

# Complexity Simplified

Modern sensors help automobiles adhere to strict emission standards like Euro 6 by sensing abnormal combustion in engines and help reduce raw emissions through efficient combustion. They are able to improve the fuel economy of cars and at the same time reduce CO<sub>2</sub> & NO<sub>x</sub> emissions. In this issue, we introduce you to complex components Indo-MIM developed for one of the world's leading sensor manufacturers.

## Manufacturing Challenge

- Earlier method : Machining
- Reason for choosing MIM :
  - Increased cost savings in the project by avoiding multiple machining operations
  - Large volumes make MIM the most cost efficient manufacturing route



Sensing element, threaded port & support ring

## Solution

- Components are made through Metal Injection Molding with CNC thread cutting done on the port



## Engineering Challenge

- Highly challenging design :
  - Distortions in the support ring caused during molding
  - Bending of pip in the sensing element
  - Cracking of neck area of threaded port

## Solution

- Distortions in support ring eliminated by educating operators about the right way of handling the component
- Pip bend was eliminated by placing the sensing element in an aluminum fixture for 10 seconds after molding
- Improved sintering fixture design eliminated cracking problem

## Newsletter Spotlight

The part won the 2013 MPIF "Grand Prize" in the "Automotive" category

Indo-MIM estimates cost savings of 50% over any other manufacturing method

Indo-MIM delivers 330,000 components to the customer annually

Stringent requirements on visual aspects added to the difficulty of fabrication

Fragile features and thin walls add to the complexity of the component

Component is made of 17-4 PH stainless steel with a hardness of 35-40 HRC

## Indo-MIM Receiving MPIF Award For The Component



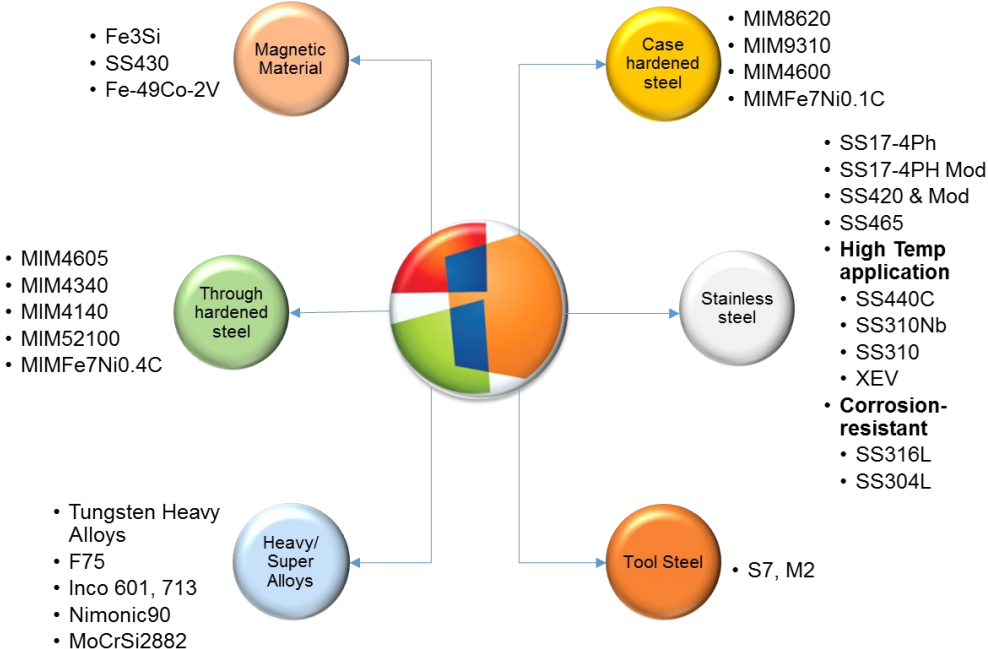
MPIF President Mr. Mathew Bulger presented the 2013 MPIF "Grand Prize" to Mr. Sreenivasulu, GM-Manufacturing and Mr. Kiran Kumar, GM-Sales & Marketing of Indo-MIM at Chicago, Illinois

## Indo-MIM Advantages

Indo-MIM reduced the manufacturing cost of the component by 50%. No industrial pollutants were released during the manufacturing process.

Indo-MIM's specialty lies in manufacturing highly complex parts. Mechanical properties of parts produced through MIM are superior to castings & powder metallurgy (reflecting fine particle size & high sintered density). Parts made through MIM are near net shape.

## Materials We Offer



Questions or comments - Write to us at [innovation@indo-mim.com](mailto:innovation@indo-mim.com) or call at +91 80 2204 8800/2797 1419

Visit us at <http://www.indo-mim.com/>

