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NEW TEXTBOOK

*Materials Science
Solid State Physics and Engineering*

Plastic Deformation and Strain Hardening

Pentti O. Kettunen and Veli-Tapani Kuokkala

ISBN 0-87849-906-7

Publication Date: June 2003

430 pages, paperback, €144.00/US\$144.00

Metals are the most thoroughly studied group among the many diverse substances that are the subject matter of Materials Science. They therefore make good paradigms, and furnish invaluable benchmarks, for guiding scientists in deciding how other materials should best be studied in order to reveal most clearly the interrelationships between structure and properties. This holds especially true for the mechanical strength properties which are associated with straining. Once one understands the basic phenomena and relationships pertaining to metals, similar types of rule can then often be transferred to other materials; in spite of the fact that the magnitudes and relative extents of elastic, anelastic and plastic straining may be very different. In recent decades, striking examples and generally encouraging results, of the application of these ideas have been reported for ceramics, polymers - and even for such complex natural composites as wood.

From the point of view of constructional design, strain hardening due to plastic deformation is the key phenomenon as it alone, in many cases, makes constructions remain secure in spite of the dimensioning errors often made by designers. This is why strain hardening, in its various guises, was chosen to be the main theme of the inspiring lecture course which is the basis of this publication.

The celebrated lectures were given by Professor Pentti O. Kettunen at the Institute of Materials Science of Tampere University of Technology, as part of the Physical Metallurgy III course which was intended for students specializing in metallic materials. At the end of each chapter there are challenging exercises, which help the reader further in deepening his or her understanding of the current topic, and which will also be a boon to other lecturers who use this as their course book.

Detailed information on this title - including the full table of contents - is available on the internet at <http://www.ttp.net> or through TTP's E-Mail Preview Service.

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