



Dynamic Failure of Composite and Sandwich Structures (Solid Mechanics and Its Applications)

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This book presents a broad view of the current state of the art regarding the dynamic response of composite and sandwich structures subjected to impacts and explosions. Each chapter combines a thorough assessment of the literature with original contributions made by the authors.

The first section deals with fluid-structure interactions in marine structures. The first chapter focuses on hull slamming and particularly cases in which the deformation of the structure affects the motion of the fluid during the water entry of flexible hulls. Chapter 2 presents an extensive series of tests underwater and in the air to determine the effects of explosions on composite and sandwich structures. Full-scale structures were subjected to significant explosive charges, and such results are extremely rare in the open literature. Chapter 3 describes a simple geometrical theory of diffraction for describing the interaction of an underwater blast wave with submerged structures.

The second section addresses the problem of impact on laminated composite structures with chapters devoted to ballistic impacts on pre-stressed composite structures, tests developed to simulate dynamic failure in marine structures, damage mechanisms and energy absorption in low velocity impacts, perforation, the numerical simulation of intra and inter-ply damage during impact, and hail impact on laminated composites.

Sandwich structures with laminated facings are considered in Section 3 with chapters dealing with the discrete modeling of honeycomb core during the indentation of sandwich structures, the behavior of fold core sandwich structures during impact, and impact on helicopter blades. The fourth section consists of two chapters presenting experimental results and numerical simulation of composite structures subjected to crash.

This volume is intended for advanced undergraduate and graduate students, researchers, and engineers interested and involved in analysis and design of composite structures.

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Editorial Review

From the Back Cover

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