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# Surface Effects and Contact Mechanics IX

## Computational Methods and Experiments

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# Preface

This book contains papers presented at the Ninth International Conference on Surface Effects and Contact Mechanics held from June 9–11, 2009 in Algarve, Portugal. Previous conferences in the same series were organized in Southampton (1993), Milano (1995), Oxford (1997), Assisi (1999), Sevilla (2001), Crete (2003), Bologna (2005) and at Wessex Institute of Technology, Ashurst, UK (2007). This series of conferences is aimed at encouraging international collaboration among the participants and the exchange of new ideas. In particular the book deals with the interplay between applied physics, materials science, computational mechanics and mechanical engineering.

To an increasing degree the search is for surface modification techniques, which can increase the wear and corrosion resistance of materials. Unfortunately, there exists an almost bewildering choice of surface treatments that cover a wide range of thickness. It is worth noting here that wear resistance is a property, not of materials but of systems, since the material of the work-piece always wears against some other medium. It is its relation to its environment – e.g. lubrication, speed of sliding/rotation – that determines the wear and corrosion resistance of the material in a given construction. The characteristics of the system, e.g. whether the wear is caused by delamination or abrasion, determine which of the surface engineering methods should be chosen. The combination surface treatment and contact mechanics is an important one.

In this book various new developments are highlighted, both from an experimental and computational viewpoint. Special emphasis is given to the application of advanced theoretical and experimental approaches. Papers have been grouped into the following subject areas:

- Surface treatments
- Thick coatings
- Thin coatings
- Surface problems in contact mechanics
- Indentation and hardness
- Fatigue

- Numerical analysis
- Applications and case studies

Thanks are due to the authors for their contributions. The editors are also grateful to the members of the International Scientific Advisory Committee, and other colleagues, who helped in the reviewing process to ensure the quality of the conference and this book.

The Editors  
Algarve, 2009

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