

# Preface

The machining of complex sculptured surfaces is an important technological topic in modern manufacturing, namely in the molds and dies sector. Today, this sector, with great importance to automotive, aircraft and others advanced industries, is placed in all industrialized or emerging countries. In the recent past, the traditional technology employed in molds and dies manufacture was a combination of conventional milling and electro-discharge machining (EDM) or electrochemical machining (ECM). Nowadays, high-speed milling (HSM) is used in roughing, semi-finishing and finishing of molds and dies with great success. This technology required modern CAM systems and process planning for 3 and 5-axis machining. HSM presents several advantages when compared with the traditional technology in terms of workpiece precision and roughness as well as in manual polishing after the machining operations.

[Chapter 1](#) of this book provides the flank milling of complex surfaces. [Chapter 2](#) is dedicated to 5-axis flank milling of sculptured surfaces. [Chapter 3](#) described high performance 5-axis milling of complex sculptured surfaces. [Chapter 4](#) contains information on milling tool-path generation in adequacy with machining equipment capabilities and behavior and [Chap. 5](#) is dedicated of intelligent optimization of 3-axis sculptured surface machining on existing CAM systems. [Chapter 6](#) contains process planning for 5-axis milling of sculptured surfaces based on cutters accessibility analysis. Finally, [Chap. 7](#) is dedicated to manufacturing of sculptured surfaces using EDM and ECM processes.

The present book can be used as a research book for final undergraduate engineering courses or as a topic on manufacturing at the postgraduate level. Also, this book can serve as a useful reference for academics, manufacturing researchers, manufacturing, industrial and mechanical engineers, professional in machining and related industries. The interest of scientific in this book is evident for many important centers of the research, laboratories and universities as well as industry. Therefore, it is hoped this book will inspire and enthuse other researches for this field of the machining of complex sculptured surfaces.

The Editor acknowledges Springer for this opportunity and for their enthusiastic and professional support. Finally, I would like to thank all the chapter authors for their availability for this work.

Portugal, January 2012

J. Paulo Davim

Machining of Complex Sculptured Surfaces

Davim, J.P. (Ed.)

2012, X, 258 p., Hardcover

ISBN: 978-1-4471-2355-2