Preface

The pursuit of efficiency, durability, and functionality across diverse technological fields drives the continuous evolution of materials engineering. This special edition reflects research results in several key areas of modern materials research – from additive manufacturing and corrosion control to the design of advanced functional materials – illustrating how innovations are connected with material design, processing, and performance.

Chapter 1: Additive Manufacturing focuses on the principles and applications of 3D printing technologies. The chapter highlights recent progress in process optimisation, material selection, and structural design, demonstrating how additive manufacturing enables the creation of complex, high-performance components with the necessary properties.

Chapter 2: Corrosion Engineering examines the mechanisms of material degradation due to corrosion in challenging environments of application. The studies presented here explore corrosion attack on austenitic stainless steel grades in food production and dezincification as a cause of damage to brass fittings.

Chapter 3: Functional and Special Materials presents developments in materials with unique physical and chemical characteristics. It also discusses innovative synthesis technologies of some of these materials.

The presented articles demonstrate the effective integration of design innovations with manufacturing innovations.

This special edition can serve as an insightful reference for scientists and engineers seeking to advance the next generation of high-performance and sustainable materials.