

Introduction to Aerospace Structures and Materials

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Introduction

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Introductions into aerospace comprise the introduction into many aerospace related disciplines, and their interrelations. The major message generally is that an optimum in aerospace constitutes compromises the related disciplines. Similarly, aerospace materials and structures represent a field in which structural engineering, material science and manufacturing contribute equally, making trade-offs and compromises necessary.

This textbook is written to fill the gap between these general introductions into aviation and textbooks covering either material science, mechanics of materials or structural analyses. Where the first are deemed insufficient to cover the basic aspects of these disciplines, the latter miss the relevant interrelations between the disciplines.

Students are warned prior to reading this book; the field of aerospace structures and materials is not solely exact science or engineering. Chapters are presented that are indeed rather scientific or engineering of nature (solid material physics, and structural analysis) allowing for theories or solutions based on formulas and equations, but other chapters are more qualitative and philosophical (safety, manufacturability, availability and costing). Students should be aware that in the long end, decisions made within the field of aerospace structures and materials are often dictated by these soft considerations rather than hard core engineering. The main objective of this textbook therefore, is to create awareness and a critical mind-set to aid the student when pursuing a study in aerospace engineering.

This book forms an update of a course reader that I wrote many years ago. Publishing this book has been made possible with the help of many. In particular I would like to thank my colleague Gillian Saunders-Smiths for coordinating and contributing to the process and suggestions for additions, Hilde Broekhuis for converting the reader text to the book format, editing and updating the illustrations, Calvin Rans, Urban Avsec and Katharina Ertman for assisting in finding and creating illustrations, Renee van der

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René Alderliesten,

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