CASE STUDY

A 2016 Award of Distinction winner in the Medical & Dental category.

Wedge Blank

Process:
Metal injection molding

Material:
MIM-440 stainless steel

Density:
7.6 g/cc^3

Tensile Strength:
230 ksi

Hardness:
44 HRC

End Use and Function
The metal injection molding (MIM) wedge blank actuates the release of staples in an endoscopic staple gun. This component is designed to be the smallest and most effective on the market. Challenges with this component included small and complex geometry.

Fabrication
Made from a MIM-440 stainless steel, the part has a complex and very small geometry that pushed the MIM process to the very limits of tolerance capabilities. 100% dimensional checks utilizing vision systems and CMM ensured product conformance. The part's 5 mm diameter size, less than half the previous low of 12 mm, enables new procedures to be created and existing procedures to be enhanced. Part density is 7.6 g/cc^3, hardness 44 HRC, ultimate tensile strength 203 ksi, and elongation 4%.

Results
This component is not economically feasible using any other manufacturing method, and its creation was the result of many design-for-manufacturing sessions with the customer. The complexity of the design required heavy communication enabling the delivery of a high precision component utilizing MIM at high volumes.