HANDBOOK OF PRECISION ENGINEERING

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- Volume 1 Fundamentals**
- Volume 2 Materials**
- Volume 3 Fabrication of Non-metals**
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- Volume 12 Precision Measurement**

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HANDBOOK OF PRECISION ENGINEERING

Edited by A. Davidson

**Volume 4 Physical and Chemical
Fabrication Techniques**

Macmillan Education

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Foreword

Experience over the past few decades has shown that precision engineering, although not a field in itself, like shipbuilding or aircraft construction, is a separate branch of engineering in which methods and concepts differ from those of conventional mechanical engineering. There is no clear-cut definition of what is meant by precision engineering. It is no longer possible to say that it embraces those cases where auxiliaries are used as extensions of human limbs.

What is included under the heading of precision engineering is best given as a form of summary. In general it includes small pieces of equipment, whether in single units or very large numbers.

Precision equipment is not really the right term. An ordinary watch, however small, is, in fact, a relatively coarse instrument as far as tolerances are concerned. In contradistinction, the control mechanism of an astronomic telescope, which is a large piece of equipment, has to be designed and built with the utmost precision. Examples of precision equipment in general include telecommunications equipment, optical devices like cameras, projectors, microscopes, comparators, etc., office machines like typewriters, book-keeping machines, calculators, etc., technical toys because of their often ingenious designs and the tools, which are often of very refined construction, electric razors, and domestic electronic appliances, etc. Many other examples could be added to this list.

As in the field of education, there is a need in the precision engineering industry for a handbook giving a clear explanation of the various subjects dealt with in the art. Although most of these subjects are not, in themselves, novel, it is nevertheless useful to deal with them in a manner specially angled toward precision engineering methods and to give the details that will be useful to designers, manufacturers and users of precision engineering products.

The authors, who are all specialists in their fields, do not claim to have dealt exhaustively with the matter forming the subject of their sections nor that they have been able, in such a small compass, to give every single detail. They have, however, attempted to give the broad outlines as well as possible, details being catered for by extensive international references.

The handbook is divided into twelve volumes. The first deals with the general bases necessary for the design of a product, the second with the materials used. They thus contain both theoretical and practical information important to the designer and manufacturer.

Manufacturing methods and techniques are discussed in Vols. 3, 4, 5, 8, 9 and 10. Production workers will find in these volumes all the information they require on methods of manufacture and the machines used in them. The

remaining Vols. (6, 7, 11 and 12) deal with the actual construction of precision-engineered products, the equipment and parts for them.

It is appropriate here to offer a word of thanks to the authors and all those who have helped to produce this handbook.

A. Davidson

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