

Extruded Nylon 12 (PA12)

Technical Datasheet



High Impact Nylon for Noise & Vibration Dampening

Service. Quality. Value.

Typical Applications

For low maintenance parts or parts subject to impact or environments in which noise and vibration dampening properties are required.

Mechanical and equipment engineering

e.g. bearing and gearbox components, housings and covers.

Vehicle construction

e.g. sealing and dampening elements, valves and quick-disconnect couplings for fuel lines, part parts

Product Description

A high quality engineering plastic material; the chemical name is polyamide 12. It's available in a range of grades and forms to suit many applications.

Technical Description

Smiths' range of extruded Nylon 12 materials includes the following grade options –

Grade	Modification	Purpose
Nylon 12 – natural (white) PA12	None	Low moisture absorbing nylon with excellent sound & vibration dampening and more stable electrical properties.
Nylon 12+30% glass (ivory colour) PA12GF	30% glass fibre reinforced.	As above + high mechanical strength and improved dimensional stability

Machinability

While not as fine as acetal, the machinability of un-modified Nylon 12 is good. Glass-filled grades will require the use of tipped tooling. As with all plastic materials, experience has shown that extra care must be taken with larger diameters, especially in the colder months when plastic materials lose some of their toughness and so have less resistance to machining stresses. So it's important that these materials are not machined while in a chilled condition. Full machining instructions may be supplied on request.

See also...

Nylon 66: - The preferred general-purpose nylon for small to medium sized components.

Cast Nylon: - Ideal for larger sections and for custom cast components that require less finish machining.

Product Attributes

Range of grades available.

Minimal moisture absorption.

Good chemical resistance.

Exceptional impact strength, even at low temperatures.

Naturally good damping properties.

Natural product may be used in contact with foodstuffs (subject to appropriate limits).

Good adhesive properties and weldability.

Good sliding properties.

Product sourced from long-standing manufacturer with ISO accreditation.

Customer Benefits

Correct grade selection for application is optimised

The combination of properties makes Nylon 12 a useful product for diverse engineering applications.

Widens the range of permissible applications.

Ease of assembly

Long wear life in many industrial bearing, wear and gear applications.

Consistent quality ensures uniform characteristics in machining and performance

Product Availability

Extruded round bar

Up to 200mm dia in natural.
Up to 90mm dia in glass-filled.

Extruded sheet/plate

Natural colour and glass-filled are both made up to 50mm thk. and in a range of formats.
Modified grades – please call for a quotation.

* Sizes not stocked are available on relatively short delivery time. 1, 2 or 3m lengths supplied or cut to customer requirements.

Chemical Resistance

Nylon 12 is highly resistant to hydrocarbons, alkalis, fats, oils, fuel, ethers, ester and ketones. Not resistant to halogens, mineral acids and certain organic acids, oxidising agents.

Dimensional Stability

Nylon 12 has minimal moisture absorption and is the most dimensionally stable of the un-filled nylon materials.

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Nylon12, natural Nylon12+30% glass

Mechanical Properties

Density at 20°C	1.02	1.25	g/cm ³
Tensile strength @ yield	50	60	MPa
Elongation @ break	200	15	%
Tensile modulus of elasticity	1,800	4,200	MPa
Notched impact strength (Charpy)	20	5	kJ/m ²
Ball indentation hardness	100	125	N/mm ²
Hardness (Shore D)	78	79	Scale D

Electrical Properties

Volume resistivity	10 ¹⁵	10 ¹⁵	Ohm cm
Surface resistivity	10 ¹³	10 ¹⁴	Ohm
Dielectric constant, 50 Hz	3.8	4.1	-
Dielectric dissipation factor, 50 Hz	0.04	0.031	-
Dielectric strength	26	40	Kv/mm
Comparative tracking index (CTI)	600	600	-
Solution 'A'			

Thermal Properties

Melting temperature	178	178	°C
Heat deflection temperature – method A, 1.8 MPa	50	130	°C
Coefficient of thermal expansion (Ave. between 20 - 60 °C)	100	50	10 ⁻⁶ .K ⁻¹
Thermal conductivity at 20°C	0.30	-	W/(m · K)
Specific thermal capacity at 100°C	1.7	-	kJ/(kg · K)
Service temperatures without high mechanical load - - long term	-50 to +80	40 to +80	°C
- short term (max)	+140	+150	

Other Physical Properties

Moisture absorption	0.8	0.5	%
Saturation in air @ 23°C and 50% RH			
Flammability according to UL94 (3mm / 6mm thick)	HB	HB	-

Technical Assistance

Our knowledgeable staff backed up by our resident team of qualified metallurgists and engineers, will be pleased to assist further on any technical topic.

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