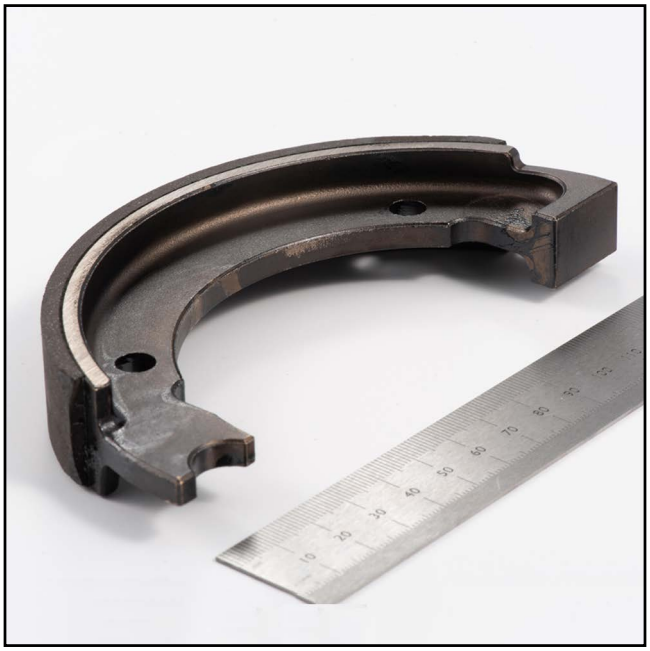
CASE STUDY



A 2021 Award of Distinction Winner in the Lawn & Garden/ Off-Highway category for Conventional PM components

Drum Brake Shoe

Process:
Conventional powder metallurgy

Material:
FC-0208 copper steel

Density:
6.8 g/cm^3

End Use and Function

This brake shoe was developed to replace a 3-piece weldment. The shoe is used in a 6 in. simplex drum brake that is used on lawn care, warehousing, and other off-road equipment. The brake shoe carries the bonded lining that provides the friction for the brake. The brake shoe is actuated using a cam, allowing the lining to rub against the drum, providing the required friction to stop the vehicle.

Fabrication

After compaction of the part, an infiltrating slug is strategically placed for localized infiltration to improve a wear point. Following sintering, holes are drilled prior to heat treatment and shot peening. Extensive durability and performance testing of the shoe component and the brake are performed on a dynamometer and other test equipment. The process reduced the number of processing steps for each brake shoe.

Results

All the testing performed indicated the new design is more durable than the weldment, easier to manufacture, improved lead-times, and is more dimensionally stable. The PM process and the improved supply chain helped the customer continue to supply high quality designed brakes using innovative methods and techniques.