
Book Review

Reviewed by L.N. López de Lacalle

E-mail: norberto.lzlacalle@ehu.es

Machining of hard materials
by: J. Paulo Davim (Ed)
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Hard machining is defined as a manufacturing operation, using tools with geometrically defined cutting edges, of workpieces harder than 45 HRC. This operation always presents the challenge of selecting a cutting tool that facilitates high-precision machining of the component, but it presents several advantages when compared with other technologies such as electrodischarge machining or grinding. This book aims at providing the reader with the fundamentals and recent advances in the field of hard machining of materials.

Fifteen-years ago the possibility to remove material from a block of tempered and/or hardened steel using milling was considered science fiction for the daily life of workshops. Electrodischarge machining was the leading technology for these matters until the development of tungsten carbide tools coated with the new physical vapour deposition (PVD) techniques, especially coatings from the AlTiN kind. Since then, high speed milling has replaced to EDM in most of applications, being a revolution regarding machining times and costs. New tools brought new requirements for machining centres, being involved in a continuous reciprocating improvement both tools and machines. Rapid technology evolution also caused that traditional texts about manufacturing technologies became somewhat obsolete at the early 2000s. New approaches require new manuals and books, usually difficult to be written by one unique author. From this base and context surged the book project *Machining of hard materials*.

All the chapters are written by international experts in this important field of research. Chapter 1 of the book provides the definitions and industrial applications of machining of hard materials. Chapter 2 is dedicated to advanced cutting tools and coatings. Chapter 3 describes the mechanics of cutting and chip formation. Chapter 4 contains information on surface integrity. Chapter 5 is dedicated to finite-element modelling and simulation. Finally, Chapter 6 is dedicated to computational methods and optimisation.

Machining of hard materials can serve as a useful reference for academics, manufacturing and materials researchers, manufacturing and mechanical engineers, and professionals in machining and related industries. It can also be used as a text for advanced undergraduate or postgraduate students studying mechanical engineering, manufacturing, or materials. Applications and problems of important sectors as aircraft, automotive, defence, aerospace and moulds industries are included in the application cases.

As conclusion, the general view of machining hard materials offered by the book published by Springer is useful for PhD students, but also for technicians working on industry. After the first reading, the opportunities opened for researchers and manufacturers will be clear and well defined.