

Technical Data

Product Description	
TECHNYL® A 222 NATURAL (干燥)	TECHNYL® A 222 Natural is an unfilled polyamide 66, heat stabilized, medium viscosity, for injection moulding, fast crystallization, for short cycles. This grade offers a good combination between primary properties of the unreinforced polyamide 66 and processing properties leading to increased productivity. These performances are associated with excellent dimensional stability and good rigidity of moulded parts.
Zytel® 103HSL NC010 (干燥)	Unreinforced, Heat Stabilized, Polyamide 66
Zytel® 103FHS NC010 (干燥)	Unreinforced, Heat Stabilized, Polyamide 66
Vydyne® 21SPC (干燥)	<p>Vydyne 21SPC is a general-purpose PA66 resin. Available in natural color. It is designed principally for injection-molding fabrication. This resin offers a well balanced combination of engineering properties characterized by high strength; rigidity; good toughness; high melt point; good surface lubricity; abrasion resistance; and resistance to many chemicals, machine and motor oils, solvents and gasoline.</p> <p>Vydyne 21SPC permits production of molded parts with good initial color plus good property and color retention when using regrind. This resin is recognized by Underwriters Laboratories and conforms to the requirements of many industrial, federal and military specifications for premium-quality, general-purpose PA66 resins.</p> <p>Internally and externally lubricated for improved machine feed and exceptional mold release. Vydyne 21SPC is intended for use in high-productivity applications. In many applications, the molding cycle can be reduced because parts may be removed from the cavity at higher temperatures. In difficult molds where parts have a tendency to stick in the cavity, Vydyne 21SPC can reduce or eliminate the need for mold release sprays. Critical molded-part dimensions should be checked against specifications before implementing shorter molding cycles on a routine production basis.</p> <p>Typical Applications/End Uses: Vydyne 21SPC has been used in many molding applications such as terminal blocks, bearings, bushings, cams, electrical connectors and housings, electrical cable ties/tie straps and many other hardware and general industrial parts.</p>
Zytel® 101L NC010 (干燥)	Unreinforced Polyamide 66

General	TECHNYL® A 222 NATURAL (干燥)	Zytel® 103HSL NC010 (干燥)	Zytel® 103FHS NC010 (干燥)	Vydyne® 21SPC (干燥)	Zytel® 101L NC010 (干燥)
Manufacturer / Supplier	• Technyl Suppliers	• DuPont Transportation & Industrial	• DuPont Transportation & Industrial	• Ascend Performance Materials Operations LLC	• DuPont Transportation & Industrial
Generic Symbol	• 尼龙 66	• 尼龙 66	• 尼龙 66	• 尼龙 66	• 尼龙 66
Material Status	• 已商用：当前有效	• 已商用：当前有效	• 已商用：当前有效	• 已商用：当前有效	• 已商用：当前有效



General	TECHNYL® A 222 NATURAL (干燥)	Zytel® 103HSL NC010 (干燥)	Zytel® 103FHS NC010 (干燥)	Vydyne® 21SPC (干燥)	Zytel® 101L NC010 (干燥)
资料 ¹	<ul style="list-style-type: none"> Technical Datasheet 	<ul style="list-style-type: none"> Processing - Injection Molding (English) Typical Processing for DuPont Engineering Polymers (English) 	<ul style="list-style-type: none"> Processing - Injection Molding (English) Typical Processing for DuPont Engineering Polymers (English) 	<ul style="list-style-type: none"> Technical Datasheet 	<ul style="list-style-type: none"> Processing - Injection Molding (English) Typical Processing for DuPont Engineering Polymers (English)
UL 黄卡 ²	--	<ul style="list-style-type: none"> E41938-234370 	<ul style="list-style-type: none"> E41938-234370 	<ul style="list-style-type: none"> E70062-249058 	<ul style="list-style-type: none"> E41938-100726136 E41938-234369
搜索 UL 黄卡	<ul style="list-style-type: none"> Technyl Suppliers TECHNYL® 	<ul style="list-style-type: none"> DuPont Transportation & Industrial Zytel® 	<ul style="list-style-type: none"> DuPont Transportation & Industrial Zytel® 	<ul style="list-style-type: none"> Ascend Performance Materials Operations LLC Vydyne® 	<ul style="list-style-type: none"> DuPont Transportation & Industrial Zytel®
Availability	<ul style="list-style-type: none"> 欧洲 	<ul style="list-style-type: none"> 北美洲 非洲和中东 拉丁美洲 欧洲 亚太地区 	<ul style="list-style-type: none"> 北美洲 非洲和中东 拉丁美洲 欧洲 亚太地区 	<ul style="list-style-type: none"> 北美洲 欧洲 亚太地区 	<ul style="list-style-type: none"> 北美洲 非洲和中东 拉丁美洲 欧洲 亚太地区
Additive	<ul style="list-style-type: none"> 热稳定剂 	<ul style="list-style-type: none"> 热稳定剂 润滑剂 脱模 	<ul style="list-style-type: none"> 热稳定剂 润滑剂 脱模 	<ul style="list-style-type: none"> 润滑剂 	<ul style="list-style-type: none"> 脱模
Features	<ul style="list-style-type: none"> Heat Stabilized - Inorganic 快的成型周期 良好的流动性 	<ul style="list-style-type: none"> 热稳定性 	<ul style="list-style-type: none"> 热稳定性 	<ul style="list-style-type: none"> 高刚性 高强度 抗溶剂性 快的成型周期 耐化学品性能, 良好 耐磨损性, 良好 耐汽油性 耐油性 韧性良好 润滑 通用 脱模性能良好 	--
Uses	<ul style="list-style-type: none"> 工业应用 连接器 消费品应用领域 	--	--	<ul style="list-style-type: none"> 衬套 电气/电子应用领域 工业应用 紧固件 连接器 通用 凸轮 外壳 轴承 	--



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Agency Ratings	• EC 1907/2006 (REACH) --	--	--	• ASTM D4066 PA0111 • ASTM D6779 PA0111 • EC 1935/2004 • EU 2023/2006 • FDA 21 CFR 177.1500 • FED L-P-410A • MIL M-20693B • NSF 51 • 欧洲 10/1/2011 12:00:00 AM	--
RoHS Compliance	• RoHS 合规	• 联系制造商	• 联系制造商	• RoHS 合规	• 联系制造商
Automotive Specifications	--	• ASTM D4000 PA121 • ASTM D4066 PA0121 • ASTM D6779 PA0121 • CHRYSLER MS-DB-41 CPN1076 • DELPHI M-53101 • FORD WSK-M4D648-A • GM GMP.PA66.018 • GM GMW15702-001391 PA66 • GM GMW16036P-PA66 • GM QK 002911 H • IMDS ID 14010230	• ASTM D4066 PA0121 • CHRYSLER MS-DB-41 CPN1076 • DELPHI 7804013 • DELPHI M-4105 • GM GMP.PA66.018 • GM GMW15702-001392 PA66 • GM GMW16036P-PA66 • GM QK 002911 H • IMDS ID 14010230	• FORD WSK-M4D647-A • GM GMP.PA66.005 • GM QK 002921	• ASTM D4066 PA0111 • CHRYSLER MS-DB-41 CPN1938 • CHRYSLER MS-DB-41 CPN2012 Color: 参见图纸上标注的颜色 • FORD WSK-M4D647-A • GM GMP.PA66.005 • GM QK 002911
UL File Number	--	--	--	• E70062	--
Appearance	• 黑色 • 自然色	--	--	• 自然色	--
Forms	• 粒子	• 粒子	• 粒子	• 粒子	• 粒子
Processing Method	• 注射成型	• 挤出 • 涂层 • 注射成型	• 注射成型	• 注射成型	• 注射成型



General	TECHNYL® A 222 NATURAL (干燥)	Zytel® 103HSL NC010 (干燥)	Zytel® 103FHS NC010 (干燥)	Vydyne® 21SPC (干燥)	Zytel® 101L NC010 (干燥)
Multi-Point Data	<ul style="list-style-type: none"> • Isothermal Stress vs. Strain (ISO 11403-1) • Viscosity vs. Shear Rate (ISO 11403-2) 	<ul style="list-style-type: none"> • Isothermal Stress vs. Strain (ISO 11403-1) • Secant Modulus vs. Strain (ISO 11403-1) • Shear Modulus vs. Temperature (ISO 11403-1) • Shear Modulus vs. Temperature, Dynamic (ISO 11403-1) • Shear Stress vs. Shear Rate (ISO 11403-1) • Specific Volume vs Temperature (ISO 11403-2) • Viscosity vs. Shear Rate (ISO 11403-2) 	<ul style="list-style-type: none"> • Isothermal Stress vs. Strain (ISO 11403-1) • Secant Modulus vs. Strain (ISO 11403-1) • Shear Stress vs. Shear Rate (ISO 11403-1) • Tensile Modulus vs. Temperature (ISO 11403-1) • Tensile Modulus vs. Temperature, Dynamic (ISO 11403-1) • Viscosity vs. Shear Rate (ISO 11403-2) 	--	<ul style="list-style-type: none"> • Isothermal Stress vs. Strain (ISO 11403-1) • Secant Modulus vs. Strain (ISO 11403-1) • Shear Modulus vs. Temperature (ISO 11403-1) • Shear Modulus vs. Temperature, Dynamic (ISO 11403-1) • Shear Stress vs. Shear Rate (ISO 11403-1) • Tensile Modulus vs. Temperature (ISO 11403-1) • Tensile Modulus vs. Temperature, Dynamic (ISO 11403-1) • Viscosity vs. Shear Rate (ISO 11403-2)
Part Marking Code (ISO 11469)	--	• >PA66<	• >PA66<	--	• >PA66<
Resin ID (ISO 1043)	• PA66	• PA66	• PA66	--	• PA66

Physical	TECH NYL® A 222 NATU RAL (干燥)	(调节 后的)	Zytel® 103HS L NC010 (干燥)	(调节 后的)	Zytel® 103FH S NC010 (干燥)	(调节 后的)	Vydyne® 21SPC (干燥)	(调节 后的)	Zytel® 101L NC010 (干燥)	(调节 后的)	单位制	测试方法
Density	--	--	1.14	--	1.14	--	1.14	--	1.14	--	g/cm³	ISO 1183
	1.14	--	--	--	--	--	--	--	--	--	g/cm³	ISO 1183/A
Molding Shrinkage												ISO 294-4
垂直	1.4	--	1.3	--	1.3	--	--	--	1.4	--	%	
流动	1.2	--	1.3	--	1.4	--	--	--	1.4	--	%	
垂直 : 23°C, 2.00 mm	--	--	--	--	--	--	1.7	--	--	--	%	
流动 : 23°C, 2.00 mm	--	--	--	--	--	--	1.8	--	--	--	%	



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Water Absorption												ISO 62
24 hr, 23°C	1.1	--	1.2	--	1.2	--	1.2	--	--	--	%	
24 hr, 23°C, 1.00 mm	--	--	--	--	--	--	--	--	4.2	--	%	
饱和, 23°C, 2.00 mm	--	--	8.5	--	8.5	--	--	--	8.5	--	%	
平衡, 23°C, 50% RH	2.9	--	--	--	--	--	2.4	--	--	--	%	
平衡, 23°C, 2.00 mm, 50% RH	--	--	2.6	--	2.6	--	--	--	2.6	--	%	
Viscosity Number (96% H2SO4)	--	--	150	--	150	--	--	--	150	--	cm³/g	ISO 307
Outdoor Suitability (全部)	--	--	--	--	--	--	f2	--	--	--		UL 746C
Mechanical	TECH NYL® A 222 NATU RAL (干燥)	(调节 后的)	Zytel® 103HS L NC010 (干燥)	(调节 后的)	Zytel® 103FH S NC010 (干燥)	(调节 后的)	Vydyne® e® 21SPC (干燥)	(调节 后的)	Zytel® 101L NC010 (干燥)	(调节 后的)	单位制	测试方法
Tensile Modulus												
--	--	--	3100	1400	3100	1400	--	--	3100	1400	MPa	ISO 527-2
23°C	--	--	--	--	--	--	3100	1400	--	--	MPa	ISO 527-2
23°C	3600	1700	--	--	--	--	--	--	--	--	MPa	ISO 527-2/1A
Tensile Stress												
屈服	--	--	85.0	55.0	85.0	55.0	--	--	82.0	55.0	MPa	ISO 527-2
屈服, 23°C	--	--	--	--	--	--	82.0	55.0	--	--	MPa	ISO 527-2
屈服, 23°C	90.0	50.0	--	--	--	--	--	--	--	--	MPa	ISO 527-2/1A
断裂, 23°C	--	--	--	--	--	--	55.0	45.0	--	--	MPa	ISO 527-2
断裂, 23°C	90.0	50.0	--	--	--	--	--	--	--	--	MPa	ISO 527-2/1A
Tensile Strain												ISO 527-2
屈服	--	--	4.5	25	4.5	25	--	--	4.5	25	%	
屈服, 23°C	5.0	25	--	--	--	--	5.0	25	--	--	%	
断裂, 23°C	20	> 200	--	--	--	--	--	--	--	--	%	
Nominal Tensile Strain at Break												ISO 527-2
--	--	--	20	> 50	20	> 50	--	--	25	> 50	%	
23°C	--	--	--	--	--	--	25	> 50	--	--	%	
Tensile Creep Modulus												ISO 899-1
1 hr	--	--	--	1200	--	--	--	--	--	1400	MPa	
1000 hr	--	--	--	650	--	--	--	--	--	820	MPa	



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Flexural Modulus					2800	1300	--	--	2800	1200	MPa	ISO 178
--	--	--	--	--	--	--	--	--	--	--	MPa	
--.4	--	--	2800	1300	--	--	--	--	--	--	MPa	
23°C	3000	1400	--	--	--	--	2900	1500	--	--	MPa	
Flexural Strength												ISO 178
23°C	--	--	--	--	--	--	80.0	50.0	--	--	MPa	
3.5% Strain	--	--	95.0	65.0	95.0	65.0	--	--	--	--	MPa	
--	--	--	--	--	--	--	--	--	90.0	54.0	MPa	
23°C	125	50.0	--	--	--	--	--	--	--	--	MPa	
Poisson's Ratio												No Standard
--	--	--	0.37	0.43	0.37	0.43	--	--	0.37	0.43		ISO 527
--	--	--	--	--	--	--	0.40	--	--	--		
Films	TECH NYL® A 222 NATU RAL (干燥)	(调节 后的)	Zytel® 103HS L NC010 (干燥)	(调节 后的)	Zytel® 103FH S NC010 (干燥)	(调节 后的)	Vydyn e® 21SPC (干燥)	(调节 后的)	Zytel® 101L NC010 (干燥)	(调节 后的)	单位制	测试方法
Tensile Elongation - MD (屈服)	--	--	4.5	--	4.5	--	--	--	4.5	--	%	ISO 527-3
Impact	TECH NYL® A 222 NATU RAL (干燥)	(调节 后的)	Zytel® 103HS L NC010 (干燥)	(调节 后的)	Zytel® 103FH S NC010 (干燥)	(调节 后的)	Vydyn e® 21SPC (干燥)	(调节 后的)	Zytel® 101L NC010 (干燥)	(调节 后的)	单位制	测试方法
Charpy Notched Impact Strength												ISO 179/1eA
-40°C	--	--	2.5	2.5	--	--	--	--	--	--	kJ/m²	
-30°C	--	--	4.5	3.5	4.5	3.0	5.0	7.0	4.5	3.0	kJ/m²	
23°C	4.5	15	5.5	12	5.5	11	6.0	20	5.5	15	kJ/m²	
Charpy Unnotched Impact Strength												ISO 179/1eU
-30°C	--	--	400 kJ/ m²	无断裂	350 kJ/ m²	无断裂	无断裂	无断裂	400 kJ/ m²	无断裂		
23°C	无断裂	无断裂	无断裂	无断裂	无断裂	无断裂	无断裂	无断裂	无断裂	无断裂		



Impact	TECH NYL® A 222 NATU RAL (干燥)	(调节 后的)	Zytel® 103HS L NC010 (干燥)	(调节 后的)	Zytel® 103FH S NC010 (干燥)	(调节 后的)	Vydyn e® 21SPC (干燥)	(调节 后的)	Zytel® 101L NC010 (干燥)	(调节 后的)	单位制	测试方法
Notched Izod Impact Strength												
-40°C ⁴	--	--	4.0	3.5	--	--	--	--	--	--	kJ/m²	ISO 180/1A
-40°C	--	--	--	--	5.5	--	--	--	5.5	3.0	kJ/m²	ISO 180/1A
-30°C	--	--	--	--	--	--	5.0	7.0	--	--	kJ/m²	ISO 180
-30°C	--	--	4.0	4.0	6.0	5.0	--	--	5.5	3.0	kJ/m²	ISO 180/1A
23°C	4.0	12	--	--	--	--	6.0	20	--	--	kJ/m²	ISO 180
23°C	--	--	5.0	10	5.5	11	--	--	5.5	12	kJ/m²	ISO 180/1A
Unnotched Izod Impact Strength												ISO 180/1U
-30°C	--	--	300 kJ/ m²	无断裂	300 kJ/ m²	无断裂	--	--	300 kJ/ m²	无断裂		
23°C	--	--	无断裂	无断裂	300 kJ/ m²	无断裂	--	--	无断裂	无断裂		
Hardness	TECH NYL® A 222 NATU RAL (干燥)	(调节 后的)	Zytel® 103HS L NC010 (干燥)	(调节 后的)	Zytel® 103FH S NC010 (干燥)	(调节 后的)	Vydyn e® 21SPC (干燥)	(调节 后的)	Zytel® 101L NC010 (干燥)	(调节 后的)	单位制	测试方法
Rockwell Hardness												ISO 2039-2
M 计秤	--	--	--	--	--	--	--	--	79	59		
R 计秤	--	--	--	--	121	--	--	--	121	108		
Ball Indentation Hardness												ISO 2039-1
H 358/30	--	--	180	85.0	180	85.0	--	--	180	85.0	MPa	
H 961/30	--	--	160	--	160	--	--	--	160	--	MPa	
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Heat Deflection Temperature												
0.45 MPa, 未退火	--	--	200	--	200	--	200	--	190	--	°C	ISO 75-2/B
1.8 MPa, 未退火	--	--	70.0	--	70.0	--	70.0	--	70.0	--	°C	ISO 75-2/A
1.8 MPa, 未退火	75.0	--	--	--	--	--	--	--	--	--	°C	ISO 75-2/Af
Glass Transition Temperature ⁵	--	--	60.0	--	60.0	--	--	--	65.0	--	°C	ISO 11357-2
Vicat Softening Temperature	--	--	240	--	--	--	--	--	240	--	°C	ISO 306/B50



Thermal	TECH NYL® A 222 NATU RAL (干燥)	(调节 后的)	Zytel® 103HS L NC010 (干燥)	(调节 后的)	Zytel® 103FH S NC010 (干燥)	(调节 后的)	Vydyn e® 21SPC (干燥)	(调节 后的)	Zytel® 101L NC010 (干燥)	(调节 后的)	单位制	测试方法
Ball Pressure Test (240°C)	--	--	--	--	--	--	--	--	通过	--		IEC 60695-10-2
Melting Temperature	263	--	--	--	--	--	260	--	--	--	°C	ISO 11357-3
-- ..5	--	--	262	--	262	--	--	--	262	--	°C	
CLTE	--	--	1.0E-4	--	1.0E-4	--	--	--	1.0E-4	--	cm/cm/°C	ISO 11359-2
流动	--	--	--	--	--	--	1.0E-4	--	--	--	cm/cm/°C	
流动 : 23 到 55°C	--	--	--	--	--	--	1.0E-4	--	--	--	cm/cm/°C	
垂直	--	--	1.1E-4	--	1.1E-4	--	--	--	1.1E-4	--	cm/cm/°C	
垂直 : 23 到 55°C	--	--	--	--	--	--	1.0E-4	--	--	--	cm/cm/°C	
Thermal Conductivity	--	--	--	--	--	--	--	--	0.24	--	W/m/K	No Standard
RTI Elec	--	--	--	--	--	--	--	--	--	--		UL 746
0.40 mm	--	--	--	--	--	--	130	--	--	--	°C	
0.71 mm	--	--	--	--	--	--	130	--	--	--	°C	
1.5 mm	--	--	--	--	--	--	130	--	--	--	°C	
3.0 mm	--	--	--	--	--	--	130	--	--	--	°C	
RTI Imp	--	--	--	--	--	--	--	--	--	--		UL 746
0.40 mm	--	--	--	--	--	--	75.0	--	--	--	°C	
0.71 mm	--	--	--	--	--	--	75.0	--	--	--	°C	
1.5 mm	--	--	--	--	--	--	75.0	--	--	--	°C	
3.0 mm	--	--	--	--	--	--	75.0	--	--	--	°C	
RTI Str	--	--	--	--	--	--	--	--	--	--		UL 746
0.40 mm	--	--	--	--	--	--	75.0	--	--	--	°C	
0.71 mm	--	--	--	--	--	--	85.0	--	--	--	°C	
1.5 mm	--	--	--	--	--	--	85.0	--	--	--	°C	
3.0 mm	--	--	--	--	--	--	85.0	--	--	--	°C	
Electrical	TECH NYL® A 222 NATU RAL (干燥)	(调节 后的)	Zytel® 103HS L NC010 (干燥)	(调节 后的)	Zytel® 103FH S NC010 (干燥)	(调节 后的)	Vydyn e® 21SPC (干燥)	(调节 后的)	Zytel® 101L NC010 (干燥)	(调节 后的)	单位制	测试方法
Surface Resistivity	1.0E +15	1.0E +13	--	--	--	--	--	--	--	--	ohms	IEC 60093



Electrical	TECH NYL® A 222 NATU RAL (干燥)	(调节 后的)	Zytel® 103HS L NC010 (干燥)	(调节 后的)	Zytel® 103FH S NC010 (干燥)	(调节 后的)	Vydyn e® 21SPC (干燥)	(调节 后的)	Zytel® 101L NC010 (干燥)	(调节 后的)	单位制	测试方法
Volume Resistivity												
--	1.0E +15	1.0E +16	--	--	--	--	--	--	--	--	ohms-cm	IEC 60093
0.750 mm	--	--	--	--	--	--	1.0E +13	--	--	--	ohms-cm	IEC 60093
--	--	--	1.0E +13	1.0E +11	1.0E +12	1.0E+9	--	--	1.0E +12	1.0E +10	ohms-m	IEC 62631-3-1
Dielectric Strength												
1.00 mm	--	--	--	--	--	--	26	--	--	--	kV/mm	IEC 60243
--	--	--	31	28	--	--	--	--	32	28	kV/mm	IEC 60243-1
23°C, 0.800 mm	35	--	--	--	--	--	--	--	--	--	kV/mm	IEC 60243-1
23°C, 2.00 mm	22	--	--	--	--	--	--	--	--	--	kV/mm	IEC 60243-1
Relative Permittivity												
23°C, 2.00 mm, 1 MHz	3.50	--	--	--	--	--	--	--	--	--		IEC 60250
1 MHz	--	--	3.50	4.00	--	--	--	--	3.50	4.00		IEC 62631-2-1
100 Hz	--	--	3.80	12.8	--	--	--	--	3.80	11.0		IEC 62631-2-1
Dissipation Factor												
1 MHz	0.033	--	--	--	--	--	--	--	--	--		IEC 60250
100 Hz	--	--	7.5E-3	0.58	--	--	--	--	8.0E-3	0.21		IEC 62631-2-1
1 MHz	--	--	0.017	0.070	--	--	--	--	0.018	0.075		IEC 62631-2-1
Arc Resistance (3.00 mm)	--	--	--	--	--	--	PLC 5	--	--	--		ASTM D495
Comparative Tracking Index (CTI)												
--	--	--	--	--	--	--	--	--	PLC 0	--		UL 746
3.00 mm	--	--	PLC 0	--	PLC 0	--	--	--	--	--		
Comparative Tracking Index												
--	--	--	600	--	600	--	--	--	600	--	V	IEC 60112
解决方案 A	575	600	--	--	--	--	--	--	--	--	V	
解决方案 B	450	--	--	--	--	--	--	--	475	--	V	
3.00 mm	--	--	--	--	--	--	600	--	--	--	V	
High Amp Arc Ignition (HAI)												
0.40 mm	--	--	--	--	--	--	PLC 1	--	--	--		UL 746
0.71 mm	--	--	--	--	--	--	PLC 0	--	--	--		
1.5 mm	--	--	--	--	--	--	PLC 0	--	--	--		
3.0 mm	--	--	--	--	--	--	PLC 0	--	--	--		



Electrical	TECH NYL® A 222 NATU RAL (干燥)	(调节 后的)	Zytel® 103HS L NC010 (干燥)	(调节 后的)	Zytel® 103FH S NC010 (干燥)	(调节 后的)	Vydyn e® 21SPC (干燥)	(调节 后的)	Zytel® 101L NC010 (干燥)	(调节 后的)	单位制	测试方法
High Voltage Arc Tracking Rate (HVTR)	--	--	--	--	--	--	PLC 0	--	--	--		UL 746
Hot-wire Ignition (HWI)												UL 746
0.40 mm	--	--	--	--	--	--	PLC 4	--	--	--		
0.71 mm	--	--	--	--	--	--	PLC 4	--	--	--		
1.5 mm	--	--	--	--	--	--	PLC 3	--	--	--		
3.0 mm	--	--	--	--	--	--	PLC 2	--	--	--		
Flammability	TECH NYL® A 222 NATU RAL (干燥)	(调节 后的)	Zytel® 103HS L NC010 (干燥)	(调节 后的)	Zytel® 103FH S NC010 (干燥)	(调节 后的)	Vydyn e® 21SPC (干燥)	(调节 后的)	Zytel® 101L NC010 (干燥)	(调节 后的)	单位制	测试方法
Flame Rating												
0.40 mm	--	--	--	--	--	--	V-2	--	--	--		UL 94
0.71 mm	--	--	V-2	--	V-2	--	V-2	--	V-2	--		UL 94
1.5 mm	--	--	V-2	--	V-2	--	V-2	--	V-2	--		UL 94
1.6 mm	V-2	--	--	--	--	--	--	--	--	--		UL 94
3.0 mm	--	--	--	--	--	--	V-2	--	--	--		UL 94
0.71 mm	--	--	V-2	--	V-2	--	--	--	V-2	--		IEC 60695-11-10, -20
1.5 mm	--	--	V-2	--	V-2	--	--	--	V-2	--		IEC 60695-11-10, -20
Glow Wire Flammability Index												IEC 60695-2-12
0.40 mm	--	--	--	--	--	--	960	--	--	--	°C	
0.71 mm	--	--	--	--	--	--	960	--	--	--	°C	
1.5 mm	--	--	--	--	--	--	960	--	--	--	°C	
1.6 mm	700	--	--	--	--	--	--	--	--	--	°C	
3.0 mm	--	--	--	--	--	--	960	--	--	--	°C	
Glow Wire Ignition Temperature												IEC 60695-2-13
0.40 mm	--	--	--	--	--	--	825	--	--	--	°C	
0.71 mm	--	--	--	--	--	--	850	--	--	--	°C	
0.75 mm	--	--	725	--	725	--	--	--	725	--	°C	
1.5 mm	--	--	725	--	725	--	850	--	750	--	°C	
3.0 mm	--	--	725	--	725	--	850	--	800	--	°C	
Oxygen Index	--	--	28	--	28	--	25	--	28	--	%	ISO 4589-2



Fill Analysis	TECH NYL® A 222 NATU RAL (干燥)	(调节 后的)	Zytel® 103HS L NC010 (干燥)	(调节 后的)	Zytel® 103FH S NC010 (干燥)	(调节 后的)	Vydyn e® 21SPC (干燥)	(调节 后的)	Zytel® 101L NC010 (干燥)	(调节 后的)	单位制	
Melt Density	--	--	0.980	--	1.01	--	--	--	0.970	--	g/cm³	
Ejection Temperature	--	--	190	--	190	--	--	--	190	--	°C	
Additional Information	TECH NYL® A 222 NATU RAL (干燥)	(调节 后的)	Zytel® 103HS L NC010 (干燥)	(调节 后的)	Zytel® 103FH S NC010 (干燥)	(调节 后的)	Vydyn e® 21SPC (干燥)	(调节 后的)	Zytel® 101L NC010 (干燥)	(调节 后的)	单位制	测试方法
Drying Recommended	--	--	yes	--	yes	--	--	--	yes	--		
Effective Thermal Diffusivity	--	--	5.00E-8	--	5.00E-8	--	--	--	5.00E-8	--	m²/s	
Emission of Organic Compounds	--	--	2.10	--	1.20	--	--	--	10.0	--	µgC/g	VDA 277
FMVSS 可燃性	--	--	SE	--	DNI	--	--	--	DNI	--		FMVSS 302
Glow Wire Temperature - No Flame												IEC 60335-1
750.0 µm	--	--	700	--	700	--	--	--	--	--	°C	
1.00 mm	--	--	700	--	700	--	--	--	--	--	°C	
1.50 mm	--	--	700	--	700	--	--	--	--	--	°C	
2.00 mm	--	--	700	--	700	--	--	--	--	--	°C	
3.00 mm	--	--	700	--	700	--	--	--	--	--	°C	
Hold Pressure Time	--	--	4.00	--	4.00	--	--	--	4.00	--	s/mm	
ISO Designation	--	--	ISO 16396- PA66,, M1G1 HNR,S 14-030	--	ISO 16396- PA66,, M1G1 HNR,S 14-030	--	--	--	ISO 16396- PA66,, M1G1 NR,S1 4-030	--		
Maximum Screw Tangential Speed	--	--	24	--	24	--	--	--	24	--	m/min	
Melt Temperature, Optimum	--	--	290	--	290	--	--	--	290	--	°C	
Mold Temperature, Optimum	--	--	70	--	70	--	--	--	70	--	°C	
Odor	--	--	2.50	--	2.50	--	--	--	3.50	--		VDA 270
Specific Heat Capacity	--	--	--	--	--	--	--	--	1680	--	J/kg/°C	
Specific Heat Capacity of Melt	--	--	2790	--	2790	--	--	--	2790	--	J/kg/°C	
Thermal Conductivity of Melt	--	--	0.16	--	0.16	--	--	--	0.16	--	W/m/K	
温度指数												IEC 60216
Tensile Strength, 20000 hr	--	--	140	--	--	--	--	--	--	--	°C	
Tensile Strength, 5000 hr	--	--	155	--	--	--	--	--	--	--	°C	



Additional Information	TECHNYL® A 222 NATURAL (干燥)	Zytel® 103HSL (调节后的) NC010 (干燥)	Zytel® 103FHS (调节后的) NC010 (干燥)	Vydyne® 21SPC (干燥)	Zytel® 101L (调节后的) NC010 (干燥)	单位制	测试方法
雾化							ISO 6452
F-value (refraction)	--	--	70	--	--	%	
G-value (condensate)	--	--	0.30	--	0.40	mg	

Injection	TECHNYL® A 222 NATURAL (干燥)	Zytel® 103HSL (干燥)	Zytel® 103FHS (干燥)	Vydyne® 21SPC (干燥)	Zytel® 101L NC010 (干燥)	单位制
Drying Temperature	80	80	80	< 70	80	°C
Drying Time						
--	--	--	--	1.0 到 3.0	--	hr
热风干燥机	--	2.0 到 4.0	2.0 到 4.0	--	2.0 到 4.0	hr
Suggested Max Moisture	0.20	0.20	0.20	--	0.20	%
Suggested Max Regrind	--	--	--	50	--	%
Rear Temperature	265 到 275	--	--	260 到 280	--	°C
Middle Temperature	270 到 280	--	--	270 到 285	--	°C
Front Temperature	280 到 285	--	--	280 到 290	--	°C
Nozzle Temperature	--	--	--	280 到 300	--	°C
Processing (Melt) Temp	--	280 到 300	280 到 300	285 到 300	280 到 300	°C
Mold Temperature	60 到 80	50 到 90	50 到 90	65 到 95	50 到 90	°C
Holding Pressure	--	50.0 到 100	50.0 到 100	--	50.0 到 100	MPa

Injection Notes

The material is supplied in airtight bags, ready for use. In case that the virgin material has absorbed moisture, it must be dried with a dehumidified air drying equipment, dew point mini -20°C. Recommended time 2-4h

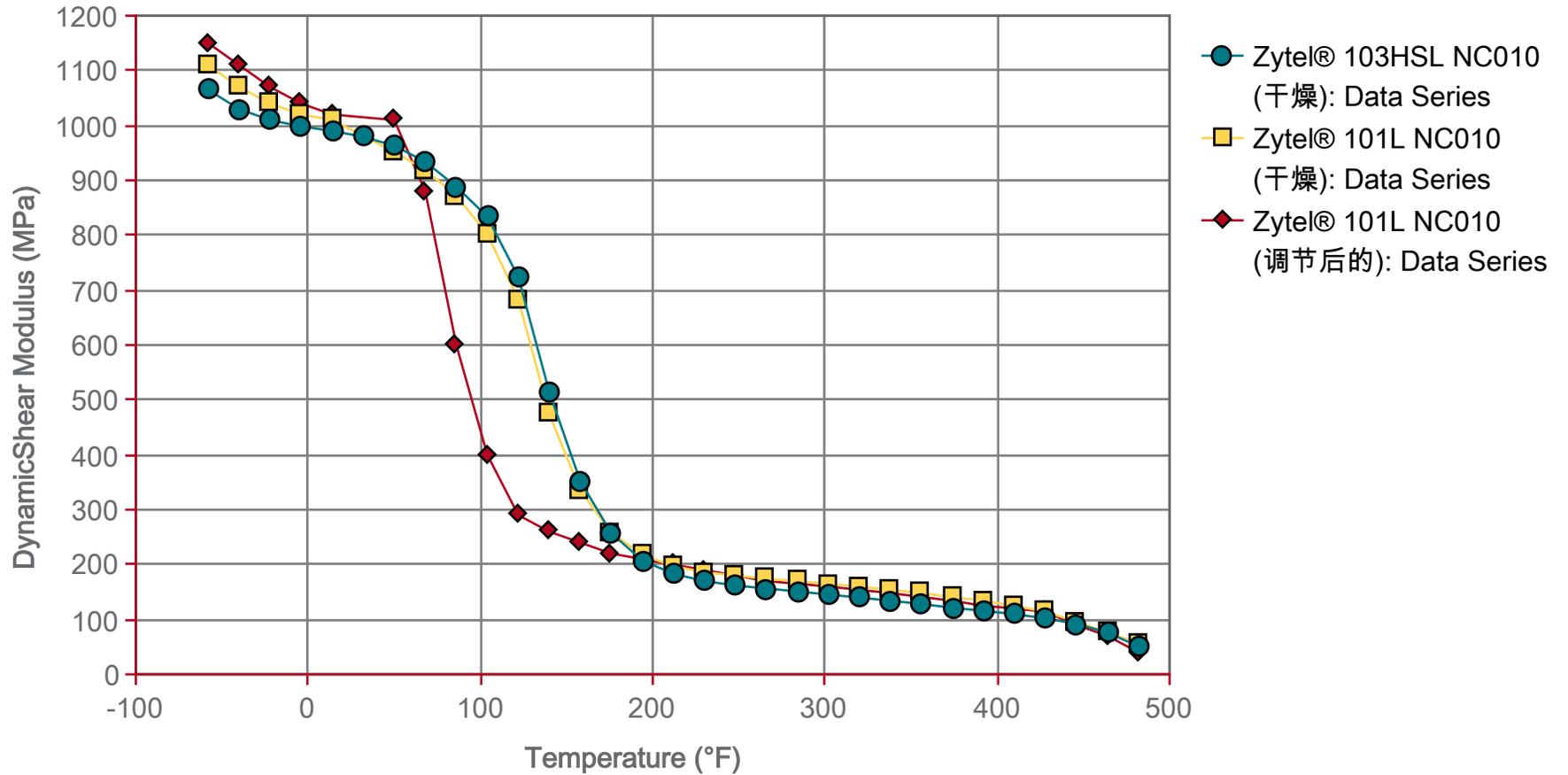
TECHNYL® A 222 NATURAL (干燥)

Injection Advice:

- For unfilled polyamides, the TECHNYL® manufacturers recommend the use of high alloy steel with a low chromium content. For example: X38CrMoV5-1 (EN Norm) - 1.2367 /1.2343 (DIN Norm). In the case of high requirements on surface quality a mould temperature of up to 120°C can be considered.
- The processing parameters like processing temperatures are a recommendation and can be adjusted in function of injection machine size, part geometry / design



Shear Modulus vs. Temperature, Dynamic (ISO 11403-1)



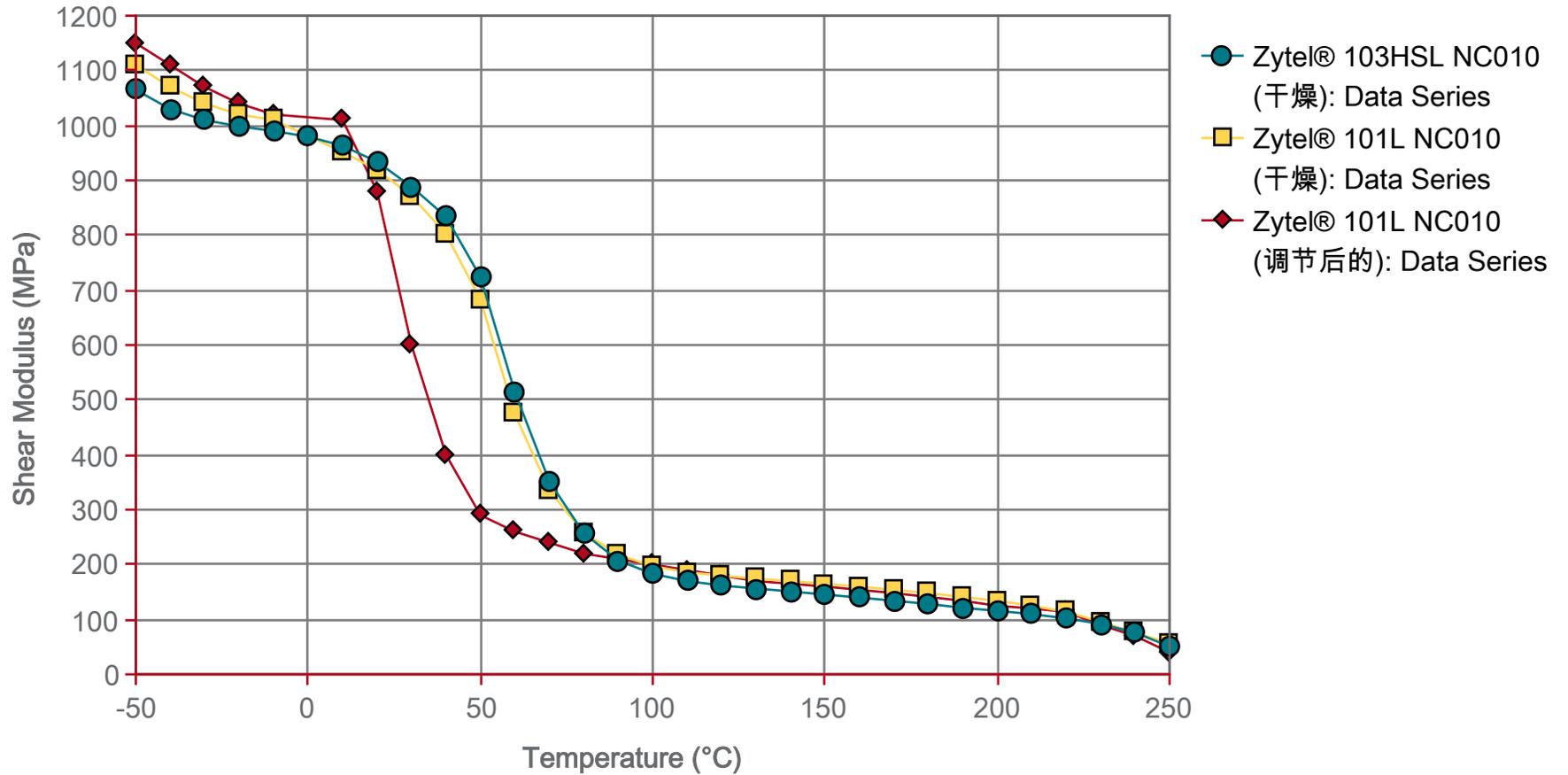
Isothermal Stress vs. Strain (ISO 11403-1)



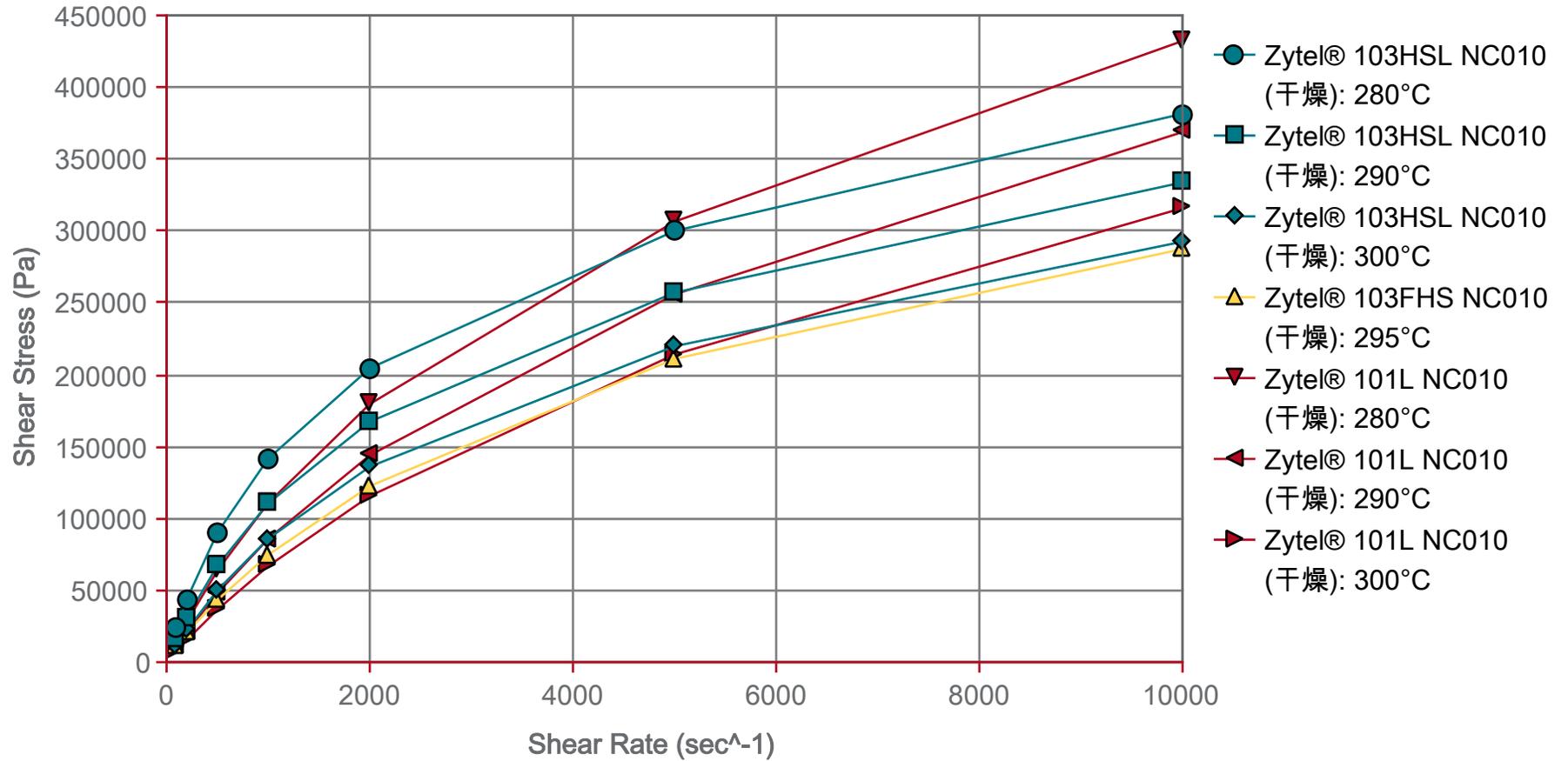
Secant Modulus vs. Strain (ISO 11403-1)



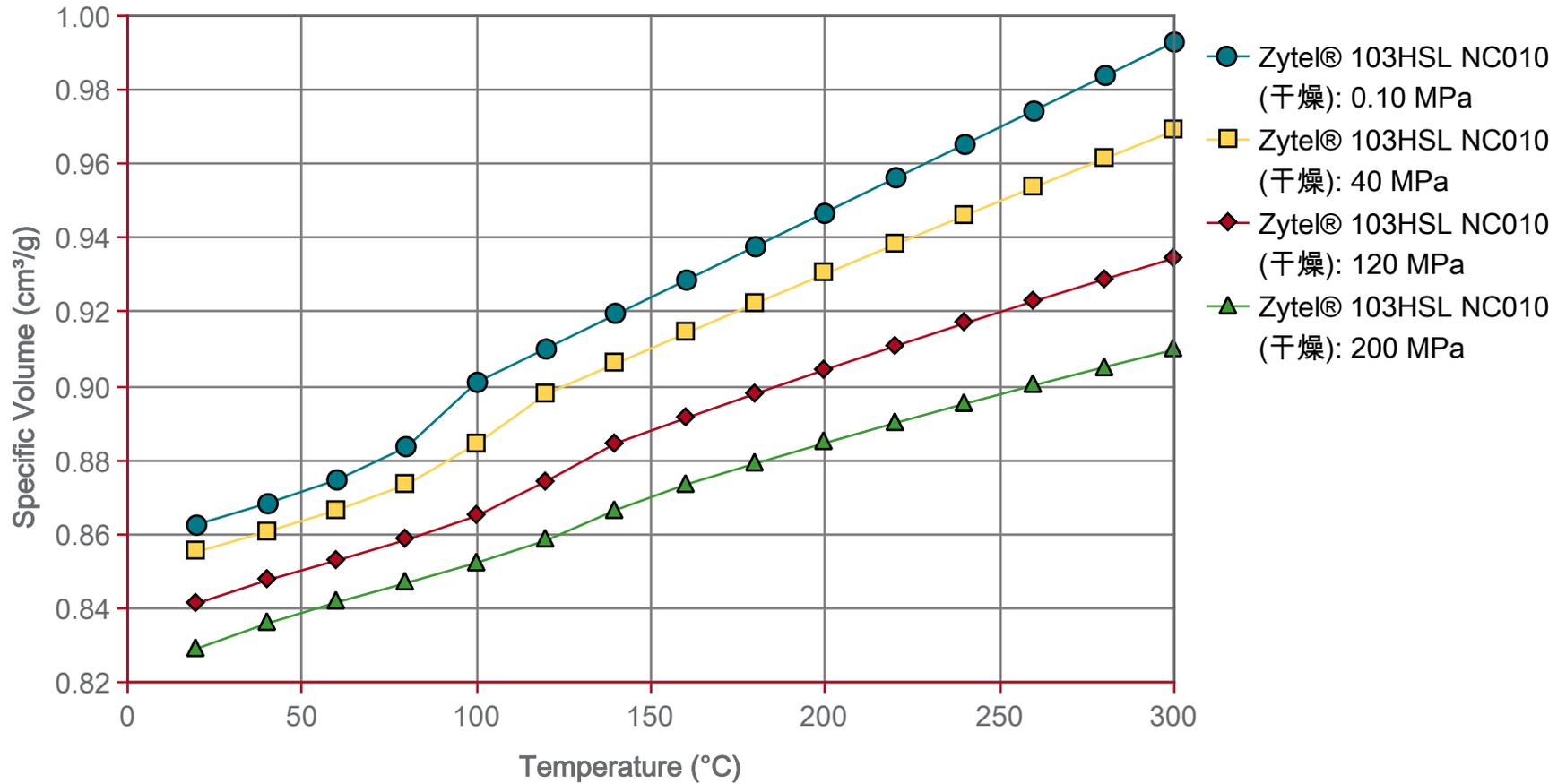
Shear Modulus vs. Temperature (ISO 11403-1)



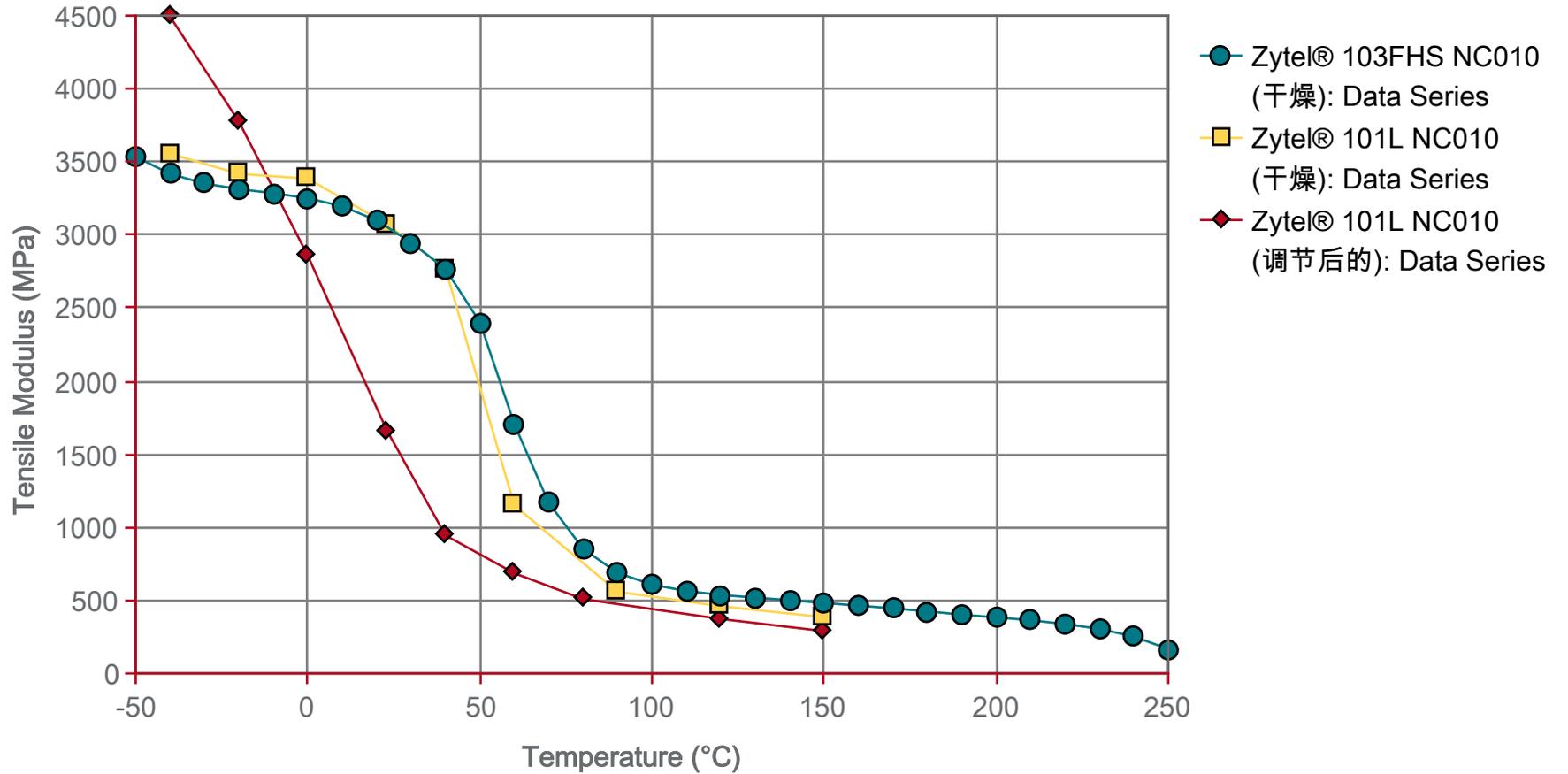
Shear Stress vs. Shear Rate (ISO 11403-1)



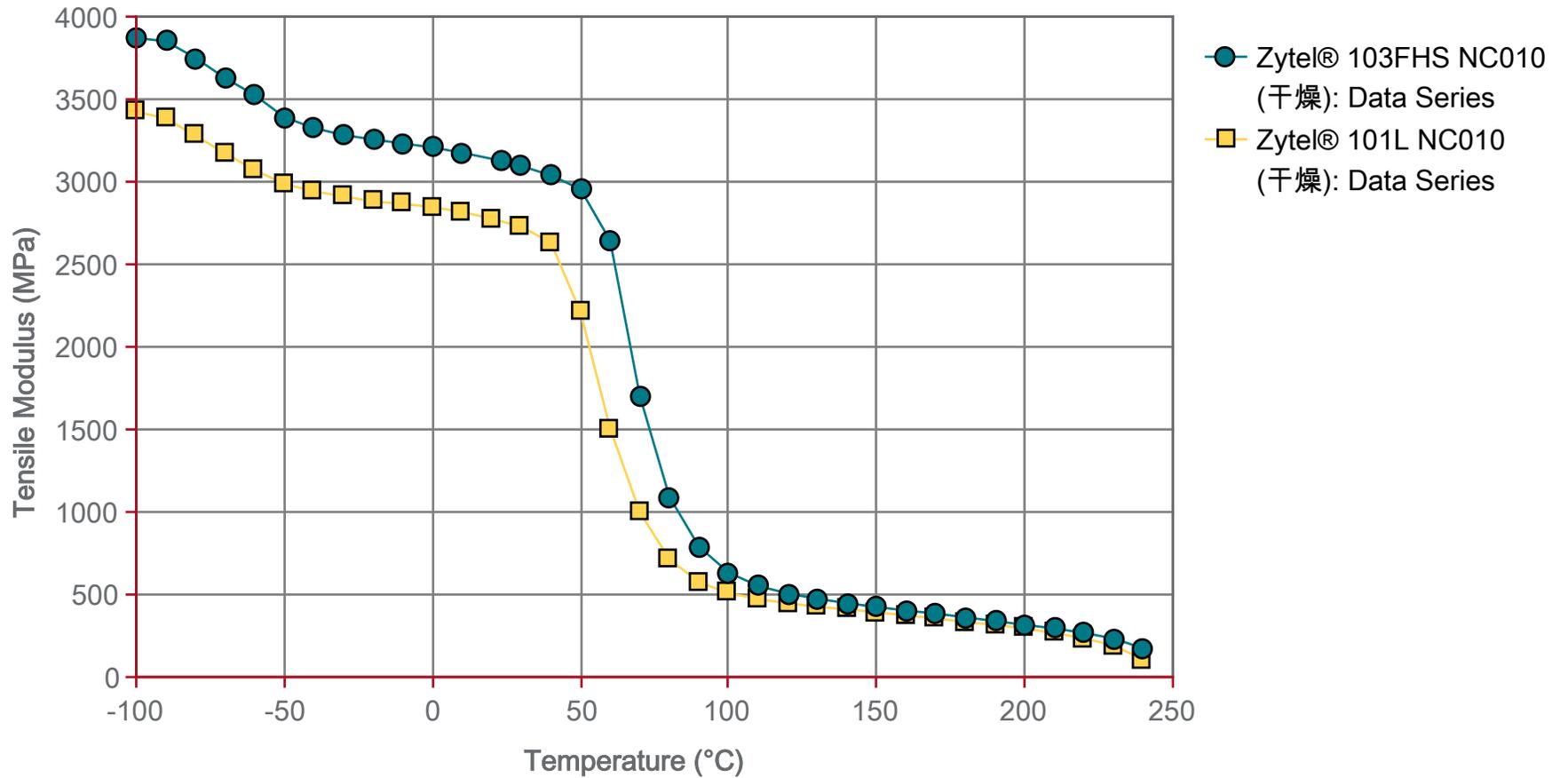
Specific Volume vs Temperature (ISO 11403-2)



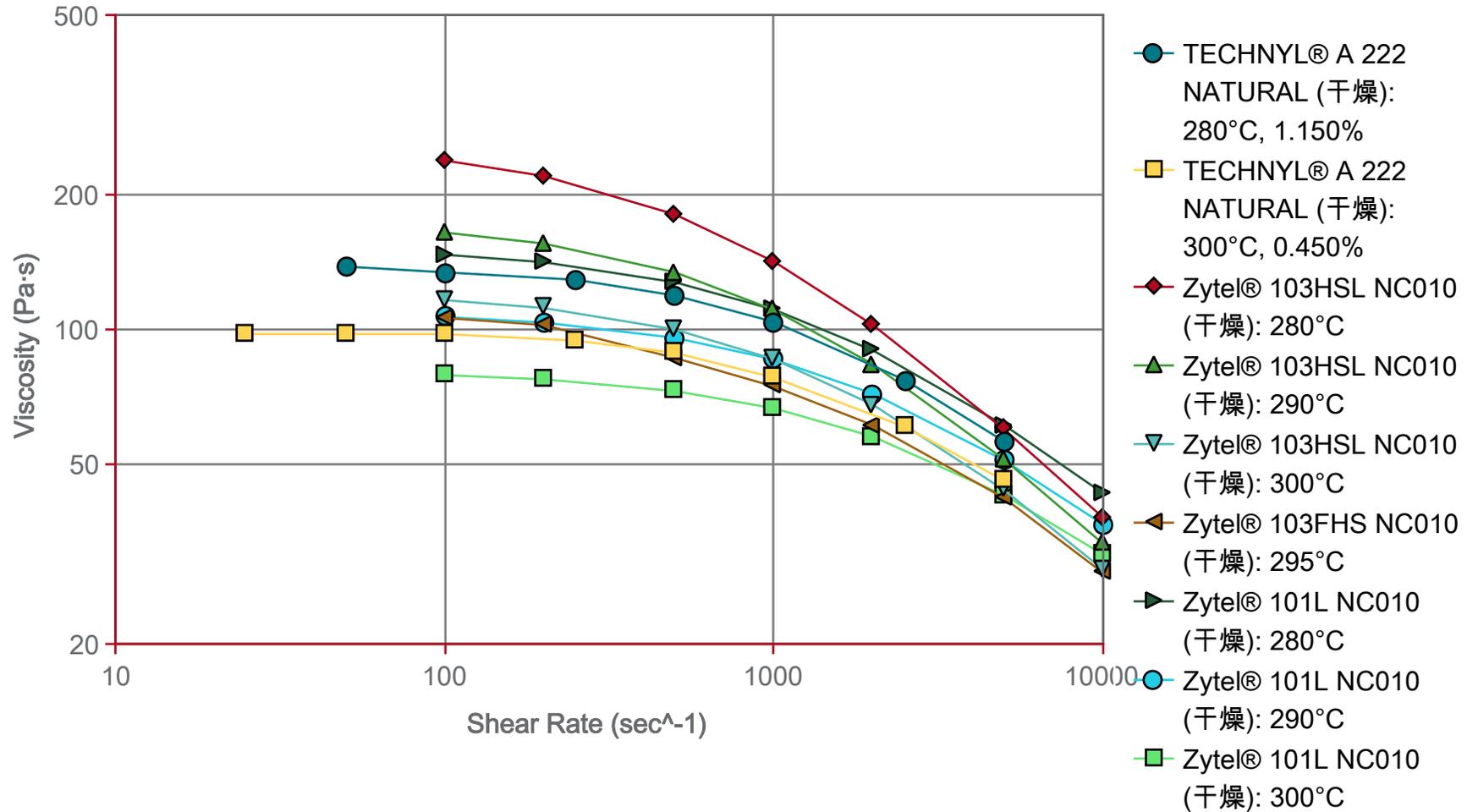
Tensile Modulus vs. Temperature (ISO 11403-1)



Tensile Modulus vs. Temperature, Dynamic (ISO 11403-1)



Viscosity vs. Shear Rate (ISO 11403-2)



备注

¹ 通过这些链接您能够访问供应商资料。我们尽量保证及时更新资料；不过您可以从供应商处了解最新资料。

² UL 黄卡含有 UL 验证的易燃性和电气特性。UL Prospector 持续努力在 Prospector 中将黄卡链接至单个塑料材料，然而此列表可能未包括所有相应链接。重要的是，我们对 Prospector 中找到的这些黄卡和塑料材料之间的关联进行验证。如需完整的黄卡列表，请访问 UL 黄卡搜索。

³ 一般属性：这些不能被视为规格。

⁴ Derived from Similar Grade

⁵ 10°C/min



购买地点

供应商	
TECHNYL® A 222 NATURAL	Technyl Suppliers Web: http://www.technyl.com
Zytel® 103HSL NC010	DuPont Transportation & Industrial Wilmington, DE USA 电话: 302-999-4592 Web: http://plastics.dupont.com/
Zytel® 103FHS NC010	DuPont Transportation & Industrial Wilmington, DE USA 电话: 302-999-4592 Web: http://plastics.dupont.com/
Vydyne® 21SPC	Ascend Performance Materials Operations LLC Houston, TX USA 电话: 888-927-2363 Web: http://www.ascendmaterials.com/
Zytel® 101L NC010	DuPont Transportation & Industrial Wilmington, DE USA 电话: 302-999-4592 Web: http://plastics.dupont.com/



分销商

TECHNYL® A 222 NATURAL

GAZECHIM PLASTIQUES*GAZECHIM PLASTIQUES is a Pan European distribution company. Contact GAZECHIM PLASTIQUES for availability of individual products by country.*

电话: +33-4-67-49-55-37

Web: <http://www.gazechim.com/>

供货地区: France

RESINEX Group*RESINEX is a Pan European distribution company. Contact RESINEX for availability of individual products by country.*

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Web: <http://www.resinex.com/>

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TER HELL Plastic GmbH*TER HELL Plastic is a Pan European distribution company. Contact TER HELL Plastic for availability of individual products by country.*

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Web: <https://www.terplastics.com/>

供货地区: Germany

Ultrapolymers*Ultrapolymers is a Pan European distribution company. Contact Ultrapolymers for availability of individual products by country.*

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Zytel® 103HSL NC010

Biesterfeld*Biesterfeld is a Pan European distribution company. Contact Biesterfeld for availability of individual products by country.*

电话: +49-40-32008-0

Web: <http://www.biesterfeld-plastic.com/>

供货地区: Algeria, Austria, Belgium, Bosnia and Herzegovina, Brazil, Bulgaria, Croatia, Cyprus, Czech Republic, Egypt, France, Germany, Greece, Hungary, Italy, Libyan Arab Jamahiriya, Luxembourg, Mauritania, Morocco, Netherlands, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Switzerland, Tunisia, Turkey

CCC Plastics

电话: 800-465-6917

Web: <https://www.ccc-group.com/>

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Distrupol Ltd*Distrupol Ltd is a Pan European distribution company. Contact Distrupol Ltd for availability of individual products by country.*

电话: 08452003040

Web: <http://www.distrupol.com/>

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PolyOne Distribution

PolyOne Distribution is a global distribution company. Contact PolyOne Distribution for availability of individual products by country.

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Zytel® 103FHS NC010

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供货地区: Global

Vydyne® 21SPC

Channel Prime Alliance

电话: 800-247-8038

Web: <http://www.channelpa.com/>

供货地区: North America

Chase Plastic Services, Inc.

Chase Plastics Services is a North American distributor with representatives throughout the region. Please find your rep here: <http://www.chaseplastics.com/contact/locations>

电话: 800-232-4273

Web: <http://www.chaseplastics.com/>

供货地区: North America

Entec Polymers

电话: 800-375-5440

Web: <http://www.entecpolymers.com/>

供货地区: North America



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Zytel® 101L NC010

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