1986 P/M PART-OF-THE-YEAR DESIGN COMPETITION WINNERS

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ABSTRACT

Winners of the 1986 P/M Part-of-the-Year Design Competition underscore powder metallurgy's reliability, strength and cost savings in very demanding applications. Made from a variety of metals and alloys, the winning parts are used in car and truck transmissions, electrical equipment, pollution control devices, locks, farm tractors, a residential fire sprinkler system, watches and aircraft equipment.

FERROUS GRAND PRIZE WINNER AIDS HOTEL SECURITY

A copper-infiltrated steel hub used in an electronic lock for hotels won the grand prize in the ferrous category of the competition (fig. 1). The complex hub is made by Colorado Sintered Metals, Inc., Colorado Springs, Colorado for Schlage Lock Company, San Francisco, California.

The electronic lock is a new product for hotel room security that requires a plastic card to open it instead of a key. A P/M link and lever are also used in the lock.

The five-level part is copper infiltrated for added strength and has a density range of 7.2 to 7.6 g/cm^3. Tensile and yield strengths are 85,000 psi (586 N/mm^2) and 75,000 psi (517 N/mm^2). It weighs 33.5 grams.

Originally a multiple-piece P/M assembly was considered with the parts sintered and brazed in one operation. This idea was discarded because of the stringent geometric tolerances on the gear/hub and cam surfaces and the additional cost of a multiple piece. A single-piece design requiring secondary machining was another choice.

To overcome the weaknesses of the first two ideas a single compact and sinter design was chosen. Complex tooling was needed to accommodate the number