

Material Information



Polypropylene

Introduction

Polypropylene (PP) is a lightweight thermoplastic known for its excellent chemical resistance, low moisture absorption, good fatigue resistance, and good machinability. Its combination of low density, durability, and resistance to many chemicals makes it a practical material for CNC-machined components used in industrial, fluid-handling, and consumer applications.

Advantages

Excellent chemical resistance, low moisture absorption, low density, good fatigue resistance, and good machinability. Polypropylene also has good resistance to moisture and many acids, bases, and solvents, making it suitable for components exposed to chemicals or repeated contact with liquids.

Disadvantages

Polypropylene has relatively low stiffness, hardness, and heat resistance compared with many engineering plastics, which can limit its use in heavily loaded or high-temperature applications. Its relatively flexible nature can also make thin or unsupported sections more susceptible to deflection during CNC machining.

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 low weight, excellent chemical resistance, low moisture absorption, fatigue resistance, and machinability makes Polypropylene suitable for CNC-machined fluid-handling components, tanks, fittings, guides, fixtures, housings, and functional prototypes. It is particularly appropriate for applications where chemical resistance, lightweight construction, and repeated flexing are important.

Material Specifications (For reference only.)	
Tensile strength	25 to 40MPa
Elongation at Break	100% to 600%

Hardness	65 to 75 HD
Heat deflection temperature at 0.45 MPa	100°C
Melting point	160°C to 170°C

Attention

Polypropylene is relatively soft and flexible, so thin walls, deep cavities, and long unsupported sections may require additional workholding or support during CNC machining. Its relatively high thermal expansion should also be considered when producing close-tolerance components. Proper tooling, cutting parameters, and chip evacuation can help control heat buildup and maintain dimensional accuracy.

Applications

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

Fluid-handling equipment:

Tanks, reservoirs, manifolds, fittings, pump components, and other parts requiring strong chemical and moisture resistance.

Industrial equipment:

Guides, wear components, fixtures, machine covers, spacers, and other lightweight parts exposed to chemicals or repeated movement.

Automotive parts and supplies:

Fluid reservoirs, ducting components, clips, covers, brackets, and other lightweight mechanical parts.

Consumer and laboratory products:

Containers, housings, trays, laboratory components, handles, and other CNC-machined parts requiring low weight, chemical resistance, and low moisture absorption.