

CASE STUDY



A 2025 Grand-Prize Winner in the Hand Tools, Recreation Category for metal injection molded components.

Knife Blade

Process:

Metal injection molding (MIM)

Material:

Proprietary high carbon alloy steel

Hardness:

60 HRC minimum

Impact Toughness:

11 Joules

End Use and Function

This knife blade, made from high carbon alloy steel using metal injection molding (MIM), achieves over high hardness, remarkable impact toughness, and has an excellent cosmetic appearance.

Fabrication

The knife blade is manufactured from high carbon alloy steel. Careful process parameter optimization through sintering, hot isostatic pressing (HIP), and heat treatment, produced MIM properties comparable to machined billet. The MIM process allows for intricate features, such as hollow grind geometry, in the as-molded state, reducing subsequent grinding operations. The blades are heat-treated and HIP processed to enhance wear resistance and edge retention. The blades can also be straightened

to ensure that straightness is maintained for an optimal cutting edge without degrading the cutting performance.

Results

The knife blade achieves over 60 HRC hardness and surpasses a minimum 11 Joules impact toughness. MIM allows for complex geometries significantly reducing machining. The process also minimizes material waste while ensuring durability and performance.



PickPM is a resource created by the Metal Powder Industries Federation, a trade association for the metal powder industry, for the benefit of the metal powder industry. To learn more about powder metallurgy, or to find a part fabricator, visit us at [PickPM.com](https://www.PickPM.com)