

DESIGN OF TOOLS FOR DEFORMATION PROCESSES

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Edited by

T. Z. BLAZYNSKI

*Department of Mechanical Engineering,
The University of Leeds, UK*



ELSEVIER APPLIED SCIENCE PUBLISHERS
LONDON and NEW YORK

ELSEVIER APPLIED SCIENCE PUBLISHERS LTD
Crown House, Linton Road, Barking, Essex IG11 8JU, England

Sole Distributor in the USA and Canada
ELSEVIER SCIENCE PUBLISHING CO., INC.
52 Vanderbilt Avenue, New York, NY 10017, USA

WITH 144 ILLUSTRATIONS AND 23 TABLES

© ELSEVIER APPLIED SCIENCE PUBLISHERS LTD 1986

Softcover reprint of the hardcover 1st edition 1986

British Library Cataloguing in Publication Data

Design of tools for deformation processes.

1. Deformations (Mechanics) 2. Machine-tools
—Design.

I. Blazynski, T. Z.

681'.7671 TS213

Library of Congress Cataloging-in-Publication Data

Design of tools for deformation processes.

Bibliography: p.

Includes index.

1. Rolling (Metal-work) 2. Drawing (Metal-work)
3. Extrusion processes. 4. Forging. I. Blazynski,
T. Z.

TS213.D38 1985 671.3 85-15976

ISBN-13: 978-94-010-8355-3 e-ISBN-13: 978-94-009-4177-9

DOI: 10.1007/978-94-009-4177-9

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PREFACE

Although the problem of tool design — involving both the selection of suitable geometry and material — has exercised the attention of metal-forming engineers for as long as this industrial activity has existed, the approach to its solution has been generally that of the ‘trial and error’ variety. It is only relatively recently that the continuing expansion of the bulk metal-forming industry, combined with an increase in the degree of sophistication required of its products and processes, has focussed attention on the problem of optimisation of tool design. This, in turn, produced a considerable expansion of theoretical and practical investigations of the existing methods, techniques and concepts, and helped to systematise our thinking and ideas in this area of engineering activity.

In the virtual absence, so far, of a single, encyclopaedic, but sufficiently deep, summation of the state of the art, a group of engineers and materials scientists felt that an opportune moment had arrived to try and produce, concisely, answers to many tool designers’ dilemmas.

This book attempts to set, in perspective, the existing — and proven — concepts of design, to show their respective advantages and weaknesses and to indicate how they should be applied to the individual main forming processes of rolling, drawing, extrusion and forging.

The framework of design — the central point of which is the geometry of the pass — would not be complete without the consideration of the likely response of the tool material. This information is provided in the book through the medium of the chapters on material

selection and tribology, backed, in turn, by a discussion of the modern computer modelling techniques.

The book is aimed primarily at the designer of industrial tooling and the mechanical and production engineer involved in planning and operating a process of metal deformation. The selection and presentation of the topics also reflects our concern over the paucity of information available to mechanical, production and industrial metallurgy students at the institutes of higher education. We feel that this compendium, well documented in terms of references, will provide them with the necessary background to the mechanics and operation of forming processes.

My thanks go to the contributors of the individual chapters, who through sharing their personal expertise have provided the reader with a wide spectrum of practical knowledge.

T. Z. BLAZYNSKI

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LIST OF CONTRIBUTORS

T. ALTAN

Engineering and Manufacture Technology Department, Battelle Laboratories, 505 King Avenue, Columbus, Ohio 43201, USA. Present address: Department of Industrial and Systems Engineering, Ohio State University, Columbus, Ohio 43210-1271, USA.

N. BAY

Procesteknisk Institut, Danmarks Tekniske Højskole, 2800 Lyngby, Denmark.

T. Z. BLAZYNSKI

Department of Mechanical Engineering, University of Leeds, Leeds, LS2 9JT, UK.

G. C. CAREY

Department of Mechanical Engineering, University of Leeds, Leeds, LS2 9JT, UK.

I. M. COLE

Department of Mechanical and Production Engineering, University of Aston in Birmingham, Birmingham, B4 7ET, UK.

A. DE PENNINGTON

Department of Mechanical Engineering, University of Leeds, Leeds, LS2 9JT, UK.

R. C. JONES

BNF Metals Technology Centre, Grove Laboratories, Wantage, OX12 9BT, UK.

G. C. PURNELL

BNF Metals Technology Centre, Grove Laboratories, Wantage, OX12 9BT, UK.

D. H. SANSOME

Technoform-Sonics Ltd., Enterprise Trading Estate, Brierley Hill, DY5 1TX, UK.

T. M. B. SESSIONS

Wolfson Industrial Unit, Department of Mechanical Engineering, University of Birmingham, Birmingham, B15 2TT, UK.

T. WANHEIM

Procesteknisk Institut, Danmarks Tekniske Højskole, 2800 Lyngby, Denmark.

D. J. WILLIAMS

University Engineering Department, Trumpington Street, Cambridge, CB2 1PZ, UK.