vydyne 41 Series **data sheet**

41 Natural, 41H Heat Stabilized Natural, 41H Heat Stabilized Black impact modified nylon

Product Description

Vydyne® 41 Nylon resins are general purpose polyamide, impact modified resins.

Available heat stabilized and in natural color and black.

Vydyne 41 Series are comprised of a variety of ("high impact" type) impact modified injection molding Nylon 66 resins. This family is recognized for all the processing and property advantages inherent to Nylon 66 with the addition of improved impact. Generally, these resins offer a well-balanced combination of engineering properties characterized by a high melt point; good surface lubricity; abrasion resistance; and resistance to many chemicals including solvents, gasoline, and machine and motor oils. The Vydyne 41 Series also provides good property retention when using regrind.

This series of Nylon 66 resins include:

Vydyne 41 Natural- An unlubricated impact modified resin for use in applications which do not require modification for improved machine feed or mold release where parts are to be kept free from lubricants. This nylon resin is supplied in natural pellets.

Vydyne 41H- A heat stabilized, externally lubricated version of Vydyne 41. The external lubrication on this product offers improved machine feed, flow, and mold release. The heat stabilizer system for Vydyne 41H was formulated to provide thermal endurance when used in applications in which continuous or extended high temperatures exposure is anticipated. This nylon resin is supplied in natural color and black.

Vydyne 41 Series Specifications and Regulations

ASTM

Conforms to ASTM D-4066 PA0151

Typical Applications/ End Uses

The Vydyne 41 family may be used in both industrial and automotive applications. Typical end uses include: clips, fasteners, engine gearing, cable ties, electrical connectors, and many other parts which require high impact properties. These resins can in many cases be used as metal replacements, offering improvements on abrasion resistance, reduction in part weight, greater processing flexibility, and lower energy consumption.

Typical Properties for Vydyne 41 Series

Test temperature 23°C unless otherwise noted

Physical Properties	Test Conditions	Dry as Molded	Conditioned 2.5% Moisture
Specific Gravity (g/cm³)	ISO 1183	**1.08**	–
Mold Shrinkage (%)	ASTM D-955		–
2 mm – Parallel		**1.6**	
2 mm -– Normal		**2.2**	
Water Absorption @ 24 hours (%)	ASTM D-570	**0.99**	**1**
Mechanical Properties	**Test Conditions**	**Dry as Molded**	**Conditioned 2.5% Moisture**
Tensile Strength @ Yield (MPa)	ISO 527	**52**	–
Tensile Elongation @ Break (%)	ISO 527	**52**	**105**
Flexural Modulus (MPa)	ISO 178	**1,965**	**738**
Flexural Strength (MPa)	ASTM D-570	**66**	**27**
Notched Izod Impact 4.0 mm (KJ/M²)	ISO 180		
23°C		**64**	–
-40°C		**16.7**	–
Thermal Properties	**Test Conditions**	**Dry as Molded**	**Conditioned 2.5% Moisture**
Heat Deflection Temperature 1.82 MPa (°C)	ISO 75	**64**	–
Melting Point (°C)	ISO 3146	**262**	–
Electrical Properties	**Test Conditions**	**Dry as Molded**	**Conditioned 2.5% Moisture**
Volume Resistivity (ohm-cm)	ASTM D-257	**$1.8x10^{15}$**	–
Dielectric Strength (kV/mm)	ASTM D-149		
Short Time		**22.5**	–
Step-By-Step		**21.5**	–
Dielectric Constant	ASTM D-150		
10^2 Hz		**3.5**	–
10^3 Hz		**3.4**	–
10^6 Hz		**3.0**	–
Dissipation Factor	ASTM D-150		
10^2 Hz		**0.02**	–
10^3 Hz		**0.02**	–
10^6 Hz		**0.02**	–

Underwriters Laboratories Recognized Component Ratings

Yellow Card File Number E70062

Color: NC

Parameters	Test Conditions	Thickness (mm)	
		0.75	3.0
Temperature Index (°C)	UL 746B		
Electrical		**65**	**65**
Mechanical w/Impact		**65**	**65**
Mechanical w/o Impact		**65**	**65**
Hot Wire Ignition (Rating)	UL 746A	–	–
UL94 Flammability Class (Rating)	UL Flame Test	**HB**	**HB**
High Amperage Arc Ignition (Rating)	UL 746A	–	–
High Volt Track Rate (Rating)	UL 746A	–	–
D495 Arc Resistance (Rating)	UL 746A	–	–
IEC Track Rate (CTI) (Rating)	UL 746A	–	–

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 41 Series

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

Melt Temperature, ºC 275 to 305

Parameters	Machine Settings
Cylinder Settings °C	**275 to 310**
Mold Surface Temperature, ºC	**19 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	**50 to 150**
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 impact-modified resins are 280 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 15 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 (50 to 150 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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