

# Vydyne® R513H Black polyamide 66



Vydyne R513H Black is general-purpose, 13% glass-fiber reinforced, heat-stabilized PA66 resin. Available in black, it is an injection-molding grade resin that is lubricated for machine feed, flow, and mold release. Glass-reinforced Vydyne resins provide a higher heat distortion temperature, better resistance to creep, higher impact, and better dimensional stability when compared with unreinforced PA66. This product has good chemical resistance to a broad range of chemicals, including many aliphatic and aromatic hydrocarbons found in most solvents, gasoline, hydraulic fluids, greases and machine oils.

Vydyne R513H Black has tensile strength and modulus properties just below aluminum and zinc and can replace these metals in numerous applications due to an excellent balance of properties. Reduction in production costs, energy consumption and part weight are key advantages of Vydyne glass-reinforced PA66 resins over aluminum and/or zinc die-cast parts.

Vydyne R513H Black is heat-stabilized and formulated to minimize the oxidative and thermal degradation of the PA66 polymer when exposed to elevated temperatures for extended periods of time. Vydyne R513H Black provides improved retention of physical properties under exposure to long-term heat. The continuous operating use temperature is 275° F, with short-term peak temperatures as high as 475° F.

#### Typical Applications/End Uses:

Vydyne R513H Black resin has been used for many under-the-hood automotive applications, motor housings for power tools and garden appliances. This resin has also been used in miscellaneous brackets, gears and clips, which require high rigidity and strength.

General			
Material Status	• Commercial: Active		
Availability	• Asia Pacific	• Europe	• North America
Filler / Reinforcement	• Glass Fiber, 13% Filler by Weight		
Additive	• Heat Stabilizer	• Lubricant	
Features	• Chemical Resistant • Gasoline Resistant • Good Flow • Good Mold Release	• Grease Resistant • Heat Stabilized • High Rigidity • High Strength	• Lubricated • Oil Resistant • Solvent Resistant
Agency Ratings	• ASTM D4066 PA012G15	• ASTM D6779 PA012G15	
Automotive Specifications	• CHRYSLER MS-DB-41 CPN 2239 • DELPHI M-4147V	• FORD ESA-M4D349-A • GM GMP.PA66.020	
UL File Number	• E70062		
Appearance	• Black		
Forms	• Pellets		
Processing Method	• Injection Molding		

Physical	Dry	Conditioned	Unit	Test Method
Density	1.23	--	g/cm <sup>3</sup>	ISO 1183
Molding Shrinkage				ISO 294-4
Across Flow : 23°C, 2.00 mm	1.0	--	%	
Flow : 23°C, 2.00 mm	0.50	--	%	
Water Absorption				ISO 62
24 hr, 23°C	1.0	--	%	
Equilibrium, 23°C, 50% RH	2.2	--	%	
Mechanical	Dry	Conditioned	Unit	Test Method
Tensile Modulus (23°C)	6200	3900	MPa	ISO 527-2
Tensile Stress (Break, 23°C)	115	75.0	MPa	ISO 527-2
Tensile Strain (Break, 23°C)	3.0	13	%	ISO 527-2
Flexural Modulus (23°C)	5200	3150	MPa	ISO 178
Flexural Stress (23°C)	165	106	MPa	ISO 178
Poisson's Ratio	0.40	--		ISO 527-2
Impact	Dry	Conditioned	Unit	Test Method
Charpy Notched Impact Strength				ISO 179
-30°C	6.0	5.3	kJ/m <sup>2</sup>	
23°C	6.0	7.5	kJ/m <sup>2</sup>	
Charpy Unnotched Impact Strength				ISO 179
-30°C	31	37	kJ/m <sup>2</sup>	
23°C	38	42	kJ/m <sup>2</sup>	
Notched Izod Impact Strength				ISO 180
-30°C	5.0	5.4	kJ/m <sup>2</sup>	
23°C	5.1	8.5	kJ/m <sup>2</sup>	

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Thermal	Dry	Conditioned	Unit	Test Method
Heat Deflection Temperature				
0.45 MPa, Unannealed	258	--	°C	ISO 75-2/B
1.8 MPa, Unannealed	240	--	°C	ISO 75-2/A
Melting Temperature	260	--	°C	ISO 11357-3
CLTE				ISO 11359-2
Flow : 23 to 55°C, 2.00 mm	3.0E-5	--	cm/cm/°C	
Transverse : 23 to 55°C, 2.00 mm	1.1E-4	--	cm/cm/°C	
RTI Elec				UL 746
0.75 mm	140	--	°C	
1.5 mm	140	--	°C	
3.0 mm	140	--	°C	
RTI Imp				UL 746
0.75 mm	120	--	°C	
1.5 mm	120	--	°C	
3.0 mm	120	--	°C	
RTI Str				UL 746
0.75 mm	125	--	°C	
1.5 mm	140	--	°C	
3.0 mm	140	--	°C	
Electrical	Dry	Conditioned	Unit	Test Method
Volume Resistivity (0.750 mm)	1.0E+13	--	ohms-cm	IEC 60093
Dielectric Strength (1.00 mm)	20	--	kV/mm	IEC 60243
Arc Resistance (3.00 mm)	PLC 6	--		ASTM D495
Comparative Tracking Index (3.00 mm)	250 to 399	--	V	IEC 60112
High Amp Arc Ignition (HAI)				UL 746
0.75 mm	PLC 0	--		
1.5 mm	PLC 0	--		
3.0 mm	PLC 0	--		
High Voltage Arc Tracking Rate (HVTR)	PLC 1	--		UL 746
Hot-wire Ignition (HWI)				UL 746
0.75 mm	PLC 4	--		
1.5 mm	PLC 3	--		
3.0 mm	PLC 4	--		

Flammability	Dry	Conditioned	Unit	Test Method
Flame Rating				UL 94
0.75 mm	HB	--		
1.5 mm	HB	--		
3.0 mm	HB	--		
Glow Wire Flammability Index				IEC 60695-2-12
0.75 mm	675	--	°C	
1.5 mm	675	--	°C	
3.0 mm	675	--	°C	
Glow Wire Ignition Temperature				IEC 60695-2-13
0.75 mm	700	--	°C	
1.5 mm	700	--	°C	
3.0 mm	700	--	°C	
Oxygen Index	25	--	%	ISO 4589-2
Injection		Dry Unit		
Drying Temperature		80 °C		
Drying Time		4.0 hr		
Suggested Max Regrind		25 %		
Rear Temperature		280 to 310 °C		
Middle Temperature		280 to 310 °C		
Front Temperature		280 to 310 °C		
Nozzle Temperature		280 to 310 °C		
Processing (Melt) Temp		285 to 305 °C		
Mold Temperature		65 to 95 °C		

Notes

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