



CAST NYLONS
LIMITED

NYMETAL™

CAST NYLON ON METAL CORES

Curbell Plastics is a proud supplier of Cast Nylons materials
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CURBELL
CURBELL PLASTICS, INC.

ALL THE ADVANTAGES OF CAST NYLON ON METAL CORES

Cast Nylons Ltd., the largest independently-owned North American manufacturer of cast nylon, has combined the best of both worlds – cast nylon and metal – to produce its NYMETAL™ composite. NYMETAL billets made exclusively with NYCAST® nylon and a variety of metal cores, are available for use in manufacturing gears, rollers, and sprockets primarily for power transmission. By combining the performance advantages of nylon and metal into one cohesive unit, NYMETAL offers advantages that cannot be obtained from traditional all metal or all nylon components.

NYMETAL ADVANTAGES

Whether you are considering a new application or redesigning an existing one, you should consider the NYMETAL advantages. NYMETAL is manufactured from the highest quality cast nylon available in North America. The nylon is bonded to metal cores using a proprietary process, producing a nylon to metal interface that stands up to the toughest engineering applications. This bond far exceeds the performance of mechanically bonded thermoplastic to steel components. The use of cast nylon produces a quiet running part, good vibration dampening, shock absorption, reduced part weight, longer wear, and the ability to reduce or eliminate lubrication.



Each NYMETAL billet is inspected to ensure the highest quality.

The metal core provides optimum strength in the bore for power transmission and keyway integrity. All these advantages can be delivered at cost competitive prices.

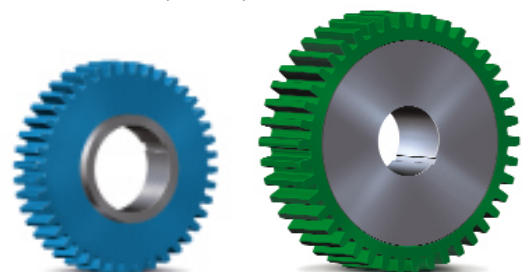
NYMETAL APPLICATIONS

NYMETAL billets can be manufactured into many different components, including gears of all types, rollers, sprockets, and augers. If you have a difficult power transmission



NYMETAL billets are saw cut prior to gear manufacturing.

application, NYMETAL may provide you with the required solution. If you work in the food processing industry, NYMETAL with NYLOIL®-FG on stainless steel can offer you a food grade solution that is FDA, USDA, and 3A compliant.



NYMETAL AVAILABILITY

Every NYCAST formulation currently offered can be manufactured as a NYMETAL billet. Please review the property information listed in this brochure for correct material selection.

Standard core materials include 1117 and 4140 steel and 303, 304, and 316 stainless steel. Metal core outside diameters are available in sizes from 1-1/2" to 6" and nylon outside diameters are available in sizes from 3" to 12". All billets are available in standard 24" lengths. Refer to the chart below for standard size combinations.

Is the size combination and/or metal core material you're looking for not included on the chart? Don't worry, just call our NYMETAL inside sales specialist for a quote. See the Custom Components section for more details.

Metal Core O.D., Round Knurled

Cast Nylon O.D.

Inches	1.5	2	2.5	3	3.5	4	4.5	5	6
3	X								
4	X								
5	X	X	X						
6	X	X	X	X	X				
7	X	X	X	X	X	X	X		
8		X	X	X	X	X	X	X	
9				X	X	X	X	X	X
10						X	X	X	X
11								X	X
12									X

*Standard Billet Lengths are 24"
All Cores are Manufactured with a Standard 12 Pitch Knurl*

NYMETAL CUSTOM COMPONENTS

Our NYMETAL product line includes more than just gears and sprockets. We have produced custom rollers of varying lengths up to 48" long in several outside diameter sizes. We have also made custom auger blanks primarily for the food processing and packaging industries.

Our expertise in the casting of nylon on metal allows us to quote on a variety of custom sizes and metal core material combinations. Let our applications engineers design a custom NYMETAL component for your application.



TORQUE TESTING

The torque-testing fixture determines the amount of torque required to separate the steel core from the NYCAST outer rim. The NYMETAL part is mounted in the fixture body and the torque arm is attached to the steel core. The fixture is mounted in a hydraulic press and force applied to the torque arm which induces rotation of the steel core within the NYCAST rim. Note that the torque arm applies force equally to both sides of the specimen, eliminating any bending moment created by a single torque arm attached to only one side of the specimen. A load cell positioned on the torque arm accurately measures applied force from which torque values are determined.

Torque capability at the nylon/metal interface is critical to successful NYMETAL part performance. Testing has shown that torque values in NYMETAL parts are more than double those of nylon shrunk or press fit on to steel cores and up to 20 times greater than the torque transmission capabilities of gear teeth machined into the nylon rim. This superior bond allows engineers to approach NYMETAL gear applications with confidence, knowing that they have the strength of a metal core with the advantages of a NYCAST nylon rim and no loss of part integrity at the interface.



Properties

PROPERTY	UNITS	TEST METHODS	NYCAST® 6PA NYCAST® 6PA-BLUE NYCAST® 6PA-MoS ₂	NYLOIL® NYLOIL-FG® NYLOIL-MDX®	NYCAST® CP	NYCAST® 6MPB NYCAST® 6MPY	NYCAST® XHA
Specific Gravity	-	ASTM D792	1.15 - 1.17	1.14 - 1.15	1.10 - 1.13	1.14 - 1.16	1.15 - 1.17
Tensile Strength	psi	ASTM D638	10,000-13,500	9,500 - 11,000	8,700 - 11,500	9,700 - 10,800	12,000 - 13,500
Tensile Elongation	%	ASTM D638	20 - 55	35 - 55	25 - 80	25 - 35	20 - 30
Tensile Modulus	psi	ASTM D638	400,000 - 550,000	375,000 - 475,000	240,000 - 330,000	375,000 - 440,000	485,000 - 550,000
Compressive Strength (@ 10% offset)	psi	ASTM D695	13,500 - 16,000	12,000 - 14,000	—	12,500 - 15,100	15,500 - 18,000
Compressive Modulus	psi	ASTM D695	325,000 - 400,000	275,000 - 375,000	—	280,000 - 345,000	300,000 - 350,000
Flexural Strength	psi	ASTM D790	15,500 - 17,500	14,000 - 16,000	15,000 - 20,000	12,000 - 13,000	15,000 - 17,500
Flexural Modulus	psi	ASTM D790	420,000 - 500,000	375,000 - 475,000	285,000 - 385,000	330,000 - 350,000	420 - 500,000
Shear Strength	psi	ASTM D732	10,000 - 11,000	8,000 - 9,000	7,600 - 9,000	10,000 - 11,000	10,000 - 11,000
Notched Izod Impact	ft.lbs/in.	ASTM D256	0.7 - 0.9	1.4 - 1.8	0.9 - 1.4	0.82 - 0.91	0.7 - 0.9
Hardness, Rockwell	R	ASTM D785	115 - 125	100 - 115	100 - 115	110 - 115	115 - 125
Hardness, Shore D	D	ASTM D2240	78 - 83	74 - 80	75 - 81	76 - 78	78 - 83
Melting Point	deg F	ASTM D789	450 ±10	450 ±10	410 ±10	450 ±10	450 ±10
Coef. of Linear Thermal Exp.	in./in./deg F	ASTM D696	5.0 X 10 ⁻⁵	5.0 X 10 ⁻⁵	4-4.5 X 10 ⁻⁵	5.0 X 10 ⁻⁵	5.0 X 10 ⁻⁵
Deformation Under Load	%	ASTM D621	0.5 - 2.5	0.7 - 0.8	Dependent on Grade	1.0 - 2.0	0.5 - 2.5
Deflection Temp. 264 psi.	deg F	ASTM D648	200 - 400	200 - 400	200 - 400	200 - 400	200 - 430
66 psi.	deg F	ASTM D648	400 - 430	400 - 430	400 - 430	400 - 430	400 - 430
Continuous Service Temp.	deg F	—	230	230	210	230	250
Intermittent Service Temp.	deg F	—	330	330	300	330	330
Coefficient of Friction Dynamic (1)			0.22	0.12	N/A	N/A	0.22
Water Absorption 24 Hours	%	ASTM D570	0.5 - 0.6	0.5 - 0.6	0.5 - 0.6	0.5 - 0.6	0.5 - 0.6
Saturation	%	ASTM D570	5.0 - 6.0	2.0 - 2.5	4.0 - 5.0	5.0 - 6.0	5.0 - 6.0
Dielectric Strength (Short Time)	v/mil.	ASTM D149	500-600	500-600	500-600	500-600	—
Dielectric Constant @ 60 cycles	—	ASTM D150	3.7	3.7	3.7	3.7	—
@ 1,000 cycles			3.7	3.7	3.7	3.7	—
@ 100,000 cycles			3.7	3.7	3.7	3.7	—

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