

# Introduction

MECHANICAL PROPERTIES is a periodic compilation, at present issued in two volumes per year, of new information on the mechanical properties of inorganic materials: Ferrous Metals and Alloys, Nonferrous Metals and Alloys, Ionic Materials, Semiconducting Materials, Ceramic Materials, and Composite Materials. Not systematically covered are the properties of joints (such as welds) and coatings (such as galvanized steel) as these topics should be dealt with separately. Quite often, the present series also covers data on joints and coatings wherever this seems appropriate within the scope of MECHANICAL PROPERTIES.

The subjects covered include creep properties; all details about cracks, their formation and propagation; ductile and brittle behavior; elastic properties; fatigue; fracture characteristics; hardness and hardening processes; impact properties; anelasticity; plastic deformation, slip, twinning, etc.; rupture characteristics; strength and strengthening methods; stress-strain behavior; superplasticity; wear and friction; and related mechanical properties.

The information covered in MECHANICAL PROPERTIES is presented in two main parts. The first consists of an alphabetical listing of the materials covered (according to the chemical symbols of the major constituents), together with abstracts, tables and figures of the newly determined properties. In this section, the materials are grouped into six major categories: Nonferrous Metals and Alloys, Ceramic Materials, Oxides, Semi-conductors, and Halides and other ionic substances.

The second part presents general references, grouped into major subject areas, such as "Creep" and "Fatigue"; the references covering general and theoretical papers are supplemented with a short abstract wherever desirable.

At the end of each volume subject and materials indexes provide easy access to the various subject areas and materials covered. It is planned to publish cumulative subject and materials indexes whenever ten volumes have been completed.

MECHANICAL PROPERTIES is research oriented and does not intend to compete with available handbooks, such as "Metals Handbook" etc. The materials scientist needs to be informed continually of the new developments in the field and this is exactly what MECHANICAL PROPERTIES has been designed to provide: an up-to-date account of the new findings of interest to the materials development engineer. It is this current-awareness aspect of the series which requires the simple and fast type of offset reproduction which has been chosen in order to insure a minimum time lag between primary publication of research results and coverage in MECHANICAL PROPERTIES.

In the past six months about 2000 papers have appeared dealing with mechanical properties of metallic and nonmetallic materials; in the coming six months 2000 more will be published. This not only indicates the widespread interest in the field; it also makes clear that no scientist could possibly keep track of what is going on in the field unless he has access to a review series such as MECHANICAL PROPERTIES, which will provide him, within a few minutes, with a succinct summary of the new findings concerning any topic or any material he may be interested in. The subscription to MECHANICAL PROPERTIES thus will help save time and money. Research

duplication will be avoided and ongoing research projects can be adjusted in accordance with the new results that have become available.

Thus MECHANICAL PROPERTIES will help bridge the gap between normal Abstract Periodicals (from which it is rather time consuming to gather information on any specific topic) and well-digested handbooks (which are usually a few years out-of-date). This has been widely accepted by scientists who have begun to work with MECHANICAL PROPERTIES or the sister series DIFFUSION AND DEFECT DATA; as an example we would like to cite the book review published by I. Lowe in the Journal of Applied

#### **Crystallography:**

"A publication of this type fulfils an obvious need. The task of sifting the veritable mountain of published papers for useful nuggets of information grows more difficult and time-consuming each year. The availability of a publication which sorts the literature and classifies papers according to the materials and properties studied is a real boon to workers in this field. The reviewer found five recent papers of interest in as many minutes, and a colleague working in an entirely different field reported a similar experience. The typography is clear and pleasing to the eye, making the volume very easy to use... .. A publication which is a useful reference source ....., at a price not significantly higher than some of the individual journals it surveys."

#### **Abbreviations**

The abbreviations for the journals, proceedings and reports are the same as used by "Chemical Abstracts", "Metals Abstracts" and "Physics Abstracts". Where in doubt, the full journal title can be deduced from the periodic listings of abbreviations in these abstract periodicals.