Stanyl® TW341

Polyamide 46

Envalior

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Technical Data

Product Description

Heat Stabilized, Lubricated

Stanyl® TW341 is a V2 UL-rated, non-reinforced high heat polyamide that offers excellent wear & friction properties in combination with outstanding creep resistance, strength, stiffness and fatigue resistance especially at high temperatures in combination with cycle-time advantages and excellent flow.

Design Challenge
Wear & Friction

General

Material Status	• Commercial: Active		
Literature [1]	• Processing (English) • Technical Datasheet (English) • White Paper - Delivering high-performance gears for compact electric engine actuators (English) • White Paper - Enhancing timing drive system performance and sustainability (English) • White Paper - High Performance Plastics in Automotive Actuator Applications (English) • White Paper - Leveraging safe, high-performance materials for kitchen utensils (English) • White Paper - Meeting food contact safety standards in the kitchen (English) • White Paper - Optimizing gear performance in small appliances (English) • White Paper - Optimizing gears for electric brake actuators (English)		
UL Yellow Card [2]	• E43392-235049 • E47960-240080 • E172082-225894		
Search for UL Yellow Card	• Envalior • Stanyl®		
Availability	• Africa & Middle East • Asia Pacific	• Europe • Latin America	• North America
Additive	• Heat Stabilizer	• Lubricant	
Features	• Heat Stabilized	• Lubricated	
Automotive Specifications	• CHRYSLER MS-DB-41	• FORD WSK-M4D671-A2	• PSA Peugeot-Citroën SPA X62 4144
Processing Method	• Injection Molding		
Multi-Point Data	• Isochronous Stress vs. Strain (ISO 11403) • Isothermal Stress vs. Strain (ISO 11403) • Secant Modulus vs. Strain (ISO 11403)	• Shear Modulus vs. Temperature, Dynamic (ISO 11403) • Shear Stress vs. Shear Rate (ISO 11403) • Tensile Fatigue	• Viscosity vs. Shear Rate (ISO 11403)
Resin ID	• PA46		

Physical	Dry	Conditioned	Unit	Test Method
Density	1.18	--	g/cm³	ISO 1183
Spiral Flow				
-- [4]	4.33 (11.0)	--	in (cm)	
-- [5]	4.72 (12.0)	--	in (cm)	
-- [6]	5.12 (13.0)	--	in (cm)	
-- [7]	2.36 (6.00)	--	in (cm)	
-- [8]	2.76 (7.00)	--	in (cm)	
-- [9]	3.54 (9.00)	--	in (cm)	

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Physical	Dry	Conditioned	Unit	Test Method
Molding Shrinkage				ISO 294-4
Across Flow	2.0	--	%	
Flow	2.0	--	%	
Water Absorption				ISO 62
24 hr, 73°F (23°C)	3.8	--	%	
Saturation, 73°F (23°C)	14	--	%	
Equilibrium, 73°F (23°C), 50% RH	3.7	--	%	
Viscosity Number	185	--	cm³/g	ISO 307

Mechanical	Dry	Conditioned	Unit	Test Method
Tensile Modulus				ISO 527-1
--	479000 (3300)	145000 (1000)	psi (MPa)	
-40°F (-40°C)	479000 (3300)	--	psi (MPa)	
212°F (100°C)	123000 (850)	--	psi (MPa)	
248°F (120°C)	116000 (800)	--	psi (MPa)	
320°F (160°C)	94300 (650)	--	psi (MPa)	
356°F (180°C)	87000 (600)	--	psi (MPa)	
392°F (200°C)	72500 (500)	--	psi (MPa)	
Tensile Stress				ISO 527-2
Yield	14500 (100)	7980 (55.0)	psi (MPa)	
Yield, -40°F (-40°C)	19600 (135)	--	psi (MPa)	
Yield, 212°F (100°C)	7980 (55.0)	--	psi (MPa)	
Yield, 248°F (120°C)	7250 (50.0)	--	psi (MPa)	
Yield, 320°F (160°C)	5800 (40.0)	--	psi (MPa)	
Yield, 356°F (180°C)	5080 (35.0)	--	psi (MPa)	
Yield, 392°F (200°C)	4350 (30.0)	--	psi (MPa)	
Tensile Strain (Yield)	10	20	%	ISO 527-2

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Mechanical	Dry	Conditioned	Unit	Test Method
Nominal Tensile Strain at Break				ISO 527-2
--	40	> 50	%	
-40°F (-40°C)	20	--	%	
212°F (100°C)	> 50	--	%	
248°F (120°C)	> 50	--	%	
320°F (160°C)	> 50	--	%	
356°F (180°C)	> 50	--	%	
392°F (200°C)	> 50	--	%	
Flexural Modulus				ISO 178
--	435000 (3000)	131000 (900)	psi (MPa)	
248°F (120°C)	116000 (800)	--	psi (MPa)	
320°F (160°C)	87000 (600)	--	psi (MPa)	
Flexural Stress				ISO 178
--	21800 (150)	7250 (50.0)	psi (MPa)	
248°F (120°C)	7250 (50.0)	--	psi (MPa)	
320°F (160°C)	5800 (40.0)	--	psi (MPa)	
Weldline Strength				ISO 527-2
39.4 mil (1.00 mm)	13779 (95.0)	7252 (50.0)	psi (MPa)	
0.16 in (4.00 mm)	14504 (100)	7977 (55.0)	psi (MPa)	
Impact	**Dry**	**Conditioned**	**Unit**	**Test Method**
Charpy Notched Impact Strength				ISO 179/1eA
-22°F (-30°C)	1.9 (4.0)	1.9 (4.0)	ft·lb/in² (kJ/m²)	
73°F (23°C)	4.8 (10)	17 (35)	ft·lb/in² (kJ/m²)	
Charpy Unnotched Impact Strength				ISO 179/1eU
-22°F (-30°C)	No Break	No Break		
73°F (23°C)	No Break	No Break		
Notched Izod Impact Strength				ISO 180/1A
-40°F (-40°C)	1.9 (4.0)	1.9 (4.0)	ft·lb/in² (kJ/m²)	
73°F (23°C)	4.8 (10)	17 (35)	ft·lb/in² (kJ/m²)	
Thermal	**Dry**	**Conditioned**	**Unit**	**Test Method**
Deflection Temperature Under Load				
66 psi (0.45 MPa), Unannealed	536 (280)	--	°F (°C)	ISO 75-2/B
264 psi (1.8 MPa), Unannealed	374 (190)	--	°F (°C)	ISO 75-2/A
Glass Transition Temperature [10]	167 (75.0)	--	°F (°C)	ISO 11357-2

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Thermal	Dry	Conditioned	Unit	Test Method
Vicat Softening Temperature	554 (290)	--	°F (°C)	ISO 306/B50
Melting Temperature [10]	563 (295)	--	°F (°C)	ISO 11357-3
CLTE				ISO 11359-2
Flow	4.7E-5 (8.5E-5)	--	in/in/°F (cm/cm/°C)	
Transverse	6.1E-5 (1.1E-4)	--	in/in/°F (cm/cm/°C)	
RTI Elec				UL 746B
0.030 in (0.75 mm)	302 (150)	--	°F (°C)	
0.12 in (3.0 mm)	302 (150)	--	°F (°C)	
RTI Imp				UL 746B
0.030 in (0.75 mm)	239 (115)	--	°F (°C)	
0.12 in (3.0 mm)	239 (115)	--	°F (°C)	
RTI Str				UL 746B
0.030 in (0.75 mm)	248 (120)	--	°F (°C)	
0.12 in (3.0 mm)	266 (130)	--	°F (°C)	
Effective Thermal Diffusivity	1.43E-4 (9.21E-8)	--	in²/s (m²/s)	
Thermal Index				IEC 60216
10000 hrs	286 (141)	--	°F (°C)	
20000 hrs	266 (130)	--	°F (°C)	
2500 hrs	325 (163)	--	°F (°C)	
5000 hrs	306 (152)	--	°F (°C)	

Electrical	Dry	Conditioned	Unit	Test Method
Surface Resistivity	--	1.0E+13	ohms	IEC 62631-3-2
Volume Resistivity	1.0E+13	1.0E+7	ohms·m	IEC 62631-3-1
Electric Strength	640 (25)	380 (15)	V/mil (kV/mm)	IEC 60243-1
Relative Permittivity				IEC 62631-2-1
100 Hz	3.90	22.0		
1 MHz	3.60	4.50		
Dissipation Factor				IEC 62631-2-1
100 Hz	7.0E-3	8700		
1 MHz	0.026	1200		
Comparative Tracking Index	400	--	V	IEC 60112

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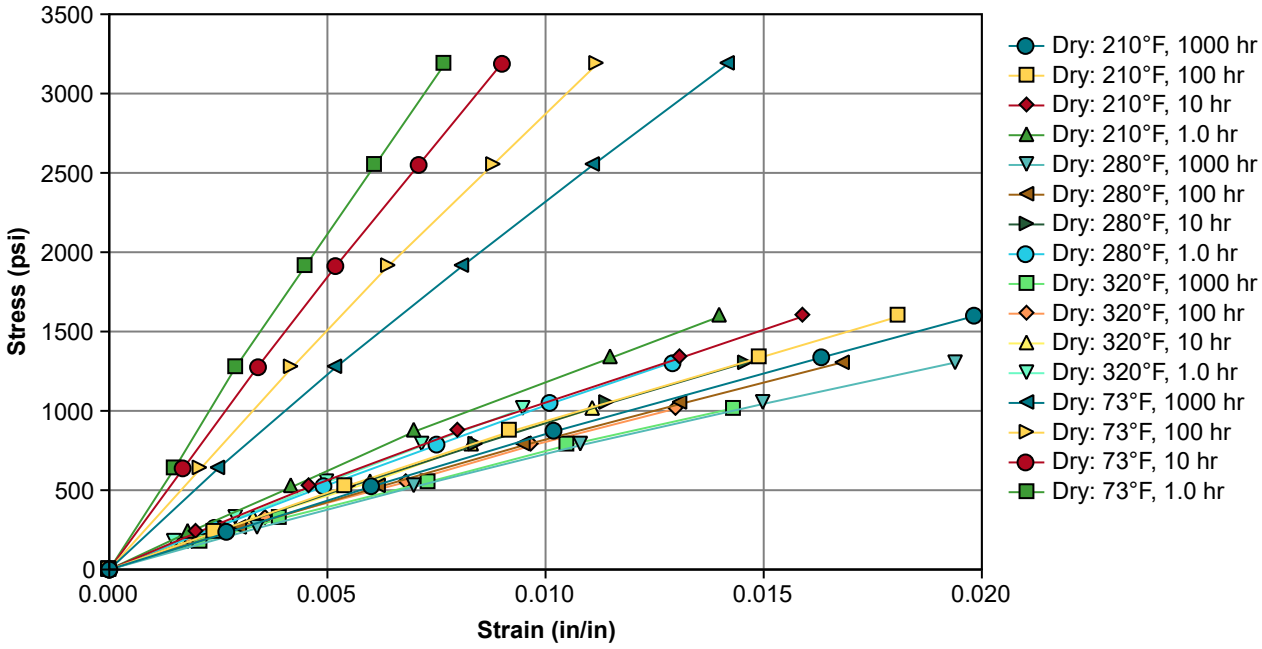
Flammability	Dry	Conditioned	Unit	Test Method
Flame Rating				UL 94 IEC 60695-11-10, -20
0.06 in (1.5 mm)	V-2	--		
0.12 in (3.0 mm)	V-2	--		
Glow Wire Flammability Index				IEC 60695-2-12
0.030 in (0.75 mm)	1380 (750)	--	°F (°C)	
0.12 in (3.0 mm)	1200 (650)	--	°F (°C)	
Glow Wire Ignition Temperature				IEC 60695-2-13
0.030 in (0.75 mm)	1340 (725)	--	°F (°C)	
0.12 in (3.0 mm)	1290 (700)	--	°F (°C)	
Oxygen Index	27	--	%	ISO 4589-2

Fill Analysis	Dry	Conditioned	Unit	Test Method
Melt Density	0.990	--	g/cm³	
Melt Specific Heat	0.638 (2670)	--	Btu/lb/°F (J/kg/°C)	
Melt Thermal Conductivity	1.7 (0.25)	--	Btu·in/hr/ft²/°F (W/m/K)	ASTM E1461

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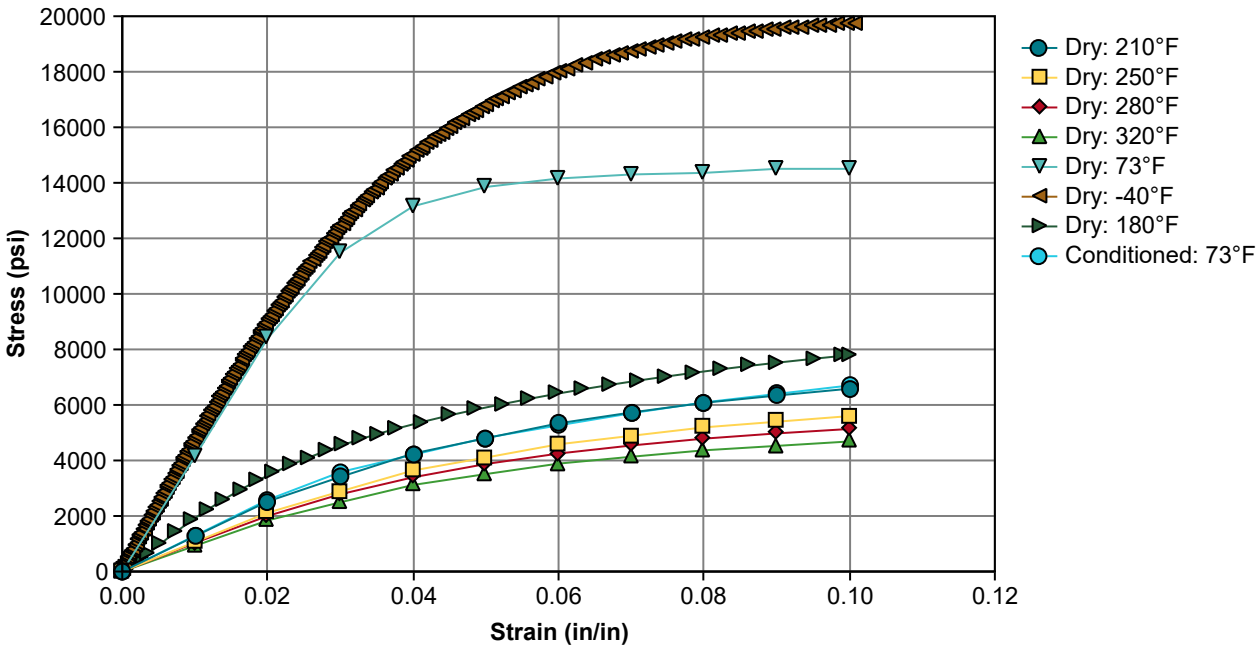
Isochronous Stress vs. Strain (ISO 11403)



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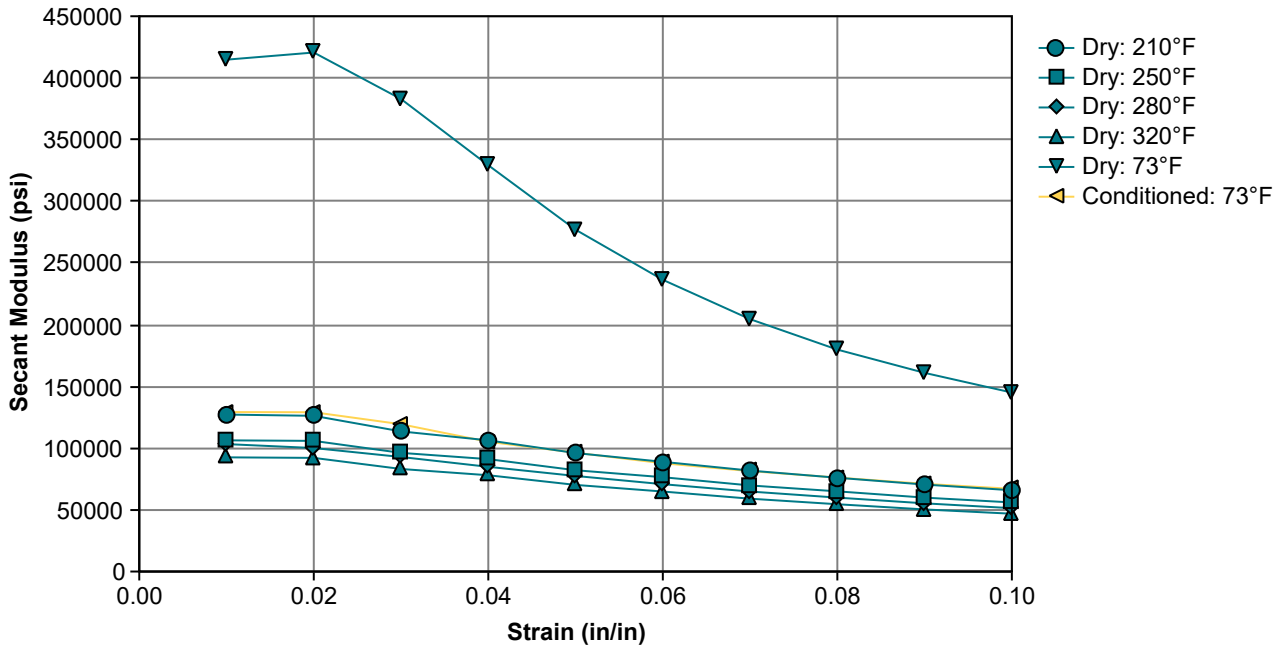
Isothermal Stress vs. Strain (ISO 11403)



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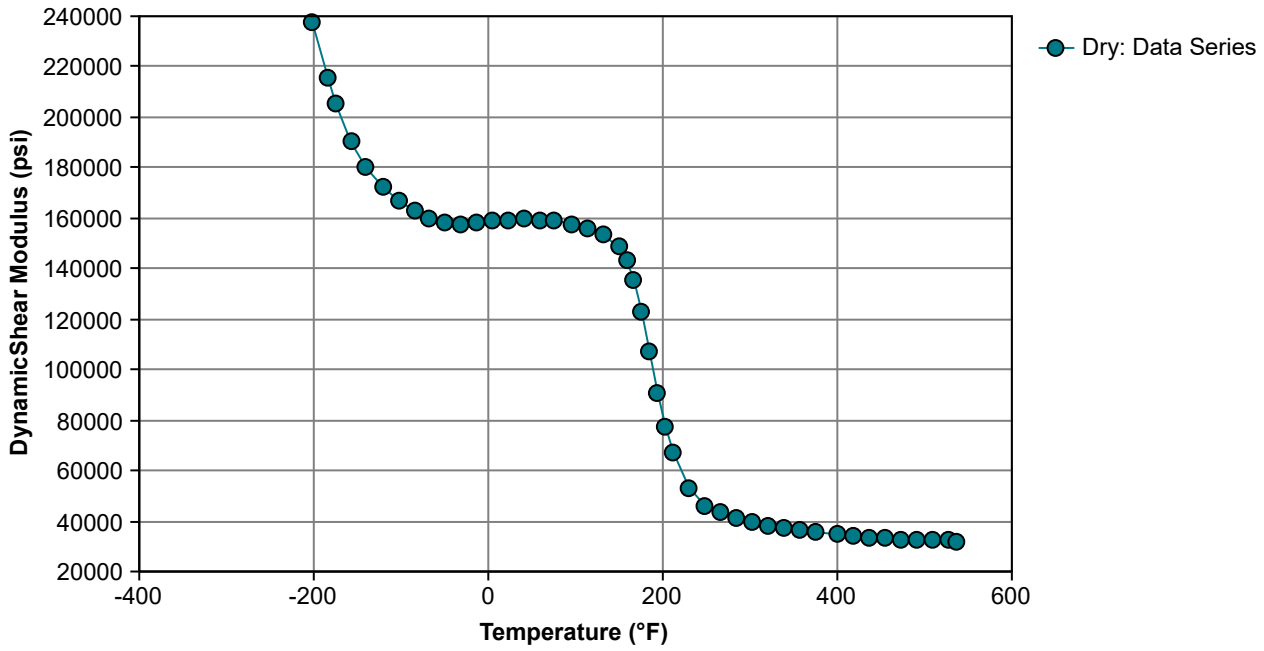
Secant Modulus vs. Strain (ISO 11403)



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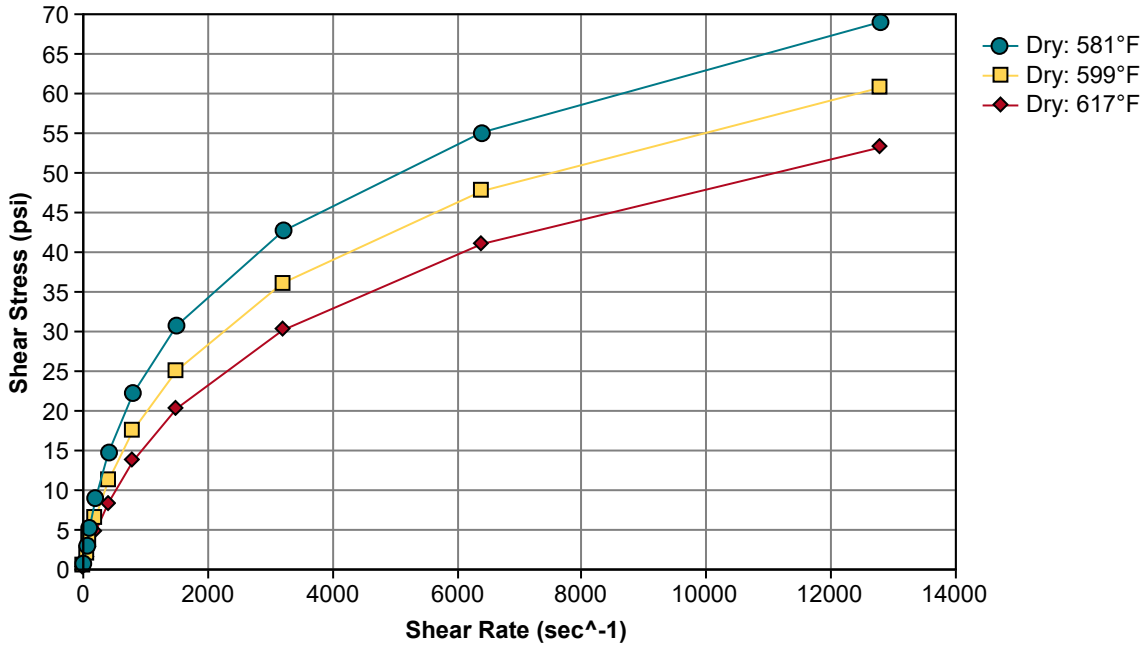
Shear Modulus vs. Temperature, Dynamic (ISO 11403)



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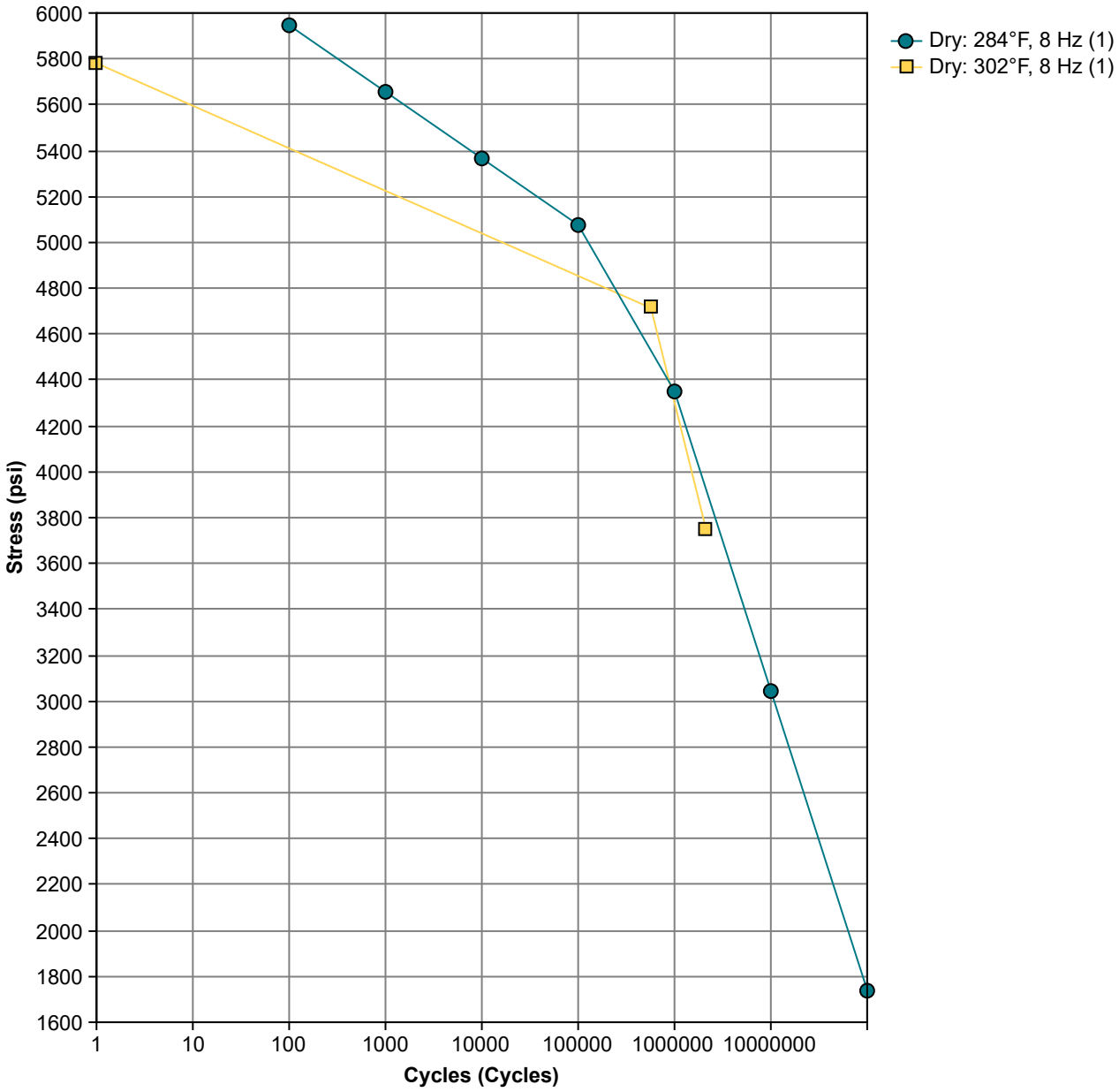
Shear Stress vs. Shear Rate (ISO 11403)



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Tensile Fatigue

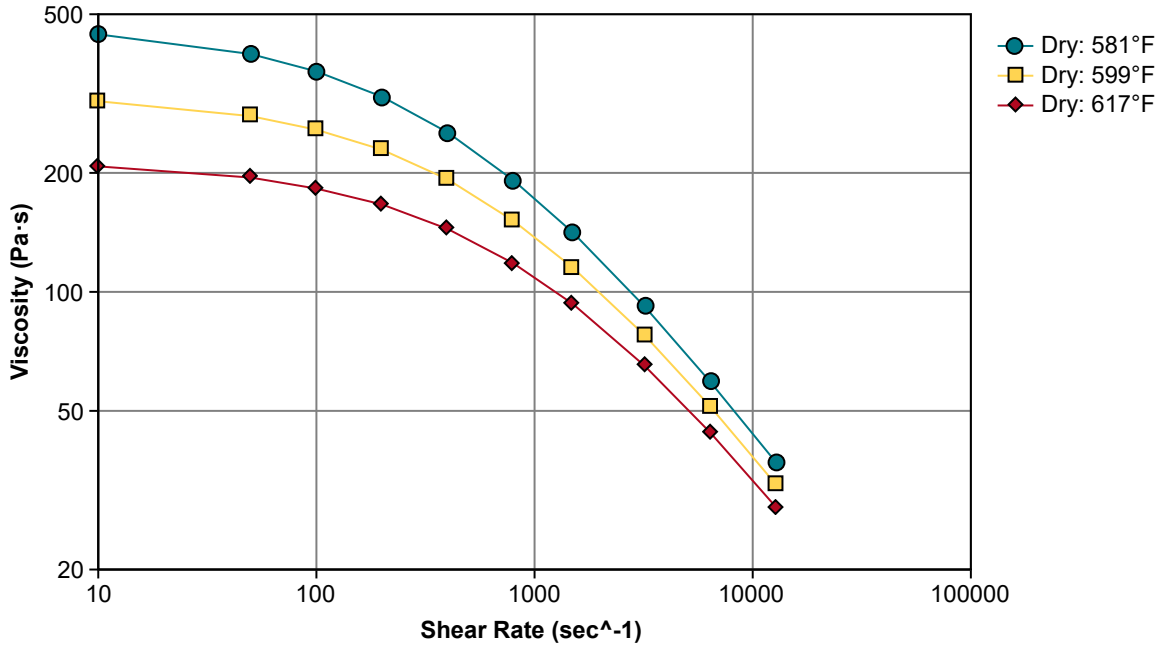


Data Notes
(1) - R=0.1

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Viscosity vs. Shear Rate (ISO 11403)



Form No. TDS-11706-en
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[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] Injection Pressure: 1.16E+4 psi (800 bar), 0.0394 in (1.00 mm)

[5] Injection Pressure: 1.31E+4 psi (900 bar), 0.0394 in (1.00 mm)

[6] Injection Pressure: 1.45E+4 psi (1.00E+3 bar), 0.0394 in (1.00 mm)

[7] Injection Pressure: 1.74E+4 psi (1.20E+3 bar), 0.0197 in (0.500 mm)

[8] Injection Pressure: 2.32E+4 psi (1.60E+3 bar), 0.0197 in (0.500 mm)

[9] Injection Pressure: 2.90E+4 psi (2.00E+3 bar), 0.0197 in (0.500 mm)

[10] 10°C/min

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Where to Buy

Supplier

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Distributor

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Web: http://www.channelpa.com/
Availability: North America

Chase Plastic Services, Inc.
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