

## ABOUT THE BOOK

The objective of this book is to provide guidelines for engineers helping them to improve machine lifetime performance and reliability. This book contains a wide range of illustrations, into how machine elements may fail, how to analyse the cause of the failure, and, most importantly, how failures may be prevented.

The main properties of materials and lubricants are considered to enable the design engineer to make logical decisions on materials and lubricants selection for specific applications.

Furthermore, the possibilities of pushing the boundaries of load-carrying capability and motion control are explored. With newly gained insights the engineer is better equipped to reach innovative solutions to further optimize machine lifetime performance, improve machine reliability and simultaneously to minimize the need of maintenance.

Many design tools, design charts and guide lines are discussed. User-friendly PC calculators of the formulae derived in this book are made available, including calculators for calculating load capability, friction, frictional heating and wear of machine elements in relative motion. Using these calculators design engineers will save much time in determining the outcomes of selecting specific design parameters.

The formulae used in the calculators are also available in Mathcad files. With these files the designer may in a user-friendly way adapt or extend calculations for specific applications. In fact this book is a goldmine of information for any engineer who intends to improve machine lifetime performance and reliability.

The text of this book is divided into two parts. The first concerns “Dynamic Contact Phenomena” including static and dynamic load rating of Hertzian contacts, friction phenomena, wear mechanisms, machine lubrication, material selection and failure analysis. It is expected that this part belongs to the under-graduate program of mechanical engineering.

The second part concerns “Full Film Lubrication” and includes the study of hydrodynamic lubricated bearings and sliders, squeeze film damping and dynamic response, dynamic sealing systems, EHL rolling and traction mechanisms, hydrostatic bearings and pressurised gas bearings. Although the designer using this part is expected to have a good background in mathematics, the objective is that the design tools illustrated by cases will be useful anyhow.

<p>This book contains 432 pages and over 250 illustrations, 300 formulae, 100 case studies and design examples, 50 easy calculators and 50 photographs of machine element failures. Although most case studies are supported by easy calculators the formula used are also available in Mathcad files. Both the Mathcad files and the calculators can be run from CD or the Internet site <a href="http://www.tribology-abc.com">www.tribology-abc.com</a></p>
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