
REVIEWED BY O. F. DEVEREUX

This book is reviewed in the context of an annual expenditure of $150 billion on metal removal in the United States alone, a growing fraction of which is expended upon grinding. Although considerable research is performed at the university level on industrial grinding in Europe and Japan, there is little, if any, comparable work in progress in the United States. The European program has produced tangible results in the form of process optimization for efficiency and control, and the use of grinding in new regimes such as high stock removal. At the very least, this book will serve as an introduction to the methodology that is currently being employed in such seemingly complex processes as grinding for those not proficient in manufacturing processes.

Handbook of Modern Grinding Technology consists of fifteen separately authored chapters, with five written by co-author Robert S. Hahn. The latter tend to be quite analytical. Chapter 1, Part Processing by Grinding, defines significant process parameters, provides some data with respect to typical parameter correlations, and describes typical generic operations. Hahn’s Chapter 7, Precision Grinding Cycles, addresses these parameters in the context of dimensional precision, and Chapter 10, Reciprocating Surface Grinding, is specific with respect to parameters pertaining to that process. Hahn’s control discussion is continued in a qualitative sense in the final chapters of the book, on Adaptive Control and Trouble Shooting. Chapter 2, Principles of Grinding, by Richard P. Lindsay, again presents basic grinding parameters and relationships in an easily comprehensible manner, addresses wheel parameters (dressing, wear, cooling) and the applications to special cases such as cutoff and belt grinding. This might have been an obvious selection for Chapter 1. William Ault, in two short chapters, reviews Types of Grinding Wheels and Truing (wheel geometry) and Dressing (surface condition) of Grinding Wheels. Superabrasives are discussed by R. L. Mahar in Chapter 5 (also by Lindsay – Ch. 2). This discussion reduces to cubic boron nitride (CBN), diamond being dismissed for use with steel due to chemical dissolution in the workpiece. CBN is not economically suited to all tasks; data for economic decisions and process parameters are given.

Chapter 6, Grinding Chatter and Vibrations, by K. Srinivasan, is appropriately long, analytical and well-referenced. Chapter 8, Centerless Grinding, by W. F. Jessup, discusses the problems unique to that process, especially “lobing,” or the development of a polygonal cross section. Chapter 9, Vertical-Spindle Surface Grinding, by D. H. Youden, is basically descriptive, as is Chapter 11, Coated Abrasives (e.g., sandpaper), by E. J. Duwell. In Chapter 12, S. C. Salmon describes creep-feed grinding processes, and in Chapter 13, Hans Fischer presents Honing. In sum, King and Hahn have presented a treatment of most topics of significance to industrial grinding creating, in effect, a short course that would prepare the uninitiated for productive contributions in the engineering of grinding processes.

The Handbook is not an easy book to read, and its presentation of typical rather than comprehensive data and a relatively brief Index limit its appeal as a desk reference. Its use as a text would be limited to the most dedicated technical personnel. Nonetheless, this is an excellent volume whose authors are to be commended for their creation. It reminds the reviewer of earlier, classical works, such as Flotation, by A. M. Gaudin, that attempt to methodically organize theory and data pertaining to a complex process and by doing so to bring it from the status of an art to that of an engineering science. Modern-day engineering has not done well by manufacturing; Handbook of Modern Grinding Technology is a step in the right direction.


REVIEWED BY H. I. EPSTEIN

This edition incorporates descriptions of recent earthquakes, techniques for strengthening buildings as well as up-to-date code requirements, in addition to topics covered by past editions. Written by a structural engineer, it is a very valuable reference for those involved in earthquake resistant design. The book pulls together information from codes, tests, failures as well as analytical results. The text is a little sparse when it comes to detailed design examples.