

1. Record Nr.	UNINA9910830771103321
Titolo	Tribology and characterization of surface coatings // edited by Sarfraj Ahmed, Vinayak S. Dakre
Pubbl/distr/stampa	Hoboken, NJ : , : John Wiley & Sons, Inc., , 2022
ISBN	1-119-81887-7 1-119-81885-0 1-119-81886-9
Descrizione fisica	1 online resource (330 pages)
Disciplina	620.44
Soggetti	Surfaces (Technology) Tribology
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di contenuto	Cover -- Half-Title Page -- Series Page -- Title Page -- Copyright Page -- Contents -- Preface -- 1 Overview of Coating Deposition Techniques -- 1.1 Introduction -- 1.2 Thin-Film Characteristics -- 1.3 Techniques Based on Physical Deposition Processes -- 1.3.1 Evaporation -- 1.3.1.1 Mean-Free Path: A Significant Parameter for High-Quality Evaporation -- 1.3.2 Sputtering -- 1.3.2.1 Characteristics of Sputtering -- 1.3.2.2 Types of Magnetron Sputtering Technique -- 1.3.3 Other Techniques Based on Physical Deposition Processes -- 1.4 Techniques Based on Chemical Deposition Processes -- 1.4.1 Chemical Vapor Deposition (CVD) -- 1.4.1.1 Atmospheric Pressure Chemical Vapor Deposition (APCVD) -- 1.4.1.2 Low-Pressure Chemical Vapor Deposition (LPCVD) -- 1.4.1.3 Metal Organic Chemical Vapor Deposition (MOCVD) -- 1.4.1.4 Plasma Enhanced Chemical Vapor Deposition (PECVD) -- 1.4.1.5 Laser Chemical Vapor Deposition (LCVD) -- 1.4.2 Atomic Layer Deposition (ALD) -- 1.4.2.1 ALD Versus CVD Deposition Technique -- 1.4.3 Other Techniques Based on Chemical Deposition Processes -- 1.5 Present Status and Future Scope -- 1.6 Conclusion -- References -- 2 Tribological Investigation of Developed Nanocomposite Mos2-Tio2-Zro2 Coating Material -- 2.1 Introduction -- 2.2 Materials and Methods -- 2.3 Experimental Details -- 2.4 Results and Discussions -- 2.5 Conclusions -- References -- 3

Methods of Microstructural Characterization of Coatings -- 3.1
Introduction -- 3.2 X-Ray Diffraction -- 3.2.1 Coating Texture -- 3.2.2
Residual Stress Measurement -- 3.3 Atomic Force Microscopy -- 3.4
Scanning Electron Microscopy -- 3.5 Energy Dispersive X-Ray
Spectroscopy -- 3.6 Transmission Electron Microscopy -- 3.7 X-Ray
Photoelectron Spectroscopy -- 3.8 Electron Probe Microanalysis -- 3.9
Secondary Ion Mass Spectroscopy -- 3.10 Raman Spectroscopy -- 3.11
Conclusion -- References.

4 Wear Mechanisms and Methods of Wear Testing -- 4.1 Introduction
-- 4.2 Mechanisms of Wear -- 4.2.1 Adhesion -- 4.2.2 Abrasion --
4.2.3 Surface Fatigue -- 4.2.4 Corrosion -- 4.2.5 Erosion -- 4.2.6
Fretting -- 4.2.7 Impact -- 4.2.8 Thermal -- 4.3 Methods of Wear
Testing -- 4.3.1 Sliding Wear Test -- 4.3.2 Rolling Wear Test -- 4.3.3
Scratch Wear Test -- 4.3.4 Abrasion Wear Test -- 4.3.5 Erosion Wear
Test -- 4.3.6 Impact Wear Test -- References -- 5 Mechanical Behavior
of Thermal Spray Coatings -- 5.1 Introduction -- 5.2 Elastic Modulus
and Fracture Toughness -- 5.2.1 Effect of Microstructure on Fracture
Toughness -- 5.3 Evaluation of Residual Stress -- 5.4 Conclusion --
References -- 6 Tribological Properties of Carbon-Based Coatings --
6.1 Introduction -- 6.1.1 Classification of Carbon-Based Coatings --
6.1.1.1 DLC Coatings -- 6.1.1.2 Diamond Coatings -- 6.2 Deposition
of Carbon-Based Coatings -- 6.2.1 Physical Vapor Deposition
Techniques -- 6.2.2 Chemical Vapor Deposition Techniques -- 6.3
Tribo-Mechanical Characteristics of Carbon-Based Coatings -- 6.3.1
H-Free a-C or DLC Coatings -- 6.3.2 Hydrogenated a-C (H-DLC)
Coatings -- 6.3.3 ta-C Coatings -- 6.3.4 Diamond Coatings: MCD,
NCD, and UNCD -- 6.3.5 Metal-Doped Carbon-Based Coatings -- 6.4
Factors Influencing Tribological Properties of Carbon-Based Coatings
-- 6.5 Conclusions -- References -- 7 Performance Evaluation of
Journal Bearing Under Thin-Film Lubrication -- 7.1 Introduction -- 7.2
Governing Equations -- 7.2.1 Hydrodynamic Lubrication Modeling --
7.2.2 Thin-Film Lubrication Modeling -- 7.3 Solution Strategy -- 7.4
Performance Characteristics -- 7.4.1 Load Carrying Capacity and
Attitude Angle -- 7.4.2 Frictional Characteristics -- 7.4.3 Oil Flow Rate
-- 7.4.4 Frictional Torque and Energy Loss -- 7.5 Results and
Discussion -- 7.6 Conclusions -- Nomenclature -- Dimensionless
Parameters.
References -- 8 Bioactive Coatings for Biomedical Applications -- 8.1
Introduction -- 8.2 Surface Coating -- 8.3 Polyether Ether Ketone --
8.4 Nitride Composites Coating -- 8.5 Binary Transition Metal Nitride
Coatings -- 8.6 Hydroxyapatite-Based Coating -- 8.7 Bioactive Glass
Coatings -- 8.8 Composite Coatings -- 8.9 Conclusions -- References
-- 9 Study of Tribological Behavior and Wear Mechanism of
Nanocomposite Coatings -- 9.1 Introduction -- 9.1.1 Techniques
Employed for Depositing Nanocoatings -- 9.1.1.1 Electrodeposition
Coating -- 9.1.1.2 Plasma Detonation Technology -- 9.1.1.3 Vacuum
Arc Deposition -- 9.1.1.4 Sol-Gel Technique -- 9.1.1.5 Cold Spray
Method -- 9.1.1.6 Chemical Vapor Deposition -- 9.1.1.7 Physical
Vapor Deposition -- 9.1.1.8 Thermal Spray Method -- 9.1.1.9 Solution
Dispersion -- 9.1.1.10 Spray Coating -- 9.1.1.11 Dip Coating -- 9.2
Applications of the Different Nanocomposite Coating Techniques --
9.2.1 The Future of Nanocoatings -- 9.3 Effect of Different Coating
Techniques on the Mechanical Properties of the Materials -- 9.4
Corrosion Behavior in Nanocoatings -- 9.5 Wear Mechanism in
Nanocoatings -- References -- 10 Investigation of Automotive Disc
Brake's Material Based on Tribological Parameters by Using
Computational Structural Analysis -- 10.1 Disc Brake -- 10.1.1
Introduction -- 10.1.2 Materials Used in Disc Brakes -- 10.2 Literature

Survey-Problem Description and Solution Technique -- 10.2.1 Problem Descriptions -- 10.2.2 Methodology Used-Computational Structural Analysis -- 10.3 Structural Analysis -- 10.3.1 Conceptual Design -- 10.3.2 Pre-Processing -- 10.3.3 Mathematical Modeling Used in this Finite Element Analysis -- 10.3.4 Generation of Grid and Its Convergence Study -- 10.3.5 Numerical Results on Disc -- 10.3.6 Comparative Analysis of Disc -- 10.3.7 Numerical Simulation on Brake Pad.
10.3.8 Comparative Analysis of Brake Pad -- 10.4 Theoretical Investigations -- 10.4.1 Investigation-1 -- 10.4.2 Investigation-2 -- 10.4.3 Investigation-3 -- 10.5 Conclusion -- References -- 11 Studies of Nanomechanical and Wear Testing Methods of Thermal Sprayed Coatings -- 11.1 Introduction -- 11.2 Nanowear Testing Methods -- 11.2.1 Nanoscratch Testing -- 11.2.2 Nanofretting Wear Testing -- 11.3 Nanomechanical Testing Methods -- 11.3.1 Nanoindentation Technique -- 11.3.2 Nanoimpact Test -- 11.3.3 Micropillar Compression -- 11.4 An Overview of Past Research -- 11.5 Design of a New Coating -- 11.6 General Discussions -- References -- 12 Overview of Biological Tissue Properties for Biotribology -- 12.1 Introduction -- 12.2 Tissue Interaction With Implant -- 12.2.1 Bone -- 12.2.2 Compact Bone -- 12.2.3 Trabecular Bone -- 12.2.4 Mechanical Property of Bone -- 12.3 Anisotropy -- 12.4 Heterogeneity -- 12.5 Aging -- 12.6 Hysteresis -- 12.7 Bone Remodeling -- 12.8 Joint -- 12.9 Biomechanics of Cartilage Degeneration -- 12.10 Biotribology of Total Hip Replacement (Metal-on-Metal Articulation) -- 12.11 Conclusion -- References -- 13 Mechanical Behavior of Single and Multilayer Hardfacing on Ferrous Alloys -- 13.1 Introduction -- 13.2 Experimental Details -- 13.2.1 Hardfacing Procedure -- 13.2.2 Characterization of the Stellite Hardfaced Surface -- 13.2.3 Erosion Investigation -- 13.2.4 Eroded Sample Characterization -- 13.3 Outcome -- 13.3.1 Hardfaced Layer Behavior -- 13.3.2 Rate of Erosion -- 13.3.3 Eroded Sample Inspection -- 13.4 Discussion -- 13.4.1 Literature Observations -- 13.4.2 Common Erosion Behavior -- 13.4.3 Deformation Depth -- 13.4.4 Efficiency of Erosion -- 13.4.4.1 Abrasive Wear -- 13.4.4.2 Sliding Wear -- 13.4.4.3 Erosive Wear -- 13.4.4.4 Microstructures for Fe-Cr Hardfaced Layers -- 13.5 Conclusions -- References -- Index -- EULA.
