Book Review

Dynamic Strength of Continuum

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One of the most challenging problems in the development of the science of fracture is dynamic fracture. This is usually regarded as a rupture of material under intense hi-rate loading taking place within relatively short time period. A new phenomenological approach in studies of brittle fracture initiation, development and arrest under shock impulses is presented in this book. Demand for a new approach in fracture dynamics was imposed by impossibility to explain and predict experimentally observed peculiarities of dynamic fracture utilizing classical approaches in fracture. New approach provides an opportunity to predict fracture of both intact media and media having macrodefects such as cracks and sharp notches. A qualitative explanation is thus obtained for a number of principally important effects of high-speed dynamic fracture that can not be clarified within the framework of previous approaches. This new strategy can be applied for solving the problems of dynamic rupture, erosion, crater formation, crater extension and arrest, etc. By extending well-known classical principles of Linear Elastic Fracture Mechanics, the suggested approach conserves the intrinsic industrial character of the analysis and can be considered as a basis for new testing methods and for certification of dynamic strength characteristics of structural materials. This book can be used as a special educational course for guidance on the deformation of materials and constructions, and fracture dynamics.