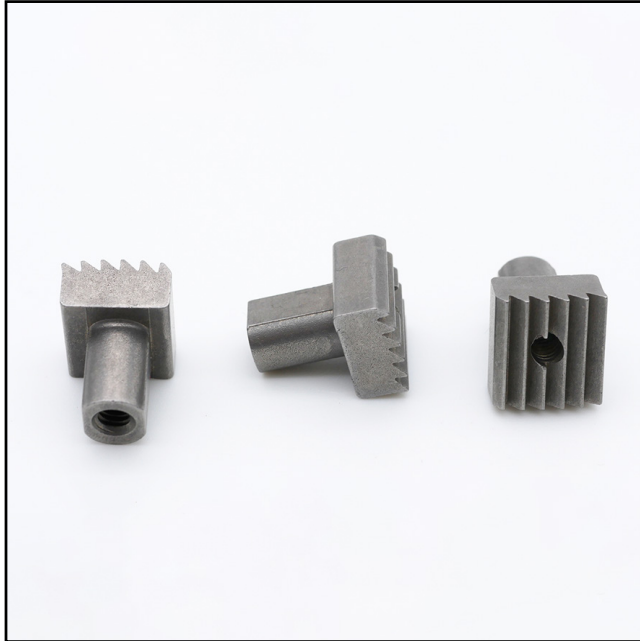


CASE STUDY



Ratchet Lock

Process:
Conventional Powder Metallurgy

Material:
FN-0405-130HT

Density:
7.0 g/cm³

Apparent Hardness:
7.0 g/cm³

Secondary Operations:
Drilling and Tapping

A 2019 Award of Distinction winner in the Hardware/Appliances category for Conventional PM Components

End Use and Function

This award-winning component is a ratcheting lock, which is part of the locking mechanism in an adjustable office chair. When the arm of the chair is moved up or down, this part is released and then locked into place. This PM part has a stem and square base with a gear feature on the bottom. The part is threaded all the way through the stem and square base until the gear feature starts.

Fabrication

The ratcheting lock is made from FN-0405-130HT, a unique blend of iron-nickel-steel, and has a typical density of 7.0 g/cm³. The component has a microindentation hardness equivalent to 55 HRC and an apparent hardness of 19 HRC. The material has a final hardness of 42 HRC. Multi-level punches are used for compaction of the radii so that the

gear can be formed in the die. Unique fixturing is needed during sintering so that the part can meet the tolerances required for the post-sintering, drilling, and tapping operation.

Results

By maximizing material utilization using conventional powder metallurgy, the customer was able to reduce costs and increase profits. Fabricating with PM allowed the part to have the strength requirements needed without using a fully machined component for high-volume manufacturing. The customer designed this component with PM from the start with the expertise of a PM component fabricator. By maximizing materials utilization using the PM process the customer was able to reduce costs and increase profits.



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 www.PickPM.com