

Development of Swing Valve for Gasoline Turbocharger Using Hybrid Metal Injection Molding

Authors : B. S. So, Y. H. Yoon, J. O. Jung, K. S. Bae

Abstract : Metal Injection Molding (MIM) is a technology that combines powder metallurgy and injection molding. Particularly, it is widely applied to the manufacture of precision mobile parts and automobile turbocharger parts because compact precision parts with complicated three-dimensional shapes that are difficult to machining are formed into a large number of finished products. The swing valve is a valve that adjusts the boost pressure of the turbocharger. Since the head portion is exposed to the harsh temperature condition of about 900 degrees in the gasoline GDI engine, it is necessary to use Inconel material with excellent heat resistance and abrasion resistance, resulting in high manufacturing cost. In this study, we developed a swing valve using a metal powder injection molding based hybrid material (Inconel 713C material with heat resistance is applied to the head part, and HK30 material with low price is applied to the rest of the body part). For this purpose, the process conditions of the metal injection molding were optimized to minimize the internal defects, and the effectiveness was confirmed by the fracture strength and fatigue test.

Keywords : hybrid metal injection molding, swing valve, turbocharger, double injection

Conference Title : ICEMEII 2018 : International Conference on Mechatronics, Mechanical Engineering and Industrial Informatics

Conference Location : Vancouver, Canada

Conference Dates : August 09-10, 2018