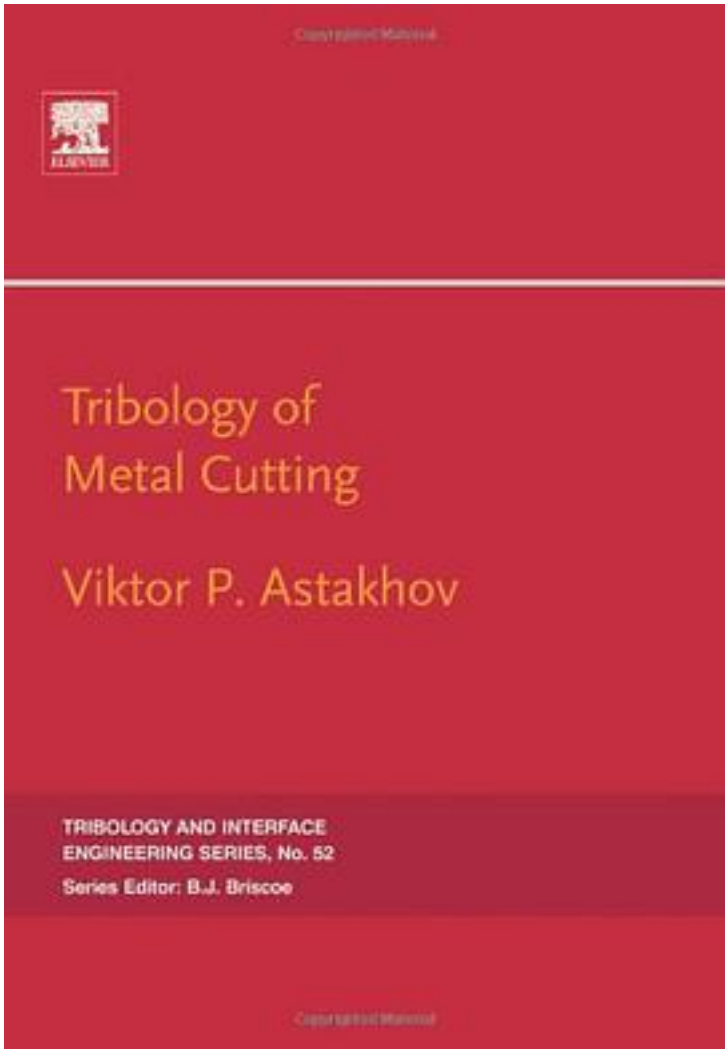
Tribology of Metal Cutting



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"Tribology of Metal Cutting" is about an emerging field of studies called Metal Cutting Tribology. Tribology is defined as 'the science and technology of interactive surfaces moving relative each other'. The science of Tribology concentrates on contact physics and mechanics of moving interfaces that generally involve energy dissipation. The book clarifies that the ultimate objective of the metal cutting tribology is the reduction of the energy spent in metal cutting. Increased tool life, improved integrity of the machined surface, higher process efficiency and stability are the results of the achieving this goal. "Tribology of Metal Cutting" is intended to be for a broad range of readers from students, practicing engineers to experienced researchers. In this book, specialists in the field of metal cutting will find information on how to apply the major principles of metal cutting tribology, or, in other words, how to make the metal cutting tribology to be useful at various levels of applications. Students majoring in manufacturing, industrial and mechanical engineering will learn about the basic ideas of the metal cutting mechanics and physics, as well as the practical aspects of the metal cutting process; manufacturing, process and tool engineers will find simple solutions to increase productivity and efficiency of various cutting operations at the shop floor level. "Tribology of Metal Cutting" summarizes the available information on metal cutting tribology with a critical review of work done in the past. The book also presents, explains and exemplifies a number of novel concepts and principles in the tribology of metal cutting such as the energy partition in the cutting system, cutting system physical efficiency and its practical assessment, versatile metrics of cutting tool wear, optimal cutting temperature and its use in the optimization of the cutting process, physical concept of cutting tool resource, and embrittlement action of the cutting fluids. The major distinguished feature of this book is that it focused on the practical ways of modeling and optimization of the cutting process using two simple in- and post-process parameters, namely, the cutting temperature and chip compression ratio that can be measured with sufficient accuracy not only at a research lab but also in the shop floor. This makes this book not just another book on the subject, but practical guidance for a wide variety of readers. This book introduces the cutting system physical efficiency and its practical assessment via analysis of the energy partition in the cutting system. It presents, explains and exemplifies a breakthrough concept of the physical resource of the cutting tool. It covers the complete system of metal cutting testing.

作者介绍:

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