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The numerical simulation of manufacturing processes and of their mechanical consequences is of growing interest in industry. However, such simulations need the modeling of couplings between several physical phenomena such as heat transfer, material transformations and solid or fluid mechanics, as well as to be adapted to numerical methodologies. This book gathers a state of the art on how to simulate industrial processes, what data are needed and what numerical simulation can bring. Assembling processes such as welding and friction stir welding, material removal processes, elaboration processes of composite structures, sintering processes, surface-finishing techniques, and thermo-chemical treatments are investigated.

This book is the work of a group of researchers who have been working together in this field for more than 12 years. It should prove useful for both those working in industry and those studying the numerical methods applied to multiphysics problems encountered in manufacturing processes.

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Editorial Review

Review

“It is useful for both those active in industry and those studying the numerical methods applied to multiphysics problems encountered in manufacturing processes.” (*Heat Processing*, 1 September 2015)

About the Author

Jean-Michel Bergheau is presently Director of Research at Ecole Nationale d'Ingénieurs de Saint-Etienne (ENISE) and is head of the Computational Mechanics research group of the Laboratory of Tribology and Systems Dynamics (LTDS, in France). His research interests concern the modeling of coupled physical phenomena applied to the numerical simulation of manufacturing processes such as welding, heat treatment and machining, and the understanding of the mechanical phenomena involved in interfaces.

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