

Fiscal 2005 Japan Powder Metallurgy Association Awards

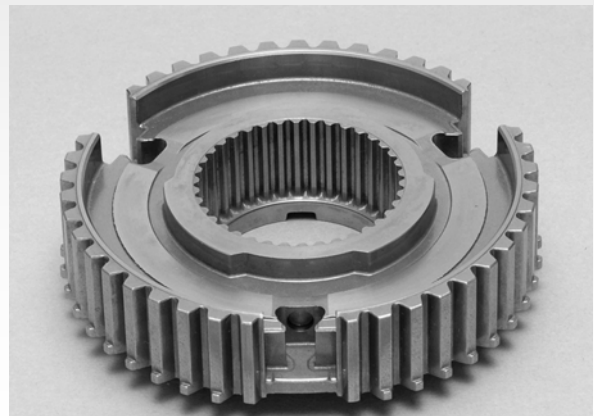
(1) New product award, materials section

“Development of Complex Designed Synchronizer Hub”

This part is a synchronizer hub for use in automobile transmissions.

As features, based on a relationship in which the synchronizer ring and cone are located on only one side, and the key and sleeve also operate on only one side, this part has a complex multi-stepped shape with stoppers to prevent pullout of the key, shaft, and sleeve on one side of the hub. Because the original shape of the key groove pullout stopper protruded, it was initially difficult to compact this shape even using a CNC press. However, as a result of study of the sintering design and die mechanism, as well as multiple innovations, Hitachi Powdered Metals succeeded in die-pressing this complicated shape.

The award was given based on “the evaluation that this established the technology to compact a very complicated shape of synchronized hub and overcame the shape restriction of powder metallurgy” (from JPMA website).



(2) New product award, materials section

“Development of Valve Guide Material with Superior Machinability and Wear Resistance”

This is a material with an Fe-Cu-Sn-C-P-MgSiO₃-MnS composition for use in valve guides in automobile engines. The properties required in valve guide materials are wear resistance in sliding parts and a free-cutting property (good machinability) because the sliding part is subjected to cutting machining after press fitting in the engine head. Although cast iron and high strength brass are also used as materials, sintered materials are widely used based on their wear resistance and cost advantages.

In order to improve the wear resistance of sintered materials, a hard phase is dispersed in the material. However, in recent years, customers' requirements for higher productivity and cost reduction have become even stronger, and a material which possesses a cutting property equal to that of ordinary cast iron and does not display aggressiveness toward the partner valve with non-surface treated valve materials had been desired.

Therefore, in this newly-developed material, Hitachi Powdered Metals succeeded in

satisfying/improving both wear resistance and machinability by dispersion of a large quantity of free graphite, addition of MgSiO₃ and MnS, and adjustment of the amount of P addition to refine the hard phase, etc. thereby reducing the friction of the valve and tool.

The JPMA evaluation noted that this product represented the development of a new material which can be used under a wide range of usage conditions and will contribute to the expanded usage of sintered valve guide materials as a global standard material.

