66B, 66J Data Sheet

General Purpose, High Viscosity Nylon

Product Description

Vydyne 66B and 66J are members of a family of unreinforced extrusion grade Nylon 6,6 resins. They are available in natural color. These resins offer high strength, rigidity, and toughness for a broad range of demanding application requirements. Vydyne extrusion grade resins provide good resistance to a wide variety of chemicals, solvents, gasoline, and machine and motor oils.

Vydyne 66B—High molecular weight grade developed to provide high and controlled melt strength.

Vydyne 66J—Heat stabilized version for added resistance to elevated temperature use. The high viscosity of Vydyne 66J allows for a very stable and easily controlled melt extrudate.

Vydyne 66B and 66J are Recognized by Underwriters Laboratories.

Typical Applications/End Uses

Vydyne 66B and 66J can be fabricated into film, monofilament, bristle, tubing, rod, profiles and sheet for use in automotive and industrial applications. They are particularly useful in blown film applications.

Vydyne® 66B and 66J Specifications and Regulations

ASTM

66B.....Conforms to ASTM D-4066 PA 0114

66J.....Conforms to ASTM D-4066 PA 0124

Federal*.....Conforms to Federal Specification LP-410a

FDA.....Complies with 21 CFR177-1500

Religious.....Certifiably Kosher under Jewish Law

Military*.....Conforms to Military Specification MIL-M-20693B

** Superseded by ASTM D-4066.*

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Typical Properties for Vydyne® 66B and 66J

Properties[1]	Test Method[2]	Test Temp	Units	Dry as Molded[3] (0.2% Moisture)
Physical				
Specific Gravity	ISO 1183	23°C	–	1.14
Water Absorption @ 24 hrs.	ASTM D-570	23°C	%	1.20
Mechanical				
Tensile Strength at Yield	ISO 527	23°C	MPa	82
Tensile Elongation at Break**	ISO 527	23°C	%	175
Tensile Elongation at Yield	ISO 527	23°C	%	9
Secant Tensile Modulus	ISO 527	23°C	MPa	3,000
Secant Flexural Modulus	ISO 178	23°C	MPa	2,900
Notched Izod Impact Strength**	ISO 180	23°C	kJ/M^2	7.1
Taber Abrasion Resistance***, CS-17 Wheel, 1 kg Load	ASTM D-1044	23°C	mg Loss/1,000 cycles	7
Rockwell Hardness:	ASTM D-785	23°C		
M Scale			–	88
R Scale			–	120
Thermal				
Deflection Temperature Under Load @ 1.8 MPa	ISO 75		°C	65.6
Melting Point	ISO 3146		°C	260
Coefficient of Thermal Expansion, (10^{-6})	ASTM D-696	23°C	mm/mm/°C	8.1
Flammability				
Federal Motor Vehicle Safety Std[4]	FMVSS302			DNI (Passes)
Limiting Oxygen Index[5]	ASTM D-2863		$\%0_2$	28

(1) Typical values represent an average of samples tested based on limited data. These values are intended as guides only and do not reflect the specification range for a particular property.
(2) All data taken on unannealed injection molded test specimens per ISO 294 / ASTM D-3641.
(3) Samples sealed in moisture barrier packages immediately after processing.
(4) The FMVSS 302 standard is a requirement for parts and/or assemblies, and not for materials per se. It is the responsibility of the component manufacturer to determine the flammability performance of their molded components. Because flammability results are dependent upon part thickness and geometry, Solutia does not typically certify a material to FMVSS 302. However, Solutia does perform flammability tests which RELATE to FMVSS 302, as specified by Ford, GM, Chrysler, and SAE J1639. A request for flammability certification should be made through Vydyne Customer Service.
(5) All numerical flame spread ratings appearing in this data 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 the 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 other sources of ignition.

** Concentrates, lubricants, stabilizers, and other additives may affect physical properties.
*** Impractical to measure on dry as molded specimens.

Underwriters Laboratories Recognized Component Ratings Yellow card file number E70062

Color	Min. Thickness (mm)	Temperature Index (°C) Elec.	Mech. w/Impact	Mech. w/o Impact	Hot Wire Ignition	UL94 Flam. Class	High Amp Arc Ign.	High Volt Track Rate	D495 Arc Resistance	IEC Track Rate (CTI)
66B										
ALL	0.71	130	75	85	4	HB	0	–	–	–
	1.5	130	75	85	3	HB	0	–	–	–
	3.0	130	75	85	2	HB	0	0	5	0
66J										
ALL	0.71	140	95	115	4	HB	0	–	–	–
	1.5	140	110	125	4	HB	0	–	–	–
	3.0	140	110	125	4	HB	0	0	6	1

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Typical Extrusion Conditions for Vydyne® 66B and 66J

Optimum 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. Stock melt temperature measured with a hand-held pyrometer is one of the best methods for selecting optimum operating conditions.

Parameters	Machine Settings
Physical	
Stock Temperature, °C	271-293
Suggested Machine Conditions:	
Cylinder Settings, °C	
Rear	248-260
Center	271-293
Front	271-293
Die Temperature, °C	271-293
Screw Design	General Purpose* or Barrier
Extruder Die Back Pressure**, MPa	3.4-17.2
Quench Water Bath Temperature, °C	21-79

* Extrusion screws should have a 3.5:1 compression ratio with a minimum L/D of 24:1.
** For monofilament applications a meter pump is suggested. A screen pack of 40/80/40 mesh is appropriate.

VYDYNE nylon resins®

Suggested Guidelines for Extrusion

Single or twin screw extruders can be used for processing Vydyne nylon.

A single screw extruder with a length-to-diameter (L/D) ratio of 24:1 and a compression ratio of at least 3.5:1 is suggested to ensure the best melt quality. The preferred screw compression zone should be a minimum of four turns in length.

Barrier screws have been successfully used with high viscosity Vydyne grades.

Extruder temperature control is critical to insure a constant delivery of a homogenous melt over the entire speed range. The extruder barrel should be equipped with at least four independent temperature control zones for heating. Cooling sections are not recommended for extrusion processes.

Vydyne nylon is non-corrosive so no special material of construction is required for screws or barrels.

D.C. drives or AC vector drives are recommended to provide precise speed control over the entire range. Circuit breakers should be provided to prevent high torque conditions that could result in screw breakage. Additional high-pressure protection should also be provided by means of a rupture disc installed in the barrel between the end of the screw and the breaker plate. A pressure transducer with a high-pressure cutout interlocked to the drive can also be used.

Nylon extruder drives require approximately 750 watts of power per 3.2 - 3.6 kg/hr (1 HP per 7-8 lb/hr) of throughput. An uninterrupted power supply is recommended.

Extruder output is typically given based on processing polystyrene. Nylon typically requires more heat input, melts more slowly and has lower viscosity and develops less shear in the barrel. To determine approximate output of Vydyne nylon, multiply the rated output for polystyrene by 0.67.

The feed throat should be water cooled to prevent excessive heating of the resin, which can cause bridging in the feed hopper. Water-cooling of the throat also provides protection for the drive bearings.

A screen pack of 40/80/40 mesh is appropriate for extruding Vydyne nylon resins. Finer filtration may be required for very low wall thicknesses or fine diameters. The use of a screen pack is recommended to remove impurities and unmelted resin from the melt stream. The screen packs also increase extruder back pressure which insures a more homogeneous melt and constant output pressures.

A melt-gear pump is recommended to provide maximum stability of output in applications where throughput control is critical.

When the extruder is shut down for over 15 minutes with nylon 6,6 left in the barrel, there exists a risk of polymer degradation. This is a function of individual set-up and fabrication. For downtimes exceeding 30 minutes in length, Solutia recommends completely emptying (purging) the barrel. This can be done with a purge compound such as nylon 6, Acrylic or commercially available purge compound.

A periodic dismantling and thorough cleaning of the extruder screw, head and die is recommended to insure uniform end product quality.

Vydyne nylon resins are hygroscopic and should be stored under cool, dry conditions in their original factory sealed packaging until ready for use.

Although Vydyne resins can be extruded straight from the factory sealed bag, it is recommended that the resins go through an additional drying step prior to extrusion. This additional step ensures uniform moisture levels (target moisture should be <0.10% by weight) to insure consistent melt quality and superior dimensional control.

For more information or to place an order in the US, please call our Customer Service Center at 1-888-927-2363.

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