vydyne R530H **data sheet**

hydrolysis resist glass reinforced nylon

Product Description

Vydyne® R530H Nylon resins are general purpose polyamide, heat stabilized, hydrolysis resistant, 30% glass fiber reinforced resins. Available in natural and black. It is specifically designed to maximize the retention of physical properties when exposed to anti-freeze solutions at elevated temperatures. This product is also lubricated for improved machine feed and flow.

Glass reinforced Vydyne resins provide higher heat distortion temperature, resistance to creep, and better dimensional stability when compared with unreinforced Nylon 66. These products have good chemical resistance to a broad range of chemicals including gasoline, hydraulic fluids, and most solvents.

Vydyne R530H is heat-stabilized to minimize oxidative degradation of the polymer when exposed to elevated temperatures in service. This product provides improved retention of physical properties under exposure to long-term heat. Also, Vydyne R530H has excellent knit-line strength and fatigue resistance, which is essential for cycle testing with anti-freeze solutions.

Typical Applications/End Uses

Vydyne R530H has been used for several under the hood automotive applications. The hydrolysis-resistant properties make it an excellent candidate for radiator end tank and heater core applications.

Vydyne R530H Specifications and Regulations

ASTM

Conforms to ASTM D-4066 PA012G30
Conforms to ASTM D-6779 PA012G30

Federal*

Conforms to Federal Specification LP-410a

Military*

Conforms to Military Specification MIL-M-20693B

** Superseded by ASTM D-4066*

Find more information or contact us at www.vydyne.com

ASCEND PERFORMANCE MATERIALS

Typical Properties for Vydyne R530H

Test temperature 23°C unless otherwise noted

Physical Properties	Test Conditions	Dry as Molded	Conditioned 2.5% Moisture
Specific Gravity (g/cm³)	ISO 1183	**1.37**	**—**
Mold Shrinkage (%)	ISO 294-4		
2 mm Parallel		**0.4**	**—**
2 mm Normal		**0.9**	**—**
Water Absorption @ 23°C (%)	ASTM D-570		
24 Hours		**0.9**	**—**
Equilibrium at 50% RH		**1.9**	**—**
Mechanical Properties	**Test Conditions**	**Dry as Molded**	**Conditioned 2.5% Moisture**
Tensile Strength @ Yield (MPa)	ISO 527	**—**	**—**
Tensile Strength @ Break	ISO 527	**195**	**140**
Elongation @ Yield (%)	ISO 527	**—**	**—**
Elongation @ Break (%)	ISO 527	**3**	**—**
Tensile Modulus (MPa)	ISO 527	**9,400**	**7,400**
Poisson's Ratio	ISO 527	**0.4**	**—**
Flexural Modulus (MPa)	ISO 178	**9,100**	**6,000**
Flexural Strength (MPa)	ISO 178	**270**	**190**
Notched Charpy Impact (KJ/M²)	ISO 179		
23°C		**11.2**	**—**
-30°C		**10.2**	**—**
Unnotched Charpy Impact (KJ/M²)	ISO 179		
23°C		**80**	**—**
-30°C		**70**	**—**
Notched Izod Impact (KJ/M²)	ISO 180		
23°C		**11**	**—**
-40°C		**9**	**—**
Thermal Properties	**Test Conditions**	**Dry as Molded**	**Conditioned 2.5% Moisture**
Melting Point (°C)	ISO 3146	**260**	**—**
Heat Deflection Temperature (°C)	ISO 75		
1.82 MPa		**250**	**—**
0.45 MPa		**260**	**—**
Vicat @ 50N (°C)	ISO 306	**252**	**—**
Coefficient of Linear Thermal Expansion	ISO 11359		
2 mm - Parallel, 23°C-55°C (10^{-5} mm/mm/°C)		**0.25**	**—**
2 mm - Normal, 23°C-55°C (10^{-5} mm/mm/°C)		**1**	**—**
Electrical Properties	**Test Conditions**	**Dry as Molded**	**Conditioned 2.5% Moisture**
Dielectric Strength (kV/mm) (step-by-step) 3.0 mm	IEC 60243	**16**	**—**
Volume Resistivity (ohm-cm x 10^{15}) 3.0 mm	IEC 60093	**3**	**—**
Comparative Tracking Index (volts) 3.0 mm	IEC 60112	**250-400**	**—**

Underwriters Laboratories Recognized Component Ratings

Yellow Card File Number E70062

Color: All

Parameters	Test Conditions	Thickness (mm)		
		0.75	1.5	3.0
Temperature Index (°C)	UL 746B			
Electrical		140	140	140
Mechanical w/ Impact		120	120	120
Mechanical w/o Impact		125	140	140
Hot Wire Ignition (Rating)	UL 746A	4	3	4
UL94 Flammability Class (Rating)	UL Flame Test	HB	HB	HB
High Amperage Arc Ignition (Rating)	UL 746A	0	0	0
High Volt Track Rate (Rating)	UL 746A	—	—	1
D495 Arc Resistance (Rating)	UL 746A	—	—	6
UL 746A Track Rate (CTI) (Rating)	UL 746A	—	—	2

Virgin and regrind up to 50% by weight have the same basic material characteristics.

All numerical flame spread ratings appearing in this data sheet 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 sources of ignition.

Typical Molding Conditions for Vydyne R530H

Optimal processing conditions will depend on such features as machine size, screw design, die design, and material residence time. The settings below are a guide to achieving stable processing and good part quality. It is best to use a hand-held pyrometer to measure stock melt temperature in an air shot.

Suggested Machine Conditions

Parameters	Machine Settings
Melt Temperature, °C	285 to 305
Cylinder Settings, °C	280 to 310
Mold Surface Temperature, °C	65 to 95
Injection Pressure, MPa	55 to 140
Holding Pressure, MPa	55 to 140
Injection Time, sec	< 1 to 2.5
Screw Back Pressure, MPa	0.2 to 1.0
Screw Speed, rpm	60 to 120
Cushion, mm	3.0 to 6.4
Clamp Pressure, tons/cm²	0.3 to 0.7

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Suggested Guidelines for Molding

1. Your Vydyne nylon resins arrive packaged in moisture-protected containers. If you do not open the original package prior to use, then drying is not necessary. However, if drying is necessary, we recommend that you use a dehumidified air-type dryer (desiccant bed) with a maximum air temperature of 70°C for 1 to 3 hours.

2. The recommended melt temperatures for Vydyne glass reinforced resins are 285 to 305°C. Measure the stock in an air shot with a hand-held pyrometer. In addition to the barrel heater bands, screw back pressure and rotation speed add heat to the melt.

3. Maintain mold surface temperatures in a range of 65 to 95°C. We recommend temperatures on the high end, as the molding cycle allows, to aid in mold filling and to improve the appearance of the molded part.

4. Injection fill rates should be fast. Minimize the use of back pressure 0.2 to 1.0 MPa to yield a consistent melt and/or adequate mixing of color concentrates. Set the screw rotation speed at the minimum required to maintain the molding cycle (60 to 120 rpm).

5. Hold pressure should be set high enough to prevent screw bounce. Hold time should be set until the gate freezes.

6. Maintain your machine's shot-weight-to-barrel-size ratio at 40% to 80% of rated (polystyrene) capacity. A lower shot-to-barrel ratio results in excess residence time and polymer degradation, which can permanently embrittle the molded part. At a shot-to-barrel ratio above the recommended ratio, molding machinery is often unable to deliver a uniform melt or the desirable fast mold fill.

7. Regrind must be dry when molded. The preferred procedure is to grind and reuse immediately after molding. Regrind-to-virgin ratios of 25% or less have shown no significant property loss when properly molded. However, to ensure adequate performance of your molded part, determine acceptable levels for each application through actual part testing.

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