

# **Solid Mechanics and Its Applications**

Volume 236

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René Alderliesten

# Fatigue and Fracture of Fibre Metal Laminates

 Springer



# Preface

After more than one and a half decades since the first status of the development of the Fibre Metal Laminate (FML) GLARE was documented by the FML community in a monograph, this new book presents the state of the art in understanding the fundamental principles of fatigue and fracture of FMLs. By selecting a narrower scope, the subjects of fatigue and fracture are discussed in substantially more depth than the first book, revealing the vast breath of detailed knowledge that has been developed over a time span of three decades.

The timing of publication of this book is aligned with the development of new applications that exploit the benefits of the FML technology for aircraft wing and fuselage structures. After ten years of successful operation of the Airbus A380, demonstrating the maturity and superior performance of the hybrid FML technology, these new applications will push limits, requiring thorough strength and damage tolerance justifications. Hence, a thorough assessment of the current status is necessary.

This book provides the industry with a sound basis to develop new hybrid applications with the corresponding strength, damage tolerance and durability assessment strategies, necessary for certification. In addition, this book provides academia with a benchmark in scientific understanding of this FML technology to enable definition of the necessary steps forward in future research. It is my ambition that this book will aid the FML community in their endeavours to advance research and development (far) beyond the current status.

The reader should be aware that similar to the first book, which was edited by Ad Vlot and Jan-Willem Gunnink, this book, despite having a single author on the cover, is to the greatest extent based on the research efforts of quite a number of MSc and Ph.D. students of the faculty of Aerospace Engineering at TU Delft. Many of them have been inspired personally by Prof. Boud Vogelesang, the ‘founding father’ of the FML technology, and the driving force behind the development towards successful application. In the end, the primary reason for publishing this

monograph is to honour those often tenacious and persevering students for their work and their contribution to the FML community.

In this place, I express my gratitude to two people in particular: Dr. Thomas Beumler and Dr.ir. John-Alan Pascoe. They reviewed the draft version of this book, and their valuable and often detailed comments and criticism were used to improve its quality.

Delft, The Netherlands  
2017

Dr.ir. René Alderliesten

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