

Material Information



Nylon PA 66

Introduction

Nylon PA 66, also known as Polyamide 66, is an engineering thermoplastic known for its good rigidity, hardness, strength, wear resistance, and thermal and dimensional stability. It also offers low friction, good chemical resistance, and good impact properties, making it suitable for CNC-machined mechanical components and functional parts.

Advantages

Good stiffness and strength, excellent wear resistance, low friction, good machinability, and good resistance to oils, greases, fuels, and many chemicals. Nylon PA 66 also provides good temperature performance and thermal dimensional stability compared with many other general-purpose engineering plastics.

Disadvantages

Nylon PA 66 readily absorbs moisture, which can change its dimensions and affect mechanical properties. It also has lower stiffness and dimensional stability than many metals, so it may be less suitable for applications requiring extremely tight dimensional control under changing humidity conditions.

Tolerance

3DSPRO can manufacture and inspect to tight tolerances, including sub +/- 0.001" tolerances, per your drawing specifications and GD&T callouts.

Recommendation

The combination of strength, stiffness, wear resistance, low friction, machinability, and chemical resistance makes Nylon PA 66 suitable for CNC-machined gears, bushings, rollers, guides, spacers, and other mechanical components. It is particularly appropriate for applications involving repeated movement, sliding contact, and exposure to oils, greases, fuels, or moderate temperatures.

Material Specifications (For reference only.)	
Tensile strength	30 to 98MPa
Elongation at Break	1% to 300%

Hardness	78 to 88 HD
Heat deflection temperature	75°C to 428°C
Melting point	197°C to 266°C

Attention

Moisture absorption should be considered when machining Nylon PA 66, especially for parts requiring close dimensional control. The material condition and moisture content can affect the final dimensions, so appropriate storage, conditioning, and machining practices are important. CNC machining should also use suitable tooling and cutting parameters to control heat generation and maintain dimensional accuracy and surface quality.

Applications

3DSPRO finds people using Nylon PA 66 to make functional parts and prototypes in the following industries and applications.

Automotive parts and supplies:

Gears, bushings, rollers, guides, cable components, fuel-system components, and other lightweight mechanical parts.

Industrial equipment:

Bearings, wear pads, conveyor components, gears, machine guides, spacers, and other components requiring good wear resistance and low friction.

Electronics and electrical equipment:

Insulating components, cable guides, connectors, housings, brackets, and other precision parts requiring electrical insulation and mechanical durability.

General engineering:

Bushings, shafts, rollers, pulleys, gears, fixtures, and other CNC-machined components requiring strength, dimensional stability, and resistance to oils and chemicals.