Book Reviews

D KLAMANN: Lubricants and Related Products (Synthesis, Properties, Applications, International Standards). Verlag Chemie, Weinheim, Deerfield Beach, Florida, Basel 1984. 490 pp. 191 figs, 139 tables.

A new book on lubricants and related products has been published by Prof. Dieter Klamann in cooperation with R. R. Rost, G. Nodop, G. Runge, L. Endom, H.-H. Siebert, G. A. Ehlers, K.-H. Wilhelmi and the Esso A. G. Research Center (Hamburg-Harburg, FRG).

The technology of lubricants and related products has been greatly extended and subtilised during the past decades. Mineral oil fractions without additives are no more sufficient as lubricants for modern equipment. Even additive — containing hydrocarbon oils fail often in complying with requirements and expectations concerning lubrication.

About 30% of the total energy produced is wasted by friction and beyond that, wear causes considerable losses of materials. Up to 4.5% of the energy consumed could be conserved by better lubrication.

Thus lubricants have become important elements of apparatus design and aids of machine operation. Therefore the science of friction, wear and lubrication, i.e. tribology became an extremely complicated and a specialized field of science.

Lately a great number of books have been published on tribology, most of them stressing questions of apparatus design and operation, while chemical aspects of lubricants and lubrication have been given less attention. Therefore this new book, treating also the chemical aspects of lubrication is nowadays of eminent importance.

The book discusses shortly general aspects of tribology, e.g. friction, viscosity, lubrication, wear and ageing of lubricants.

After this a comprehensive, short survey of production of lubricating oils from petroleum is given, followed by a chapter on reconditioning and regeneration of used lubricating oils.

One of the most interesting and very modern features of the book is the detailed discussion of synthetic and solid lubricants, comprising description of synthetic hydrocarbon-oils, polyether-oils, ester-oils, silicon containing oils, halogenated hydrocarbons and halocarbons as well as special synthetic lubricants. A short chapter indicates tendencies in gas lubrication. In the chapter on solid lubrication, next to the well known problem of MoS_2 and graphite etc., metal films, self-lubricating materials, chemical surface layers and use of plastics in lubrication are discussed.

The problem of additives is one of the most important questions in modern lubrication. The most frequently used types and their application problems are discussed, to give a sufficient information to consumers in the understanding of this very sophisticated problem.

In the chapters no. 11 and 12 on available products, basic application information is given on all automotive and industrial oils as well as on metal working fluids, lubricating greases and related products.

Special chapters deal with the finishing, storage, transport of lubricants and human factors are considered in chapters on environmental protection and toxicology.

Summing up: all areas of theoretical and practical interest are dealt with and all types of lubricants and related products are described and therefore the book will serve as an authentic, very modern, practical and informative guide for scientists and technologists involved with the production, application and distribution, as well as with the research and development of lubricants.

The work of Prof. Dr. Klamann is a most valuable contribution to technical literature of tribology, lubrication and oil application, a book, which should be present on the bookshelves of every specialist and engineer concerned with the design and operation and maintenance of machinery of any kind.

E. VÁMOS

R. E. MARK: Handbook of Physical and Mechanical Testing of Paper and Paperboard Vol. I. Marcel Dekker, INC., New York 1983. 672 pp.

The first volume of the handbook published in the United States in 1983 deals with the physical and mechanical testing of paper and paperboard through 640 pages.

The various chapters are authored by widely known leading experts of the special fields.

The first part of the handbook is compiled by A. H. Nissan and is entitled by "Introduction to Paper Testing" and "Retrospect and Prospect of Physical and Mechanical Testing of Paper and Paperboard".

The second part of the book details the "Theory and Test for Mechanical Parameters" including the following chapters:

R. W. Perkins, jun: Models for Describing the Elastic, Viscoelastic and Inelastic Mechanical Behaviour of Paper and Board

Tetsu Uesaka: Specimen Design for Mechanical Testing of Paper and Paperboard

V. C. Setterholm and D. E. Gunderson: Observation on Load-Deformation Testing

J. A. Johnson, K. A. Bennett and H. M. Montrey: Failure Phenomena

P. Kolseth and A. de Ruvo: The Measurement of Viscoelastic Behaviour for the Characterization of Time-, Temperature-, and Humidity-dependent Properties

C. Fellers: Edgewise Compression Strength of Paper

J. W. Koning, Jun.: Corrugated Fiberboard

R. E. Mark and P. P. Gillis: Mechanical Properties of Fibers

H. Hollmark: Mechanical Properties of Tissue

In the third part of the book the subject of "General Instrumentation" is dealt with according to the next subchapters:

J. L. de Yong: Conditioned Test Atmosphere

J. M. Mendel and C. V. Davis: Data Acquisition and Processing by Mini or Microcomputers

H. R. Schuierer: Equipping the Paper and Board Testing Laboratory

H. R. Schuierer: Interlaboratory Reference Systems

The enclosure contains the list of testing standards.

Comprehensively it can be stated that the first volume of the handbook discusses the testing methods of paper and paperboard at an up-to-date high standard and with high-level mathematical tools.

The book is very useful in the university and high-school education and may command interest among rasearchers and engineers engaged in paper producing and processing industry, as well as in printing industry.

J. ERDÉLYI