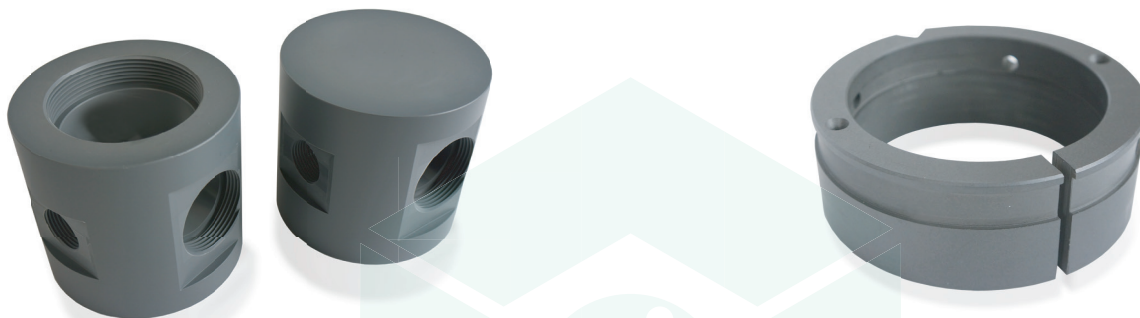
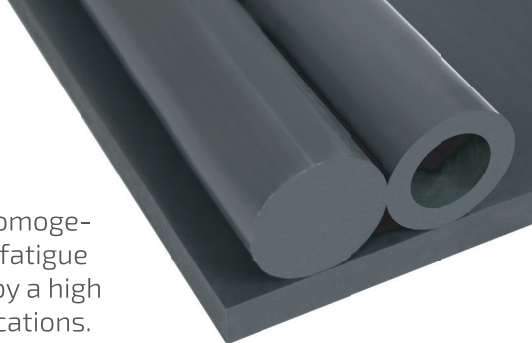




PA ●

# NYLATRON® GSM

**Semi-crystalline plastic**, NYLATRON® GSM contains fine MoS2 particles homogeneously dispersed to improve sliding properties without losing impact and fatigue resistance, characteristics of additive-free polyamides. It is characterized by a high concentration of MoS2, making it a "Premium" material in demanding applications.



## MAIN CHARACTERISTICS

- High mechanical resistance
- High rigidity and hardness
- Self-lubricating material
- High resistance to wear without reducing resistance to impact and fatigue
- Good resistance to high energy radiation (gamma rays and X-rays)
- Good sliding properties
- Good electrical insulation properties
- High mechanical damping capacity
- Easy machining

## APPLICATIONS

- Bushings with rotation, subjected to heavy loads
- Steel Cable Pulleys
- Sprockets
- Gears



CHEMICAL RESISTANCE



ELECTRICAL INSULATION



WEAR RESISTANCE



SLIDING PROPERTIES



IMPACT RESISTANCE



TEMPERATURE RANGE

\*continuously (20.000H)



PROPERTIES	TEST METHODS	UNITS	NYLATRON® GSM
COLOR		-	GREY-BLACK
DENSITY	ISO 1183-1	g/cm <sup>3</sup>	1.16
WATER ABSORPTION			
AFTER 24/96H IMMERSION IN WATER OF 23°C <sup>1</sup>	ISO 62	mg	52/98
AFTER 24/96H IMMERSION IN WATER OF 23°C <sup>1</sup>	ISO 62	%	0.76/1.43
AT SATURATION IN AIR OF 23°C / 50% RH	-	%	2.4
AT SATURATION IN WATER OF A 23°C	-	%	6.7
<b>THERMAL PROPERTIES<sup>2</sup></b>			
MELTING TEMPERARUTE (DSC, 10°C/MIN)	ISO 11357-1/-3	°C	215
GLASS TRANSITION TEMPERATURE (DSC, 20°C/MIN) <sup>3</sup>	ISO 11357-1/-3	°C	-
THERMAL CONDUCTIVITY A 23°C	-	W/(K.m)	0.30
COEFFICIENT OF LINEAR THERMAL EXPANSION			
AVERAGE VALUE BETWEEN 23-60°C	-	M/(m.K)	80 x 10 <sup>-6</sup>
AVERAGE VALUE BETWEEN 23-100°C	-	M/(m.K)	90 x 10 <sup>-6</sup>
TEMPERATURE OF DEFLECTION UNDER LOAD			
METHOD A 1.8 MPA	+ ISO 75-1/-2	°C	80
MAXIMUM ALLOABLE SERVICE TEMPERATURE IN AIR			
FOR SHORT PERIODS <sup>4</sup>	-	°C	170
CONTINUOUSLY: FOR 5.000/20.000H <sup>5</sup>	-	°C	105/90
MINIMUM SERVICE TEMPERATURE <sup>6</sup>	-	°C	-30
FAMMABILITY <sup>7</sup>			
"OXYGEN INDEX"	ISO 4589-1/-2	%	25
ACCORDING TO UL94 (3/6MM DE ESPESSURA)	-	-	HB/HB
<b>MECHANICAL PROPERTIES AT 23°C<sup>8</sup></b>			
TENSION TEST <sup>9</sup>			
TENSILE STRESS AT YIELD/AT BREAK <sup>10</sup>	+ ISO 527-1/-2	MPa	80/-
TENSILE STRESS AT YIELD/AT BREAK <sup>10</sup>	++ ISO 527-1/-2	MPa	50/-
TENSILE STRENGTH <sup>10</sup>	+ ISO 527-1/-2	MPa	82
TENSILE STRAIN AT YIELD <sup>10</sup>	+ ISO 527-1/-2	%	5
TENSILE STRAIN AT BREAK <sup>10</sup>	+ ISO 527-1/-2	%	25
TENSILE STRAIN AT BREAK <sup>10</sup>	++ ISO 527-1/-2	%	>50
TENSILE MODULUS OF ELASTICITY <sup>11</sup>	+ ISO 527-1/-2	MPa	3400
TENSILE MODULUS OF ELASTICITY <sup>11</sup>	++ ISO 527-1/-2	MPa	1650
COMPRESSION TEST <sup>12</sup>			
COMPRESSIVE STRESS AT 1/2/5% NOMINAL STRAIN <sup>11</sup>	+ ISO 604	MPa	33/62/91
CHARPY IMPACT STRENGTH - UNNOTCHED <sup>13</sup>	+ ISO 179-1/1eU	KJ/m <sup>2</sup>	NO BREAK
CHARPY IMPACT STRENGTH - NOTCHED	+ ISO 179-1/1eA	KJ/m <sup>2</sup>	3
BALL IDENTATION HARDNESS <sup>4</sup>	+ ISO 2039-1	N/mm <sup>2</sup>	160
ROCKWELL HARDNESS <sup>14</sup>	+ ISO 2039-2	-	M 84
<b>ELECTRICAL PROPERTIES AT 23°C</b>			
ELECTRIC STRENGTH <sup>15</sup>	+ IEC 60243-1	kV/mm	24
ELECTRIC STRENGTH <sup>15</sup>	++ IEC 60243-1	kV/mm	16
VOLUME RESISTIVITY	+ IEC 60093	Ohm.cm	> 10 <sup>16</sup>
VOLUME RESISTIVITY	++ IEC 60093	Ohm.cm	> 10 <sup>12</sup>
SURFACE RESISTIVITY	+ IEC 60093	Ohm	> 10 <sup>13</sup>
SURFACE RESISTIVITY	++ IEC 60093	Ohm	> 10 <sup>12</sup>
RELATIVE PERMITTIVITY $\epsilon_r$ : A 100HZ	+ IEC 60250	-	3.6
RELATIVE PERMITTIVITY $\epsilon_r$ : A 100HZ	++ IEC 60250	-	6.6
RELATIVE PERMITTIVITY $\epsilon_r$ : A 1MHZ	+ IEC 60250	-	3.2
RELATIVE PERMITTIVITY $\epsilon_r$ : A 1MHZ	++ IEC 60250	-	3.7
DIELECTRIC DISSIPATION FACTOR TAN $\delta$ : A 100HZ	+ IEC 60250	-	0.012
DIELECTRIC DISSIPATION FACTOR TAN $\delta$ : A 100HZ	++ IEC 60250	-	0.14
DIELECTRIC DISSIPATION FACTOR TAN $\delta$ : A 1MHZ	+ IEC 60250	-	0.016
DIELECTRIC DISSIPATION FACTOR TAN $\delta$ : A 1MHZ	++ IEC 60250	-	0.05
COMPARATIVE TRACKING INDEX (CTI)	+ IEC 60112	-	600
COMPARATIVE TRACKING INDEX (CTI)	++ IEC 60112	-	600

NOTE: 1 g/cm<sup>3</sup> = 1000 kg/m<sup>3</sup> ; 1 MPa = 1 N/mm<sup>2</sup> ; 1 KV/mm = 1 MV/m

+: values for dry material

++: values referring to material in equilibrium with the standard atmosphere 23°C / 50% rh

**(1)** According to method 1 of ISO 62 and measured on  $\phi$  50x3 mm discs. **(2)** The elements supplied for this property are for the most part supplied by the manufacturers of the raw materials. **(3)** The values of this property are only attributed to amorphous rather than semi-crystalline materials. **(4)** Only for short periods of exposure in applications where only very low loads are applied to the material. **(5)** Temperature that resists after a period of 5,000 / 20,000 hours. After this time, there is a decrease of about 50% in tensile strength compared to the original value. The given temperature values are based on the thermal oxidation degradation which occurs which causes a reduction of the properties. In the meantime, the maximum permissible service temperature depends in many cases essentially on the deduction and magnitude of the mechanical stresses to which the material is subject. **(6)** As the impact strength decreases with decreasing temperature, the minimum allowable service temperature is determined by the extent of impact to which the material is subjected. The values given are based on unfavorable impact conditions and can not therefore be considered absolute limits. **(7)** These assessments derive from the technical specifications of the manufacturers of the raw materials and do not allow the determination of the behavior of the materials under fire conditions. **(8)** Most of the figures given by the properties of the (+) materials are mean values of the tests done on species machined with  $\phi$  40-60 mm. **(9)** Specimen testing: Type 1b. **(10)** Speed test: 5 or 50 mm / min. **(11)** Speed test: 1m / min. **(12)** Testing specimens: cylinders  $\phi$  8 x 16 mm. **(13)** Pendulum used: 15J. **(14)** Test on 10 mm thick specimens. **(15)** Electrode configuration: cylinders  $\phi$  25 /  $\phi$  75 mm, in transformer oil according to IEC 60296.

Note that the electrical force for the extruded black material can be considerably lower than that of natural material. The possible micro porosity in the center of conserved forms in stock significantly reduces the electric force.