Defect Analysis of Investment Cast Ni-Base Super Alloy

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ABSTRACT

During the solidification of alloys, a mushy zone is formed at the solidification front. In nickel-base super alloys usually the solidification interval is large which leads to formation of an extended mushy zone. In the investment casting of complex geometries, the solidification front grows from different directions and meets at intersections or along the centerline. The areas where solidification fronts meet usually are more prone to the interdendritic shrinkage. The materials used to build the investment shell mould, especially binders and refractories, play a vital role in the production of quality castings. Using different refractory filler materials can affect the ability of the shell mould to absorb heat and maintain a critical thermal gradient.

The present work was designed to investigate the relation between refractory filler materials and thermal gradient and thus shrinkage porosity of Ni-base super alloy.

Figure 1: Investment shell moulds.

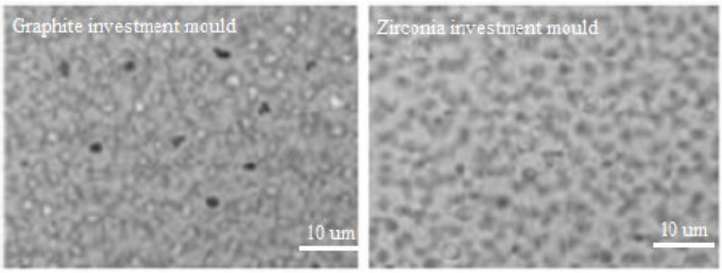

Figure 2: Microstructure if Ni-base super alloy.

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