

**TOOL ENGINEERS
HANDBOOK**



HANDBOOK

SECOND EDITION

A Reference Book
on All Phases
of Planning, Control, Design,
Tooling, and Operations
in the
Manufacturing Industries

Revised under Supervision of
A.S.T.E. NATIONAL TECHNICAL PUBLICATIONS COMMITTEE
AMERICAN SOCIETY OF TOOL ENGINEERS, DETROIT, MICH.

FRANK W. WILSON
Editor-in-Chief

PHILIP D. HARVEY
Assistant Editor

McGRAW-HILL BOOK COMPANY, INC.
NEW YORK TORONTO LONDON
1959



LIST OF CONTRIBUTORS

	REVISION GROUP*
E. F. Abbey , Vice President-Sales, Abbey Etia Company, Perrysburg, Ohio	9
James E. Abella , Chief Engineer, Dove Die & Stamping Company, Cleve- land, Ohio	10
Carroll R. Alden , Associate Professor, Electrical Engineering, College of Engineering, Ohio Northern University, Ada, Ohio	7
Fred Alexander , Armour Research Foundation, Illinois Institute of Tech- nology, Chicago, Illinois	9
M. C. Aljanich , President, Dependable Engineering Service, Inc., Mil- waukee, Wis.	5C
W. Fay Allar , Vice President & Director of Research, The Sheffield Cor- poration, Dayton, Ohio	2
John H. Alton , Research Engineer, The Eastern Machine Screw Corpora- tion, New Haven, Conn.	7
Otto L. Andersen , Manager, Tool Engineering, Microtools Div., Elgin National Watch Company, Elgin, Ill.	6A
B. T. Anderson , Chief Electrical Engineer, Sundstrand Machine Tool Company, Rockford, Ill.	2
John F. Anderson, Jr. , Manager, Production Engineering, Engine Div., Chrysler Corporation, Detroit, Mich.	5C
Robert B. Anderson , President, Atlantic Coating & Engineering Cor- poration, Clifton, New Jersey	8A
C. T. Appleton , Vice President, Reed Bolted Thread Die Company, Wur- cester, Mass.	7
Harry L. Armitage , President, Conner Steel Products, Detroit, Mich.	5C
Anthony Audino , Illinois Tool Works, Chicago, Ill.	5D
Howard S. Avery , Research Metallurgist, American Brake Shoe Com- pany, Mahwah, N.J.	13A
A. Dudley Bach , President, New England Metallurgical Corporation, S. Boston, Mass.	3A
F. A. Badger , Vice President, Haynes Stellite Company, Kokomo, Ind.	8A
L. J. Barker , Chief Specification Engineer, Kaiser Aluminum & Chemical Corporation, Oakland, Calif.	3A
Glenn A. Barth , President, Barth Corporation, Cleveland, Ohio	19

* See Group Index on page 7.

01524