

## CAST NYLON: Polyamides (PA)

Cast polyamide is a partially crystalline thermoplastic which is produced by means of anionic polymerisation of the raw material Caprolactam. In a pressureless casting process the liquid monomer is polymerised via a controlled chemical reaction directly to a semi-finished product or mould.

Standard quality for high wear demands on parts in machine and plant engineering. Colours: natural, black, blue

Mechanical Properties		
Density	g/cm <sup>3</sup>	1.15
Yield Stress	MPa	80/60
Elongation at break	%	40/100
E-Module (Tensile)	MPa	3,100/1,800
E-Module (Bending)	MPa	3,400/2,000
Flexural strength	MPa	140/60
Impact strength	KJ/m <sup>2</sup>	o. B.
Notched-bar impact strength	KJ/m <sup>2</sup>	>4/>15
Ball indentation Hardness H <sub>358/30</sub>	MPa	160/125
Creep rate stress at 1% elongation	MPa	>7
Sliding friction coefficient against steel (dry running) <sup>3</sup>	-	0.36/0.42
Sliding wear against steel (dry running) <sup>3</sup>	µm/km	0.10
Thermal Properties		
Melting temperature	°C	+220
Thermal conductivity	W/(k m)	0.23
Specific thermal capacity	J/(g K)	1.7
Coefficient of linear expansion	10 <sup>-5</sup> - K <sup>-1</sup>	7-8
Operating temperature range (long-term)	°C	-40 to +105
Operating temperature range (short-term)	°C	+170
Fire behaviour after UL 94 IEC 60695	-	HB
Electrical Properties		
Dielectric constant <sup>6)</sup> IEC 60250	-	3.7
Dielectric loss facto <sup>6)</sup>	-	0.03
Specific volume resistance	Ω-cm	10 <sup>15</sup> /10 <sup>12</sup>
Surface resistance	Ω	10 <sup>13</sup> /10 <sup>12</sup>
Dielectric strength	KV/mm	50/20
Creep resistance	-	CTI 600
Moisture absorption in NK	W(H <sub>2</sub> O)%	2.2
Water absorption until saturated	W <sub>5</sub> %	6.5

Due to its balanced mechanical properties and its excellent mechanical features this standard quality manufactured in a monomer casting process is the ideal construction material for a wide range of applications.

Cast Nylon offers compelling advantages compared to extruded polyamide 6 due to

- better mechanical strength
- lower moisture absorption
- better creep resistance
- better dimensional stability
- higher wear resistance

### Very good sliding properties mean

that PA 6 G is the classical slider material for highly loaded machine components. Among these are bearing bushes, slider pads, guide pads as well as gears and sprockets. Because of the low coefficient of friction only an initial lubrication is generally needed. Often lubrication can be dispensed with altogether.

### High wear resistance at

low and medium speeds, in particular under rough conditions (e.g. dust or sand contamination in the bearings) are further characteristics of PA 6 G as a sliding material for bearings. Contrary to conventional bearing materials such as cast iron, steel or bronze a much longer running life can be achieved under rough conditions.

### Good damping properties

for the reduction of vibration and noise, particularly in the case of wire rope and conveyor rollers are of particular interest. PA 6 G reduces vibration which is transferred from metallic rollers to shafts, bearings and machine frames. In the same way, use of friction bearings of PA 6 G allows reduction of the vibration affecting the machine frame. This way the life of machines and their parts can be extended. Furthermore, a contribution is made to lowering machine noise.

### Good machining, dimensional stability, low residual stress

allow production of complex engineered components and application in all design areas. Machining can be performed with standard tools and conventional machines for wood and metal working. High feed and cutting speeds promote cost-effective production.

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