

VYDYNE® 21SPC

Polyamide (Nylon 66)

VYDYNE 21SPC Nylon resins are general purpose polyamide resins with improved color. These resins contain internal and external lubricants. Available in natural.

Properties ⁽¹⁾	Test Method ⁽²⁾	Units	Dry as Molded ⁽³⁾ (0.2% Moisture) SI (English)	Conditioned ⁽⁴⁾ (2.5% Moisture) SI (English)
Physical				
Density – Specific Gravity, 23°C (73°F)	ISO 1183	sp gr 23/23°C	1.14	
Density – Specific Gravity, 23°C (73°F)	ASTM D 792	sp gr 23/23°C	1.14	
Mold Shrinkage, Flow Direction, 23°C (73°F)	ASTM D 955	mm/mm (in/in)	0.015-0.020	
Water Absorption @ 24 hours, 23°C (73°F)	ASTM D 570	%	1.3	
Saturation		%	8.0	
Mechanical				
Tensile Modulus, Secant, 23°C (73°F)	ASTM D 638	MPa (psi)	29.6x10 ² (430,000)	13.1x10 ² (190,000)
Tensile Strength @ Yield 23°C (73°F)	ISO 527	MPa (psi)	83 (12,000)	
Tensile Strength @ Yield -40°C (-40°F)	ASTM D 638	MPa (psi)	107 (15,500)	104 (15,000)
23°C (73°F)	ASTM D 638	MPa (psi)	83 (12,000)	62 (9000)
77°C (170°F)	ASTM D 638	MPa (psi)	62 (9000)	41 (6000)
Tensile Elongation @ Yield -40°C (-40°F)	ASTM D 638	%	5	6
23°C (73°F)	ASTM D 638	%	10	20
77°C (170°F)	ASTM D 638	%	30	30
Tensile Elongation @ Break -40°C (-40°F)	ASTM D 638	%	20	20
23°C (73°F)	ASTM D 638	%	70	200
77°C (170°F)	ASTM D 638	%	300	300
Flexural Modulus, Secant, 23°C (73°F)	ISO 178	MPa (psi)	2860 (414,000)	
Flexural Modulus, Secant, 23°C (73°F)	ASTM D 790	MPa (psi)	3030 (440,000)	1310 (190,000)
Flexural Strength, 23°C (73°F)	ASTM D 790	MPa (psi)	90 (13,000)	41 (6000)
Notched Izod Impact, 4.0 mm (0.16 in) @ 23°C (73°F)	ISO 180	kJ/m ²	6	
@ -40°C (-40°F)	ISO 180	kJ/m ²	2.2	
Notched Izod Impact, 3.2 mm (0.125 in) @ 23°C (73°F)	ASTM D 256	J/m (ft lb/in)	53 (1.0)	159 (3.0)
@ -40°C (-40°F)	ASTM D 256	J/m (ft lb/in)	32 (0.6)	27 (0.5)

(1) Typical properties; not to be construed as specifications. Fabrication conditions, part design, additives, processing aids, finishing materials, and use conditions can all affect the integrity, performance, and regulatory status of finished goods.

(2) All data taken on unannealed injection molded test specimens per ISO 294/ASTM D 1897.

(3) Samples sealed in moisture barrier packages immediately after molding.

(4) Equilibrium moisture at 50% relative humidity and 23°C (73°F). Conditioned per ISO 291 and/or ASTM D 618.

Properties ⁽¹⁾	Test Method ⁽²⁾	Units	Dry as Molded ⁽³⁾ (0.2% Moisture) SI (English)	Conditioned ⁽⁴⁾ (2.5% Moisture) SI (English)
Thermal				
Deflection Temperature Under Load Unannealed @ 1.8 MPa (264 psi)	ISO 75	°C (°F)	64 (147)	
Deflection Temperature Under Load Unannealed @ 1.8 MPa (264 psi)	ASTM D 648	°C (°F)	80 (180)	70 (160)
Unannealed @ 0.45 MPa (66 psi)	ASTM D 648	°C (°F)	232 (450)	221 (430)
Melting Point	ISO 3146	°C (°F)	260 (500)	
	ASTM D 789	°C (°F)	260 (500)	
Electrical				
Volume Resistivity, 23°C (73°F)	ASTM D 257	ohm-cm	6.0x10 ¹⁵	2.0x10 ¹³
Dielectric Strength, 23°C (73°F) Short Time	ASTM D 149	kV/mm (V/mil)	23 (570)	22 (550)
Step-By-Step			22 (540)	19 (480)
Dielectric Constant, 23°C (73°F) 10 ² Hz	ASTM D 150		3.7	6.0
10 ³ Hz			3.6	6.0
10 ⁶ Hz			3.1	3.5
Dissipation Factor, 23°C (73°F) 10 ² Hz	ASTM D 150		0.02	0.04
10 ³ Hz			0.02	0.04
10 ⁶ Hz			0.03	0.08
Ignition Characteristics⁽⁵⁾				
Flame Rating – UL 0.71 mm (0.028 in)	UL 94		V-2	
1.47 mm (0.058 in)	UL 94		V-2	
3.05 mm (0.120 in)	UL 94		V-2	
Limiting Oxygen Index	ASTM D 2863	%	30	31
UL 746				
Relative Temperature Index – Mechanical without Impact 0.71 mm (0.028 in)	UL 746	°C (°F)	85 (185)	
1.47 mm (0.058 in)	UL 746	°C (°F)	85 (185)	
3.05 mm (0.120 in)	UL 746	°C (°F)	85 (185)	
Relative Temperature Index – Mechanical with Impact 0.71 mm (0.028 in)	UL 746	°C (°F)	75 (167)	
1.47 mm (0.058 in)	UL 746	°C (°F)	75 (167)	
3.05 mm (0.120 in)	UL 746	°C (°F)	75 (167)	
Relative Temperature Index – Electrical 0.71 mm (0.028 in)	UL 746	°C (°F)	130 (266)	
1.47 mm (0.058 in)	UL 746	°C (°F)	130 (266)	
3.05 mm (0.120 in)	UL 746	°C (°F)	130 (266)	
Comparative Track Index 3.05 mm (0.120 in)	UL 746		0	
High Volt Arc Track Rate 0.71 mm (0.028 in)	UL 746	mm/min (in/min)	–	
1.47 mm (0.058 in)	UL 746	mm/min (in/min)	0	
3.05 mm (0.120 in)	UL 746	mm/min (in/min)	0	
Hot Wire Ignition 0.71 mm (0.028 in)	UL 746		4	
1.47 mm (0.058 in)	UL 746		3	
3.05 mm (0.120 in)	UL 746		2	
High Ampere Arc Ignition 0.71 mm (0.028 in)	UL 746		0	
1.47 mm (0.058 in)	UL 746		0	
3.05 mm (0.120 in)	UL 746		0	

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(5) All numerical flame spread ratings appearing in this data are not intended to reflect hazards presented by this or any other material under actual fire conditions. Each end user should determine whether potential fire hazards are associated with the finished product and whether VYDYNE resin is suitable for the particular use. Products made from VYDYNE resins should not be exposed to open flames. In the case of direct exposure to open fire, VYDYNE resins and products made therefrom can ignite and burn. Always store and use finished products in locations well away from open flames and other sources of ignition.

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