



NYLON

Also Known As (common industry trade names):

Ensilon . Nycast . Nycast/612 VS . Nycast/Nyloil . Nycast XHA Nylaflow . Nylatron
Nylatron GS Nylatron GSM . Nylatron NS & NSM . NylonMD . Nylawear Nylon 101
Oilamid . Para-Lite . Polyamide Polypenco . Polypenco Nylon 101 Polypenco . Sustamid
66 . Sustimid 6G . Tecamid . Type 6 (cast) Type 6/6 (extruded) . Vekton

Material Information:

Nylon (polyamide) has enjoyed increasing success in replacing bronze, brass, steel and aluminum as well as wood and rubber in engineering applications. Nylon's high impact resistance, high resistance to brittleness and deterioration, high heat distortion temperature, vibration resistance and machinability make it the perfect material for many applications. Nylon exhibits excellent resistance to a wide array of chemicals including, alkalis, dilute acids, and oxidizing agents which cause many metalics to fail. The relatively light weight of nylon eases handling of large parts as well as lessens both inertial and static loads. Nylon is available in a variety of fills and basic shapes to meet just about every need.

Applications:

- Bearings
- Bushings
- Gears
- Rollers
- Cams
- Seals
- Valve Seats
- Washers
- Sleeves

Characteristics/Enhancements/Varieties:

Fills:

- *Molybdenum Disulfide (MOS2): A dry lubricant that is popular in bearing applications.
- *Oil Filled: With one of the lowest frictional coefficients coupled with the strength and wear of nylon, oil filled is the choice for the most demanding of applications.
- *30% Glass Reinforced: The glass fill provides additional strength and wear needed in load bearing applications.

Standard Shapes and Sizes (please call for custom sizes not listed):

- Sheet Sizes: 24" x 48", 48" x 96", limited thickness up to 96" x 144"
- Sheet Thicknesses: 1/32" extruded, 6" cast
- Rod Diameters: 1/16" (extruded) through 12" (cast)
- Rod Diameters: 10' standard length
- Tube: 1/4 OD through 6" OD (extruded in 6 ft. lengths only) in limited wall thicknesses. Cast up to 3 and 4 ft. OD with various wall thicknesses.
- Film: Specialty products used in laminating applications are available.
- Other: Many types of cast shapes are made. Sheave blanks, near cast shapes, rings and solid blocks.

(continued - next page)

Dallas, Texas (Corporate Offices)
Houston, Texas
Brandon, Mississippi

phone 800-782-1836 / 214-239-3870
phone 800-282-4388 / 713-979-0660
phone 800-457-8623 / 601-825-7919

fax 214-239-3871
fax 713-979-0664
fax 601-825-7109



NYLON (continued - page 2)

More Information on Nylon:

Nylons were the first of the thermoplastic engineering resins. These crystalline plastics are available in many compositions. Nylon 6/6 (usually extruded) is the most widely used of the nylon plastics. Higher priced grades for more specific or demanding applications include 6/10 and 6/12.

Nylon 6 (usually cast) is the second most widely used of the nylons. Its properties are similar to those of 6/6, but it absorbs moisture more rapidly and its melting point is around 70F lower.

Nylon 11 and 12 have better dimensional stability and electrical properties than the other nylons because they absorb less moisture. These types, which are more expensive than the others, are available compounded with plasticizers to provide greater flexibility and ductility.

Newest additions to the Nylon family of products are transparent molding grades – amorphous polyamides that offer superior performance in hot water, compared with other nylons. A recent development in nylon toughening technology has resulted in the availability of super tough resins, such as Dupont's Zytel ST. These materials are 17 times the notched impact resistance of conventional 6/6 nylon.

In part because it has been around the longest, but also because of the many variations of resins and additives used in nylon, it is one of the most widely used of the mechanical plastics and can be specially formulated to a wide variety of applications.



TECAMID™

TECAMID™

(Nylon)

Nylon was the first engineering resin. It has been used in applications ranging from electronic, marine, and automotive industries to fibers used to make carpet.

Nylon has outstanding wear resistance and low frictional properties. It has very good temperature, chemical, and impact properties. However, nylon's one weakness is a propen-

sity to absorb moisture and thus have poor dimensional stability.

- **TECAMID™ 6/6**

Type 6/6 general purpose standard grade nylon. Extruded in natural and black. (Weather Resistant Black Grade is also available as a custom.)

- **TECAMID™ 6/12**

Type 6/12 nylon. This nylon has lower moisture absorption rates than nylon 6/6, hence superior dimensional stability.

- **TECAMID™ ST**

Type 6/6 nylon. Super Tough nylon. Increased impact resistance and toughness over Tecamid™ 6/6.

- **TECAMID™ HS**

Type 6/6 nylon. Heat Stabilized nylon. Increased ability to withstand the negative effects of heat exposure and increased overall service temperature over Tecamid™ 6/6.

TECAMID™ has an excellent balance of properties which make it an ideal material for metal replacement in applications such as automotive parts, industrial valves, railway tie insulators, and other industry uses whose design requirements include high strength, toughness, and weight reduction.

Dallas, Texas (Corporate Offices)
Houston, Texas
Brandon, Mississippi

phone 800-782-1836 / 214-239-3870
phone 800-282-4388 / 713-979-0660
phone 800-457-8623 / 601-825-7919

fax 214-239-3871
fax 713-979-0664
fax 601-825-7109



TYPICAL PROPERTY VALUES

PROPERTIES	ASTM Test Method	Units	TECAMID™ 6/6	TECAMID™ 6/12	TECAMID™ ST	TECAMID™ HS	
PHYSICAL	Density	D792	lbs/in ³	0.0412	0.0383	0.0390	0.0412
	Specific Gravity	D792	g/cc	1.14	1.06	1.08	1.14
	Water Absorption, @24 hours, 73°F	D570	%	1.2	0.25	1.2	-
	@Saturation, 73°F	D570	%	8.5	3.0	6.7	-
MECHANICAL	Tensile Strength @ Yield, 73°F	D638	psi	100,00	8,000	7,200	10,000
	Tensile Modulus	D639	psi	350,000	300,000	-	350,000
	Elongation @ Break, 73°F	D638	%	25	20	60	25
	Flexural Strength, 73°F	D790	psi	15,500	-	9,800	-
	Flexural Modulus, 73°F	D790	psi	440,000	275,000	245,000	440,000
	Compressive Strength	D695	psi	5,000	2,400	-	-
	Izod Impact Strength, 73°F	D256	ft-lbs/in	1.1	0.9	170	1.2
	Rockwell Hardness, 73°F	D785	M or R Scale	M-90	R-114	R-112	-
	Shore Hardness	-	D Scale	-	-	-	-
	Wear Factor Against Steel, 40 psi, 50 fpm	D3702	$\frac{\text{in}^3 \times 1}{\text{hr} \times \text{PV}}$	200×10^{10}	190×10^{10}	200×10^{10}	-
Static Coefficient of Friction	D3702	-	-	0.31	-	-	
Dynamic Coefficient of Friction, 40 psi, 50 fpm	D3702	-	0.26	-	0.28	-	
THERMAL	Heat Deflection Temperature @ 66 psi	D648	°F	455	-	421	392
	@264 psi	D648	°F	194	142	160	194
	Coefficient of Linear Thermal Expansion	D696	in/in/°F	4.5×10^{-5}	5×10^{-5}	6.7×10^{-5}	-
	Maximum Servicing Temperature, Intermittent	-	°F	300	-	-	-
	Long Term	UL746B	°F	185	-	-	-
	Specific Heat	-	BTU/lb-°F	0.4	0.45	-	-
	Thermal Conductivity	-	-	-	1.53	-	-
	Vicat Softening Point	-	°F	-	-	505	504
Melting Point	D2133	°F	491	422	505	504	
Flammability	UL94	(mm)	V-2 (3.0)	HB (0.86)	HB (0.81)	HB (0.75)	
ELECTRICAL	Surface Resistivity	D257	ohm/square	-	-	-	-
	Volume Resistivity	D257	ohm-cm	10^{11}	10^{11}	-	-
	Dielectric Strength	D149	V/mil	300-400	-	-	-
	Dielectric Constant, @ 60 Hz, 73°F, 50% RH	D150	-	4	4	-	-
	@ 1 MHz	D150	-	3.6	3.5	-	-
	@ 20 GHz	D150	-	-	-	-	-
	@ 30 GHz	D150	-	-	-	-	-
Dissipation Factor, @ 60 HZ, 73°F	D150	-	0.01	0.02	-	-	

This information is only to assist and advise you on current technical knowledge and is given without obligation or liability. All trade and patent rights should be observed. All rights reserved. Data obtained from extruded shapes material. TECAMID™ - Ensinger Industries, Inc.

MATERIAL AVAILABILITY

Rods: Diameters: 3/16" to 4 3/4", 10' length
Length: 5' and greater, 5' length

Plates: 1/32" to 2" thickness inclusive are 2' x 4'
3 3/4" to 2" thickness inclusive are 1' x 2'

Primary Specification (Resin) (Typical)

TECAMID 6/6: ASTM-D-4066 PA0114

TECAMID ST: ASTM-D-4066 PA0162

ASTM-D-5989 S-PA0111

ASTM-D-5989 S-PA0000

TECAMID 6/12: ASTM-D-4066 PA0613

TECAMID HS: ASTM-D-4066 PA124854380

ASTM-D-5989 S-PA0511

ASTM-D-5989 S-PA0131

Profiles, tubes, and special sizes are custom-produced on request.



DISTRIBUTED BY

HEADQUARTERS

365 Meadowlands Boulevard
Washington, Pennsylvania 15301

Telephone: 800-243-3221 Sales
800-869-4029 Technical
Fax: 724-746-9209

e-mail: sales@ensinger-ind.com

DS108/0507

Dallas, Texas (Corporate Offices)
Houston, Texas
Brandon, Mississippi

phone 800-782-1836 / 214-239-3870
phone 800-282-4388 / 713-979-0660
phone 800-457-8623 / 601-825-7919

fax 214-239-3871
fax 713-979-0664
fax 601-825-7109