HANDBOOK OF PRECISION ENGINEERING

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- Volume 1 Fundamentals**
- Volume 2 Materials**
- Volume 3 Fabrication of Non-metals**
- Volume 4 Physical and Chemical Fabrication Techniques**
- Volume 5 Joining Techniques**
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HANDBOOK OF PRECISION ENGINEERING

Edited by A. Davidson

Volume 6 Mechanical Design Applications

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Foreword

During the last twenty or thirty years, precision engineering, albeit not a separate field such as, say, naval architecture or aeronautics, has nevertheless emerged as a technology in its own right, involving methods and concepts different from those of conventional engineering.

No clear definition of what is meant by precision engineering can be given. The view that this covers all those sectors of technical activity in which artificial aids are employed as extensions of the senses can no longer be upheld.

The question of what is to be regarded as a precision mechanism can best be settled by summarizing a number of devices which qualify for this description. Generally, they are small devices ranging from the unique to the mass produced.

The term precision mechanism may well be a misnomer as applied, say, to a watch, since an ordinary watch, although small, is a relatively crudely tolerated instrument, whereas the drive of an observatory telescope, a massive piece of equipment, is constructed to operate with the utmost precision. Examples of precision engineering in the sense in which the term is employed in this handbook are: telecommunications equipment; optical apparatus such as cameras, projectors, but also such instruments as microscopes, comparators, etc.; office machines such as typewriters, accounting machines, calculating machines, etc.; technical construction kits, marketed as toys, in view of the often ingenious constructions and highly sophisticated tool designs employed; electric shavers, electronic equipment for use in the home, etc. Many other examples could be added to this list.

Both in the precision engineering industry and in education, there is a need for a handbook providing ready access to all the different subjects involved in this branch of engineering. Although in most cases these subjects are not new in themselves, there is much to be gained from a review of them which places special emphasis on those aspects which have a specific bearing on precision mechanisms and which provides information of possible use to designers, manufacturers and users of products in this category.

The authors, specialists in their field, do not claim either to have covered every aspect of the subject dealt with in their chapter, or to have included all the details in the limited space available. What they have tried to do is to describe the essentials as thoroughly as possible, whilst providing an extensive list of references to the international literature as a source of detail.

The handbook has been divided into twelve parts. Part 1 deals with the general principles upon which the design of a product should be based, whilst Part 2 discusses the materials required. They contain both theory and

practical information of interest to the designer and the engineer. Methods and technical processes of production are discussed in Parts 3 to 5 and 8 to 10. Here, production engineers will find full information on production methods and the machines involved.

The remaining parts (6, 7, 11 and 12) cover the construction of precision engineering products and equipment, together with components for same. Designers, manufacturers and users will all find useful data in them.

This handbook is published as a sequel to the first two parts of the *Handbook of Precision Engineering*, produced as long ago as 1957 by the Cosmos Publishing Company.

The authors take this opportunity to thank all those who have assisted in its production.

Eindhoven, 1968

A. Davidson

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