2017 AWARD OF ENVIRONMENTAL RESPONSIBILITY: FRECH FGS TECHNOLOGY

PRODUCT INFORMATION

Name of Part or Process: FGS Technology for Magnesium Hot Chamber Die Casting
Product Using Part: Die Casting Mold, HPDC Process Controller
Function of Part: New Die Casting Process / Alloy Used: AZ91 and AM60

DESCRIPTION

The FGS technology is the consequent further development of the Hot Chamber Die Casting process with the primary target of mostly eliminating the customary runners in a die using a hot runner technique and corresponding HPDC process control. The challenges in HPDC of non-ferrous metals are quite significant when developing a hot runner system. Using Mg alloys, which have rather high melting temperatures, this requires a specific heating technology, equipped with very good temperature control. So the precondition in HPDC is to have a powerful close-loop temperature controlled casting unit.

Due to metal casting process, the system has to be extremely robust and with excellent tightness, so it can stand functioning in operation as well as during start-up procedures, when strong thermal expansion take effect. In the HPDC process there is no possibility to put locking elements in the die, since during the die open period, formation of Magnesium oxides are possible, which will interfere proper operations. The FGS technology has a great number of advantages, which in the above matrix. Measurements have shown that the hot runner system significantly relieves the classical temperature control of the die and the casting system. This means that the overall energy consumption is less. The electrically heated casting system requires more than 50% less than conventional heating and the FGS system reduces the energy consumption for die temperature by 11%. This energy saving is associated with a corresponding reduction in CO_2 emissions during die casting. Approximately 38 t CO_2 is thus avoided for casting a 320 g Mg part with an annual production of 660,000 pieces.

Thus, the FGS technology is a milestone in HPDC.