

# Engineering Tribology

Third Edition



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# ENGINEERING TRIBOLOGY

THIRD EDITION

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# ENGINEERING TRIBOLOGY

*To the most important persons in our lives*  
**Grazyna Stachowiak**  
**Gwidon (Jr.) Stachowiak**  
*and*  
**Valli M. Batchelor**  
**Diana, Vicky & Vincent Batchelor**

## P R E F A C E

Several years ago, the idea arose to write a general book on tribology. Students often requested a suitable book for the study of tribology and there were problems in recommending any one textbook. Existing textbooks were either too specialized or too literal. Many books provided exhaustive reviews of friction and wear data while others provided detailed description of the lubrication and wear problems occurring in machinery. A book which explains the concepts of tribology in terms useful to engineering students and engineers was, however, lacking. In many cases the basic models of friction and wear were not explained adequately. As a result more sophisticated concepts could not be understood. The interdisciplinary nature of tribology with knowledge drawn from different disciplines such as mechanical engineering, materials science, chemistry and physics leads to a general tendency for the chemist to describe in detail, for example, lubricant additives, the mechanical engineer to discuss, for example, pad bearings and so on, with no overall guide to the subject. In this book, the interaction between these different fields of knowledge to achieve the final result, the control of friction and wear, is emphasized. The interdisciplinary view of tribology was largely developed by Professor Alastair Cameron about three decades ago and has proved to be the most successful way of analysing friction and wear problems.

In many cases tribology is viewed as an inaccessible subject which does not produce useful answers. In this book we try to redress this problem. Rutherford's maxim, that 'any good scientific theory is explainable to the average barmaid', is applied in this book with various concepts explained in the simplest possible terms with supporting illustrations.

In this third edition of 'Engineering Tribology' we aim to update the contents of the second edition while maintaining its style. In this edition a number of extra topics have been included to make the book more comprehensive. The listings of literature citations have been extended to include recent findings from tribology research. Extra diagrams have also been included where it was found that the readability of the original text could be improved. Computer programs used in the numerical analysis have been upgraded to allow for the friction stress and friction coefficient calculations. A new chapter on 'Current Trends in Tribology' has been written to conclude the book. To provide opportunities for active learning, a series of revision questions are provided at the end of each chapter. This should be helpful in assessing the understanding for both students and lecturers. Despite all these changes, the purpose of writing 'Engineering Tribology' remains the same, i.e., to provide a reader-friendly and comprehensive introduction to the subject of tribology and its implications for engineering. This edition, like the previous editions, is intended for final year under-graduate and post-graduate students and professional engineers. The subject matter of the book is also relevant to mechanical and materials engineering, applied chemistry, physics and biomedical courses.

Gwidon W. Stachowiak

Andrew W. Batchelor

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