

## CASE STUDY

### Shaft Grounding MIM Guide Section



A 2018 Grand-Prize winner in the Electronic/Electrical Components category

**Process:**  
Metal injection molding

**Density:**  
7.5 g/cc minimum

**Finish:**  
Aluminum oxide abrasive blast

**Hardness:**  
23–25 HRC

**Material:**  
MIM-17-4 PH stainless steel

#### End Use and Function

This robust metal injection molded (MIM) component is part of a shaft grounding system used in brush excitation maintenance on turbine generators in the nuclear, gas, coal, wind, and hydro industries.

#### Fabrication

Designed specifically for the metal injection molding process, the fabrication included features that minimized tooling complexity and post-secondary operations. Multiple design sessions were held with the customer to ensure the highest quality and most efficient component. Although the part design has many undercuts due to the nature of the sliding track features, its design still allows for a two-plate mold without any slides. The part is supplied to the customer complete, with no additional operations necessary by the customer; however,

functional and industry-standard testing was performed by the customer in conjunction with the mating assemblies.

#### Results

This component is an excellent example of the benefits of contacting a powder metallurgy component fabricator early in the component design process. By controlling features such as gate location, fill time, hold pressure, and barrel temperature, the MIM process was optimized to produce near final netshape components with great aesthetics.

Metal injection molding is a sustainable process due to its low amount of scrap and elimination of any metal waste.



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