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Tuesday, January 24, 2006

Zytel® 151L NC010 (Dry)

DuPont Engineering Polymers - *Polyamide 6/12 Copolymer*

Unit System: English

View	
Datasheet	**Shown Below**
ASTM Data Sheet	
ISO Data Sheet	
CAMPUS® Data Sheet	
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General Information

General		Test Method
Material Status	• Commercial: Active	
Availability	• Asia • North America • Europe • Pacific Rim	
Test Standards Available	• ASTM • ISO • ISO 10350	
Additive	• Lubricant	
Features	• Chemical Resistance, Good • Moisture Absorption, Low • Dimensional Stability, Good • Water Absorption, Low to None • Lubricated • Weldable, Ultrasonic	
Uses	• Electrical/Electronic Applications • Gears	
Appearance	• Natural Color	
Forms	• Pellets	
Processing Method	• Injection Molding	
Multi-Point Data	• Isothermal Stress vs. Strain (ISO 11403-1) • Secant Modulus vs. Strain (ISO 11403-1) • Shear Modulus vs. Temperature (ISO 11403-2)	
Part Marking Code	• >PA612<	ISO 11469
Resin ID	• PA612	ISO 1043

ASTM and ISO Properties [1]

Physical	Nominal Value	Unit	Test Method
Density -Specific Gravity	1.06	sp gr 23/23°C	ASTM D792
Density	1.06	g/cm³	ISO 1183
Mold Shrink, Linear-Flow (0.126 in)	0.011	in/in	ASTM D955
Mold Shrink, Linear-Trans (0.126 in)	0.011	in/in	ASTM D955
Molding Shrinkage			ISO 294-4
(Across Flow, 0.0787 in)	1.4	%	
(Flow, 0.0787 in)	1.3	%	
Water Absorption @ 24 hrs (73 °F)	0.25	%	ASTM D570
Water Absorption @ Sat. (73 °F)	3.0	%	ASTM D570
Water Absorption Sat/23C	3.0	%	ISO 62
Water Absorption 23C/50RH	1.3	%	ISO 62
Mechanical	**Nominal Value**	**Unit**	**Test Method**
Tensile Modulus (73 °F)	348000	psi	ISO 527-1, -2
Tensile Strength			ASTM D638
(-40 °F)	13600	psi	
(73 °F)	8850	psi	
(171 °F)	5950	psi	
Tensile Strength @ Yield			ASTM D638
(-40 °F)	13600	psi	
(73 °F)	8850	psi	

(171 °F)	4350	psi	
Tensile Stress at Yield (73 °F)	8990	psi	ISO 527-1, -2
Tensile Elongation @ Yld			ASTM D638
(-40 °F)	8.0	%	
(73 °F)	7.0	%	
(171 °F)	30	%	
Tensile Strain at Yield (73 °F)	4.5	%	ISO 527-1, -2
Tensile Elongation @ Brk			ASTM D638
(-40 °F)	10	%	
(73 °F)	100	%	
(171 °F)	230	%	
Nominal Tensile Strain at Break (73 °F)	17	%	ISO 527-1, -2
Flexural Modulus			ASTM D790
(-40 °F)	339000	psi	
(73 °F)	294000	psi	
(171 °F)	59500	psi	
Flexural Modulus (73 °F)	305000	psi	ISO 178
Shear Strength (73 °F)	8410	psi	ASTM D732
Impact	**Nominal Value**	**Unit**	**Test Method**
Charpy Notched Impact Strength [2]			ISO 179
(-22 °F)	1.67	ft-lb/in²	
(73 °F)	1.67	ft-lb/in²	
Charpy Unnotched Impact Strength [3]			ISO 179
(-22 °F)	No Break	ft-lb/in²	
(73 °F)	No Break	ft-lb/in²	
Notched Izod Impact			ASTM D256
(-40 °F)	0.599	ft-lb/in	
(73 °F)	0.806	ft-lb/in	
Notched Izod Impact Strength [4]			ISO 180
(-22 °F)	2.14	ft-lb/in²	
(73 °F)	1.90	ft-lb/in²	
Hardness	**Nominal Value**	**Unit**	**Test Method**
Rockwell Hardness (R-Scale)	114		ASTM D785
Rockwell Hardness (R-Scale)	114		ISO 2039-2
Thermal	**Nominal Value**	**Unit**	**Test Method**
HDT B (0.45 MPa) Unannealed [5]	275	°F	ISO 75B-1, -2
DTUL @264psi - Unannealed	131	°F	ASTM D648
HDT A (1.80 MPa) Unannealed [5]	144	°F	ISO 75A-1, -2
Brittle Temperature	-184	°F	ASTM D746
Melting Temperature (DSC)	424	°F	ISO 3146
Melting Point	424	°F	DSC
Coefficient of Linear Thermal Expansion, Flow			ISO 11359-1, -2
(-40 to 73°F (-40 to 23°C))	0.000050	in/in/°F	
(73 to 130°F (23 to 55°C))	0.000061	in/in/°F	
(130 to 320°F (55 to 160°C))	0.000089	in/in/°F	
Coefficient of Linear Thermal Expansion, Transverse			ISO 11359-1, -2
(-40 to 73°F (-40 to 23°C))	0.000050	in/in/°F	
(73 to 130°F (23 to 55°C))	0.000067	in/in/°F	
(130 to 320°F (55 to 160°C))	0.00010	in/in/°F	
Electrical	**Nominal Value**	**Unit**	**Test Method**
Surface Resistivity	1.0E+12	ohms	IEC 60093
Volume Resistivity	1.0E+15	ohm-cm	ASTM D257
Volume Resistivity	1.0E+15	ohm-cm	IEC 60093
Dielectric Strength [6]			ASTM D149
(73 °F, 0.126 in)	361	V/mil	
(199 °F)	180	V/mil	
Dissipation Factor			ASTM D150
(73 °F, 100 Hz)	0.020		
(73 °F, 1000 Hz)	0.020		
(73 °F, 1E+6 Hz)	0.020		
Dissipation Factor			IEC 60250
(100 Hz, 73 °F)	0.0135		
(1E+6 Hz, 73 °F)	0.0160		

Comp Track Index	600	V	IEC 60112
Electric Strength (0.0787 in)	560	V/mil	IEC 60243-1
Relative Permittivity			IEC 60250
(100 Hz, 73 °F)	3.60		
(1E+6 Hz, 73 °F)	3.20		
Flammability	**Nominal Value**	**Unit**	**Test Method**
Flame Rating - UL			UL 94
(0.0339 in)	V-2		
(0.0591 in)	V-2		
(0.118 in)	V-2		
Flammability Classification			IEC 60695-11-10
(0.0339 in)	V-2		
(0.0591 in)	V-2		
(0.118 in)	V-2		
Limiting Oxygen Index	27	%	ISO 4589-1, -2
UL 746	**Nominal Value**	**Unit**	**Test Method**
Rel Temp Indx Mech w/oImp			UL 746
(0.0339 in)	149	°F	
(0.0579 in)	149	°F	
(0.118 in)	149	°F	
Rel Temp Indx Mech w/Imp			UL 746
(0.0339 in)	149	°F	
(0.0579 in)	149	°F	
(0.118 in)	149	°F	
Rel Temp Indx Elect			UL 746
(0.0339 in)	221	°F	
(0.0579 in)	221	°F	
(0.118 in)	221	°F	
Comparative Tracking Index (CTI)	600	V	UL 746

Additional Properties

The value listed as Melting Temperature, ISO 3146, was tested in accordance with ISO 11357-1/-3.
The value listed as Mold Shrinkage, Linear-Flow, ASTM D955, was tested in accordance with DuPont test methods.
The value listed as Mold Shrinkage, Linear-Trans, ASTM D955, was tested in accordance with DuPont test methods.
CTI, ASTM D3638, 23°C: >600 V
CTI, UL 746A, 23°C: >600 V

CAMPUS® Properties [7]

Mechanical properties 23°C/50%r.h.	**Nominal Value**	**Unit**	**Test Method**
Tensile modulus	348000	psi	ISO 527-1, -2
Yield stress	8990	psi	ISO 527-1, -2
Yield strain	4.5	%	ISO 527-1, -2
Nominal strain at break	17.0	%	ISO 527-1, -2
Charpy impact strength (+23°C)	No Break	ft-lb/in²	ISO 179 /1eU
Charpy impact strength (-30°C)	No Break	ft-lb/in²	ISO 179 /1eU
Charpy notched impact strength (+23°C)	1.67	ft-lb/in²	ISO 179 /1eA
Charpy notched impact strength (-30°C)	1.67	ft-lb/in²	ISO 179 /1eA
Thermal properties	**Nominal Value**	**Unit**	**Test Method**
Melting temperature (10°C/min)	424	°F	ISO 11357-1, -3
Temp. of deflection under load (1.80 MPa)	144	°F	ISO 75-1, -2
Temp. of deflection under load (0.45 MPa)	275	°F	ISO 75-1, -2
Vicat softening temperature (50°C/h 50N)	358	°F	ISO 306
Coeff.of linear therm. expansion (parallel)	0.000061	in/in/°F	ISO 11359-1, -2
Coeff.of linear therm. expansion (normal)	0.000067	in/in/°F	ISO 11359-1, -2
Burning Behav. at 1.6mm nom. thickn. (0.06 in, UL)	V-2		ISO 1210
Burning Behav. at thickness h (0.0339 in, UL)	V-2		ISO 1210
Oxygen index	27	%	ISO 4589-1, -2
Electrical properties 23°C/50%r.h.	**Nominal Value**	**Unit**	**Test Method**
Relative permittivity (100 Hz)	3.60		IEC 60250
Relative permittivity (1 MHz)	3.20		IEC 60250
Dissipation factor (100 Hz)	0.014		IEC 60250
Dissipation factor (1 MHz)	0.016		IEC 60250
Volume resistivity	3.9E+14	ohm-in	IEC 60093
Electric strength	560	V/mil	IEC 60243-1
Comparative tracking index	600		IEC 60112

Other properties	Nominal Value	Unit	Test Method
Water absorption	3.0	%	ISO 62
Humidity absorption	1.3	%	ISO 62
Density	0.0383	lb/in³	ISO 1183
Test specimen production	**Nominal Value**	**Unit**	**Test Method**
Processing conditions acc. ISO	ISO 7792-2		

Processing Information

Injection	Nominal Value	Unit
Suggested Max Moisture	0.15	%
Processing (Melt) Temp	446 to 554	°F
Mold Temperature	122 to 194	°F

Notes

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

2 Type 1, Edgewise, Notch A

3 Type 1, Edgewise

4 Type 1, Notch A

5 Flatwise

6 Method A (Short-Time)

7 Typical properties: these are not to be construed as specifications. Additional CAMPUS® data and disclaimer information may be found on CAMPUS® Data Sheet.