

# vydyne 63A data sheet

general purpose, medium viscosity nylon

## Product Description

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**Vydyne® 63A is a member of a family of unreinforced extrusion grade Nylon 66 resins from Solutia.** It is available in natural color only. These resins offer high strength, rigidity, and toughness over a broad range of demanding applications. Vydyne extrusion grade resins provide good resistance to a wide variety of chemicals, solvents, and oils.

**Vydyne 63A** is a medium viscosity resin suitable for injection molding and extrusion applications.

## Typical Applications/End Uses

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The high melt strength of Vydyne 63A makes it a candidate for cast film or other applications requiring a high melt strength. Typical extrusion applications include film for food packaging, monofilament, bristles, rods, tubing, as well as sheet for use in many automotive and industrial applications.



Find more information or contact us at [www.vydyne.com](http://www.vydyne.com)



# Typical Properties for Vydyne 63A

Test temperature 23°C unless otherwise noted

Physical Properties	Test Conditions	Dry as Molded
Specific Gravity (g/cm <sup>3</sup> )	ISO 1183	1.14
Mold Shrinkage (%)	ISO 294-4	
2 mm - Parallel		1.4
2 mm - Normal		1.6
Water Absorption @ 23°C (%)	ISO 62	
24 Hours		1.1
Equilibrium at 50% RH		2.3
Mechanical Properties	Test Conditions	Dry as Molded
Tensile Strength @ Yield (MPa)	ISO 527	83
Tensile Strength @ Break (MPa)	ISO 527	—
Elongation @ Yield (%)	ISO 527	—
Elongation @ Break (%)	ISO 527	90
Tensile Modulus (MPa)	ISO 527	3,250
Poisson's Ratio	ISO 527	0.4
Flexural Modulus (MPa)	ISO 178	3,100
Flexural Strength (MPa)	ISO 178	33
Notched Charpy Impact (KJ/M <sup>2</sup> )	ISO 179	
23°C		7.8
-30°C		6.9
Unnotched Charpy Impact (KJ/M <sup>2</sup> )	ISO 179	
23°C		NB
-30°C		NB
Notched Izod Impact (KJ/M <sup>2</sup> )	ISO 180	6.0
Thermal Properties	Test Conditions	Dry as Molded
Melting Point (°C)	ISO 3146	260
Heat Deflection Temperature (°C)	ISO 75	
1.82 MPa		65
0.45 MPa		195
Vicat @ 50N (°C)	ISO 306	239
Coefficient of Linear Thermal Expansion	ISO 11359	
2 mm - Parallel, 23°C-55°C (10 <sup>-5</sup> mm/mm/°C)		1
2 mm - Normal, 23°C-55°C (10 <sup>-5</sup> mm/mm/°C)		1
Electrical Properties	Test Conditions	Dry as Molded
Dielectric Strength (kV/mm) (step-by-step) 3.0 mm	IEC 60243	14
Volume Resistivity (ohm-cm x 10 <sup>15</sup> ) 3.0 mm	IEC 60093	5
Comparative Tracking Index (volts) 3.0 mm	IEC 60112	> 600

## Typical Extrusion Conditions for Vydyne 63A

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, °C 270 to 295

Parameters	Machine Settings
Cylinder Settings °C	250 to 295
Die Temperature, °C	270 to 295
Screw Design	General Purpose or Barrier
Extruder Die Back Pressure,* MPa	3.0 to 17.0
Quench Water Bath Temperature, °C	20 to 80

\*Note: For monofilament applications, a meter pump is suggested. A screen pack of 40/80/40 mesh is appropriate.

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## Suggested Guidelines for Extruding

1. Although you can use a twin-screw extruder to process Vydine nylon, a single-screw extruder with a length-to-diameter ratio of 24 to 1 and a compression ratio of at least 3.5 to 1 is recommended 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 Vydine grades.

2. Extruder temperature control is critical to ensure constant delivery of a homogeneous 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. Vydine nylon is noncorrosive, so no special material or construction is required for screws or barrels. DC drives or AC vector drives are recommended to provide precise speed control over the entire range. Circuit breakers should be used to prevent high torque conditions that could result in screw breakage. Nylon extruder drives require approximately 750 watts of power per 3.2 to 3.6 kg/hr. of throughput. Make sure you are using an uninterrupted power supply.

3. You can gain additional high-pressure protection by either of these methods:

- A rupture disk 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

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

5. 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 protects the drive bearings.

6. We recommend that you use a screen pack to remove impurities and unmelted resin from the melt stream. A screen pack of 40/80/40 mesh is appropriate. Finer filtration may be required for very low wall thicknesses or fine diameters. The screen packs also increase extruder back pressure, which ensures a more homogeneous melt and constant output pressures.

7. A melt-gear pump is recommended for maximum stability of output when throughput control is critical.

8. A 15- to 30-minute shutdown with Nylon 66 remaining in the barrel causes a risk of polymer degradation. This is a function of individual setup and fabrication. For downtimes exceeding 30 minutes, we recommend completely emptying (purging) the barrel with a commercial purge compound, nylon 6, or acrylic. We recommend that you periodically dismantle and thoroughly clean the extruder screw, head, and die to ensure uniform quality of your end product.

9. Store Vydine nylon resins in cool, dry conditions in their original factory-sealed packaging until you use them. Although they can be extruded straight from the factory-sealed bag, it is recommended that the resins be dried before extruding. This ensures uniform moisture levels (target moisture should be less than 0.10% by weight) to ensure consistent melt quality and superior dimensional control. It is recommended that Vydine extrusion grades be dried in a dehumidified air-type drier (desiccant bed) with a maximum air temperature of 70°C for 1-3 hours.



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