

Preface

The term *machining* refers a group of processes that remove gradually material from a workpiece by various methods involving single-point or multipoint cutting tools, each with a clearly defined geometry as well as abrasive wheels which consist of a large number of micro-cutting edges with geometrically undefined. Machining processes can be applied to work metallic and non-metallic materials such as polymers, wood, composites and special materials. Typical applications of machining processes include complex geometry, high accuracy and good surface finish. Today, machining processes present great importance to automotive, aircraft, moulds and dies and other advanced industries placed in all industrialized or emerging countries.

The purpose of this book is to present a collection of examples illustrating research in machining processes. Chapter 1 of the book provides information on polycrystalline diamond (PCD) tool material (emerging applications, problems and possible solutions). Chapter 2 is dedicated to analysis of orthogonal cutting experiments using diamond-coated tools with force and temperature measurements. Chapter 3 describes estimation of cutting forces and tool wear using modified mechanistic models in high performance turning. Chapter 4 contains information on cutting under gas shields (phenomenological concepts versus industrial applications). Chapter 5 is dedicated to machinability of magnesium and its alloys (a review). Chapter 6 provides information on grinding science. Finally, Chap. 7 is dedicated to flexible integration of shape and functional modelling of machine tool spindles in a design/optimisation framework.

The present book can be used as a research book for final undergraduate engineering course or as a topic on manufacturing engineering at the postgraduate level. Also, this book can serve as a useful reference for academics, researchers, mechanical, manufacturing, industrial and materials engineers, professionals in machining processes and related industries. The scientific interest in this book is evident from many important centers of the research, laboratories and universities as well as industry. Therefore, it is hoped this book will inspire and enthuse others to undertake research in machining processes.

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