



## **63A DATA SHEET**

**GENERAL PURPOSE, MEDIUM VISCOSITY NYLON**

### ***Product Description***

**Vydyne 63A is a member of a family of unreinforced extrusion grade Nylon 6,6 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***

**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.**



**Typical Properties for Vydyne® 63A**

PROPERTIES <sup>1</sup>	TEST METHOD <sup>2</sup>	TEST TEMP	UNITS	DRY AS MOLDED <sup>3</sup> (0.2% MOISTURE)
<b>PHYSICAL</b>				
Specific Gravity	ISO 1183	23°C	–	1.14
Water Absorption @ 24 hrs.	ASTM D-570	23°C	%	1.11
<b>MECHANICAL</b>				
Tensile Strength at Yield	ISO 527	23°C	MPa	82.4
Tensile Elongation at Break**	ISO 527	23°C	%	90
Secant Flexural Modulus	ISO 178	23°C	MPa	3,100
Notched Izod Impact Strength**	ISO 180	23°C	kJ/m <sup>2</sup>	6.0
Taber Abrasion Resistance***, CS-17 Wheel, 1 kg Load	ASTM D-1044	23°C	mg Loss/1,000 cycles	7
<b>THERMAL</b>				
Deflection Temperature Under Load @ 1.8 MPa	ISO 75		°C	67.1
Melting Point	ISO 3146		°C	260

(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.

\*\* Concentrates, lubricants, stabilizers, and other additives may affect physical properties.

\*\*\* Impractical to measure on dry as molded specimens.

**Typical Extrusion Conditions for Vydyne® 63A**

Optimum processing conditions will depend on such features as machine size, screw 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 operation 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.



**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.**

**World Headquarters  
Solutia Inc.**

575 Maryville Centre Drive  
St. Louis, MO 63141  
Phone: 1-888-927-2363  
(314) 674-1000  
Fax: (314) 674-5084

**Technical Center  
Solutia Inc.**

3000 Old Chemstrand Road  
Cantonment, FL 32533  
Phone: (850) 968-8520  
Fax: (850) 968-7844

**European Regional Headquarters  
and Technical Center  
Solutia Europe N.V./S.A.**

Rue Laid Burniat, 3  
Parc Scientifique-Fleming  
B1348 Louvain-la-Neuve (Sud)  
Belgium  
Phone: +32-1048-1374  
Fax: +32-1048-1400

**Asia Regional Headquarters  
Solutia Singapore Pte. Ltd.**

101 Thomson Road #19-01/02  
United Square  
Singapore 307591  
Phone: +65-6357-6197  
Fax: +65-6357-6194

**Also visit our website at [www.vydyne.com](http://www.vydyne.com).**

**Disclaimer of Warranty and Liability**

*NOTICE: Although the information and recommendations set forth herein (hereinafter "Information") are presented in good faith and believed to be correct as of the date hereof, Solutia Inc. makes no representations or warranties as to the completeness or accuracy thereof. Information is supplied upon the condition that the persons receiving same will make their own determination as to its suitability for their purposes prior to use. In no event will Solutia Inc. be responsible for damages of any nature whatsoever resulting from the use of or reliance upon Information or the products to which information refers. Nothing contained herein is to be construed as a recommendation to use any product, equipment or formulation in conflict with any patent, and Solutia makes no representation or warranty, express or implied, that use thereof will not infringe any patent. No representations or warranties, either express or implied, of merchantability, fitness for a particular purpose or of any other nature are made hereunder with respect to information or the product to which Information refers.*