
Preface

A surface can be defined as a border between a machined workpiece and its environment. The term surface integrity describes the state and attributes of a machined surface and its relationship to functional performance. In general, surface integrity can be divided into two aspects: first the external topography of surfaces (surface finish) and second, the microstructure, mechanical properties and residual stresses of the internal subsurface layer. For example, surface integrity is commonly defined as “the topographical, mechanical, chemical and metallurgical state of a machined surface and its relationship to functional performance”. Performance characteristics that are usually sensitive to surface integrity include, for example, fatigue strength, fracture strength, corrosion rate, tribological behavior (friction, wear and lubrication, dimensional accuracy, etc.

This book aims to provide the fundamentals and the recent advances in the study of integrity surface in machining processes.

Chapter 1 of the book provides the definition of surface integrity and its importance in functional performance. Chapter 2 is dedicated to surface texture characterization and evaluation. Chapter 3 describes residual stresses and microstructure modification, as well as the mechanical properties in the subsurface layer. Chapter 4 contains information on characterization methods of surface integrity. Chapter 5 is dedicated to surface integrity of machined surfaces by traditional and nontraditional machining. Finally, Chapter 6 is dedicated to surface integrity of micro/nano-finished surfaces.

The present book can be used as a textbook for a final undergraduate engineering course or as a topic on manufacturing at the postgraduate level. Also, this book can serve as a useful reference for academics, manufacturing researchers, manufacturing, materials and mechanical engineers, professionals in machining and related industries. The interest of scientific in this book is evident for many important centers of the research, laboratories and universities throughout the world. Therefore, it is hoped this book will inspire and enthuse other researches in this field of science and technology

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