

# Table of Contents

## Preface, Committees

## Chapter 1: Building Materials and Structures

<b>Development and Experimental Verification of Sliding Elements of Transparent Loggia Enclosures in High-Rise Building</b> B. Bielek, D. Szabó and D. Čehel'ová	3
<b>Experimental Preparation of Magnesium Oxide Board</b> D. Dubecký, M. Špak and M. Kozlovská	11
<b>Material Optimization of Wooden Window Structures to Increase their Thermal Properties</b> M. Flimel	19
<b>Characterization of Lightweight Concrete Produced from Plastics Waste - Polystyrene and EVA</b> V. Gregorová and S. Unčik	24
<b>Examination of Mechanical Properties and Temperature Resistance of Epoxy Coatings Filled with Secondary Raw Materials</b> J. Hodul, J. Hodná and R. Drochytka	32
<b>The Development of Lightweight Thermal Insulation Plasters and Experimental Analysis of their Moisture Behavior</b> J. Hroudová, M. Sedlmajer, J. Zach and M. Kociánová	40
<b>Analysis of Unreinforced Ceramic Wall Panels in the Mounting State</b> Š. Karlík, M. Lavický and J. Pěňčík	48
<b>Design and Numerical Modelling of Prefabricated Roller Blind Lintels</b> M. Lavický, J. Pěňčík and Š. Karlík	56
<b>Modern Electrical Measurement of Alkali Activated Slag Mortars with Increased Electrical Conductivity</b> M. Lunak and I. Kusak	64
<b>Testing of Fire Retardants</b> A. Fanfarová, L. Makovická Osvaldová and S. Gašpercová	72
<b>Research on Slaked Lime as Ecological Moisture Retardant on Sheep Wool and Straw</b> M. Mitterböck and A. Korjenic	80
<b>Finite Element Analysis of Composite Ceramic-Concrete Slab Constructions Exposed to Fire</b> B. Nagy and E. Tóth	88
<b>Study on Surface Treatments of Modified Wood Plastic Composite (WPC) to Improve Adhesion</b> B. Nečasová, P. Liška and J. Kelar	96
<b>Fire Safety of Apartment Buildings Fabricated from Glued Sandwich Panels Compared with the more Frequently Used Structural Systems</b> M. Rusinová and J. Šlanhof	104
<b>Optimization of Mineral Dry-Shake Topping Dosage in Industrial Concrete Floors with Respect to Selected Quality Parameters</b> M. Sedláková and P. Sedlák	112
<b>Analysis of Fire Protection with Focus on the Specific Conditions of the Historic Roofs</b> R. Benešová, M. Rusinová and L. Sibilla	120
<b>Multiple Aspects of Comparing Surface Properties of Ceramic Tiles Regarding Slip Resistance</b> A. Terjek	129
<b>Constitutive Laws Assessment for Unconfined Concrete under Compression</b> E. Gil, J. Vercher, C. Lerma, Á. Mas and Q. Angulo	137
<b>The Effect of Aggregate Type on the Properties of Lime Mortars</b> M. Vyšvařil, T. Žižlavský and P. Bayer	141

## Chapter 2: Energy Performance of Buildings

<b>Performance Simulation of External Metal Mesh Screen Devices: A Case Study</b> G. Gourlis, F. Tahmasebi and A. Mahdavi	151
<b>The Effect of Boundary Conditions to Specify the Energy Performance of Buildings</b> K. Kubenková, B. Hrubá and M. Jašek	160
<b>Simulation Study on Thermal Performance of a Ventilated PV Façade Coupled with PCM</b> J. Curpek and J. Hraska	167
<b>Energy Aspects of Gravitational Ventilation in the Heating Season</b> F. Kalmár	175
<b>Effect of Glazed Ratio on Indoor Comfort and Energy Need for Heating</b> A. Kerekes	183
<b>An Impact of Air Permeability on Heat Transfer through Partitions Insulated with Loose Fiber Materials</b> P. Kosiński and R. Wójcik	190
<b>Analysis of Energy Sources on Energy Indicators Performance</b> A. Pitonak and M. Lopusniak	198
<b>Glazing with Low-Emissivity Layers and its Performance Simulation</b> R. Rabenseifer	206
<b>Experimental Full-Scale Test Cell Optimizing for Research of Novel Concepts towards Climatically Active Solar Façade Design</b> M. Čekon, R. Slávik, K. Struhala and M. Formánek	213
<b>Material of Thermal Insulation Affects Heat Gains in the Summer Period</b> S. Svobodová and L. Matějka	221

## Chapter 3: Hygrothermal Performance of Buildings

<b>Determination of Capillary Conductivity Coefficient by Using Electromagnetic Microwave Radiation</b> M. Manychova and O. Fuciman	231
<b>Comparison of Driving Rain Index Calculated According to EN 15927-3 to the CFD Simulation and Experimental Measurement</b> P. Juras and M. Jakubcik	239
<b>Double Windows in Heritage Listed Buildings</b> R. Kolář and J. Sobotka	247
<b>Incidence of Microorganisms on Insulated Facades in the Selected Location (Ostrava-Poruba)</b> M. Kubečková, D. Kubečková and V. Kučeriková	255
<b>Analysis Method for Studying Groundwater under a Church</b> M.E. Torner, A. Mas, C. Lerma, E. Gil, J. Vercher, J. Padin and J. Herráez	263
<b>Dynamic Heat and Moisture Transport Modeling of Industrial Floors on Different Climates</b> B. Nagy and D. Szagri	271
<b>Reinforcement-Dependent Thermal Properties of Reinforced Concrete Columns and Slabs</b> B. Nagy and E. Paulik	279
<b>Evaluation of the Dependence of the Parameters of Internal Environment of Wooden Truss on the Orientation of the Building</b> L. Sibilla, M. Vlček, K. Struhala and P. Kříž	287
<b>Drying of the Basement Spaces of the Faculty of Arts in Brno</b> J. Sobotka and R. Kolář	295
<b>Moisture Monitoring of Built-In Wooden Elements</b> P. Soudek	303
<b>Cooling and Thermal Insulating Effects in Layers of Roof Garden</b> D. Sukopová	311
<b>Effect of the Moisture in the Heat Storage Capacity of Building Structures</b> F. Szodrai and A. Lakatos	320

<b>Comparison of Meteorological Climate Data Sets from Greater Žilina and their Influence on Temperatures within the Experimental Wall</b>	
D. Staffenova and R. Ponechal	327
<b>Calibration Method of Cool Box Used for Measuring of Thermal Conductivity Coefficient</b>	
P. Kurečka and J. Teslík	335
<b>The Risk of Humidity at Greened Façades</b>	
D. Tudiwer and A. Korjenic	343

## **Chapter 4: Indoor Climate, Thermal Comfort and Ventilation**

<b>Optimization of Thermal Stability of Atrium Based on Computational Modeling</b>	
A. Rubina, P. Uher and P. Blasinski	353
<b>Analysis of Thermal Comfort in Flat in New High Residential Building</b>	
M. Budiaková	361
<b>Evaluation of Indoor Climate in Small University Lecture Hall</b>	
M. Budiaková	369
<b>Recommendations for Automatic Opening Vents (AOV) in an Office Building in Terms of Thermal Instability in Relation to Natural Ventilation and Cooling</b>	
P. Sedlák, J. Stuart and D. Buryová	376
<b>Impact of Inlet Boundary Conditions on the Fluid Distribution of Supply Duct</b>	
L. Czetany and P. Lang	384
<b>Monitoring of a Prototypical Free-Running Building: A Case Study in a Hot-and-Humid Climate</b>	
S. Eikemeier, M. Schuss, U. Pont, A. Mahdavi and R. Wimmer	392
<b>Parametric Analysis of Floor Cooling</b>	
L. Horká and J. Weyr	401
<b>Effect of Ventilation in Protected Escape Ways upon the Thermal Properties of these Spaces</b>	
M. Rusinová, M. Sedláková and M. Kalousek	409
<b>Energy Saving Potential of Personalized Ventilation Applied in an Open Space Office under Winter Conditions</b>	
M. Krajčík, L. Kudiváni and A. Mahdavi	417
<b>The Importance of Cooperation between Heating and Ventilation in the Industry Buildings</b>	
Z. Straková, D. Koudelková and J. Takács	425
<b>CFD Model of Thermal Plume Occuring above Hot Surface of Kitchen Appliance</b>	
P. Vojkůvková, O. Sikula and J. Weyr	433
<b>Consideration of Operative Temperature in Design and Operation</b>	
A. Kerekes and A. Zöld	438

## **Chapter 5: Retrofitting and Revitalization of Buildings**

<b>Experiment Based Analysis of Complex Posterior Waterproofing Systems</b>	
A. Dudás, V.V. Horn and G. Vinczlér	449
<b>Economic Analysis of Energy Saving Measures in Current Prefabricated Panel Buildings</b>	
J. Pašek and D. Tvrzníková	457

## **Chapter 6: Daylighting and Insolation**

<b>Modelling of Daylight Sources in the Artificial Sky</b>	
S. Darula, R. Kittler and M. Malikova	469
<b>Comparison between Dynamic and Static Metrics for Daylight Evaluation in the Case of Obstructed Buildings</b>	
L. Gábrová	477
<b>Impact of External Shading on Light Comfort and Energy Efficiency in Apartment Buildings</b>	
A. Iringová	485

<b>The Influence of Internal Coloured Surfaces on the Circadian Efficiency of Indoor Daylight</b> P. Hartman, L. Maňková, P. Hanuliak and M. Krajčík	493
<b>The Implications of Assumed Boundary Conditions for the Reliability of Indoor Illuminance Predictions: A Case Study</b> G. Etmnan, E. Vazifeh and A. Mahdavi	501
<b>A Comparative Assessment of Diffuse Fraction Models</b> E. Vazifeh, M. Schuss and A. Mahdavi	509

## **Chapter 7: Acoustics and Noise Protection**

<b>Problems in the Designing of Acoustic Properties of Musical Rehearsals</b> D. Katunský, J. Katunská, I. Bullová and R. Germánus	519
<b>Improving the Impact Sound Insulation of an Existing and Refurbished Wooden Beam Floor Construction</b> C. Theocharis, E. Kainmüller, J. Lechleitner, U. Pont and A. Mahdavi	527
<b>Double Skin Facades with Natural Ventilation Capability: A Case Study of Acoustical Enhancement via Passive and Active (Noise Cancelling) Methods</b> C. Tauber, E. Bajraktari, J. Lechleitner, U. Pont and A. Mahdavi	537

## **Chapter 8: Smart Technologies in Building**

<b>An Inquiry into the Current Practice of Building Product Data Handling by Different Stakeholders in Austria</b> M. Čović, U. Pont, N. Ghiassi, M. Taheri, R. Bräuer and A. Mahdavi	547
<b>Building Monitoring and Diagnostics: A Web-Based Approach</b> M. Schuss, S. Glawischnig and A. Mahdavi	556
<b>Rule Based Building Construction Generation: An Approach Based on Formal Language Methods</b> C. Sustr, U. Pont and A. Mahdavi	564

## **Chapter 9: Sustainable Building and Environmental Assessments**

<b>Case Study of the Straw Bale House</b> A. Pitonak, M. Lopušniak and M. Bagoňa	577
<b>Criteria and Indicators for Assessment of NZEB in Slovakia</b> I. Chmúrny	585
<b>The Impact of Decisions Made in Various Architectural Design Stages on Life Cycle Assessment Results</b> B. Kiss and Z. Szalay	593
<b>Environmental Assessment of Buildings Constructed by Modern Methods of Construction</b> D. Mačková, M. Spisakova, M. Kozlovská and J. Svajlenka	601
<b>Biomass Use for Low Energy Buildings and Retrofits</b> K. Severnyak and A. Zöld	609
<b>Environmental Simulations and their Role in the Research of Human Responses to Environmental Stimuli</b> V. Kotradyová, I. Salcer and E. Vavrinský	618