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Multi-scale modelling of composite material systems

The art of predictive damage modelling
Edited by C Soutis, Sheffield University, and P W R Beaumont, Cambridge University, UK

One of the most important and exciting areas of composites research is the development of modelling techniques to predict the response of composite materials to different types of stress. Predictive modelling provides the opportunity both to understand better how composites behave in different conditions and to develop materials with enhanced performance for particular industrial applications. Multi-scale modelling of composite material systems summarises the key research in this area and its implications for industry.

The book covers modelling approaches ranging from the micron to the metre in scale, and from the single fibre to complete composite structures. Individual chapters discuss a variety of material types from laminates and fibre-reinforced composites to monolithic and sandwich composites. They also analyse a range of types of stress and stress response from fracture and impact to wear and fatigue. Authors also discuss the strengths and weaknesses of particular models.

With its distinguished editors and international team of contributors, Multi-scale modelling of composite material systems will be a standard reference for both academics and manufacturers in such areas as aerospace, automotive and civil engineering.

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About the editors

Professor Costas Soutis is Head of Aerospace Engineering at The University of Sheffield.

Dr Peter Beaumont is Reader in Engineering at the University of Cambridge. Both have international reputations for their research on composites behaviour.

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Nanolithography and patterning techniques in microelectronics
Edited by D Bucknall, Oxford University, UK

Techniques such as surface patterning have facilitated the emergence of advanced polymers with applications in areas such as microelectronics. Surface patterning of polymers has conventionally been undertaken by optical lithography. However, a new generation of nanolithographic and patterning techniques has made it possible to develop complex patterns at the nanoscale. Non-conventional lithography and patterning summarises this new range of techniques and their industrial applications.

A number of chapters look at ways of forming and modifying surfaces for patterning. These are complemented by chapters on particular patterning techniques such as soft lithography, ion beam patterning, the use of nanostencils, photolithography and inkjet printing. The book also discusses prototyping and the manufacture of particular devices.

With its distinguished international team of contributors, Non-conventional lithography and patterning will be a standard reference for both those researching and using advanced polymers in such areas as microelectronics and biomedical devices.

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About the editor
Dr David Bucknall is an Associate Professor at the Georgia Institute of Technology. He holds a joint appointment in the School of Polymers, Textiles and Fiber Engineering and the School of Materials Science and Engineering.

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Ceramic-matrix composites
Microstructure/property relationship
Edited by J Low, Curtin University of Technology, Australia

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