



# Fundamentals of Materials Modelling for Metals Processing Technologies: Theories and Applications

By Jianguo Lin

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This book provides a comprehensive introduction to the unique theory developed over years of research on materials and process modelling and its application in metal forming technologies. It starts with the introduction of fundamental theories on the mechanics of materials, computational mechanics and the formulation of unified constitutive equations. Particular attention is paid to elastic plastic formulations for cold metal forming and unified elastic viscoplastic constitutive equations for warm/hot metals processing. Damage in metal forming and numerical techniques to solve and determine the unified constitutive equations are also detailed. Examples are given for the application of the unified theories to solve practical problems encountered in metal forming processes. This is particularly useful to predict microstructure evolution in warm/hot metal forming processes. Crystal plasticity theories and modelling techniques with their applications in micro-forming are also introduced in the book.

The book is self-contained and unified in presentation. The explanations are highlighted to capture the interest of curious readers and complete enough to provide the necessary background material to further explore/develop new theories and applications.

Readership: Researchers, academics, professionals and postgraduate students in materials, mechanical engineering and industrial engineering.

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From the Inside Flap

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