

Preface

The evolution of materials science shapes the modern world, transforming production technologies and industries. This special edition offers a comprehensive overview of diverse research findings and engineering solutions in the fields of advanced composites, cultural heritage preservation, and building materials.

Chapter 1: Composite Materials examines the structure and performance of advanced composites, which combine different materials to achieve superior mechanical, thermal, and chemical properties. The chapter discusses natural fibre-reinforced polymers and metal matrix composites, as well as hybrid configurations, emphasising the importance of interfacial bonding, analysing manufacturing methods, and performance evaluation. These materials have become indispensable in aerospace, automotive, civil, and marine engineering applications where lightweight strength and durability are critical.

Chapter 2: Properties and Processing Technologies of Cultural Heritage Materials shifts focus from modern engineering to the preservation of historical artefacts and structures. It investigates the physical and chemical properties of heritage materials.

Chapter 3: Building Materials examines the fundamental and applied aspects of materials used in construction, including innovative eco-friendly alternatives. The discussion extends to performance optimisation, durability, and lifecycle assessment, reflecting current trends toward sustainable infrastructure.

The collected articles present relationships between innovation, tradition, technology, and sustainability. By addressing both cutting-edge materials development and the conservation of historical materials, this special edition aims to inspire interdisciplinary research and inform its application across engineering, construction, architecture, and culture.