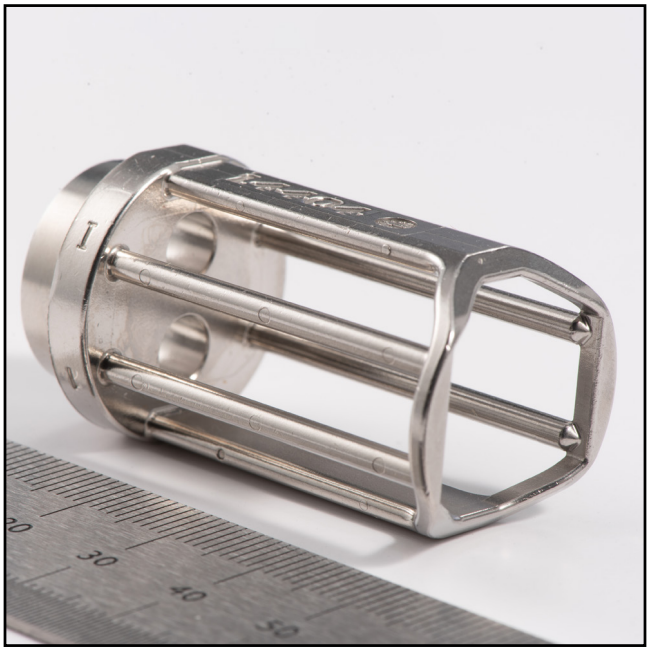
CASE STUDY



A 2021 Award of Distinction Winner in the Hardware/Appliances category for metal injection molded PM components

Ceramic Sensor

Process:
Metal injection molding (MIM)

Material:
MIM-316L stainless steel

Density:
7.6 g/cm^3

Tensile Strength:
520 MPa (75,000 psi)

End Use and Function

The part is a ceramic sensor used in an electronic device. Material selection was key to its success.

Fabrication

The complex part has varying wall thicknesses and is susceptible to distortion. Staging during sintering is key to keep distortion to a minimum, reducing secondary operations. Most of the dimensions are achieved during molding. Due to its complexity, a single-cavity die was used. Sufficient air vents, effective cooling, and optimized molding parameters were required to ensure success.

Results

Previously, the part was produced by machining with excessive scrap generated. The complexity of the part made MIM attractive. Suitable for high volume manufacturing, MIM satisfied the customer's needs by reducing lead time, inventory, and cost per piece. Consistent quality, delivery, and a cost savings of more than 30% over machining made this 10,000 piece per year a MIM success!