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| 1. Record Nr.           | UNINA9910822995303321                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Autore                  | Bonneau D (Dominique)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Titolo                  | Mixed lubrication in hydrodynamic bearings / / Dominique Bonneau, Aurelian Fatu, Dominique Souchet                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| Descrizione fisica      | 1 online resource (200 p.)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Collana                 | Numerical Methods in Engineering Series                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Disciplina              | 665.5385                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Soggetti                | Lubrication and lubricants<br>Fluid-film bearings - Mathematical models<br>Bearings (Machinery)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Lingua di pubblicazione | Inglese                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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| Livello bibliografico   | Monografia                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Note generali           | Description based upon print version of record.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Nota di bibliografia    | Includes bibliographical references and index at the end of each chapters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Nota di contenuto       | Cover; Title Page; Copyright; Contents; Preface; Nomenclature; Chapter 1: Introduction; 1.1. Lubrication regimes - Stribeck curve; 1.2. Topography of rough surfaces; 1.2.1. 2D profile parameters; 1.2.1.1. Definition of the reference height; 1.2.1.2. Statistical treatment of the ordinate; 1.2.1.3. Statistical treatment of the ordinate respective to the abscissa; 1.2.1.4. Fractal analysis; 1.2.2. Common standard profile parameters; 1.2.2.1. EN ISO 4287, 4288 Standard: "Mean line"; 1.2.2.2. NF EN ISO 12085 Standard "motifs and envelope line"; 1.2.2.3. EN ISO 13565 standard: Abbott curve<br>1.3. BibliographyChapter 2: Computing the Hydrodynamic Pressure; 2.1. Patir and Cheng stochastic model; 2.1.1. Model description; 2.1.2. Computation of the flow factors; 2.1.3. Computation of the friction torque for a journal bearing; 2.1.4. Application limits for the Patir and Cheng model; 2.2. Model based on a direct computation of the flow factors; 2.2.1. Model description; 2.2.2. Introduction of the cross-factors: new expression of the Reynolds equation.; 2.2.3. Flow factors calculation methods |

2.2.4. Calculation of the hydrodynamic load capacity and friction force in the presence of the contact zones; 2.2.5. Recommendations for the calculation of flow and shear factors; 2.2.6. Calculation of the principal direction; 2.2.7. Analysis of the combination of two combined rough surfaces; 2.2.8. Examples relating to real rough surfaces; 2.3. Homogenization method; 2.3.1. Incompressible and isoviscous steady-state case; 2.3.2. Incompressible and isoviscous unsteady case; 2.3.3. Taking into account the cavitation; 2.3.4. Non-Newtonian or thermoviscous fluid; 2.3.5. Implementation for internal combustion engine bearing computation; 2.4. Comparison between the flow factors obtained with Patir and Cheng, direct computation and homogenization models; 2.5. Example of pressure profiles obtained from flow factors calculated with Patir and Cheng, direct computation and homogenization models; 2.6. Comparison with deterministic computations; 2.7. Bibliography; Chapter 3: Computing the Contact Pressure; 3.1. Concept of sum surface; 3.1.1. The microgeometric properties of the sum surface; 3.1.2. Elastic and plastic properties of the sum surface; 3.2. Elastic contact model proposed by Greenwood and Williamson; 3.3. Elasto-plastic contact model proposed by Robbe-Valloire et al.; 3.3.1. Elasto-plastic constitutive law; 3.3.2. Description of microgeometric properties of rough surfaces; 3.3.2.1. Asperities' radius; 3.3.2.2. Distribution of asperities' heights; 3.3.3. Asperity deformation; 3.3.3.1. Elastic deformation; 3.3.3.2. Elasto-plastic deformation; 3.3.3.3. Plastic deformation; 3.3.4. Contact between two rough surfaces; 3.4. Elasto-plastic double-layer contact model proposed by Progre et al.; 3.4.1. Elastic regime; 3.4.2. Elasto-plastic and plastic regimes

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## Sommario/riassunto

This Series provides the necessary elements to the development and validation of numerical prediction models for hydrodynamic bearings. This book is dedicated to the mixed lubrication.

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