EUROPEAN TEXTBOOK SERIES
for professions in the metal industry

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Metal Engineering Textbook

1st English edition

VERLAG EUROPA-LEHRMITTEL · Nourney, Vollmer GmbH & Co. KG
Düsselberger Straße 23 · 42781 Haan-Gruiten, Germany

Europa no.: 12432

Original title:
Fachkunde Metall, 57th edition, 2013

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Editor:	Josef Dillinger
Photos:	Kindly provided by the companies mentioned in the directory starting from page 664
Graphic design:	Design office of Verlag Europa-Lehrmittel, Ostfildern, Germany
Translation of the "Review" chapters:	Senior Teacher Christina Murphy, Wolfratshausen, Germany

1st edition 2016

Impression 6 5 4 3 2 1

All impressions of the same edition can be used in parallel, as they do not differ from each other except with regard to the correction of printing errors.

ISBN 978-3-8085-1243-2

Cover design: MediaCreativ, G. Kuhl, Hilden, Germany, using a photo provided by TESA/Brown & Sharpe, Renens, Switzerland

http://www.europa-lehrmittel.de
Translation and typesetting: A.C.T. Fachübersetzungen GmbH, Mönchengladbach, Germany
Printing: B.O.S.S. Medien GmbH, Goch, Germany

Preface

METAL ENGINEERING TEXTBOOK is the first English edition of "Fachkunde Metall" (57th edition). Fachkunde Metall is the leading textbook for metalworking in Germany, a country that boasts a highly developed metalworking industry and a world renowned dual training system. For years, the textbook has been implemented in a wide range of applications in vocational schools within programs geared towards jobs in the metalworking trade.

METAL ENGINEERING TEXTBOOK encompasses the fundamentals of the entire professional field of metal technology and expert knowledge pertaining to jobs within the fields of mechanical, metal cutting and automation technology. METAL ENGINEERING TEXTBOOK has an extensive spectrum of application in on-the job training and continuing education for apprentices, foremen and technicians in businesses within the metalworking industry.

For students of the various specialist fields of engineering studies, it offers a comprehensive introduction. Together with the reference book MECHANICAL AND METAL TRADES HANDBOOK published by Europa-Lehrmittel it serves as an invaluable source of information and reference also for students doing their professional traineeship and those in their first semesters of study.

Target groups

- Industrial mechanics
- Precision mechanics
- Production mechanics
- Cutting machine operators
- Technical product designers
- Foremen and technicians
- Trainees in the metal-processing industry and in trade
- Technical school students
- Trainees and students in the subject of mechanical engineering

METAL ENGINEERING TEXTBOOK assists users in their qualified vocational endeavours. The information available in the form of text and illustrations helps students hone and broaden their skills in the areas of independent planning, performance and supervision. The authors have placed special importance on application and problem orientation in order to make the scientific-technical operating principles and their context within the production process more accessible to students. The scientific-technical and trade-relevant mathematical foundations are incorporated in certain topic segments so as to provide a clearer understanding of the context.

METAL ENGINEERING TEXTBOOK follows the norms DIN, DIN EN and DIN EN ISO applicable in Germany. Please keep in mind that these norms vary in countries in which other national norms apply.

The authors and the publisher are grateful to all users of METAL ENGINEERING TEXTBOOK for critical information and suggestions for improvement (lektorat@europa-lehrmittel.de).

Summer 2016 The authors

Subject guide

The content of "Metal Engineering Textbook" is logically structured to give teachers and students maximum educational and methodological freedom. The structure of the topics selected in the book aims to allow students to independently familiarise themselves with the different technical content required in the subject areas.

The following selection shows the allocation of the chapters and the content in the textbook to the individual subject areas. It is provided as a suggestion and guideline in order to hold lessons that target the subject areas.

Subject area	Factual information in the book (examples)
Manufacturing components using hand-held tools Preparing and manufacturing components typical of the profession using hand-held tools. Creating and modifying drawings for simple components.	**Project: Key fob** . . . . . 638 3.6.2 Manufacturing with handheld tools 1.2 Principles of metrology 1.2.1 Basic terms 1.2.2 Errors of measurement 1.2.3 Measuring equipment capability and inspection of measuring instruments 1.3 Length-measuring devices 1.5 Tolerances and fits
Planning work steps with tools and materials and performing calculations. Selecting and using appropriate measuring instruments and recording the results. Roughly estimating production costs.	2.7.1 Inspection planning 3.2 Structure of manufacturing processes 3.4.1 Material behaviour during forming 3.4.2 Forming processes 3.4.3 Bend forming 3.5 Cutting 3.5.1 Shear cutting 4.1 General survey of materials and process materials 4.2 Material selection and properties 4.4 Steels and iron casting alloys 4.5 Non-ferrous metals 4.9 Plastics 4.10 Composite materials
Documenting and presenting work results.	10.5 Documenting technical projects
Complying with health and safety and environmental protection regulations.	3.1 Safety at work 3.11 Manufacturing operations and environmental protection 4.12 Environmental issues of materials and process materials
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Selecting and using measuring instruments.	1.2 Principles of metrology 1.2.1 Basic terms

Subject area	Factual information in the book (examples)
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Documenting and presenting work results.	10.5 Documenting technical projects
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Documenting and presenting work results.	10.5 Documenting technical projects
Complying with health and safety and environmental protection regulations.	3.1 Safety at work 3.11 Manufacturing operations and environmental protection 4.12 Environmental issues of materials and process materials

Subject area	Factual information in the book (examples)
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