



Modeling of Oxide Bifilms in Aluminum Castings

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Condition: New. Publisher/Verlag: VDM Verlag Dr. Müller | Application of the Immersed Element-Free Galerkin Method to Model the Fluid-Structure Interaction of Highly Deformable Solids and Newtonian Fluids | Porosity is known to be one of the primary detrimental factors controlling fatigue life and total elongation of several cast alloy components. The two main aims of this work are to examine pore nucleation and growth effects for predicting gas micro porosity and to study the physics of bifilm dynamics to gain understanding in the role of bifilms in producing defects and the mechanisms of defect creation. In chapter II, a technique based on the combination of a set of conservation equations that solves the transport phenomena during solidification at the macro-scale and the hydrogen diffusion into the pores at the micro-scale, was used to quantify the amount of gas micro porosity in A356 alloy castings. The results were compared with published experimental data. In the remainder of this work, the Immersed Element-Free Galerkin method is presented and used to study the physics of bifilm dynamics. The IEFGM is an attractive technique for simulating FSI problems involving highly deformable solids. The analysis should help shed some light on the IEFGM, and it should be specially useful to professionals in engineering interested in modeling processes involving large deformations. | Format: Paperback | Language/Sprache: english | 130 gr...



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