Research on Wear Resistance Property of Superior Zinc-Aluminum Alloys by Hot Chamber Die Casting

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ABSTRACT

The zinc-aluminum metal alloy owns the very excellent machine property and wear resistance behavior, its strength in addition to highly in the casting aluminum metal alloy and general iron casting, the degree of hardness is also good.It is cheap to compare the aluminum metal alloy, the magnesium metal alloy and the titanium metal alloy , again it has the aluminum metal alloy of compare,the iron casting or the bearings bronze metal alloy alters the characteristic of the foundry. This research is to aim at three kinds of researches that the zinc-aluminum metal alloy of different and high aluminum content carries on the wear resistance, wearing the way is adopt the pin-on-disc(POD), carries on with three kinds of zinc aluminum metal alloy ZA-8,ZA-12 and the ZA-27 to the wear test, more each one wears the distance to descend the differences of the wearing quantities.Use of the section and the surface of wear variety that the OM and the SEM observation wears to descend by understanding the different foundry parameter the ZA metal alloy to the wear trend. Study the result manifestation, under the die-casting or the gravity casting condition , the ZA-27 zinc-aluminum metal alloy casting compares the ZA-12 and the ZA-8 zinc-aluminum alloy to own to more goodly wear resistance.Compared with the manufacturing process parameter of the casting temperature,the molding temperature and the casting pressure relatively, show the liquid mutually limits temperature -10℃ are the best casting temperature for three kinds of zinc-aluminum metal alloys, but the casting temperature is not obviously to wear resistance influence degree to compare of the ZA-8 metal alloys .Secondly in molding temperature of the 150℃, three kinds of ZA zinc-aluminum metal alloys all have the lowerly wear rate.In the casting pressure of 100 kg/cm2, the ZA-8, ZA-12 and the ZA-27 zinc-aluminum metal alloys own the lower wear rate.At the gravity casting condition, sprinkle the influence of the casting temperature also show the trend of the likeness to die-casting.In small degree of hardness test, the wear surface of the surface hardening layer obviously high in the metal alloy base matrix , in the fluxion layer of subsurface then because the crystal a haulage transforms to cause soften, its degree of hardness value is lowest.

Keywords : ZA-8, ZA-12, ZA-27, Zinc, Aluminum, Hot Chamber Die-casting, Wear Resistance

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