

# Table of Contents

## Preface

## Chapter 1: Friction, Mechanical Wear and Vibration in Machines

|                                                                                                                                                                                         |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Effect of Surface Roughness on the Friction Moment in a Ball Bearing</b><br>H. Kumar and M. Tiwari                                                                                   | 3  |
| <b>A Study on the Effects of Cam Eccentricity and Cylinder Phase Angle on the Output Performance of a Two Cylinder Stirling Engine</b><br>C.K. Lin, S.C. Yang, W.K. Liang and Y.X. Wang | 13 |
| <b>Auxiliary Lubrication Effects of Polyolefin Resin and Porous Polymer Materials Used in the Linear Slide Rails</b><br>H.Y. Wang, Y.P. Chang, P.C. Huang, C.Y. Kuo and J.C. Wang       | 19 |

## Chapter 2: Tribological Performance of Protective Coatings

|                                                                                                                                                      |    |
|------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Mechanical Properties and Cutting Performance of CH<sub>x</sub>-TiNbAlN Coatings</b><br>W.H. Kao and B.Y. Chen                                    | 27 |
| <b>Mechanical and Tribological Properties of NbC<sub>x</sub> Coatings with Different C<sub>2</sub>H<sub>2</sub> Fluxes</b><br>W.H. Kao and Y.C. Cian | 33 |

## Chapter 3: Friction, Wear and Vibration Processes in Materials Processing

|                                                                                                                                                                     |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <b>Forging Process of Graphite Lubricated LED Lamp Heat Sink</b><br>T.S. Yang and M.W. Ke                                                                           | 41 |
| <b>Ductile Fracture Analysis of Lubricated Magnesium Alloy Sheet during Hemispherical Deep Drawing Process at Elevated Temperatures</b><br>T.S. Yang and G.Z. Cheng | 49 |
| <b>Feasibility Study of Friction Stir Drilling of Pet Recycled Nonwoven Sheets</b><br>C.T. Liu, Y.P. Chang, J.T. Guo and W.L. Kuo                                   | 55 |
| <b>Fatigue Life Prediction of a CNC Machine Spindle Support Shaft under Realistic Loading Using RecurDyn Simulation</b><br>Y.L. Hwang and A. Munir                  | 61 |
| <b>Dynamic Analysis of CNC Machine Tool Structures Using FBGMT and R-Flex Flexible Multibody Dynamics Approaches</b><br>Y.L. Hwang and N. Ahmad                     | 71 |