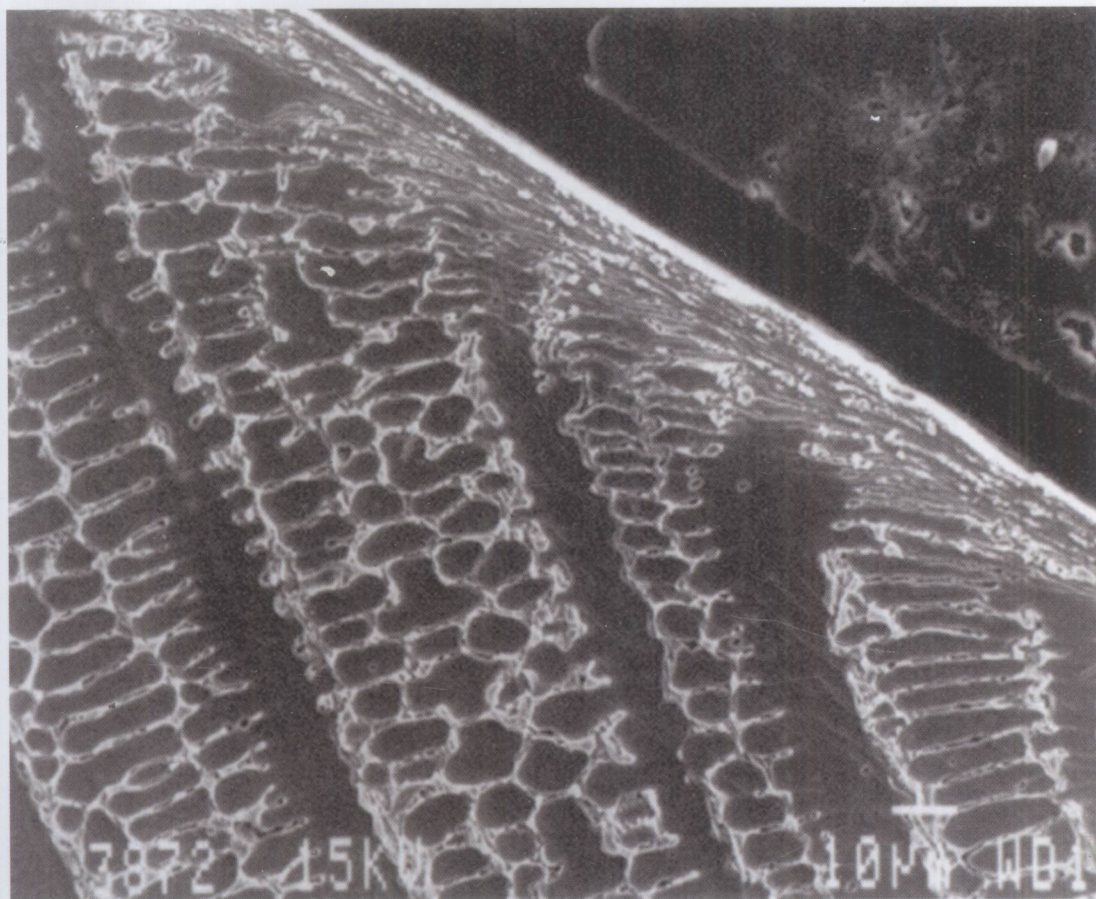


Edited by Alfons Fischer
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 WILEY-VCH

Friction, Wear and Wear Protection

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TB302.3-53
F897
2008

Friction, Wear and Wear Protection

International Symposium on Friction, Wear
and Wear Protection 2008 Aachen, Germany

Edited by
Alfons Fischer and Kirsten Bobzin



E2010000739

DGM

Deutsche Gesellschaft
für Materialkunde e.V.



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Library of Congress Card No.:

applied for

British Library Cataloguing-in-Publication Data

A catalogue record for this book is available from the British Library.

Bibliographic information published by the Deutsche Nationalbibliothek

The Deutsche Nationalbibliothek lists this publication in the Deutsche Nationalbibliografie; detailed bibliographic data are available on the Internet at <<http://dnb.d-nb.de>>.

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Typesetting WGV Verlagsdienstleistungen, Weinheim

Printing Strauss GmbH, Mörlenbach

Binding Litges & Dopf GmbH, Heppenheim

Cover Design Adam-Design, Weinheim

Printed in the Federal Republic of Germany
Printed on acid-free paper

ISBN: 978-3-527-32366-1

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ISBN: 978-1-86058-288-2



Preface

Friction, Wear, and Wear Protection 2008

Basics – Materials – Tools – Parts – Coatings – Processes

It is certainly one of the major challenges of material scientists and mechanical engineers to cope with the demands for long lasting and reliable systems in all markets and for all applications. The loss of energy by friction and the limits of endurance by wear should be countered by well selected materials and surfaces. The economical and ecological significance of this is undisputable and can sum up to 4 % of the gross national product of industrial countries. Although the basic understanding of the mechanisms of friction and wear has remarkably increased during the last five decades, many technical solutions are still carried out following "trial and error". But any well-aimed selection of the most suitable surface materials, the optimal topography, and the properly adjusted chemistry in combination with productional and structural properties require a systematic approach and a deep understanding of the acting mechanisms. Thus friction, wear, and wear protection are truly interdisciplinary fields that integrate scientists from basic and applied science as well as engineering.

This publication represents the contributions of many different aspects of tribology which have been presented at the International Symposium on Friction, Wear, and Wear Protection from April 9th to 11th, 2008, in Aachen, Germany.

Beside aspects of metals, ceramics, polymers and their composites as bulk materials or thick and thin coatings modelling and the emerging field of computer simulation were of certain interest. Thus new understanding could be gained by modern testing and surface analysis techniques supported by computer simulations on all length scales. This combination helps to correlate the macroscopic parameters with the micro- and nanoscopic alterations of topography, chemistry, physics and microstructure of near surface materials, the interfacial media, and the environment.

Today we can find wear resistant and low friction materials by means of a systemic analysis for any tribosystem e.g. under extreme environments or the demand of being environmentally friendly. Still these materials cannot be separated from appropriate production processes of whatever kind, which finally must result in a reliable and affordable product.

Besides the traditional areas like mining, plant construction, automotive, air- and spacecraft, tooling, and civil engineering modern tribomaterials have to be also available for micro- and nanosystems as well as for information and medical technologies. Thus members from all disciplines working in basic and applied research, development, and the application of tribomaterials took part and discussed the latest findings on the basic understanding of friction and wear and shared possible solutions for wear protection.

This publication would not have been possible without the authors and the reviewers of these papers. Thus we would like to thank all of them for their valuable contributions. In particular the editors would like to thank Prof. Dr.-Ing. Hubertus Murrenhoff and Dr.-Ing. Nazlim Bagci-van RWTH Aachen as well as Dipl.-Ing. Mareike Hahn and Dipl.-Ing. Robin Pourzal, Universitaet Duisburg-Essen, for their involvement and steady support during the reviewing process.

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