

Third Laureate Research & Development

Project Title: Innovative method in production of low-weight wax models in investment casting process of turbine blades

Executive Organizations: Eng. & Manufacturing Turbine Blade MAPNA (Parto) & Tarbiat Modares University

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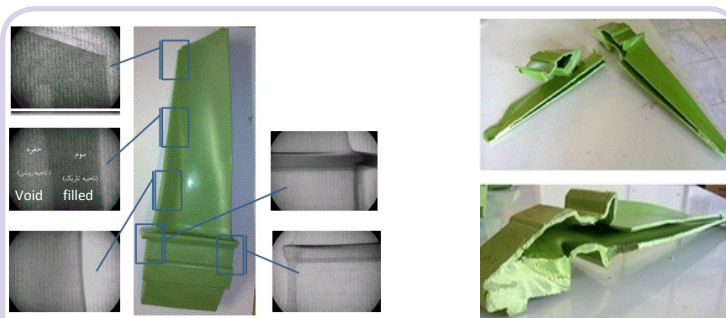
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Abstract:

This invention presents an innovative method to produce low-weight wax models used in investment casting process, for instance, for producing gas turbine blades. The method consists of creating a hollow space inside the molded wax part during the molding process. An inert gas is injected into the wax melt in a partially or fully filled mold. A reduction of weight up to %40 has been obtained. Reduction in production time and shrinkage, warpage and sink marks are followed due to the significant reduction in part wall thickness. Time reduction in calibration stage or complete elimination is another prospect using the innovative process. The primary challenge in carrying the process is too low a viscosity of the wax material in the molten state which is the main obstacle in forming a stable bubble created by injecting the inert gas. A fundamental revision in process concept, sequence, and arrangement was required. No similar method, for producing low-weight wax models with hollow section, has been reported in the published documents worldwide.



produced blade with X-Ray examination indicating hollow section- and the part destructed to show the hollow section

