

Preface

The more stringent requirements for enhanced quality of engineered products, especially those of miniature size and that have typical features and made from difficult-to-machine materials; accelerated global competitiveness; and strict environmental regulations, have been responsible for the development and subsequent wide use of *advanced manufacturing technologies*.

In general, advanced manufacturing technologies encompass modern manufacturing techniques and advancements in the existing or conventional manufacturing. They offer excellent part quality, cost-effectiveness, and high productivity with less environmental footprint. Some of these technologies such as modern machining methods, advanced repair and joining processes, and sustainable manufacturing techniques are primarily focused in this book.

Part I is about modern machining and consists of four chapters (Chaps. 1–4). Chapter 1 describes various advanced processes and a hybrid process developed for fabrication of micro cutting tools. Chapter 2 provides an overview of advanced machining of glass materials. Chapter 3 is dedicated to thermal assisted machining of titanium alloys. Chapter 4 sheds light on advanced machining of composite materials by abrasive water jet technique.

Part II includes four chapters (Chaps. 5–8) on advanced repair and joining techniques. Chapter 5 provides an insight into advanced joining and welding techniques. Chapter 6 describes laser-based advanced repair of dies, molds, and gears. Chapter 7 details the important aspects of friction stir welding technique. Chapter 8 highlights the novel aspects of ultrasonic spot welding for transport applications.

Part III is dedicated to sustainable manufacturing and comprises four chapters. Chapter 9 discusses various important aspects of green manufacturing. Chapter 10 details the experimental work on environment-friendly machining of super alloys. Chapter 11 describes dry and near dry type sustainable electrical discharge machining processes. Chapter 12 discusses the remanufacturing of engineered products using laser metal deposition process.

The present book is intended to facilitate the researchers, engineers, technologists, and specialists who are working in the field of advanced manufacturing, production and sustainable engineering by offering the theoretical background, novel aspects, research advances, and applications of advanced manufacturing technologies. It will also enable and encourage the researchers to explore the field and develop the technology further with an objective to find the solutions for the major industrial problems, and to work for the societal benefits.

I sincerely acknowledge Springer for this opportunity and for their professional support. Finally, I would like to thank all the chapter authors for their availability and valuable contribution.

Johannesburg, South Africa
May 2017

Kapil Gupta

Advanced Manufacturing Technologies

Modern Machining, Advanced Joining, Sustainable
Manufacturing

Gupta, K. (Ed.)

2017, VIII, 294 p. 169 illus., 96 illus. in color., Hardcover

ISBN: 978-3-319-56098-4