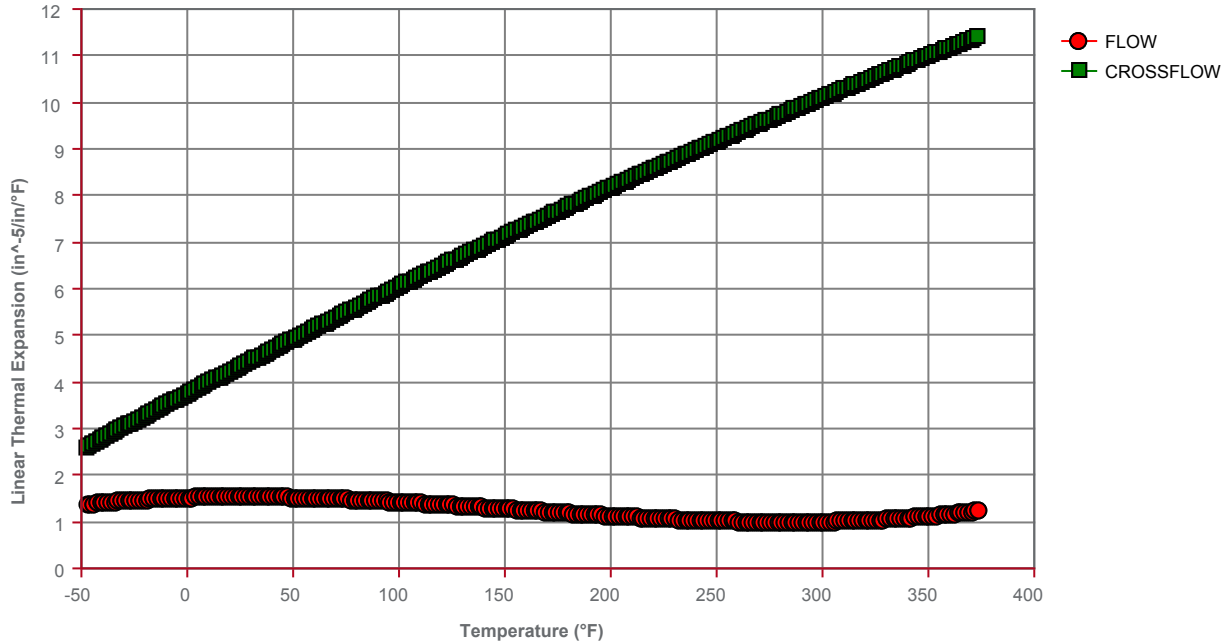
Mechanical	Nominal Value (English)	Nominal Value (SI)	Test Method
Tensile Modulus			
-- <sup>8</sup>	1.35E+6 psi	9300 MPa	ASTM D638
--	1.35E+6 psi	9300 MPa	ISO 527-2/1
Tensile Strength			
Yield <sup>9</sup>	17400 psi	120 MPa	ASTM D638
Yield	18100 psi	125 MPa	ISO 527-2/5
Break <sup>9</sup>	17400 psi	120 MPa	ASTM D638
Break	18100 psi	125 MPa	ISO 527-2/5
Tensile Elongation			
Yield <sup>9</sup>	2.7 %	2.7 %	ASTM D638
Yield	2.0 %	2.0 %	ISO 527-2/5
Break <sup>9</sup>	2.7 %	2.7 %	ASTM D638
Break	2.0 %	2.0 %	ISO 527-2/5
Flexural Modulus			
1.97 in (50.0 mm) Span <sup>10</sup>	1.10E+6 psi	7580 MPa	ASTM D790
-- <sup>11</sup>	1.23E+6 psi	8500 MPa	ISO 178
Flexural Strength			
-- <sup>11, 12</sup>	28300 psi	195 MPa	ISO 178
Yield, 1.97 in (50.0 mm) Span <sup>10</sup>	28300 psi	195 MPa	ASTM D790
Break, 1.97 in (50.0 mm) Span <sup>10</sup>	27500 psi	190 MPa	ASTM D790
Taber Abrasion Resistance			ASTM D1044
1000 Cycles, 1000 g, CS-17 Wheel	19.0 mg	19.0 mg	
<b>Impact</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Charpy Notched Impact Strength <sup>13</sup>			ISO 179/1eA
-22°F (-30°C)	2.4 ft·lb/in <sup>2</sup>	5.0 kJ/m <sup>2</sup>	
73°F (23°C)	2.4 ft·lb/in <sup>2</sup>	5.0 kJ/m <sup>2</sup>	
Charpy Unnotched Impact Strength <sup>13</sup>			ISO 179/1eU
-22°F (-30°C)	21 ft·lb/in <sup>2</sup>	45 kJ/m <sup>2</sup>	
73°F (23°C)	21 ft·lb/in <sup>2</sup>	45 kJ/m <sup>2</sup>	
Notched Izod Impact			
-22°F (-30°C)	1.5 ft·lb/in	80 J/m	ASTM D256
73°F (23°C)	1.6 ft·lb/in	85 J/m	ASTM D256
-22°F (-30°C) <sup>14</sup>	3.3 ft·lb/in <sup>2</sup>	7.0 kJ/m <sup>2</sup>	ISO 180/1A
73°F (23°C) <sup>14</sup>	3.8 ft·lb/in <sup>2</sup>	8.0 kJ/m <sup>2</sup>	ISO 180/1A
Unnotched Izod Impact			
73°F (23°C)	15 ft·lb/in	800 J/m	ASTM D4812
-22°F (-30°C) <sup>14</sup>	21 ft·lb/in <sup>2</sup>	45 kJ/m <sup>2</sup>	ISO 180/1U
73°F (23°C) <sup>14</sup>	21 ft·lb/in <sup>2</sup>	45 kJ/m <sup>2</sup>	ISO 180/1U
Instrumented Dart Impact			ASTM D3763
73°F (23°C), Total Energy	70.8 in·lb	8.00 J	
<b>Hardness</b>	<b>Nominal Value (English)</b>	<b>Nominal Value (SI)</b>	<b>Test Method</b>
Rockwell Hardness (R-Scale)	118	118	ASTM D785 ISO 2039-2
Ball Indentation Hardness (H 358/30)	17700 psi	122 MPa	ISO 2039-1

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)	428 °F	220 °C	ASTM D648
66 psi (0.45 MPa), Unannealed, 0.252 in (6.40 mm)	420 °F	216 °C	ASTM D648
66 psi (0.45 MPa), Unannealed, 2.52 in (64.0 mm) Span <sup>15</sup>	423 °F	217 °C	ISO 75-2/Bf
264 psi (1.8 MPa), Unannealed, 0.126 in (3.20 mm)	397 °F	203 °C	ASTM D648
264 psi (1.8 MPa), Unannealed, 0.252 in (6.40 mm)	405 °F	207 °C	ASTM D648
264 psi (1.8 MPa), Unannealed, 2.52 in (64.0 mm) Span <sup>15</sup>	399 °F	204 °C	ISO 75-2/Af
Vicat Softening Temperature			
--	419 °F	215 °C	ASTM D1525 <sup>16</sup>
--	433 °F	223 °C	ISO 306/A50
Ball Pressure Test (257°F (125°C))	Pass	Pass	IEC 60695-10-2
CLTE			
Flow: -40 to 104°F (-40 to 40°C)	0.000014 in/in/°F	0.000025 cm/cm/°C	ASTM E831 ISO 11359-2
Flow: 140 to 280°F (60 to 138°C)	0.000014 in/in/°F	0.000025 cm/cm/°C	ASTM E831
Transverse: -40 to 104°F (-40 to 40°C)	0.000067 in/in/°F	0.00012 cm/cm/°C	ASTM E831 ISO 11359-2
Thermal Conductivity	1.3 Btu·in/hr/ft <sup>2</sup> /°F	0.19 W/m/K	ISO 8302
RTI Elec	284 °F	140 °C	UL 746
RTI Imp	284 °F	140 °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 ohm	> 1.0E+15 ohm	IEC 60093
Volume Resistivity			
--	> 3.2E+16 ohm·cm	> 3.2E+16 ohm·cm	ASTM D257
--	> 1.0E+15 ohm·cm	> 1.0E+15 ohm·cm	IEC 60093
Dielectric Strength			
0.0630 in (1.60 mm), in Oil	630 V/mil	25 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	710 V/mil	28 kV/mm	IEC 60243-1
0.0394 in (1.00 mm) <sup>17</sup>	480 V/mil	19 kV/mm	IEC 60243-1
0.0630 in (1.60 mm), in Oil	610 V/mil	24 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
1 MHz	3.70	3.70	ASTM D150
50 Hz	3.10	3.10	IEC 60250
60 Hz	3.10	3.10	IEC 60250
1 MHz	3.10	3.10	IEC 60250
Dissipation Factor			
100 Hz	0.0020	0.0020	ASTM D150
1 MHz	0.020	0.020	ASTM D150
50 Hz	0.0010	0.0010	IEC 60250
60 Hz	0.0010	0.0010	IEC 60250
100 Hz	0.0010	0.0010	IEC 60250
1 MHz	0.010	0.010	IEC 60250
Arc Resistance <sup>18</sup>	PLC 5	PLC 5	ASTM D495
Comparative Tracking Index (CTI)	PLC 0	PLC 0	UL 746
Comparative Tracking Index	300 V	300 V	IEC 60112

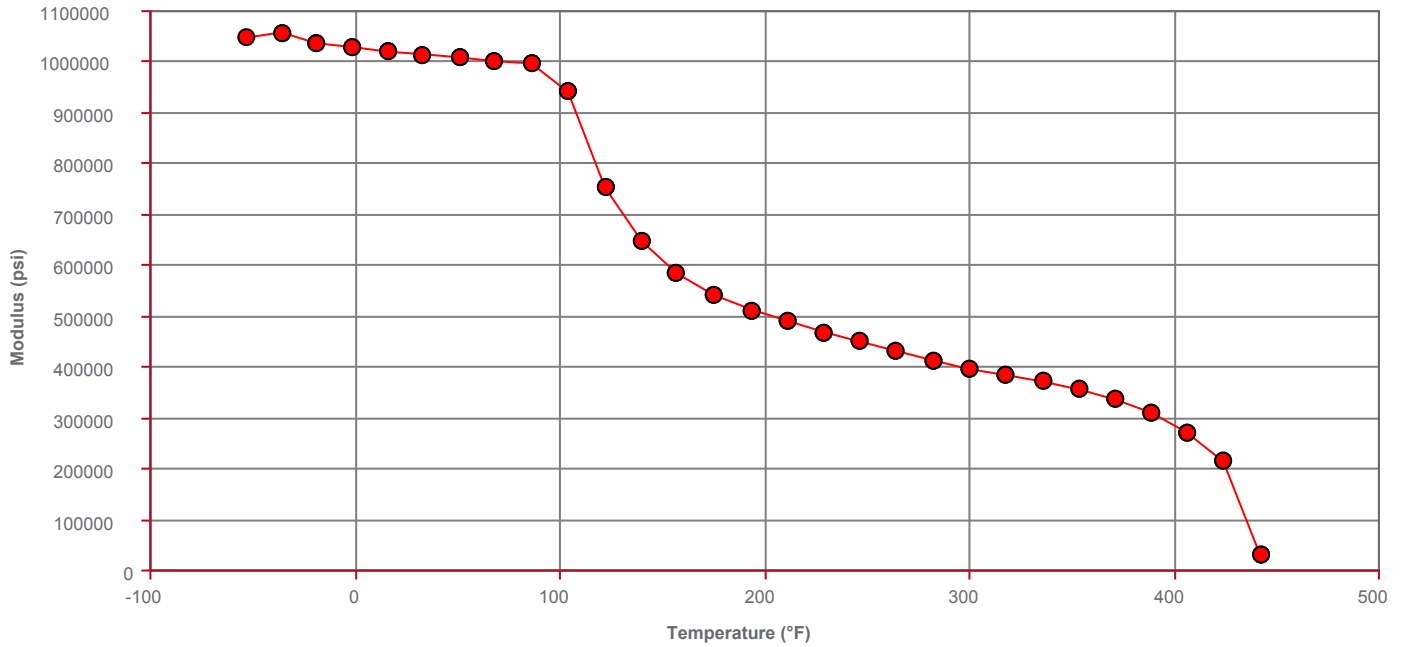
Electrical	Nominal Value (English)	Nominal Value (SI)	Test Method
High Voltage Arc Tracking Rate (HVTR)	PLC 1	PLC 1	UL 746
Flammability	Nominal Value (English)	Nominal Value (SI)	Test Method
Flame Rating (0.0331 in (0.840 mm))	HB	HB	UL 94
Glow Wire Flammability Index 0.0394 in (1.00 mm)	1380 °F	750 °C	IEC 60695-2-12
Oxygen Index	19 %	19 %	ASTM D2863
Additional Information	Nominal Value (English)	Nominal Value (SI)	Test Method
Filler Content	30 %	30 %	ASTM D229

Injection	Nominal Value (English)	Nominal Value (SI)
Drying Temperature	250 °F	121 °C
Drying Time	3.0 to 4.0 hr	3.0 to 4.0 hr
Drying Time, Maximum	12 hr	12 hr
Suggested Max Moisture	0.020 %	0.020 %
Suggested Shot Size	40 to 80 %	40 to 80 %
Rear Temperature	460 to 490 °F	238 to 254 °C
Middle Temperature	470 to 500 °F	243 to 260 °C
Front Temperature	480 to 510 °F	249 to 266 °C
Nozzle Temperature	470 to 500 °F	243 to 260 °C
Processing (Melt) Temp	480 to 510 °F	249 to 266 °C
Mold Temperature	150 to 190 °F	65.6 to 87.8 °C
Back Pressure	50.0 to 100 psi	0.345 to 0.689 MPa
Screw Speed	50 to 80 rpm	50 to 80 rpm
Vent Depth	0.0010 to 0.0015 in	0.025 to 0.038 mm

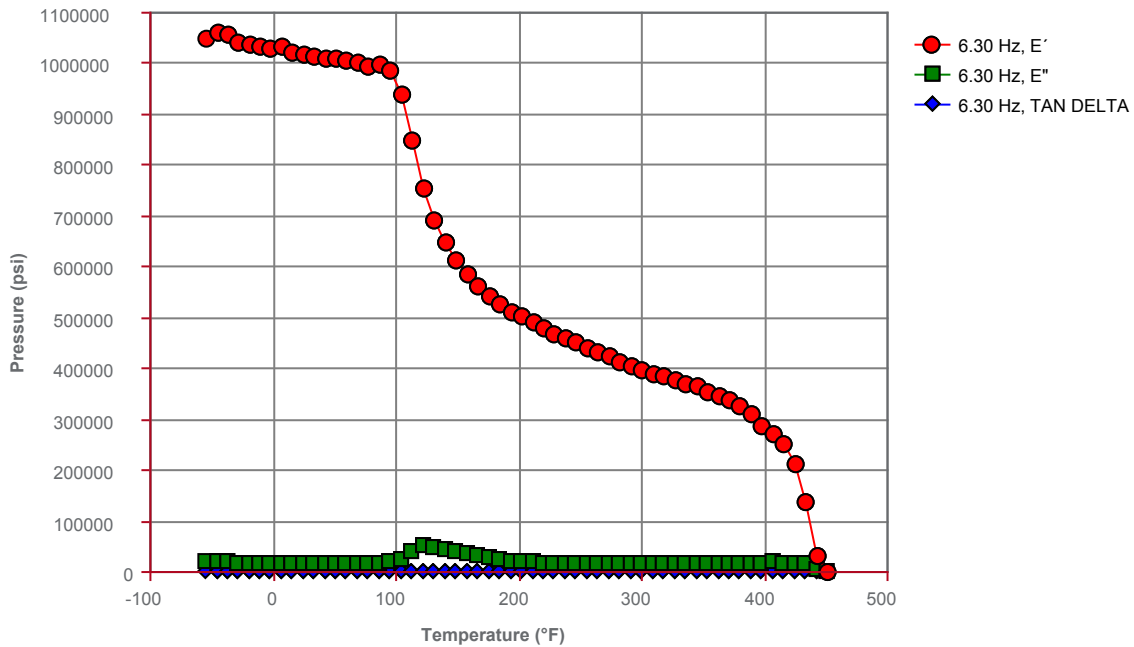
**Coefficient of Thermal Expansion vs. Temperature (ASTM E831)**



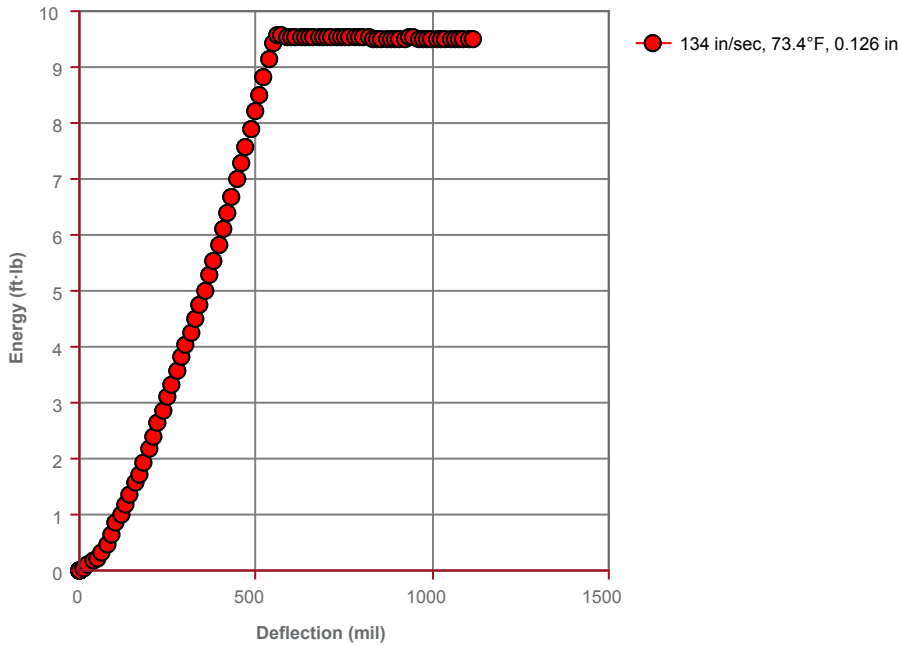
**Elastic Modulus vs Temperature (ASTM D4065)**



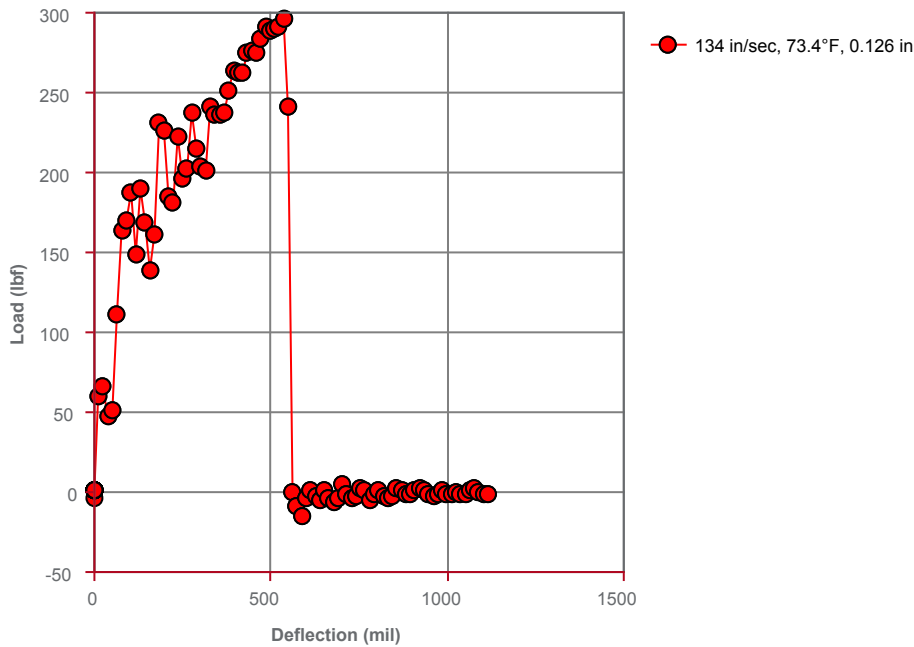
**Flexural DMA (ASTM D4065)**



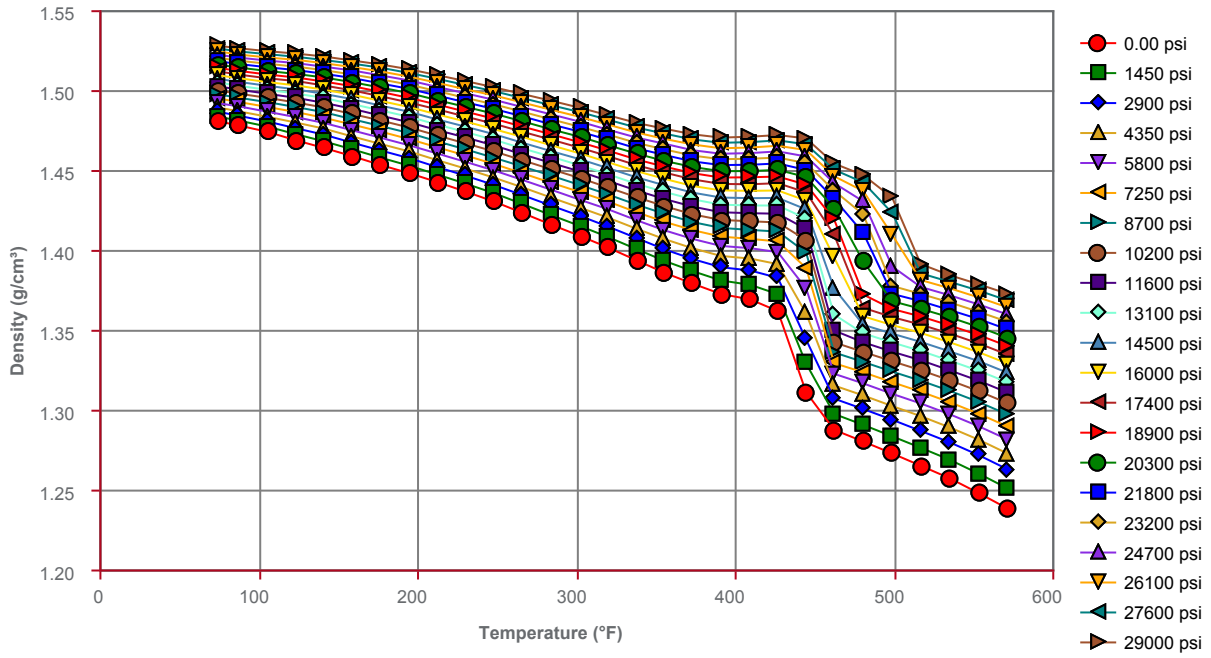
Instrumented Impact (Energy) (ASTM D3763)



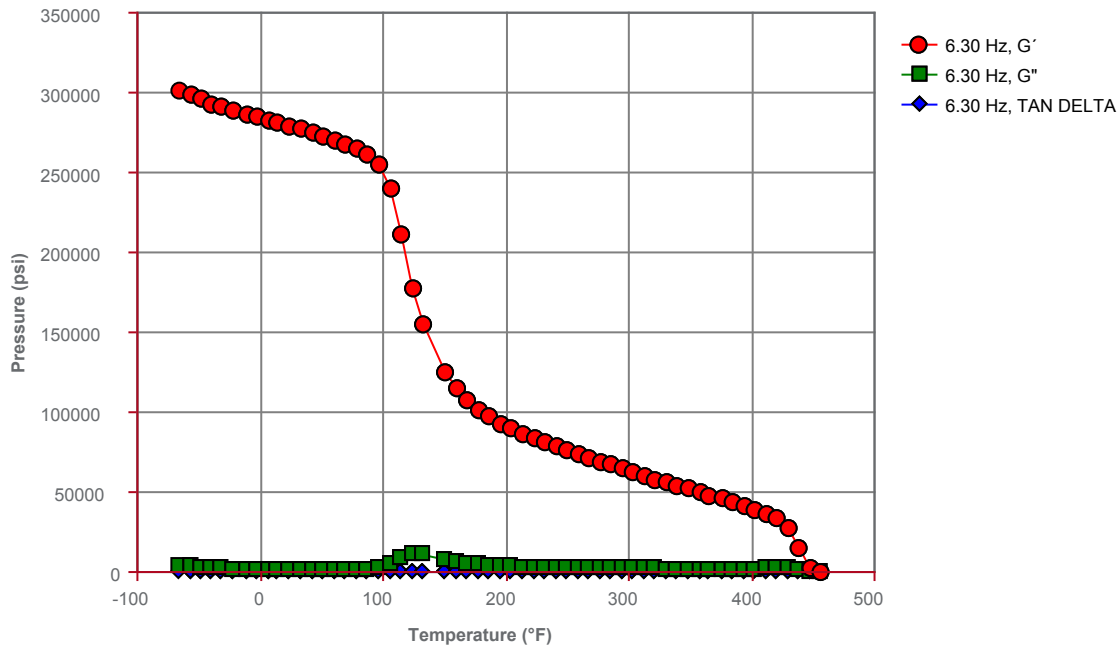
Instrumented Impact (Load) (ASTM D3763)



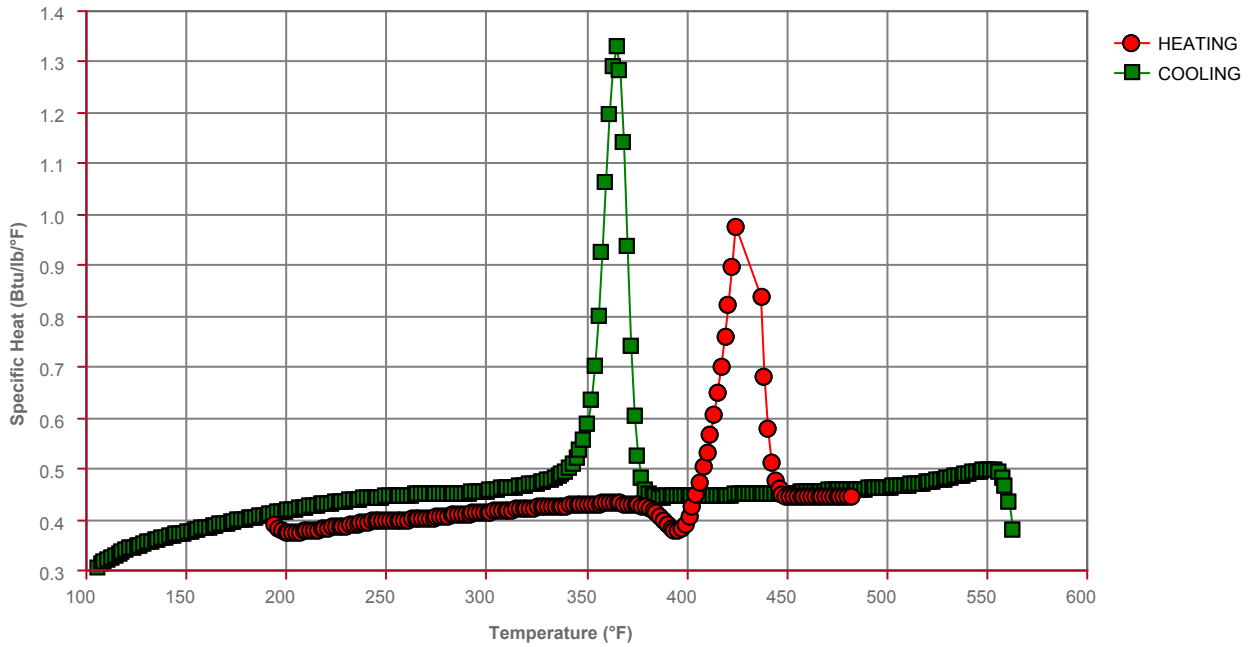
Pressure-Volume-Temperature (PVT - Zoller Method)



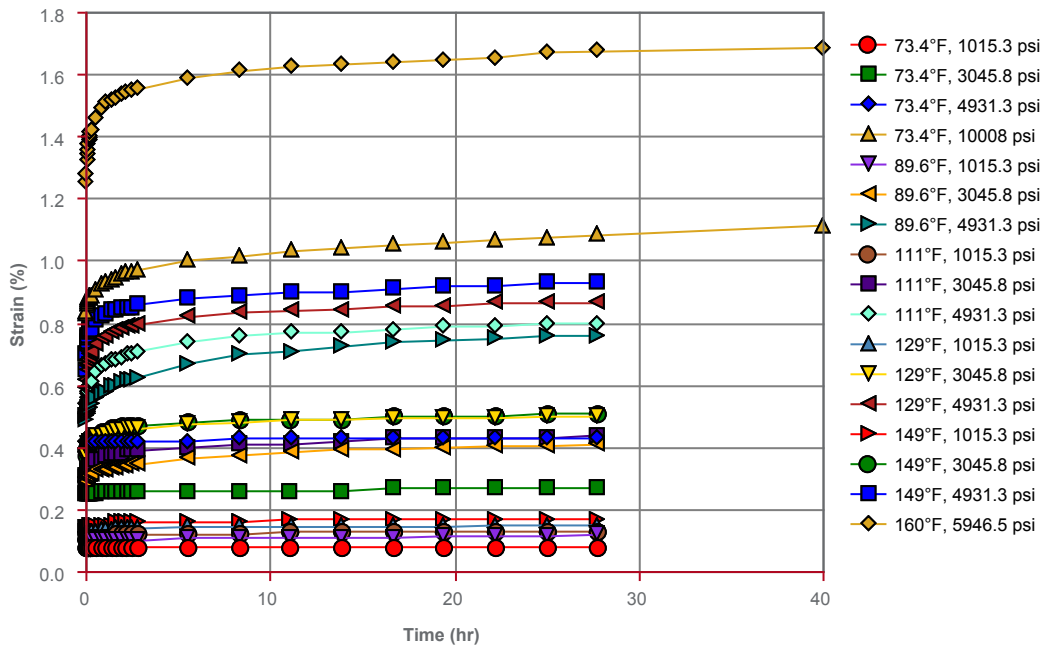
Shear DMA (ASTM D4065)



Specific Heat vs. Temperature (ASTM D3417)

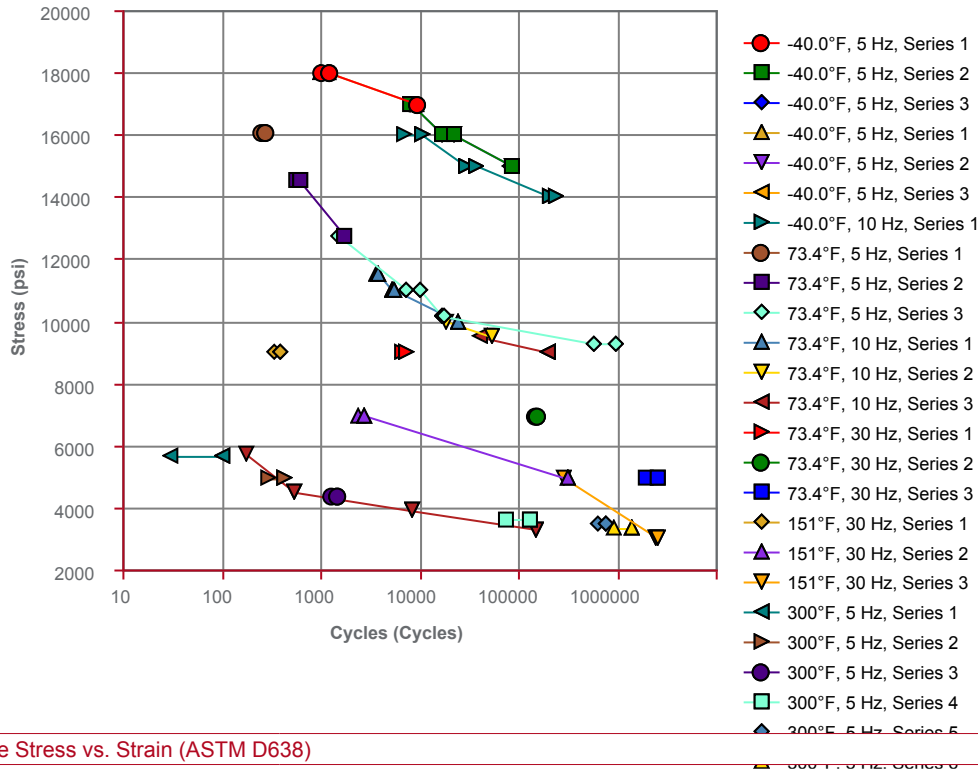


Tensile Creep (ASTM D2990)

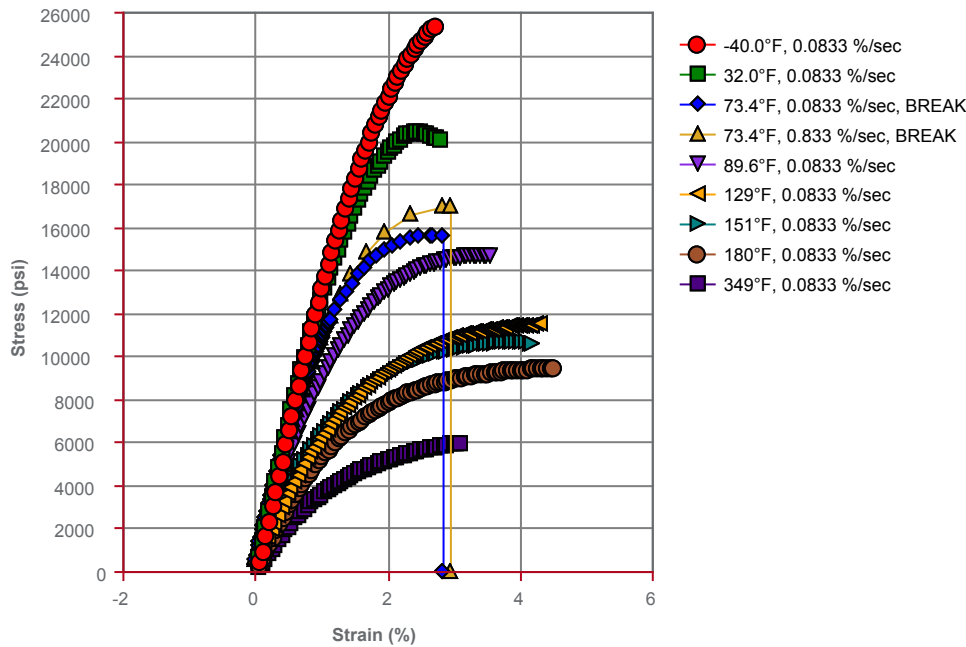




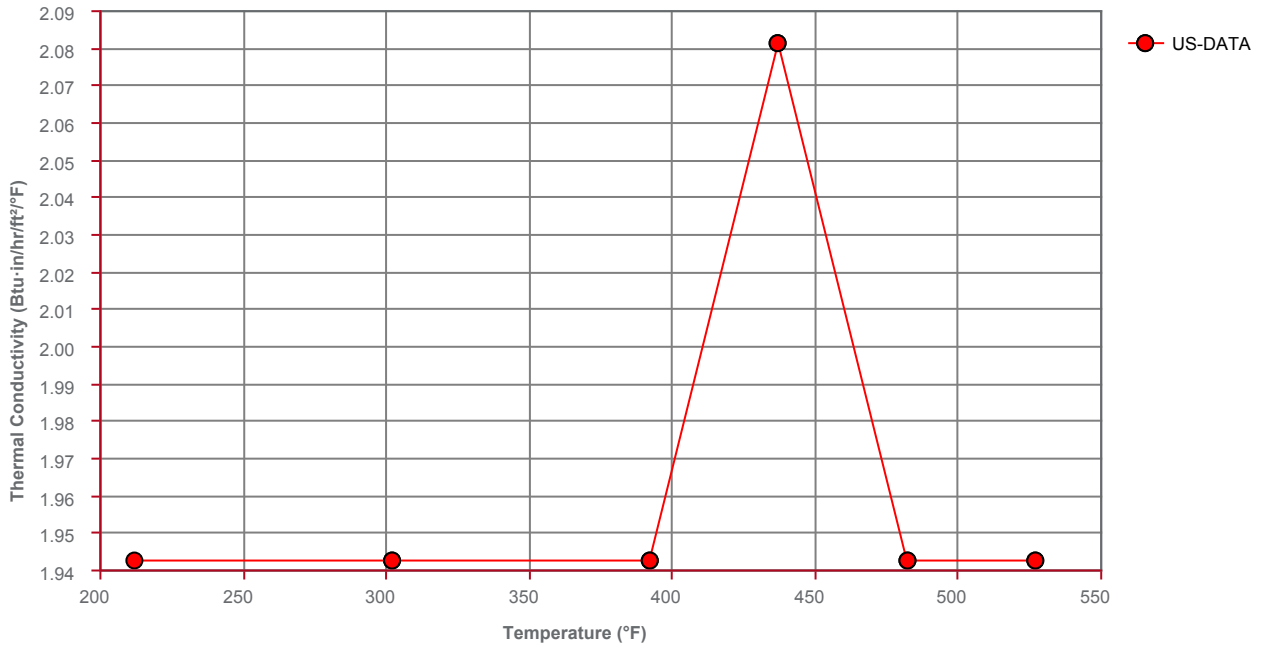
**Tensile Fatigue**



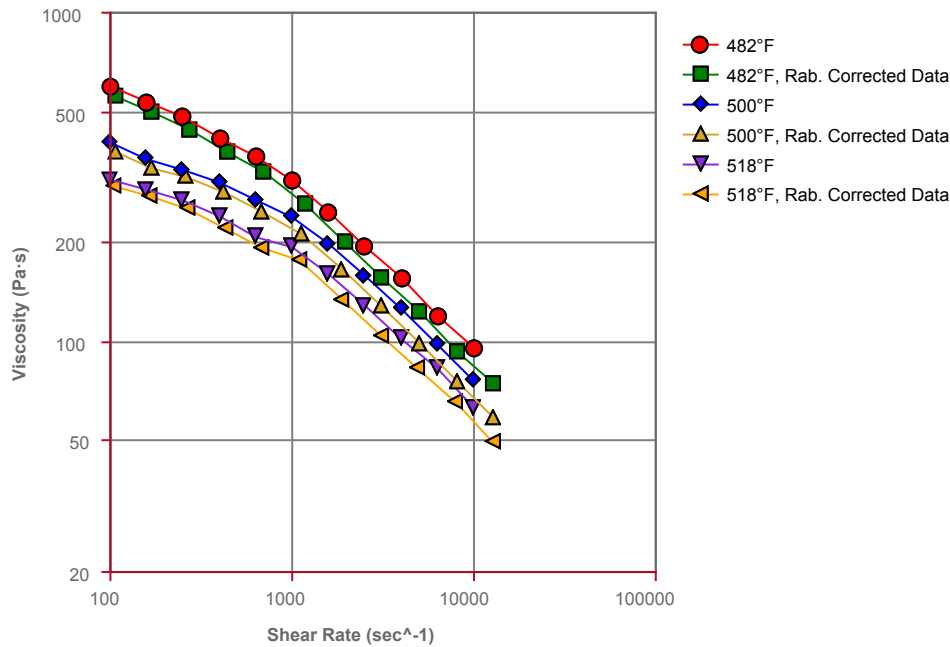
**Tensile Stress vs. Strain (ASTM D638)**



Thermal Conductivity vs. Temperature (ASTM E1530)



Viscosity vs. Shear Rate (ASTM D3835)



## Notes

- <sup>1</sup> 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.
- <sup>2</sup> A UL Yellow Card contains UL-verified flammability and electrical characteristics. UL IDES 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.
- <sup>3</sup> Typical properties: these are not to be construed as specifications.
- <sup>4</sup> Tensile Bar
- <sup>5</sup> 1.5 to 3.2 mm
- <sup>6</sup> 3.2 to 4.6 mm
- <sup>7</sup> 3.2-4.6 mm
- <sup>8</sup> 0.20 in/min (5.0 mm/min)
- <sup>9</sup> Type I, 0.20 in/min (5.0 mm/min)
- <sup>10</sup> 0.051 in/min (1.3 mm/min)
- <sup>11</sup> 0.079 in/min (2.0 mm/min)
- <sup>12</sup> Yield
- <sup>13</sup> 80\*10\*4 sp=62mm
- <sup>14</sup> 80\*10\*4
- <sup>15</sup> 80\*10\*4 mm
- <sup>16</sup> Rate B (120°C/h), Loading 2 (50 N)
- <sup>17</sup> Short-Time
- <sup>18</sup> Tungsten Electrode

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## Where to Buy

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### Supplier

**SABIC Innovative Plastics**  
Pittsfield, MA USA  
**Telephone:** 800-845-0600  
**Web:** <http://www.sabic-ip.com/>

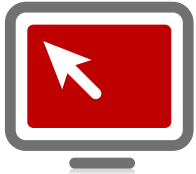
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### Distributor

**Nexeo Solutions**  
**Telephone:** 800-531-7106  
**Web:** <http://www.nexeosolutions.com/>  
**Availability:** North America



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Prospector is a searchable online database that includes 85,000 data sheets from 875 manufacturers and 44,000 UL yellow cards. Each data sheet includes property, processing and supplier contact information. Prospector is relied on by nearly 400,000 design engineers and plastics processors. Using Prospector, they save time with plastic material selection by quickly and easily referencing technical information critical to the success of their products.

*"Prospector is absolutely the best and most well-known search engine for plastic raw materials in the world. We use Prospector every day – it's a real time saver!"*

– Birgit Elvardt Bader, Production Manager, Micotron

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**Curve Data** – view, overlay and export curve data.



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*"With UL IDES data services, our website now displays the most current information on the products we distribute and links to our backend RFQ and sales order system, adding both value and service for our customers."*

– Kevin Chase, Owner & President, Chase Plastics



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