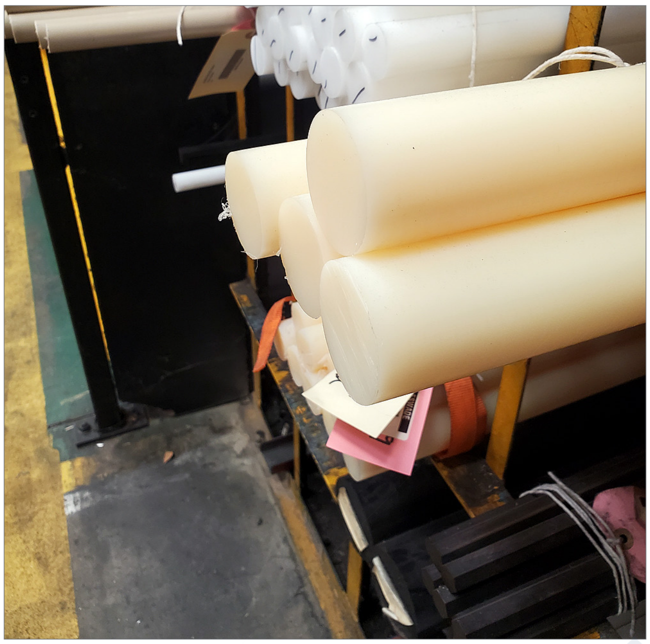
THAMES STOCKHOLDERS

NYLON 66 & 6

HARD WEARING ENGINEERING PLASTIC



Product Overview

The characteristics of **Nylon 66** and **Nylon 6** are similar (with a few exceptions).

While Nylon 66 is the preferred general-purpose nylon in the UK and the principal stocked nylon at Thames, Nylon 6 finds use in the same applications throughout much of mainland Europe. We cover both types in this datasheet and highlight any significant differences.

Product Description

High-quality general-purpose wear resistant engineering nylons; the chemical name is polyamide, and is available in a range of grades and forms to suit many applications. Nylon 66 is harder and stronger than Nylon 6 whereas Nylon 6 absorbs slightly more moisture.

Technical Description

Thames offers extruded Nylon including the following grade options:

Grade	Modification	Purpose
Nylon 66 Natural (off white)	None	Component Indentification
Nylon 66 +30% glass fibre - black PA66GF	Reinforced with 30% glass fibre	Increased strength & stiffness
Nylon 66 + MoS (Molybdenum Disulphide) - black, PA66MO	Additive to increase tensile strength & surface hardness. Crystalline structure is also finer	Improved bearing & wear performance. Improved UV resistance.

ATTRIBUTES	BENEFITS
Range of grades available	Correct grade selection for each application is optimised
Good mechanical properties Good chemical resistance Good impact strength Natural product may be used in contact with foodstuffs, subject to appropriate limits	Very good all-round product for a broad range of engineering applications
Good damping qualities	Reduces machinery noise
Good sliding properties High wear resistance Good abrasion resistance	Ideal for use in industrial bearing, gear and wear applications
Product sourced from long-standing manufacturer with ISO accreditation	Consistent quality ensures uniform machining and performance characteristics

Machinability

While not as fine as acetal, the machinability of un-modified nylon 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. It's, therefore, important to ensure that these materials are not machined while in a chilled condition. Full machining instructions may be supplied on request.

Chemical Resistance

Nylon 66 and 6 are highly resistant to hydrocarbons, alkalis, fats, oils, fuels, ethers, esters and ketones. But are susceptible to halogens, mineral acids, certain organic acids and oxidising agents.

Dimensional Stability

Like all polyamides, Nylon 66 will slowly absorb/exude moisture from the surrounding atmosphere - this has three significant effects. A component will change dimension, so consideration must be given to this, e.g. bearing clearances. Electrical insulation properties will change – consider Nylon 12 as an alternative. Usefully, high humidity will toughen Nylons, with significantly higher impact strength recorded, although the cost is a lower tensile strength.

Typical Applications

Mechanical engineering, automotive and general machinery construction, e.g. plain bearings, coil bodies, guide and clutch parts, gears, cams, rollers, slide bearings, seal rings and guide rails.

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Mechanical Properties

	Nylon 66, un-modified (Nylon 6 un-mod)	Nylon 66 + 30% glass (Nylon 6+30% glass)	Nylon 66+MoS2 (Nylon 6+MoS2)	
Density at 20°C	1.15 (1.14)	1.35 (1.35)	1.15 (1.14)	g/cm³
Tensile strength @ yield	85 (80)	100 (100)	90 (80)	MPa
Elongation @ break	50 (>50)	5 (5)	20 (>50)	%
Tensile modulus of elasticity	3,300 (3,200)	5,000 (5,000)	3,400 (3,200)	MPa
Notched impact strength (Charpy)	>3 (>3)	6 (6)	>2 (>3)	kJ/m²
Ball indentation hardness	180 (170)	210 (210)	180 (170)	N/mm²
Shore – hardness	83 (82)	86 (86)	83 (82)	Scale D

Electrical Properties

Volume resistivity	10^{15} (10^{15})	- (-)	- (-)	Ohm cm
Surface resistivity	10^{13} (10^{13})	- (-)	- (-)	Ohm
Dielectric constant, 50 Hz	3.8 (3.9)	- (-)	- (-)	-
Dielectric dissipation factor, 50 Hz	0.015 (0.02)	- (-)	- (-)	-
Dielectric strength	25 (20)	- (-)	- (-)	Kv/mm
Comparative tracing index (CTI), Solution 'A'	600 (600)	- (-)	- (-)	-

Thermal Properties

Melting temperature	260 (200)	260 (200)	260 (200)	°C
Heat deflection temperature – method A, 1.8 MPa	100 (75)	150 (140)	100 (75)	°C
Coefficient of thermal expansion (Ave. between 20 - 60 °C)	80 (90)	50 (60)	80 (90)	10^{-6}.K^{-1}
Specific thermal capacity at 100°C	1.70 (1.70)	1.50 (1.50)	1.70	kJ/(kg · K)
Thermal conductivity at 20°C	0.23 (0.23)	0.24 (0.28)	0.23	W/(m· K)
Service temperatures without high mechanical load – long term	-30 to +95 (-40 to +85)	-20 to +120 (-30 to +110)	-30 to +95	°C
Service temperature – short term (max)	+170 (+160)	+200 (+180)	+170 (160)	°C

Chemical Resistance

Key: + = Yes   0 = Limited   - = No

Acid resistance	- (-)	- (-)	- (-)
Alkali resistance	+ (+)	+ (+)	+ (+)
Hydrocarbon resistance	0 (0)	0 (0)	0 (0)
Chlorinated hydrocarbon resistance	- (-)	- (-)	- (-)
Aromatic resistance	0 (0)	0 (0)	0 (0)
Ketone resistance	+ (+)	+ (+)	+ (+)
Resistance to hot water	0 (0)	0 (0)	0 (0)

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