

5th International Conference
"Innovative Materials,
Structures and Technologies"



IMST 2022

Conference programme



28.09.2022.  **Kipsalas str. 6**

10.00–11.30 Workshops

12.00–15.00 Matchmaking breakfast

18.00–21.00



Kipsalas str. 6A

Registration and welcome drinks



29.09.2022.  **Azenes str. 12**

8.00–9.00 Registration

9.00–9.15 Conference opening

9.15–11.00 Keynote speeches

11.00–11.30 Coffee break

11.30–13.00 Oral presentations

13.00–14.00 Lunch

14.00–15.30 Oral presentations

15.30–16.00 Coffee break

16.00–17.00 Poster Session

19.00–... Conference evening event



30.09.2022.  **Azenes str. 12**

9.30–10.00 Coffee

10.00–10.25 Keynote speech

10.30–12.00 Oral presentations

12.00–13.00 Lunch

13.00–14.30 Oral presentations

14.30–15.00 Coffee break

14.50–17.00 Excursion to laboratories

18.00–... Visit to Riga old town



28.09.2022.



Kipsalas str. 6

10.00–11.30

Workshops

12.00–15.00

Matchmaking breakfast

18.00–21.00



Kipsalas str. 6A

Registration and welcome drinks



29.09.2022.



Azenes str. 12

8.00–9.00

Registration

9.00–9.15

Conference opening (Room 115)

9.15–11.00

Keynote speeches (Room 115)

9.15–9.45

NATURAL FIBRE COMPOSITES FOR STRUCTURAL APPLICATIONS. CAN IT BE DONE?

Roberts Joffe, Sweden

9.45–10.15

CIRCULARITY POTENTIAL OF SILICATE BRICK WALLS – A CASE STUDY IN ESTONIA

Simo Ilomets, Estonia

10.15–10.35

FOSTERING STUDENT ENGAGEMENT WITH SOCIETY. AI-DRIVEN QUALITATIVE QUALITY ASSURANCE PRACTICES

Elina Gaile-Sarkane, Latvia

10.35–11.00

STUDENT-CENTRED ACADEMIC EDUCATION IN A CO-CREATIVE GLOBAL BUT LOCAL CONTEXT

Torsten Fransson, Sweden

11.00–11.30

Coffee break

11.30–13.00

Room 115

Sustainable Building Materials and Waste Management

3D Printing of Building Materials

Chairman. Maris Sinka

Room 116

Civil Engineering Education

Construction Technology and Project Management

Chairman. Martins Vilnitis

11.30–11.45

METHODS FOR MEASUREMENT OF THE PLASTIC SHRINKAGE CRACKING OF 3D PRINTED CONCRETE COMPOSITIONS

Slava Markin, Germany

DEVELOPMENT OF PRACTICAL EXERCISES FOR THE ENGINEERING GRAPHICS COURSES INTEGRATED INTO AR MOBILE APPLICATION

Zoja Veide, Latvia

11.45-12.00	LIMESTONE FILLER AS SCM ADDITIVE IN BINDERS FOR 3D CONCRETE PRINTING Hillar Joon, Estonia	EXPERIENCE IN USING BIM ON THE BASIS OF MAGICAD IN COURSE AND DIPLOMA DE-SIGN IN THE SPECIALTY "ENGINEERING SYSTEMS AND NETWORKS" Kamidulla Fazylov, Kazakhstan
12.00-12.15	3D/4D PRINTING OF NATURAL FIBRE COMPOSITES Beatriz Arsuffi, Brazil	SHAPING STEEL BUILDING STRUCTURES WITH APPLICATION OF VISUAL PROGRAMMING LANGUAGE Jolanta Dzwierzynska, Poland
12.15-12.30	THE USE OF WASTE POWDERS IN 3D CONCRETE PRINTING Damir Knezevic, Slovenia	ENVIRONMENT RISK MANAGEMENT OF WAREHOUSE AND PRODUCTION HALL INVESTMENT PROJECTS Eric Kalisa, Czech Republic
12.30-12.45	EFFECTS OF 3D PRINTING ON DURABILITY OF CONCRETE Ella Spurina, Latvia	SOLUTION OF ECONOMIC ANALYSIS OF INVESTMENT PROJECTS FOCUSED ON BROWNFIELD REVITALIZATION Jakub Sabo, Czech Republic
12.45-13.00	3D CONCRETE PRINTING WITH WASTES FOR BUILDING APPLICATIONS Karolina Butkute, Lithuania	SOCIO-ECONOMIC IMPACTS OF GREENERY AREAS IN URBAN DEVELOPMENT Svatopluk Pelcak, Czech Republic
13.00-14.00	Lunch	
14.00-15.30	Room 115 Sustainable Building Materials and Waste Management Ecological Building Materials <i>Chairman. Girts Bumanis</i>	Room 116 Smart Multifunctional Materials and Structures Inspection, Assessment, Repair <i>Chairman. Liva Pupure</i>
14.00-14.15	INFLUENCE OF NATURAL AGING ON THE CHEMICAL COMPOSITION OF HEMP MORTAR Dmytro Kosiachevskyi, France	BIOINSPIRED COMPOSITES. ADVANCED MATERIALS' FUTURE Anna Cecilia do Nascimento Pereira, Brazil
14.15-14.30	INFLUENCE OF THE SHIVES ORIENTATION ON SELECTED HYGRO-THERMAL PROPERTIES OF HEMP-MAGNESIUM COMPOSITE Przemyslaw Brzyski, Poland	EFFECTIVE THERMAL CONDUCTIVITY OF COMPOSITES WITH ANISOTROPIC PARTICLES OF VARIOUS SHAPES EMBEDDED IN AN ISOTROPIC MATRIX Karol Pietrak, Poland

14.30–14.45	PRODUCTION TECHNOLOGY OF ECOLOGICAL HIGH-PERFORMANCE FIBRE COMPOSITE CONSTRUCTION MATERIALS Genadijs Sahmenko, Latvia	THERMAL MODIFICATION OF TUNGSTEN COATINGS FOR DETECTION BY INFRARED SPECTROMETRY METHOD Annija Elizabete Goldmane, Latvia
14.45–15.00	EXPERIMENTAL INVESTIGATION OF HEAT AND MOISTURE TRANSFER IN BIO-BASED BUILDING BLOCK WITH MICROENCAPSULATED PCM Lukasz Cieslikiewicz, Poland	SEQUENTIAL BENDING CONTROL VIA ORIGAMI WITH MULTI-STABILITY Willian de Padua Oliveira Silva, Brazil
15.00–15.15	HYGROTHERMAL PERFORMANCE OF HEMP BLOCK IN A MULTI-LAYER WALL Baiba Jirgensone, Latvia	METHOD AND APPARATUS FOR DYNAMIC TESTING OF STRUCTURAL JOINTS Viktors Kurtenoks, Latvia
15.15–15.30	COMPARISON OF THERMAL CONDUCTIVITY OF FOAMED GEOPOLYMERS CONTAINING PHASE CHANGE MATERIALS Agnieszka Bak, Poland	
15.30–16.00	Coffee break	
16.00–17.00	Poster session	
P01	LIGHTWEIGHT EPS – GYPSUM COMPOSITE FOR 3D PRINTING Ella Spurina, Latvia	
P02	RESPONSIBILITY FOR MEASURING CONSTRUCTION CONTRACTS IN CZECH CONSTRUCTION COMPANIES Petr Trtilek, Czech Republic	
P03	ENGINEERING GRAPHICS AS THE LANGUAGE TOOL FOR COMMUNICATION WITHIN ENGINEERING COMMUNITY Renno Reitsnik, Estonia	
P04	MODELLING OF INDOOR THERMAL COMFORT. RADIANT CAPILLARY HEAT EXCHANGERS VS. CONVENTIONAL RADIATORS Baiba Jirgensone, Latvia	
P05	BIQUADRATIC TRANSFORMATIONS OF THE PLANE GENERATED BY A BINARY MAPPING OF TWO SECOND-ORDER LINEAR HYPERBOLIC SURFACES Auyez Baidabekov, Kazakhstan	
P06	IMPACT OF POLYPROPYLENE, STEEL AND PVA FIBRE REINFORCEMENT ON GEOPOLYMER COMPOSITE CREEP AND SHRINKAGE DEFORMATIONS Rihards Gailitis, Latvia	

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- P07 **LATENT HEAT ACCUMULATOR FOR STABLE OPERATION OF THE COOLING SYSTEM**
Lana Migla, Latvia
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- P08 **EFFECT OF FIBRES IN CONCRETE WALLS NEAR POINT LOADS**
Ulvis Skadins, Latvia
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- P09 **THE EFFECT OF CONCRETE CONSISTENCY AND PRINTHEAD NOZZLE SIZE ON 3D CONCRETE PRINTING QUALITY**
Kristis Ziemeļis, Latvia
-
- P10 **RECYCLED WASTE GLASS USAGE FOR CONSTRUCTION MATERIALS**
Pavels Tihomirovs, Latvia
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- P11 **EFFECT OF HOLLOW CORUNDUM MICROSPHERES ADDITIVE ON PHYSICAL AND MECHANICAL PROPERTIES AND THERMAL SHOCK RESISTANCE BEHAVIOR OF REFRACTORY CASTABLE**
Valentin Antonovic, Lithuania
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- P12 **THE EFFECT OF RUBBER MICROGRANULES ON THE PHYSICAL-MECHANICAL PROPERTIES OF CONCRETE (FROM RECYCLED TYRES)**
Girts Kolendo, Latvia
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- P13 **HUMAN AND ORGANIZATIONAL FACTORS IMPACT AND IMPORTANCE IN ENGINEERING DESIGN**
Pavels Stankevics, Latvia
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- P14 **ROAD TRAFFIC SAFETY ANALYSIS OF DIFFERENT JUNCTION TYPES ON THE STATE ROADS**
Valentina Amare, Latvia
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- P15 **STATE-OF-ART CONTROL SOLUTIONS AND TECHNOLOGIES FOR HVAC SYSTEMS. A REVIEW ARTICLE**
Jurgis Zemitis, Latvia
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- P16 **INFLUENCE OF SLUDGE FROM RESIDUAL CONCRETE RECYCLING SYSTEMS ON FRESH AND HARDENED CEMENT PASTE**
Dzigita Nagrockiene, Lithuania
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- P17 **RECYCLED GYPSUM AND EPS GRANULE UTILISATION IN PRODUCTION OF SUSTAINABLE INSULATION MATERIAL**
Girts Bumanis, Latvia
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- P18 **INFLUENCE OF ALKALINE ACTIVATOR SOLUTION RATIO ON THE PROPERTIES OF BIOMASS FLY ASH-BASED ALKALI-ACTIVATED MATERIALS**
Chengjie Zhu, Lithuania
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- P19 **IMPACT OF AMINO ACIDS AS PERFORMANCE-CONTROLLING ADDITIVES ON THE HYDRATION OF REACTIVE MGO**
Shuang Liang, The United Kingdom
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- P20 **AL-TI-MG COMPOSITE TARGET FOR PVD PROTECTIVE COATINGS FOR MAGNESIUM MADE BY POWDER METALLURGY TECHNIQUE**
Vjaceslavs Zemcenkovs, Latvia
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- P21 **CU-AL-AG COMPOSITE TARGET FOR PVD PROTECTIVE COATINGS FOR MAGNESIUM MADE BY POWDER METALLURGY TECHNIQUE**
Elionora Pole, Latvia
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- P22 **COMPLEX COATING SYSTEM FOR IMPROVING CORROSION RESISTANCE OF AZ31 MAGNESIUM ALLOY**
Paula Iesalniece, Latvia
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- P23 **TWO APPROACHES FOR ANALYZING THE DYNAMIC PILE BEARING CAPACITY VIA PILE DRIVING FORMULAS**
Jurijs Kovzels, Latvia
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- P24 **EXPERIMENTAL VERIFICATION OF CONDITIONS WITHIN THE CUPS IN THE CUP METHOD OF WATER VAPOR PERMEABILITY MEASUREMENT**
Karol Pietrak, Poland
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- P25 **OPTIMAL SENSOR PLACEMENT IN COMPOSITE CIRCULAR CYLINDRICAL SHELLS FOR STRUCTURAL HEALTH MONITORING**
Andrejs Kovalovs, Latvia
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- P26 **DEVELOPMENT OF INNOVATIVE INSULATION MATERIALS FROM PLANT ORIGIN FIBRES**
Diana Bajare, Latvia
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- P27 **INDOOR AIR CO₂ SENSORS AND POSSIBLE UNCERTAINTIES OF MEASUREMENTS**
Anatolijs Borodinecs, Latvia
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- P28 **APPLICATION OF TROMBE WALL IN LATVIA CLIMATE**
Guna Bebre, Latvia
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- P29 **3D CONCRETE PRINTING WITH WASTES FOR BUILDING APPLICATIONS**
Karolina Butkute, Lithuania
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- P30 **FOAMED GEOPOLYMERS. A REVIEW OF RECENT STUDIES**
Liga Radina, Latvia

19.00–... Conference evening event



30.09.2022.



Azenes str. 12

9.30–10.00 Coffee

10.00–10.20 Keynote speech (Room 115)

10.00–10.25 Robert Marinescu-Muster, Netherland

Room 115
Sustainable Building Materials
and Waste Management

Alternative Binders and
Materials including AAM and
Geopolymers

Chairman. Danute Vaiciukyniene

Room 116
Structural Engineering

Chairman. Līga Gaile

10.30–10.45 **PILOT STUDY ON SHRINKAGE
AND FRACTURE OF
MATERIALS BASED ON THE
ALKALI-ACTIVATED SLAG.
INFLUENCE OF CURING
REGIME**

Barbara Kucharzykova
Czech Republic

**PUFJ (POLYURETHANE
FLEXIBLE JOINTS) AS AN
INNOVATIVE POLYURETHANE
SYSTEM FOR STRUCTURAL
AND NON STRUCTURAL
BONDING OF TIMBER
ELEMENTS**

Klaudia Sliwa-Wieczorek,
Poland

10.45–11.00 **THE INFLUENCE OF THE
HORNIFICATION ON THE
MECHANICAL PROPERTIES
OF THE HEMP FIBRE
REINFORCED FLY ASH-BASED
GEOPOLYMER MORTAR**

Bojan Poletanovic, Austria

**EXPERIMENTAL PARAMETER
IDENTIFICATION FOR
INELASTIC 3D MATERIAL
MODEL**

Liva Pupure, Latvia

11.00–11.15 **APPLICATION OF DIATOMITE
AS A SUBSTITUTE FOR
FLY ASH IN FOAMED
GEOPOLYMERS**

Karolina Brudny, Poland

**SHAPING OF ROOFING
STRUCTURES BASED ON A
HYPERBOLIC PARABOLIC
MODEL**

Patrycja Lechwar, Poland

11.15–11.30 **LIGHTWEIGHT POROUS
GEOPOLYMERS FROM WASTE
RED BRICK PRECURSOR AND
SYNTHETIC FOAMING AGENT**

Girts Bumanis, Lithuania

**DEVELOPMENT OF A STATIC
PLATE TEST FINITE ELEMENT
CALCULATION MODEL AND
ANALYSIS OF THE OBTAINED
DATA USING GEOTECHNICAL
RESEARCH FIELD DATA
AND FINITE ELEMENT
CALCULATIONS**

Endijs Virsis, Latvia

11.30–11.45	THE PROPERTIES OF COMPOSITES BASED ON RECYCLED BUILDING MATERIALS Katarzyna Kalinowska-Wichrowska, Poland	TESTING OF BRITTLINESS FOR SELECTED STAINLESS STEEL GRADES COOLED DOWN AFTER SIMULATED FIRE OCCURRENCE Paulina Zajdel, Poland
11.45–12.00	ORDINARY GYPSUM PLASTERBOARD AND KNAUF TORRO GYPSUM PLASTERBOARD BULLET-PROOFING Elna Barone, Latvia	EXPERIMENTAL ANALYSIS OF TIMBER-CONCRETE COMPOSITE BEHAVIOUR WITH SYNTHETIC FIBRES Karina Buka-Vaivade, Latvia
12.00–13.00	Lunch	
13.00–14.30	Room 115 Sustainable Building Materials Renewable and Raw Materials <i>Chairman. Przemyslaw Brzyski</i>	Room 116 Energy Efficient Building Indoor Environmental Systems <i>Chairman. Andris Jakovics</i>
13.00–13.15	INVESTIGATIONS OF CEMENT COMPOSITE WITH EXPANDED GLASS FILLER AT HIGH TEMPERATURES Renata Boris, Lithuania	INTEGRATION OF DECENTRALIZED SOLAR COLLECTORS INTO A DISTRICT HEATING SYSTEM Aleksandrs Zajacs, Latvia
13.15–13.30	A PRELIMINARY REVIEW OF MECHANICAL TREATMENTS' EFFECT ON THE REACTIVATION OF HYDRATED CEMENT PASTE Pauls P. Argalis, Latvia	INFLUENCE OF HVAC SYSTEMS OPERATING MODES ON OF ENERGY EFFICIENCY Jelena Tihana, Latvia
13.30–13.45	POSSIBILITIES TO USE MUNICIPAL SOLID WASTE INCINERATION BOTTOM ASH IN CEMENTITIOUS MATERIALS Jurgita Malaiskiene, Lithuania	PROTOTYPE OF AN EXPERIMENTAL STAND FOR INVESTIGATING HEAT AND MOISTURE TRANSFER PHENOMENA IN BUILDING MATERIALS Michal Wasik, Poland
13.45–14.00	THE INFLUENCE OF MODIFIED BIOPOLYMER ON MECHANICAL, HYGROTHERMAL PROPERTIES AND DURABILITY OF ECOLOGICAL CLAY MATERIALS Yahor Trambitski, Lithuania	RADIANT CAPILLARY HEAT EXCHANGERS - POWER CALCULATIONS FOR OPTIMAL HEATING AND COOLING Stanislavs Gendelis, Latvia

14.00–14.15	HEMPCRETE - CO₂ NEUTRAL WALL SOLUTIONS FOR 3D PRINTING Maris Sinka, Latvia	EVALUATION OF HEATING AND COOLING LOADS FOR A WELL-INSULATED SINGLE-FAMILY HOUSE UNDER VARIABLE CLIMATE PATTERN Aleksejs Prozuments, Latvia
14.15–14.30	ADDRESSING SHRINKAGE STRESSES IN ADMIXTURES AND SURFACE HARDENERS OF CONCRETE FLOORS Renno Reitsnik, Estonia	MODEL OF RADIANT CAPILLARY HEATING AND COOLING SYSTEM Kiril Bolotin, Latvia
13.00–14.30	Room 114 Workshop "Structural Health Monitoring"	
13.00–13.20	DEVELOPMENT OF NEW STRUCTURAL HEALTH EVALUATION METHOD FOR HEALTH MONITORING OF STRUCTURAL COMPONENTS Sandris Rucevskis, Latvia	
13.20–13.40	STRUCTURAL HEALTH MONITORING OF BUILDINGS UNDER AMBIENT VIBRATIONS Liga Gaile, Latvia	
13.40–14.00	EXPERIMENTAL STUDY OF NEW CEMENT AND CONCRETE COMPOSITES CREEP AND SHRINKAGE DEFORMATIONS Andina Sprince, Latvia	
14.00–14.30	Discussion	
14.30–15.00	Coffee break	
14.50–17.00	Excursion to laboratories	
18.00–...	Visit to Riga old town	