

# NYLOIL<sup>®</sup>

**NYLOIL**  
Original  
Green  
Oil-Filled

**NYLOIL-FG**  
Natural  
Approved  
Food  
Grade  
Oil-Filled

**NYLOIL-MDX**  
Gray  
Molybdenum  
Disulfide and  
Oil-Filled



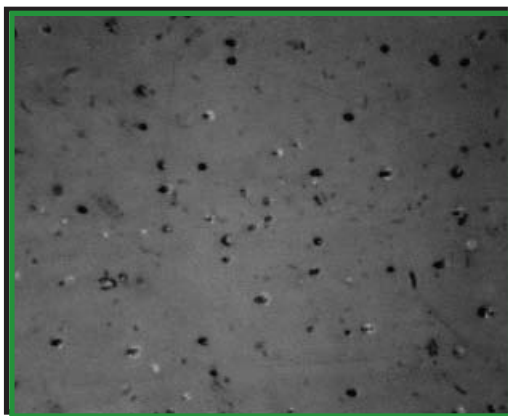
Only NYLOIL from Cast Nylons Ltd. offers three grades of self-lubricating Nylon bearing material tailored to meet your specific application.

A cast nylon with built-in oil lubrication, NYLOIL provides superior machinability, performance, and durability compared to other plastic and traditional bearing materials. Three grades of NYLOIL are available to fit the most demanding applications: original *Green* Nyloil for most bearing applications; food-grade, *Natural* Nyloil-FG for direct contact with food; and MoS<sub>2</sub> filled *Gray* Nyloil-MDX with slightly higher compressive load capabilities than original NYLOIL.

The incorporation of an oil lubricant package into the nylon matrix provides significant advantages over other bearing materials:

- Lubrication results in 25% lower coefficient of friction than other grades of nylon.
- Performs in harsh environments where lubrication is difficult, impossible, or un-desirable.
- Operates efficiently in direct contact with abrasive slurries.
- Works successfully in marine applications.
- Reduced water absorption promotes higher dimensional stability.
- Works and machines as easily as brass.
- Oil will not spin out, dry out, or drain out, even under the harshest operating conditions.

During NYLOIL's manufacturing process, an oil lubricant package is completely dispersed within the cast nylon matrix, making it an integral part of the casting's structure.



350x Magnification of NYLOIL sample showing oil dispersion.

Although not evident by sight or touch, the oil lubricant in NYLOIL is always at the surface regardless of the amount of material removed during finish machining or normal wear.

NYLOIL-FG is a self lubricating nylon bearing material which meets the provisions of FDA Regulations 21 CFR,

Section 177.15 (and others) and USDA 3A Sanitary Standards 20-17 for direct contact with food. This is a particularly useful material where additional lubrication is not desirable because of cleanability, contamination, or other considerations.

Gray NYLOIL-MDX is formulated with a Molybdenum Disulfide filler which promotes higher crystallinity in the cast polymer, in addition to the oil lubricant package. This yields a bearing material with more consistent intermolecular structure and generally a narrower distribution within the range of physical property values, while retaining the advanced friction properties of unfilled Nyloil.

## Average Thrust Bearing Test Results

PV = 2500 @ V = 40 fpm

Material	Wear Factor K <sup>(1)</sup>	Coefficient of Friction Dynamic <sup>(1)</sup>	Comparative Wear Rate to NYLOIL
NYCAST NYLOIL	4	.12	1
ACETAL/PTFE FILLED	16	.15	4
NYLATRON NSM <sup>(2)</sup>	33	.17	8
NYCAST 6 PA MoS <sub>2</sub> FILLED	274	.22	68
NYLON 6/6	900	.43	225
BRONZE (ASTM B-147)	3,000	.34	750

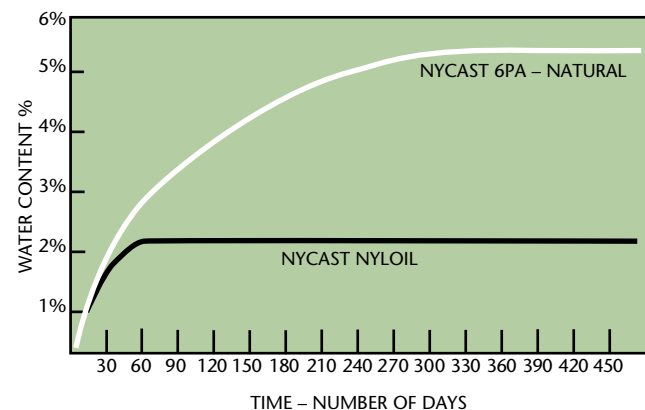
(1) Measured on thrust washer testing machine, unlubricated @ 40 fpm and 50 lb./sq. in.

(2) Polymer Corporation

## Dimensional Stability

With their higher crystallinity, all NYCAST® products exhibit improved dimensional stability compared to their extruded nylon counterparts. But NYLOIL provides even better dimensional stability than regular grades of cast nylon: Its oil droplets fill gaps in the amorphous structure of the polymer, allowing less room for water to be absorbed into these areas. The moisture absorption graph shows that despite a slow absorption rate, NYLOIL stabilizes at approximately 2.5% moisture content - less than half the moisture content of other unfilled nylons.

## Water Absorption



## TYPICAL APPLICATIONS

Gears	Sleeves
Bearings	Insulators
Bushings	Scraper Blades
Sprockets	Wear Strips
Wear Pads	Rollers
Sheaves	Die Wear Plates
Pulleys	Telescoping Boom Wear Pads
Guides	Slipper Blocks
Tooling Fixtures	Supports
Cams	Form Tools
Feed Screws	Star Wheels
Wear Rails	Valve Seats
Housings	Wear Rings
Wear Shoes	Seals
Conveyor Wheels	Wheels
Buffer Plates	Rubbing Blocks

## STOCK SHAPE AVAILABILITY

Rod	1" Diameter to 12" Diameter
Plate	1/4" to 1" Thk (in 1/8" increments). 1-1/4" to 4" Thk (in 1/4" increments) Available in 24" x 48", 28" x 57" and 36" x 48", and 36" x 60".
Tubular Bar	2" to 40" O.D. (wall sections, 1/4" to 4") Standard lengths: 13", 26" and 39".
Discs	12 1/2" to 58" Diameter (Thickness starts at 2")
Rings	Call for specific sizes
Rectangular Bar	Call for specific sizes
Custom Casting	Available upon request.

ASTM PROPERTY	UNITS	TEST METHOD	NYLOIL	NYLOIL-FG	NYLOIL-MDX
TEST OR PUBLISHED					
SP GRAV.		D792	1.14-1.15	1.14-1.15	1.14-1.15
TENSILE STRENGTH	PSI	D638	9,500-11,000	9,500-11,000	10,500-11,000
TENSILE ELONGATION	%	D638	45-55	45-55	35-45
TENSILE MODULUS	PSI	D638	375,000-475,000	375,000-475,000	425,000-475,000
COMPRESSIVE STRENGTH (@ 10% OFF SET)	PSI	D695	12,000-14,000	12,000-14,000	13,500-14,000
COMPRESSIVE MODULUS	PSI	D695	275,000-375,000	275,000-375,000	325,000-375,000
FLEXURAL STRENGTH	PSI	D790	14,000-16,000	14,000-16,000	15,500-16,000
FLEXURAL MODULUS	PSI	D790	375,000-475,000	375,000-475,000	425,000-475,000
SHEAR STRENGTH	PSI	D732	8,000-9,000	8,000-9,000	8,000-9,000
NOTCHED IZOD	FT-LBS/IN	D256	1.4-1.8	1.4-1.8	1.4-1.8
TENSILE IMPACT	FT-LBS/SQ.IN	D1822	33-36	33-36	33-36
ROCKWELL	R	D785	100-115	100-115	100-115
MELT POINT	DEG.F	D789	450+/-10	450+/-10	450+/-10
COEF. OF LINEAR THERMAL EXP.	IN/IN/DEG.F	D696	5.0X10 <sup>-5</sup>	5.0X10 <sup>-5</sup>	5.0X10 <sup>-5</sup>
DEFORM UNDER LOAD	%	D621	0.7-0.8	0.7-0.8	0.7-0.8
DEFLECT. TEMP.					
264 PSI	DEG.F	D648	200-400	200-400	200-400
66 PSI	DEG.F	D648	400-430	400-430	400-430
CONT SERV. TEMP.	DEG.F		230	230	230
INTER. SERV. TEMP.	DEG.F		330	330	330
WATER ABSORPTION					
24 HR.	%	D570	.5-.6	.5-.6	5-.6
SAT.	%	D570	2.0-2.5	2.0-2.5	2.0-2.5
COEFF. OF FRICTION					
DYNAMIC			.12	.12	.12
MAX PV.					
UNLUBED @ 40 FPM	PSI x FPM		16,000	16,000	16,000
WEAR FACTOR K			4	4	4

### Physical Properties

Because of the presence of oil in the matrix of the nylon, NYLOIL exhibits superior physical properties including notched load impact (NYLOIL is two times less likely to break under load impact than a regular cast nylon), improved elongation (twice the elongation of 6PA Natural), coefficient of friction (because oil is constantly present at the material's surface) and water absorption (the oil in the matrix leaves less room for water to be absorbed).