

CASE STUDY



A 2014 Award of Distinction winner in the Hand Tools & Recreation category.

Retainer Weight

Process:
Conventional powder metallurgy

Secondary Processes:
Tooling, steam treatment

Density:
6.7 g/cm³

Tensile Strength:
284 MPa

Yield Strength:
490 MPa

Hardness:
97 HRB

End Use and Function

The award was given to a sinter-hardened steel retainer weight that operates in the transmission of large motorcycles, controlling the on/off position of the clutch. Dimensional accuracy was a large part of the challenge with this component.

Fabrication

The challenge of attaining dimensional accuracy in a component with such a thin, large-diameter shape was overcome with process optimization and the choice of steam treatment. Wear resistance and durability were also key for a successful part.

The parts have a density of 6.7 g/cm³, a tensile strength of 284 MPa, a compressive yield

strength of 490 MPa, an elongation of 0.3%, and a 97 HRB hardness.

Results

- This redesign of a previous PM part achieved a 17% weight reduction with increased dimensional accuracy.
- Sustainability increased due to the reduction of weight in the completed motorcycle, which would need less fuel. Additionally, this part uses less raw material than the previous iteration.
- The fabricator anticipates this accomplishment could open the door to additional opportunities in the small- to medium-size motorcycle market.



PickPM is a resource created by the Metal Powder Industries Federation, a trade association for the metal powder industry, for the benefit of the metal powder industry. To learn more about powder metallurgy, or to find a part fabricator, visit us at PickPM.com