Vydyne® 21SPF1
polyamide 66

Vydyne 21SPF1 is a general-purpose PA66 resin. Available in natural, it is designed principally for injection-molding applications with the added benefit of improved flow during the molding process. 21SPF1 offers the same 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.

Vydyne 21SPF1 resin 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.

Vydyne 21SPF1 resin is internally and externally lubricated for improved machine feed and exceptional mold release. It 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 21SPF1 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.

Typical Applications/End Uses:

Vydyne 21SPF1 resin 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.

General			
Material Status	• Commercial: Active		
Availability	• Asia Pacific	• Europe	• North America
Additive	• Lubricant		
Features	• Abrasion Resistant • Chemical Resistant • Fast Molding Cycle • Gasoline Resistant	• Good Mold Release • Good Toughness • High Rigidity • High Strength	• Lubricated • Oil Resistant • Solvent Resistant
Uses	• Bearings • Bushings	• Cams • Connectors	• Electrical Housing • Industrial Applications
Agency Ratings	• ASTM D 4066 PA0111 • ASTM D 6779 PA0111 • EC 1935/2004	• EU 10/2011 • EU 2023/2006 • FDA 21 CFR 177.1500	• FED L-P-410A • MIL M-20693B
RoHS Compliance	• RoHS Compliant		
Automotive Specifications	• CHRYSLER MS-DB-41 CPN1938 Color: Natural • CHRYSLER MS-DB-41 CPN1948 Color: Black • FORD WSK-M4D647-A Color: Black	• FORD WSK-M4D647-A Color: Natural • GM GMP.PA66.005 • GM GMP.PA66.005 Color: Black	• SAE J1639 PA0121 Z6 Color: Black • SAE J1639 PA0121 Z6 Color: Natural
UL File Number	• E70062		
Appearance	• Natural Color		
Forms	• Pellets		
Processing Method	• Injection Molding		

Physical	Dry	Conditioned	Unit	Test Method
Density	1.14	--	g/cm³	ISO 1183
Molding Shrinkage				ISO 294-4
Across Flow : 23°C, 2.00 mm	2.0	--	%	
Flow : 23°C, 2.00 mm	2.0	--	%	
Water Absorption (23°C, 24 hr)	1.2	--	%	ISO 62
Water Absorption (Equilibrium, 23°C, 50% RH)	2.4	--	%	ISO 62
Outdoor Suitability	f2	--		UL 746C
Mechanical	**Dry**	**Conditioned**	**Unit**	**Test Method**
Tensile Modulus (23°C)	3300	1600	MPa	ISO 527-2
Tensile Stress (Yield, 23°C)	88.0	55.0	MPa	ISO 527-2
Tensile Stress (Break, 23°C)	60.0	45.0	MPa	ISO 527-2
Tensile Strain (Yield, 23°C)	5.0	20	%	ISO 527-2
Nominal Tensile Strain at Break (23°C)	20	> 50	%	ISO 527-2
Flexural Modulus (23°C)	3300	1050	MPa	ISO 178
Flexural Strength (23°C)	105	30.0	MPa	ISO 178
Poisson's Ratio	0.40	--		ISO 527-2
Impact	**Dry**	**Conditioned**	**Unit**	**Test Method**
Charpy Notched Impact Strength				ISO 179/1eA
-30°C	5.0	7.0	kJ/m²	
23°C	6.0	23	kJ/m²	
Charpy Unnotched Impact Strength				ISO 179/1eU
-30°C	No Break	No Break		
23°C	No Break	No Break		
Notched Izod Impact Strength				ISO 180
-30°C	5.0	7.0	kJ/m²	
23°C	6.0	23	kJ/m²	

Thermal	Dry	Conditioned	Unit	Test Method
Heat Deflection Temperature				ISO 75-2/B
0.45 MPa, Unannealed	210	--	°C	
Heat Deflection Temperature				ISO 75-2/A
1.8 MPa, Unannealed	72.0	--	°C	
Melting Temperature	260	--	°C	ISO 11357-3
CLTE - Flow (23 to 55°C, 2.00 mm)	1.0E-4	--	cm/cm/°C	ISO 11359-2
CLTE - Transverse (23 to 55°C, 2.00 mm)	1.0E-4	--	cm/cm/°C	ISO 11359-2
RTI Elec				UL 746
0.71 mm	130	--	°C	
1.5 mm	130	--	°C	
3.0 mm	130	--	°C	
RTI Imp				UL 746
0.71 mm	75.0	--	°C	
1.5 mm	75.0	--	°C	
3.0 mm	75.0	--	°C	
RTI Str				UL 746
0.71 mm	85.0	--	°C	
1.5 mm	85.0	--	°C	
3.0 mm	85.0	--	°C	
Electrical	**Dry**	**Conditioned**	**Unit**	**Test Method**
Volume Resistivity (0.750 mm)	1.0E+13	--	ohms·cm	IEC 60093
Dielectric Strength (1.00 mm)	26	--	kV/mm	IEC 60243
Arc Resistance (3.00 mm)	PLC 5	--		ASTM D495
Comparative Tracking Index (3.00 mm)	600	--	V	IEC 60112
High Amp Arc Ignition (HAI)				UL 746
0.71 mm	PLC 0	--		
1.5 mm	PLC 0	--		
3.0 mm	PLC 0	--		
High Voltage Arc Tracking Rate (HVTR)	PLC 0	--		UL 746
Hot-wire Ignition (HWI)				UL 746
0.71 mm	PLC 4	--		
1.5 mm	PLC 3	--		
3.0 mm	PLC 2	--		

Flammability	Dry	Conditioned	Unit	Test Method
Flame Rating				UL 94
0.71 mm	V-2	--		
1.5 mm	V-2	--		
3.0 mm	V-2	--		
Glow Wire Flammability Index				IEC 60695-2-12
0.71 mm	960	--	°C	
1.5 mm	960	--	°C	
3.0 mm	960	--	°C	
Glow Wire Ignition Temperature				IEC 60695-2-13
0.71 mm	850	--	°C	
1.5 mm	850	--	°C	
3.0 mm	850	--	°C	
Oxygen Index	26	--	%	ISO 4589-2

Injection	Dry	Unit
Drying Temperature	< 70	°C
Drying Time	1.0 to 3.0	hr
Suggested Max Regrind	50	%
Rear Temperature	260 to 280	°C
Middle Temperature	270 to 285	°C
Front Temperature	280 to 290	°C
Nozzle Temperature	280 to 300	°C
Processing (Melt) Temp	285 to 300	°C
Mold Temperature	65 to 95	°C

Notes
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