1. Record Nr. UNINA9910847089603321 The 17th International Conference Interdisciplinarity in Engineering: Titolo Inter-Eng 2023 Conference Proceedings - Volume 1 / / edited by Liviu Moldovan, Adrian Gligor Cham:,: Springer Nature Switzerland:,: Imprint: Springer,, 2024 Pubbl/distr/stampa 3-031-54664-4 **ISBN** [1st ed. 2024.] Edizione Descrizione fisica 1 online resource (605 pages) Lecture Notes in Networks and Systems, , 2367-3389 ; ; 926 Collana 620 Disciplina Soggetti **Engineering mathematics** Engineering - Data processing Industrial engineering Production engineering Computational intelligence Mathematical and Computational Engineering Applications Industrial and Production Engineering Computational Intelligence Lingua di pubblicazione Inglese **Formato** Materiale a stampa Livello bibliografico Monografia Note generali Includes index. Nota di contenuto Intro -- Foreword -- Contents -- Evaluation of AA 7075-T6 Allov's Corrosion Behavior Using Salt Spray Test -- 1 Introduction -- 2 Materials and Methods -- 2.1 Material -- 2.2 Methods -- 3 Results and Discussion -- 3.1 Pitting Density of AA705 -- 3.2 Weight Loss of AA 7075T6 -- 3.3 Electrical Conductivity of AA7075 T6 -- 4 Conclusion -- References -- Stress Corrosion of AA2024 Aluminium Alloy: Effects of Shot Peening in Sodium Chloride Solution -- 1 Introduction -- 2 Materials and Methods -- 3 Results and Discussion -- 3.1 Microstructure of 2024T3 Aluminum Alloys -- 3.2 Mass Loss of AA2024 T3 Alloy -- 3.3 Stress Corrosion Test -- 4 Conclusion --References -- E2ZB Approximation of the Cylindrical Roller Optimal Profile to Increase the Performance of Rolling Bearings -- 1 Introduction -- 2 Cylindrical Roller Optimal Profile -- 3 Enhanced E2ZB

Profile -- 4 E2ZB Optimal Approximation -- 4.1 Objective Function Definition -- 4.2 Optimization Algorithm -- 5 Case Study -- 5.1 Case

3: RICw= 0.100 mm, = 130" -- 6 Conclusions -- Annex --References -- Analyzing the Productivity and Costs Between 3D Printed Ceramic and CNC Machined Aluminum Wax Injection Tool in Lost Wax Casting -- 1 Introduction -- 2 The Design of the Gating System and the Tree Assembly -- 3 General Information's About the Baking Process -- 4 FDM Rapid Prototyping -- 5 3D Printing Ceramic Injection Tool via SLS Technology -- 6 Virtual Casting Simulations -- 7 CNC Machined Aluminum Wax Injection Tool -- 8 Conclusions -- References -- Free Vibration Analysis of Orthotropic Thin Rectangular Plates -- 1 Introduction -- 2 Experimental Set-Up -- 2.1 Materials -- 2.2 Experimental Modal Analysis -- 3 Results and Discussion -- 4 Conclusion -- References. Impact of Organic Ingredients on the Frictional Performance of NAO Brake Pad -- 1 Introduction -- 2 Natural Fibers -- 3 Friction Additives -- 4 Binders -- 5 Fillers -- 6 Characteristics and Properties of Sustainable Composite Materials in Brake Pads -- 7 Advantages and Drawbacks of Natural Material -- 8 Conclusion -- References --Effects of Cutting Parameters on Surface Roughness and Flank Wear in Face Turning of Inconel 718 -- 1 Introduction -- 2 Literature Review -- 3 Research Methodology -- 4 Results -- 4.1 Taguchi Results -- 4.2 ANOVA Results -- 5 Conclusion -- References -- Analysis of the Wear of Die Cut Knives Used in Flexographic Technology -- 1 Introduction --2 Experimental Research -- 2.1 Choosing Representative Die Cuts --2.2 Analysis of Representative Die Cuts Defects -- 3 Results and Discussion -- 4 Conclusions -- References -- Effect of Foam Thickness on Two-Wheeler Seat in View of Seat Height Adjustment and Vibration Damping -- 1 Introduction -- 1.1 Seat Height Adjustable Devices -- 2 Materials and Methods -- 2.1 Material Properties and Boundary Conditions -- 2.2 Modal and Harmonic Analysis -- 3 Result and Discussion -- 3.1 Modal Analysis -- 3.2 Harmonic Analysis -- 4 Conclusion -- References -- Rail Fastening Maintenance Impact on Track Stability for Continuously Welded Rail Tracks -- 1 Literature Review -- 1.1 Introduction -- 1.2 Rail Track Stability Calculus Methods -- 2 Calculus of CWR Track Stability -- 2.1 CWR Track Critical Stability Loss Force Determined Using the Energetic Method -- 2.2 Stability Condition for CWR Track -- 2.3 Stability Calculus for CWR Track the Critical Stability Force Represented as a Curved Surface -- 3 Conclusions -- References -- Dynamics of Fine Boring of Intermittent Surfaces -- 1 Introduction -- 2 Literature Review -- 3 Research Methodology -- 4 The Main Part -- 5 Conclusion -- References. Optimization of the Processes of Operation of Basalt Plastic Friction Unit -- 1 Introduction -- 2 Objects and Research Methods -- 3 Discussion of the Results -- 4 Conclusion -- References -- A 3D-Printed Functional Knee Orthosis for Daily Activities -- 1 Introduction -- 2 Functional Knee Orthosis Design -- 3 Materials Used to Make the Functional Knee Orthosis -- 3.1 Printing Material - PLA -- 3.2 Metal Material -C45 -- 4 Printing the Functional Orthosis -- 5 Conclusions --References -- Stress in the Strap of the Safety Belt with Accidental Burns -- 1 Introduction -- 2 Testing Method -- 3 Result -- 3.1 Result Traction Strap New Condition -- 3.2 Result for Strap Burned -- 4 Conclusions -- References -- Sound Absorption Characteristics of Orthotropic Porous Materials -- 1 Introduction -- 2 Materials and Methods -- 2.1 Sample Preparation -- 2.2 Experimental Method --3 Results and Discussion -- 3.1 Sound Absorption Coefficient -- 3.2 Acoustic Absorption Properties Versus Porosity -- 4 Conclusion --References -- Constructive Solution and Mounting Technology for Two Pedestrian Walkways Over the Some River -- 1 Introduction -- 2

1: RICw= 0, = 0 -- 5.2 Case 2: RICw= 0.100 mm, = 0 -- 5.3 Case

Aspects Regarding the Structure Resistance -- 3 The Level of Traffic Comfort Correlated with the Pedestrians' Density -- 4 Dynamic Analysis of the Footbridge Corelated with Pedestrian's Traffic Comfort -- 5 Superstructure Mounting Technology and its Effect on the Effort State in the Deck -- 6 Conclusions and Final Remarks -- References --Efficiency of Silica Fume and Fly Ash in Road Concrete -- 1 Introduction -- 2 Experimental Program -- 2.1 Materials and Samples -- 3 Results and Discussions -- 3.1 Flexural Strength -- 3.2 Compressive Strength -- 3.3 Split Tensile Strength -- 4 Conclusions -- References --Mechanical Properties of Lightweight Concrete with Saw Dust Waste --1 First Section -- 2 Experimental Program. 2.1 Materials and Samples -- 3 Testing Results and Discussions -- 3.1 Materials and Samples the Density of Experimental Concretes -- 3.2 Compressive Strength of Concrete with Saw Dust Wastes -- 3.3 Flexural Strength of Concrete with Saw Dust Wastes -- 3.4 Split Tensile Strength of Concrete with Saw Dust Wastes -- 4 Conclusions -- References --Reuse of Construction Waste -- 1 Introduction -- 2 Methods and Strategies for the Reuse of Construction Waste -- 3 Advantages and Disadvantages of Using Construction Waste -- 4 Circular Economy and the "3 R" s' Rule (Reduce, Reuse, Recycle) -- 5 Buildings Constructed with Construction Waste or Recycled Materials -- 6 Conclusions -- References -- Mechanical Characteristics of Green Concretes with Marble Waste -- 1 Introduction -- 2 Experimental Program -- 2.1 Materials -- 2.2 Sample -- 3 Results and Discussions -- 3.1 Compressive Strength -- 3.2 Flexural Strength -- 3.3 Split Tensile Strength -- 3.4 Failure of Smaples -- 4 Conclusions --References -- Study on the Frost-Thaw Behavior of Self Compacting Concretes with Fly Ash and Ceramic Powder -- 1 Introduction -- 2 Experimental Program -- 2.1 Materials -- 3 Conclusions -- References -- Medium-Term Mechanical Properties of Cement Mortar Modified with Bentonite Nanoparticles -- 1 Introduction -- 2 Experimental Program -- 2.1 Materials -- 2.2 Mixing Details -- 2.3 Sample Preparation -- 2.4 Experimental Tests -- 3 Results and Discussion --3.1 Density -- 3.2 Flexural Strength -- 3.3 Compressive Strength --3.4 Scanning Electron Microscopy (SEM) Analysis -- 4 Conclusion --References -- Multiple Linear Regression Model to Predict Compressive Strength of Concrete with Silica Fume and Metallic Fibers -- 1 Introduction -- 2 Experimental Study -- 3 Methodology -- 4 The Modelling Process for Prediction of Compressive Strength -- 5 Conclusions -- References. Dynamic Response Analysis of Footbridges on Hot-Rolled Steel Girders for Spans Varying Between 10 to 40 m and Width Between 2 and 6 m --1 Introduction -- 2 Dynamic Analysis of Footbridges -- 2.1 The Comfort Levels -- 2.2 Frequencies that Require Dynamic Assessment -- 2.3 Research Methods and Objectives -- 3 Results and Conclusions -- References -- Influence of Modification on the Textural Properties of the Natural Zeolite and Its Efficiency for the Heavy Metals Ions Removal from Contaminated Aqueous Solution -- 1 Introduction -- 2 Experimental Methods -- 3 Results and Discussion -- 3.1 Determination of Textural Properties of the NZ and FeZ -- 3.2 Adsorption Experiments -- 4 Conclusion -- References -- Elements of the Structure of Principal Schemes of Processes that Run in Heterogeneous Mediums -- 1 Introduction -- 2 Literature Review --3 Research Methodology -- 4 Results -- 5 Conclusions -- References -- An Investigation into the Effect of Firing Temperature on the Physical and Thermal Properties of Clay Bricks: -- 1 Introduction -- 2 Materials and Methods -- 2.1 Sampling -- 2.2 Clays' Characterization -- 2.3 Preparation of Clay Brick Samples -- 2.4 Determination of Physical

and Thermal Properties of Ceramic Bodies -- 3 Results and Discussions -- 3.1 Clays' Characterization -- 3.2 Properties of the Fired Clay Samples -- 4 Conclusion -- References -- Need for Textile Waste Decontamination in a Post-pandemic Environment -- 1 Foreword -- 2 Guidelines for Textile Decontamination -- 2.1 Reusing Textiles as Second-Hand Clothes -- 3 Methods for Textile Decontamination -- 3.1 Chemical Decontamination -- 3.2 Thermal Decontamination -- 3.3 Physical Decontamination -- 4 Conclusions -- References -- "Rebuilding History" with 3D Printing Models: The Use of 3D Printing in History of Architecture and Reconstruction of Historical Buildings -- 1 3D Printing.

1.1 The Evolution of 3D Printing: A Revolutionary Technological Journey.

## Sommario/riassunto

This book contains research papers that were accepted for presentation at the 17th International Conference on Interdisciplinarity in Engineering—INTER-ENG 2023, which was held on 5–6 October 2023, in the city of Târgu Mure, Romania. The general scope of the conference "Towards transition for a more competitive European industry in a smart, safe and sustainable future" is proposing a new approach related to the development of a new generation of smart factories grounded on the manufacturing and assembly process digitalization. It is related to advance manufacturing technology, lean manufacturing, sustainable manufacturing, additive manufacturing, manufacturing tools and equipment. It is a leading international professional and scientific forum of great interest for engineers and scientists who can read in this book research works contributions and recent developments as well as current practices in advanced fields of engineering.