CASE STUDY

A 2025 Award of Distinction Winner in the Hand Tools/Recreation category for metal injection molded components

ASV Top Plate

Process:
Metal Injection Molding (MIM)

Material:
MIM-4605 low-alloy steel

Density:
7.8 g/cm^3

UTS:
1,550 MPa (225,000 psi)

End Use and Function

The ASV top plate is a complex component in vehicle suspension, featuring narrow slots and rib structures that enhance its functionality and strength.

Fabrication

Manufactured using MIM-4605 low-alloy steel, the ASV top plate features a circular design with 30 narrow slots and rib-like structures. A multi-cavity tool molds the parts, with the injection point strategically placed in the center to ensure even material flow and eliminate weld lines. Optimized cooling and venting systems prevent short fills. After molding, parts are robotically transferred to ceramic trays for sintering. Heat treatment follows, achieving a density of 7.8 g/cm^3 and a hardness of 42–48 HRC.

Results

The MIM process for the ASV top plate results in significant cost savings of 40% compared to traditional machining. It supports the production of 120,000 units annually while minimizing material waste. The final components boast excellent structural integrity and tight tolerances, crucial for performance in vehicle suspension systems.