

# Preface

The aerospace industry is at the forefront of materials and technology developments. There are never-ending demands for high-performance aerospace vehicles with lightweight, highly reliable and durable structures. Candidate materials are continually being developed and improved, and their property envelopes expanded. Structural design and certification requirements and inspection and monitoring techniques also evolve to keep pace with these developments.

There are many excellent materials handbooks and source books available, most notably the ASM International series. These offer comprehensive multivolume guides that belong to the libraries of every materials-oriented university and institute. However, they are less suitable, even in e-form, for regular ‘desktop’ consultation. This led us to the concept of a compact and affordable vade mecum that would serve as a ready reference for practicing engineers, and a comprehensive introduction, at an advanced level, for students and faculty members.

It soon became evident that a two-volume series would be appropriate. These have the distinguishing titles ‘Aerospace Materials’ (Volume 1) and ‘Aerospace Material Technologies’ (Volume 2). These volumes are divided into the following main parts:

- Volume 1:
  - Part I: Metallic Materials (Chaps. 1–12)
  - Part II: Composites (Chaps. 13–17)
  - Part III: Special Materials (Chaps. 18–26)
- Volume 2:
  - Part I: Processing Technologies (Chaps. 1–5)
  - Part II: Characterization and Testing Technologies (Chaps. 6–11)
  - Part III: Structural Design (Chaps. 12–19)
  - Part IV: Special Technologies (Chaps. 20–25)

This Volume 2 contains chapters on (i) primary and secondary processing, superplastic forming, welding and nanomanufacturing; (ii) microstructure, texture,

physical and mechanical properties, and non-destructive testing; (iii) primary structures, mechanical systems, aircraft engines, missile propulsion, fatigue (including full-scale testing) and residual strength requirements, and stress corrosion cracking; and (iv) aero stores inspection and quality assurance, life extension, structural health monitoring, failure analysis, airworthiness certification and light-weight ballistic armour.

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