



## Micromechanics of Deformation and Failure of Composites

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### **Synopsis:**

This book provides comprehensive analysis of the micromechanics of the composite materials including particulate filled, short fibre and continuous fibre reinforced composites. Some background to the various phenomenological and analytical models is given, but the main focus

is in development of the suitable finite element models of the micromechanics of composites based on the concept of the unit cell. The stiffness and the failure mechanisms of different types of the composites are predicted using micromechanical model. The effect of the interface and the bonding of the matrix and filler in the progressive failure of the composites are investigated. The failure in perfectly bonded and fully debonded particulate filled composites presented, provides two extreme cases in terms of the effect of the adhesion in the composite mechanics. Also another parameter that would have deterministic effect on the composite behaviour is the type of the particles used as filler. Therefore with special attention to the filler particle type, analysis of the deformation and failure of the composites with soft rubbery fillers and hard fillers is explained.