

Titanium Alloys: Modelling of Microstructure, Properties and Applications (Woodhead Publishing Series in Metals and Surface Engineering)

By W Sha, S Malinov

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Given their growing importance in the aerospace, automotive, sports and medical sectors, modelling the microstructure and properties of titanium and its alloys is a vital part of research into the development of new applications. This is the first time a book has been dedicated to modelling techniques for titanium.

Part one discusses experimental techniques such as microscopy, synchrotron radiation X-ray diffraction and differential scanning calorimetry. Part two reviews physical modelling methods including thermodynamic modelling, the Johnson-Mehl-Avrami method, finite element modelling, the phase-field method, the cellular automata method, crystallographic and fracture behaviour of titanium aluminide and atomistic simulations of interfaces and dislocations relevant to TiAl. Part three covers neural network models and Part four examines surface engineering products. These include surface nitriding: phase composition, microstructure, mechanical properties, morphology and corrosion; nitriding: modelling of hardness profiles and kinetics; and aluminising: fabrication of Ti coatings by mechanical alloying.

With its distinguished authors, Titanium alloys: Modelling of microstructure, properties and applications is a standard reference for industry and researchers concerned with titanium modelling, as well as users of titanium, titanium alloys and titanium aluminide in the aerospace, automotive, sports and medical implant sectors.

- Comprehensively assesses modelling techniques for titanium, including experimental techniques such as microscopy and differential scanning calorimetry
- Reviews physical modelling methods including thermodynamic modelling and finite element modelling
- Examines surface engineering products with specific chapters focused on

surface nitriding and aluminising

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Editorial Review

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