

# Vydyne® R533H

Polyamide 66

Ascend Performance Materials LLC.

# PROSPECTOR®

www.ulprospector.com

## Technical Data

### Product Description

The Vydyne R533® Series of 33% glass fiber reinforced nylons are available in natural, black and heat stabilized versions. They are general purpose, injection molding grades which are lubricated for good machine feed, flow and mold release.

Vydyne R533 Series resins are members of a wide range of glass reinforced resins supplied by Ascend Performance Materials. Other glass fiber loadings available include 13% and 43%.

Vydyne R533 Series resins have 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 Nylon 6,6 resins over aluminum and/or zinc die cast parts.

Vydyne R533H is a heat stabilized grade, formulated to minimize the oxidative and thermal degradation of the nylon polymer when exposed to elevated temperatures for extended periods of time. Vydyne R533H provides improved retention of physical properties under exposure to long-term heat. The continuous operating use temperature is 275°F and short-term peak temperatures as high as 475°F.

### General

Material Status	• Commercial: Active
Literature <sup>1</sup>	• <a href="#">Technical Datasheet</a>
UL Yellow Card <sup>2</sup>	• <a href="#">E70062-249086</a>
Search for UL Yellow Card	• <a href="#">Ascend Performance Materials LLC.</a> • <a href="#">Vydyne®</a>
Availability	• Asia Pacific • Europe • North America
Filler / Reinforcement	• Glass Fiber, 33% Filler by Weight
Additive	• Heat Stabilizer • Lubricant
Features	• Good Flow • Heat Stabilized • High Strength • Good Mold Release • High Rigidity • Lubricated
Uses	• Automotive Under the Hood • Housings • Gears • Power/Other Tools
Agency Ratings	• ASTM D 4066 PA012G35 • FED L-P-410A • ASTM D 6779 PA012G35 • MIL M-20693B
UL File Number	• E70062
Appearance	• Black • Natural Color
Forms	• Pellets
Processing Method	• Injection Molding
Multi-Point Data	• Isothermal Stress vs. Strain (ISO 11403-1) • Tensile Stress vs. Strain (ASTM D638)

Physical	Dry	Conditioned	Unit	Test Method
Density	1.40	--	g/cm <sup>3</sup>	ISO 1183
Molding Shrinkage				ISO 294-4
Across Flow : 73°F (23°C), 0.0787 in (2.00 mm)	0.90	--	%	
Flow : 73°F (23°C), 0.0787 in (2.00 mm)	0.40	--	%	
Water Absorption				ISO 62
73°F (23°C), 24 hr	0.80	--	%	
Equilibrium, 73°F (23°C), 50% RH	1.8	--	%	
Mechanical	Dry	Conditioned	Unit	Test Method
Tensile Modulus (73°F (23°C))	1.48E+6 (10200)	1.15E+6 (7900)	psi (MPa)	ISO 527-2
Tensile Stress (Break, 73°F (23°C))	29700 (205)	21500 (148)	psi (MPa)	ISO 527-2



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Mechanical	Dry	Conditioned	Unit	Test Method
Tensile Strain (Break, 73°F (23°C))	3.0	5.0	%	ISO 527-2
Flexural Modulus (73°F (23°C))	1.41E+6 (9700)	943000 (6500)	psi (MPa)	ISO 178
Flexural Strength (73°F (23°C))	42000 (290)	29700 (205)	psi (MPa)	ISO 178
Poisson's Ratio	0.40	--		ISO 527-2
Impact	Dry	Conditioned	Unit	Test Method
Charpy Notched Impact Strength				ISO 179
-22°F (-30°C)	5.6 (12)	--	ft·lb/in <sup>2</sup> (kJ/m <sup>2</sup> )	
73°F (23°C)	5.9 (12)	--	ft·lb/in <sup>2</sup> (kJ/m <sup>2</sup> )	
Charpy Unnotched Impact Strength				ISO 179
-22°F (-30°C)	36 (75)	--	ft·lb/in <sup>2</sup> (kJ/m <sup>2</sup> )	
73°F (23°C)	40 (85)	--	ft·lb/in <sup>2</sup> (kJ/m <sup>2</sup> )	
Notched Izod Impact Strength (73°F (23°C))	5.6 (12)	--	ft·lb/in <sup>2</sup> (kJ/m <sup>2</sup> )	ISO 180
Thermal	Dry	Conditioned	Unit	Test Method
Heat Deflection Temperature				
66 psi (0.45 MPa), Unannealed	500 (260)	--	°F (°C)	ISO 75-2/B
264 psi (1.8 MPa), Unannealed	482 (250)	--	°F (°C)	ISO 75-2/A
Vicat Softening Temperature	486 (252)	--	°F (°C)	ISO 306/B
Melting Temperature (DSC)	500 (260)	--	°F (°C)	ISO 3146
CLTE				ISO 11359-2
Flow : 73 to 131°F (23 to 55°C), 0.0787 in (2.00 mm)	1.1E-6 (2.0E-6)	--	in/in/°F (cm/cm/°C)	
Transverse : 73 to 131°F (23 to 55°C), 0.0787 in (2.00 mm)	5.0E-6 (9.0E-6)	--	in/in/°F (cm/cm/°C)	
RTI Elec				UL 746
0.0295 in (0.750 mm)	284 (140)	--	°F (°C)	
0.0591 in (1.50 mm)	284 (140)	--	°F (°C)	
0.118 in (3.00 mm)	284 (140)	--	°F (°C)	
RTI Imp				UL 746
0.0295 in (0.750 mm)	257 (125)	--	°F (°C)	
0.0591 in (1.50 mm)	257 (125)	--	°F (°C)	
0.118 in (3.00 mm)	257 (125)	--	°F (°C)	
RTI Str				UL 746
0.0295 in (0.750 mm)	284 (140)	--	°F (°C)	
0.0591 in (1.50 mm)	284 (140)	--	°F (°C)	
0.118 in (3.00 mm)	284 (140)	--	°F (°C)	
Electrical	Dry	Conditioned	Unit	Test Method
Volume Resistivity (0.118 in (3.00 mm))	3.0E+15	--	ohm·cm	IEC 60093



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Electrical	Dry	Conditioned	Unit	Test Method
Electric Strength <sup>4</sup>				IEC 60243-1
73°F (23°C), 0.118 in (3.00 mm)	410 (16)	--	V/mil (kV/mm)	
Arc Resistance (0.118 in (3.00 mm))	PLC 6	--		ASTM D495
Comparative Tracking Index (CTI)				UL 746
0.118 in (3.00 mm)	PLC 2	--		
Comparative Tracking Index				IEC 60112
0.118 in (3.00 mm)	400 to 599	--	V	
High Amp Arc Ignition (HAI)				UL 746
0.0295 in (0.750 mm)	PLC 0	--		
0.0591 in (1.50 mm)	PLC 0	--		
0.118 in (3.00 mm)	PLC 0	--		
High Voltage Arc Tracking Rate (HVTR)				UL 746
0.118 in (3.00 mm)	PLC 1	--		
Hot-wire Ignition (HWI)				UL 746
0.0295 in (0.750 mm)	PLC 4	--		
0.0591 in (1.50 mm)	PLC 3	--		
0.118 in (3.00 mm)	PLC 4	--		

Flammability	Dry	Conditioned	Unit	Test Method
Flame Rating				UL 94
0.0295 in (0.750 mm), All colors	HB	--		
0.0591 in (1.50 mm), All colors	HB	--		
0.118 in (3.00 mm), All colors	HB	--		
Oxygen Index	28	--	%	ASTM D2863

Injection	Dry (English)	Dry (SI)
Drying Temperature	< 158 °F	< 70.0 °C
Drying Time	1.0 to 3.0 hr	1.0 to 3.0 hr
Suggested Shot Size	40 to 80 %	40 to 80 %
Suggested Max Regrind	25 %	25 %
Rear Temperature	536 to 590 °F	280 to 310 °C
Middle Temperature	536 to 590 °F	280 to 310 °C
Front Temperature	536 to 590 °F	280 to 310 °C
Nozzle Temperature	536 to 590 °F	280 to 310 °C
Processing (Melt) Temp	545 to 581 °F	285 to 305 °C
Mold Temperature	149 to 203 °F	65.0 to 95.0 °C
Injection Pressure	7980 to 20300 psi	55.0 to 140 MPa
Injection Rate	Fast	Fast
Holding Pressure	7980 to 20300 psi	55.0 to 140 MPa
Back Pressure	29.0 to 145 psi	0.200 to 1.00 MPa
Screw Speed	60 to 120 rpm	60 to 120 rpm
Clamp Tonnage	1.9 to 4.5 tons/in <sup>2</sup>	2.7 to 6.2 kN/cm <sup>2</sup>
Cushion	0.118 to 0.252 in	3.00 to 6.40 mm



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**Injection Notes**

Injection Time: <1 to 2.5 sec

**Notes**

<sup>1</sup> These links provide you with access to supplier literature. We work hard to keep them up to date; however you may find the most current literature from the supplier.

<sup>2</sup> A UL Yellow Card contains UL-verified flammability and electrical characteristics. UL Prospector continually works to link Yellow Cards to individual plastic materials in Prospector, however this list may not include all of the appropriate links. It is important that you verify the association between these Yellow Cards and the plastic material found in Prospector. For a complete listing of Yellow Cards, visit the UL Yellow Card Search.

<sup>3</sup> Typical properties: these are not to be construed as specifications.

<sup>4</sup> Step-by-step



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**Where to Buy**

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**Supplier**

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**Ascend Performance Materials LLC.**

St. Louis, MO USA

**Telephone:** 888-927-2363**Web:** <http://www.ascendmaterials.com/>

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**Distributor**

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**Channel Prime Alliance****Telephone:** 800-247-8038**Web:** <http://www.channelpa.com/>**Availability:** 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>***Telephone:** 800-232-4273**Web:** <http://www.chaseplastics.com/>**Availability:** North America**Entec Polymers****Telephone:** 800-375-5440**Web:** <http://www.entecpolymers.com/>**Availability:** North America**GAZECHIM PLASTIQUES***GAZECHIM PLASTIQUES is a Pan European distribution company. Contact GAZECHIM PLASTIQUES for availability of individual products by country.***Telephone:** +33-4-67-49-55-37**Web:** <http://www.gazechim.com/>**Availability:** Belgium, Denmark, Finland, Italy, Netherlands, Norway, Poland, Romania, Spain, Sweden, United Kingdom**Nexeo Solutions - Europe***Nexeo Solutions is a Pan European distribution company. Contact Nexeo for availability of individual products by country.***Telephone:** +34-93-480-9125**Web:** <http://www.nexeosolutions.com/>**Availability:** Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Poland, Portugal, Spain, Sweden, Switzerland, United Kingdom**Ultrapolymers***Ultrapolymers is a Pan European distribution company. Contact Ultrapolymers for availability of individual products by country.***Telephone:** +32-11-57-95-57**Web:** <http://www.ultrapolymers.com/>**Availability:** Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Latvia, Lithuania, Macedonia, Netherlands, Norway, Romania, Serbia, Slovakia, Slovenia, South Africa, Spain, Sweden, Turkey, United Kingdom