Preface

This volume is a compilation of work undertaken in recent years by leading experts in the field of micro-manufacturing who are members of the consortium of the Leonardo da Vinci project MIMAN-T: Micro-Manufacturing Training System for SMEs (542424-LLP-1-2013-1-IT-LEONARDO-LMP). This includes Karlsruhe Institute of Technology (KIT), The University of Nottingham, ASERM, Eurecat, Institute of Industrial Technologies and Automation (CNR-ITIA).

This book collates contributions from within the fields of micro-manufacturing technologies and engineering, and complements the online training platform developed by the MIMAN-T consortium. This platform provides the reader with an in-depth exposure to the theoretical issues along with practical tips on some of the leading edge technologies for the manufacture and measurement of micro-components, devices, and products.

The introductory chapter reviews the main physical concepts behind the downscaling of components and describes the impact of miniaturisation on materials, processes, and production systems. Subsequently, chapters present six technologies: micro-injection moulding, micro-additive manufacturing, micro-machining, micro-EDM, micro-waterjet, and micro-assembly, each addressing the physics of the process, materials, design and simulation, tools, machines, sectors, and applications.

A chapter is devoted to moulded interconnected devices, and another reviews the main issues and techniques for effectively measuring the surface topography and geometry of micro-components. Numerous examples are included to assist readers in learning and implementing the described technologies.

A further chapter is devoted to technological foresight, addressing challenges such as market analysis and business models for micro-manufacturing operations.

This book primarily targets technicians and prospective professionals operating within the sector and aims to serve as an effective tool to facilitate the translation of micro-manufacturing technologies into tangible industrial benefits.

We hope we have achieved this goal.

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