

NYLON 66 - Stock Shapes (rods, plates, tubes)

POLYAMIDE 66 (NYLON 66) engineering plastic extruded stock shapes available in **NYLON 66** is part of high performance engineering plastic products offered under trade name **POLYMAT** for machining into industrial components. These products are made using the best raw material in modern production facility under strict quality confirming to international standards.

Polyamide, also properly known as Nylon, are classified according to the number of carbon atoms contained in the primary structure between the nitrogen atoms. Accordingly, Polyamide 66 contains two groups of six carbon atoms each. The resulting structure offers marked difference in some of the properties useful for engineering applications when compared with other available Nylons.

Polyamide 66 has a high tensile strength, high melting point, high flexural modulus and better creep resistance in comparison to other unmodified polyamides. It is the hardest material with excellent rigidity among various types of extruded nylons. Polyamide 66 displays high resistance to wear and high degree of dimensional stability because of lower moisture absorption. It offers good resistance to fuels, most organic solvents, and alkaline solutions at moderate temperatures. These in addition to the overall well-balanced combinations of properties render Polyamide 66 useful in many mechanical applications with high load.

NYLON 66 is amenable to standard metal working machine tools and can be fabricated with ease to yield smooth surface finish. It is semi crystalline thermoplastic with high tensile strength, stiffness, good wear resistance, low coefficient of friction, excellent chemical resistance, and very low moisture absorption.

Information on technical properties for designers is provided below. More specific data and engineering assistance is available upon request.

Chemical Designation PA 66 (Polyamide)

Colour off white Density 1.14 g/cm³

Main features

- Good heat deflection temperature
- Excellent machinability
- Low coefficient of friction
- High Dimensional Stability
- High Melting Point
- High Wear and abrasion resistance
- High tensile strength and Hardness

Target Industries

- Bearing and Bushings
- Mechanical engineering
- Cam and followers
- Coupling, Gears
- Guides, Rollers
- Sprockets
- Washers, Wear Strips

• Mechanical properties	Parameter	Value	Unit	Norm
Tensile Strength				
	-40°C (-40°F)	114	MPa (kpsi)	ASTM D 638
		-16.5		
	23°C (73°F)	83 (12.0)	MPa (kpsi)	
	77°C (170°F)	62 (9.0)	MPa (kpsi)	
	121°C (250°F)	43 (6.2)	MPa (kpsi)	
Tensile Strength at Yield				
	-40°C (-40°F)	114	MPa (kpsi)	ASTM D 638
		-16.5		
	23°C (73°F)	83 (12.0)	MPa (kpsi)	
	77°C (170°F)	45 (6.5)	MPa (kpsi)	
	121°C (250°F)	33 (4.8)	MPa (kpsi)	
Yield Stress		83 (12.0)	MPa (kpsi)	ISO 527-1/-2
Elongation at Yield				ASTM D 638
	-40°C (-40°F)	4	%	
	23°C (73°F)	5	%	
	77°C (170°F)	30	%	
	121°C (250°F)	45	%	
Yield Strain		4.5	%	ISO 527-1/-2
Elongation at Break				
	-40°C (-40°F) 23°C (73°F)	15		ASTM D 638
	77°C (170°F)	60		
	121°C (250°F)	>300		
Nominal Strain at Break	>300			ASTM D 638
Tensile Modulus		22	%	ISO 527-1/-2
Shear Strength Poisson's		3100	MPa (kpsi)	ISO 527-1/-2
		-450		
Flexural Modulus				
	-40°C (-40°F)	3240	MPa (kpsi)	ASTM D 790
		-470		
	23°C (73°F)	2830	MPa (kpsi)	
		-410		
	77°C (170°F)	690 (100)	MPa (kpsi)	
	121°C (250°F)	538 (78)	MPa (kpsi)	
Flexural Modulus		2700	MPa (kpsi)	ISO 178
		-392		
Hardness, Rockwell				
	Scale M	79		ASTM D 785
	Scale R	121		
Deformation Under Load				

50°C (122°F), 13.8MPa (2000psi)		1.4	%	ASTM D 621
Tensile Impact Strength			kJ/m2 (ft lb/in2)	ASTM D 1822
Long specimen		504 (240)		
Short specimen		157 (75)		
Izod Impact			J/m (ft lb/in)	ASTM D 256
-40°C (-40°F)		32 (0.6)		
23°C (73°F)		53 (1.0)		
Notched Izod Impact			kJ/m2	ISO 180/1A
-30°C (-22°F)		5		
23°C (73°F)		5		
Notched Charpy Impact			kJ/m2	ISO 179/1eA
-30°C (-22°F)		4		
23°C (73°F)		5		
Unnotched Charpy Impact			kJ/m2	ISO 179/1eU
-30°C (-22°F)			NB	
23°C (73°F)			NB	
• Thermal properties	Parameter	Value	Unit	Norm
Heat Deflection Temperature			°C (°F)	ASTM D 648
0.45MPa (66psi)		210 (410)		
1.8MPa (264psi)		65 (149)		
Deflection Temperature			°C (°F)	ISO 75-1/-2
0.45MPa		200 (392)		
1.80MPa		70 (158)		
Melting Temperature		263 (505)	°C (°F)	ISO 3146C
CLTE, Parallel			E-4/C (E-4/F)	ASTM E 831
23 - 55°C (73 - 130°F)		1.0 (0.56)		
CLTE, Normal			E-4/C (E-4/F)	ASTM E 831
23 - 55°C (73 - 130°F)				
Thermal Conductivity				
Conco-Fitch apparatus		0.25 (1.7)	W/m K (Btu in/h ft2 F)	ASTM C 177
• Electrical properties	Parameter	Value	Unit	Norm
Surface resistivity		1 E12	ohm	IEC 60093
Relative Permittivity				
1E2 Hz		3.8		
1E6 Hz		3.5		

Volume resistivity		1.00E+12	ohm m	IEC 60093
Dielectric Constant				ASTM D 150
1E2 Hz			4	
1E3 Hz			3.9	
1E6 Hz			3.6	
Dissipation Factor				ASTM D 150
1E2 Hz		0.01		
1E3 Hz		0.02		
1E6 Hz		0.02		
Dissipation Factor			E-4	IEC 60250
1E2 Hz				
1E6 Hz				
Electric Strength			kV/mm (V/mil)	IEC 60243-1
1.0mm		31.5		
		-800		
CTI			V	IEC 60112
1.0mm		600		
• Other properties	Parameter	Value	Unit	Norm
Water absorption			%	ASTM D 570
Immersion 24h		1.2		
Saturation		8.5		
Humidity absorption			%	ISO 62, Similar to
Equilibrium 50%RH		2.7		
Density		1140	kg/m3 (g/cm3)	ISO 1183
		-1.14		

- NYLON 66 products may be based on DOPONT® Zytel®101L NC010.