

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 down-scaling 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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