

Hydrolyzed Ethyl Silicate Binder for Ceramic Shell Investment Casting Process to Cast Al-Alloys

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ABSTRACT

Ceramic shell mould process is used to produce high quality casting products with relatively close dimensional tolerance. The refractory material and binder play very important role on the strength of ceramic shell moulds. Zircon flour is being used as a primary slurry material in the ceramic shell investment casting process. The binder materials are ethyl silicate and colloidal silica. The investment shell molds produced using the hydrolyzed ethyl silicate have no flaws in the ceramic shell moulds. Tests were performed at temperatures from 100 to 1100° C. The analysis of the measurements has indicated that along with the filler phase content increase the investigated slurry viscosity also increased. When the dynamic velocity of the mixture increased the deposited layers became thicker and thicker. This made difficult their drying and could cause moulds cracking during that process.

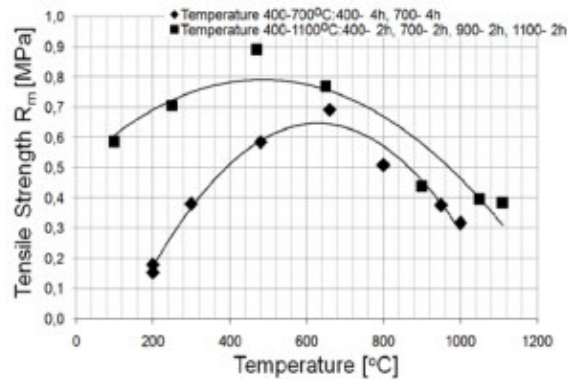


Figure 1: Influence of a temperature on the strength of ceramic moulds annealed in the temperature range: from 400 to 700° C and from 400 to 1100° C.



Figure 2: Application of investment casting process.

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