

1983 P/M PART-OF-THE-YEAR
DESIGN COMPETITION WINNERS

Peter K. Johnson

Metal Powder Industries Federation

Manufacturers of automobiles and light trucks, industrial equipment, business machines and lock hardware have selected powder metallurgy (P/M) over machined and cast parts for the winning entries in the 1983 P/M Part-of-the-Year Design Competition. Made from steel, bronze and stainless steel, the winning parts demonstrate P/M's precision, design complexity, self-lubricating properties and cost savings.

The competition is sponsored by the Metal Powder Industries Federation. Awards were given in ferrous, nonferrous and stainless steel categories.

Complex Housing Assembly Wins Ferrous Grand Prize

A complex steel (prealloyed 4620) housing and slide block used in a mechanical hand tool for the electrical industry won the Grand Prize in the ferrous category of the competition (Fig. 1). The parts are made by Engineered Sinterings & Plastics, Inc., Watertown, Connecticut, for Doylestown Manufacturing Corp., Division of Thomas & Betts, Raritan, New Jersey.

Powder metallurgy provided a complex shape for the parts' thin sections and good hardness for wear. The housing (13.5 grams) has a minimum particle hardness of RC57 and the slide block (3.6 grams), RC60. Both have a tensile strength of 100,000 psi (689 N/mm²). The housing is fabricated to a density of a 6.6 g/cm³ and the slide block, 6.7 g/cm³. Both parts are machined, carburized and oil impregnated for self-lubrication.

Important dimensions of the housing are: .474" (12.039mm) +.003/-.000" (.000-.076mm) width, .0930" (2.362mm) +/- .0005" (.0127mm) slot, .049" (1.244mm) + .000/.003" (.000-.076mm) wide rib, and location .100" (2.54mm) + .003/-.000" (.076-.000mm). The slide block has the following dimensions: .473" (12.014mm) +.000/-.003" (.000-.076mm) width, not qualified with a secondary, and .062" (1.574mm) +.000/-.001" (.000-.025mm) diameter blind hole. Powder metallurgy allowed control of the die dimension to .473" (12.014mm) +.000/-.003"