

Material Information



ABS

Introduction

ABS, or Acrylonitrile Butadiene Styrene, is an amorphous engineering thermoplastic known for its good impact strength, toughness, stiffness, and machinability. It is a practical material for CNC-machined parts and prototypes where low weight, good dimensional stability, and a balance of mechanical performance and cost are important.

Advantages

Good machinability, high impact resistance, good stiffness, low density, and good dimensional stability. ABS is also easy to bond with adhesives and can be painted or finished after machining, making it suitable for both functional prototypes and appearance-focused components.

Disadvantages

ABS has lower heat resistance and mechanical strength than many high-performance engineering plastics, making it less suitable for high-temperature or heavily loaded applications. It can also soften when exposed to excessive machining heat, so cutting conditions should be controlled carefully 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 impact resistance, machinability, stiffness, lightweight construction, and cost-effectiveness makes ABS suitable for CNC-machined components, functional prototypes, housings, covers, fixtures, and general-purpose parts. It is particularly appropriate for applications where good mechanical performance and dimensional stability are required without the higher cost of advanced engineering plastics.

Material Specifications (General ABS. For reference only.)	
Tensile strength	40.7MPa
Elongation at Break	53.4%
Hardness	107 HRR

Heat deflection temperature	97.4°C
Melting point	267°C

Attention

ABS has relatively low thermal conductivity, so excessive heat generated during CNC machining can soften the material and affect dimensional accuracy or surface quality. Sharp cutting tools, suitable cutting parameters, and effective chip evacuation should be used to limit heat buildup. ABS is also better suited to moderate-temperature environments than applications involving prolonged exposure to elevated temperatures.

Applications

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

Automotive components:

Interior trim, handle components, housings, brackets, covers, and other lightweight interior parts.

Electronics and electrical equipment:

Equipment housings, enclosures, covers, control panels, and other insulating components.

Industrial equipment:

Machine covers, fixtures, guards, brackets, prototypes, and other general-purpose mechanical components.

Consumer products:

Handles, knobs, housings, enclosures, product prototypes, and other lightweight parts requiring good impact resistance and machinability.