INTRODUCTION

The mechanical properties define the behaviour of the timber under external loads, resulting directly from the timber anisotropic and heterogeneous characteristics. Depending upon the type of applied load the failure can be tensile, shear or torsion. When load enter the plastic regime, the stress-strain relationship passes through a maximum called the tensile strength. The tensile strength of wood being constant above the fibre saturation point, it increases with decreasing moisture content below the fibre saturation. This can be related to where the water is absorbed in the microstructure. Their study is of great interest allowing the rational use of different wood species for structural and building purposes.

The tensile strength of wood parallel to the grain depends upon the strength of the fibres and is affected by the nature and dimensions of the wood elements, and also by their arrangement. The highest value is obtained in straight-grained specimens with thick-walled fibres. Cross grain of any kind of material reduces the tensile strength of wood, since the tensile strength at right angles to the grain is only a small fraction of that parallel to the grain. The wood properties are as well conditioned by the anatomical characteristics such as knots, cross grain and checks. Different values were obtained depending on four issues: compressive or tensile test, as well as the cut direction (parallel or transverse to the grain).

The main goal of the current experimental and numerical study was to evaluate, using tensile tests, the mechanical properties such as tensile strength, ultimate stress, Young's modulus and Poisson's ratio, of two different wood species: Pine and Ash.

EXPERIMENTAL TESTS

Different representative samples have been considered for each wood species: Pine and Ash. Fig. 1 and Fig. 2 show the dimensions of the wooden samples cut in directions parallel and transverse to the grain, respectively. The dimensions were established according to standards and publications.

MODULUS

Some of the specimens were instrumented with strain gauges connected to a portable P3 strain indicator as can be seen in Fig. 3 and Fig. 4. Tensile tests were conducted using a universal tensile test machine, Instron Model 4400, as depicted in Fig. 4.

NUMERICAL SIMULATION

A 3D solid finite element (Solid186) with 20 nodes elements was used for structural analysis with non-linear material and an incremental loading, using ANSYS® software. The obtained axial displacements corresponding to the ultimate applied load condition for Pine and Ash in directions along and across to the grain are presented in Fig. 7 and Fig. 8, respectively.

CONCLUSIONS

The experimental and FEA numerical results from the tensile test in the direction parallel to the grain (t0) can be compared in Fig. 9 and Fig. 10 for Pine and Ash specimens, respectively.

The experimental and FEA results obtained from the tensile tests regarding the direction transverse to the grain (t50) are shown in Fig. 11 and Fig. 12 for Pine and Ash Pine specimens, respectively.
M2D2015

PROGRAM

University of Porto
University of Toronto
University of Azores
MAIN TOPICS

A - Analytical and Numerical Tools. (Sessions: 2A-3A)
B - Testing and Diagnostics. (Sessions: 2B-3B)
C - Surface and Interface Engineering. (Sessions: 2C-3C)
D - Civil Engineering Applications. (Sessions: 2D-3D)
F - Tribology, Gears and Transmissions. (Session: 4F)
G - Mechanical Design and Prototyping. (Sessions: 5C-6C)
H - Modes of Failure. (Session: 1C)
I - Composite & Advanced Materials. (Sessions: 4B-6B)
J - Nanotechnologies & Nanomaterials. (Session: 1A)
K – Biomechanical Applications. (Sessions: 5D-6D)
L - Energy and Thermo-Fluid Systems. (Session: 7G)
M - Impact and Crashworthiness. (Sessions: 7D-8D)
N - Case Studies. (Session: 8D)

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4. ANALYSIS DESIGN & TESTING OF TOWERS AND POLES, by Rui C. Barros (FEUP/U. Porto, Portugal) - Session: 8B.
5. DESIGN AND PRODUCT DEVELOPMENT, by Jorge Lino (FEUP/U. Porto, Portugal) and Xavier de Carvalho (FEUP/U. Porto, Portugal) - Session: 4C.
6. MECHANICAL BEHAVIOUR OF BIO-BASED MATERIALS, by Nuno Dourado (CITAB/UTAD, Portugal) and Marcelo Moura (FEUP/U. Porto, Portugal) - Session: 5E.
7. SYSTEMATIC INNOVATION AND LEAN APPROACH IN ENGINEERING, by Helena V.G. Navas (FCT/UNL, Portugal) and Anabela Alves (U. Minho, Portugal) - Sessions: 5G-6G.
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17. QUALITY CONTROL AND METROLOGY IN ENGINEERING, by José Barradas (CATIM, Portugal), José Carlos Sá (IPVC, Portugal) and José Oliveira (IPVC, Portugal) - Session: 1G.
18. THERMODYNAMICS AND FLUIDS, by Clito F. Afonso (FEUP/U. Porto, Portugal) - Session: 8G.
19. COMPUTATIONAL MECHANICS IN DESIGN, by Xiong Zhang (Tsinghua University, China) - Sessions: 1F-3F.
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23. FIRE AND STRUCTURAL ENGINEERING, by P. Piloto (IPB, Portugal) and A. Meda (U. Rome, Italy) - Session: 8A.
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## PROGRAM

### SUNDAY, 26 JULY 2015

**15:00-18:00**
**EARLY-BIRD REGISTRATION AND WELCOME DRINK**
**Lobby**

### MONDAY, 27 JULY 2015

**08:00-09:00**
**REGISTRATION**
**Lobby**

**09:00-09:30**
**OPENING SESSION**
**Serreta**

**09:30-10:15**
**KEYNOTES SESSION - 1**
**Serreta & Auditorium**

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**10:15-10:45**
**COFFEE-BREAK**
**Lobby**

**10:45-12:30**
**PAPERS SESSION - 1**
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| Ref:** 5536
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| Ref:** 5340
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| Ref: 5533 | POLYNOMIAL STRESS FUNCTION FOR GENERAL 2D PROBLEMS. Yingtao Zhao, Tianbing Zhao, Himing Yin |
| Ref: 5537 | POLYNOMIAL STRESS FUNCTION FOR GENERAL 2D PROBLEMS. Yingtao Zhao, Tianbing Zhao, Himing Yin |
| Ref: 5554 | BIOTROBOLOGICAL BEHAVIOUR OF AG-ZRC01-X COATINGS AGAINST UHMWPE FOR JOINT PROSTHESSES DEVICES. V.S. Calderon, J.C. Sanchez-Lopez, Albano Cavaleiro, Sandra Carvalho |
Topics: C & D
Ref: 5612
A STUDY ON CRACKING IN RBS JOINTS IN MOMENT RESISTING FRAMES. Sadegh Bakhtiari Somayeh, Sadegh Bakhtiari Morteza
Ref: 5728
FULL-SCALE TESTS OF TEMPORARY STEEL (FOOT) BRIDGES. Maroela Karmazinova, Jindrich J. Melcher, Milan Pilgr, Michal Strba
Ref: 5765
IN-PLANE AND OUT-OF PLANE EXPERIMENTAL CHARACTERIZATION OF RC MASONRY INFILLED FRAMES. Farhad Akhoundi, Graça Vasconcelos, Paulo B. Lourenço, Carlos Palha, Luis Silva

Topic: J
Ref: 5380
MECHANICAL PROPERTIES OF HMX AND RDX CRYSTALS DETERMINED BY NANOINDENTATION TEST. Xin-Jie Wang, Yan-Qing Wu, Feng-Lei Huang
Ref: 5550
DIMENSIONAL INTERVAL AND CRITICAL SIZES OF NON-LEGEND NAND- AND MICRO- PARTICLES. A.N. Kharkhardin, V.V. Strokova, N.I. Kozhuhova
Ref: 5564
DETERMINATION OF BASIC CHARACTERISTICS OF PROTECTIVE LAYERS BASED ON POLYMERIC NANOFIBERS. Pedra Ticha, Alexey Sveshnikov, Pavel Demko, Michal Havíř, Martin Cernohorsky
Ref: 5724
SHAPE DESIGN SENSITIVITY ANALYSIS OF MOLECULAR DYNAMICS FOR NANOSCALE LATTICE STRUCTURES. Hong-Lae Jang, Song-Hyun Cha, Youmee Park, Seonho Cho
Ref: 5727
NANOSCALE SELECTIVE NOISE REMOVAL AND EXTRACTION OF INTRINSIC GEOMETRY FROM AFM EXPERIMENTAL DATA. Hong-Lae Jang, Hyun-Seok Kim, Youmee Park, Seonho Cho
Ref: 5762
THE EFFECT OF LA ON PROPERTIES OF AL2O3/CU COMPOSITES. Gui-min Liu, Tao Yan, Zhong-xu Yang, Bin Li

Symp: 2
Ref: 5409
PRECISION INSPECTION OF FLATNESS BY MOIRÉ INTERFEROMETRY. Meguellati Said
Ref: 5582
CRAFT SHOES DEVELOPMENT: POETICS OF CREATION TO MAKING PROCESSES. Castori Souza

Symp: 10
Ref: 5555
AN OVERVIEW THROUGH PORTUGUESE SEISMIC DESIGN REGULATION AND THE NEW EUROCODES. Maria João Silva
Ref: 5588
COST-BENEFIT ANALYSIS FOR SEISMIC REABILITY OF BUILDINGS. Filipa Salvado, Maria João Silva
Ref: 5677
SEISMIC REINFORCEMENT OF CONCRETE BUILDINGS. M. Tavares da Silva, Maria João Silva
Ref: 5750
APPLICATION OF LIGHT STEEL FRAMING IN SEISMIC REHABILITATION. Raquel Fernandes, Maria João Silva
Ref: 5774
SEISMIC BEHAVIOUR OF PORTUGUESE RAMMED EARTH BUILDINGS. Ricardo Barros, Humberto Varum, Hugo Rodrigues, Mariana Correia, Graça Vasconcelos, Paulo Lourenço

Symp: 17
Ref: 5392
ABNORMAL FRACTURE IN TITANIUM ALLOY TA6V. Thomas Paris, Aymeric Migliarini
Ref: 5463
FRACTURE TOUGHNESS OF HDPE EVALUATED BY FATIGUE AND NOTCH PRECRACKING. Luis Iglesias, Thais Sequeira, Marysilvia Costa, Celio Costa
Ref: 5503
THEORETICAL AND EXPERIMENTAL STUDY OF PIEZOELECTRIC CANTILEVER BIMORPH DYNAMIC CHARACTERISTICS BY ELECTROMECHANICAL EQUIVALENT REPLACEMENT. Hongzhuang Zhang, Shijun Luo, Jiangtian Shi

Symp: 25 & 27
Ref: 5703
ARTIFICIAL NEURAL NETWORK: A MODULAR APPROACH. Catarina F. Castro
Ref: 5723
ADJOINT DESIGN SENSITIVITY ANALYSIS OF DYNAMIC CRACK PROPAGATION USING PERIDYNAMIC THEORY. Jae-Hyun Kim, Song-Hyun Cha, Seonho Cho
Ref: 5587
TRIBOLOGICAL PERFORMANCE OF MODIFIED W-S COATINGS IN RUBBER MOULDING APPLICATIONS. Anatoliy Manaia, Geet Raju, Albano Cavaleiro, Tomas Policar
TUESDAY, 28 JULY 2015

08:00-12:00  POSTERS SESSION -2

TOPICS: F, I; SYMPOSIA: 5, 26

Lobby

Topic: F
Ref: 5353
EFFECT OF SURFACTANT ON SURFACE MODIFICATION OF CaCO3 NANOPARTICLES FOR LUBRICANT APPLICATION. EunMin Song, DoWon Kim, JongChoo Lim
Ref: 5425
POSSIBILITY OF REDUCING THE EFFECTIVE EQUIVALENT MISALIGNMENT IN HELICAL GEARS BY A DISC-TYPE LARGE WHEEL CENTRE. Maciej Krasinski
Ref: 5437
DEVELOPMENT OF A SYSTEM OF FIXING FOR RECTIFYING THE INTERNAL DIAMETER OF GEARS. Marlon Intriglio, Alessandra Montenegro
Ref: 5449
PREPARATION OF ENVIRONMENTAL FRIENDLY BENZENE-FREE METAL SULFONATE SURFACTANT FOR LUBRICANT ADDITIVE FORMULATION. EunMin Song, DoWon Kim, ByungJo Kim, JongChoo Lim
Ref: 5562
PROCESS FOR TREATMENT SURFACE BY USING GRANULAR VIBRO-IMPACT. Khaled Hamouda, A.P. Babichev
Ref: 5577
FRICITION AND WEAR CHARACTERISTICS OF MAGNETORHEOLOGICAL ELASTOMER UNDER VIBRATING CONDITION. Chenglong Lian, Kwang-Hee Lee, Chul Hee, Eun Sang

Topic: I
Ref: 5422
INVESTIGATION OF LOCALLY RESONANT ABSORPTION OF PHONONIC GLASS. Meng Chen, Meng Dan, Yuren Wang, Heng Jiang, Yafei Feng
Ref: 5435
SPECIAL CLASS OF QUASI-ISOTROPIC LAMINATES FOR AEROSPACE APPLICATIONS. Biranchi N. Panda, M. Raju Bahubalendruni, Bhusan Biswal
Ref: 5493
SHEAR THICKENING FLUIDS IMPREGNATED SPACER FABRICS FOR ENERGY ABSORBING SYSTEMS. Lukasz Wierzbicki, Marcin Leonowicz, Malysa Maria
Ref: 5508
WALL-SLIP AS A PHENOMENON ATTENDING PROCESSING OF HIGHLY POWDER PARTICLE FILLED POLYMER MELTS. Daniel Sanetnik, Berenika Hauneroevá, Eva Hnatkova
Ref: 5518
VISCOELASTIC ANALYSIS OF THE PRE-STRESSED DOUBLE-RINGS UNDER THE STATE OF CONSTANT TEMPERATURE DISPERSION. Min Yang, Shengli Chen
Ref: 5547
MECHANICAL PROPERTIES OF ALLOYS | SiO2 AND AUTOMATED SYSTEM OF ANISOTROPY VISUALIZATION. Anatoly Onanko, Georgiy Prodayvoda, Yry Onanko, Aleksandr Shabatura, Galina Onanko, Artue Onischenko
Ref: 5573
ANALYSIS OF LONG-TERM INFLUENCE OF CHLORIDE AGGRESSIVE ENVIRONMENT ON THE UHPC. Radka Pernicova, Daniel Dobias
Ref: 5634
NOVEL COMPOSITE ALLOY FOR COMBUSTION ENGINE PISTONS. Jozef Zurek, Zenon Slawinski, Antoni Jankowski
Ref: 5659
RHEOLOGY-SIMULATION OF SHORT FIBRE REINFORCED CONCRETE CASTING. Heiko Hermann, Aarne Lees, Michael Krause, Marcel Padilla, Emiliano Pasorelli
Ref: 5697
MICROSTRUCTURE EVOLUTION AND MECHANICAL PROPERTIES OF COLD DRAWN HYPREUTECTOID STEEL WIRE. Zifei Ni, Lili Yao, Huafang Ni
Ref: 5708
STUDY OF THE INCORPORATION OF MINERAL ADDITIVES AND CARBON FIBER ON THE DURABILITY AND PERFORMANCE OF A MORTAR FOR REHABILITATION WORKS. Djihen Benchebr, Chahinez Amouri, Hacene Houari
Ref: 5737
OPTIMIZATION OF COMPOSITES FEEDSTOCKS WITH MWCNT NANOREINFORCEMENT. T.J. Ferreira, M.T. Vieira
Ref: 5561
STUDY OF TRIBOLOGICAL BEHAVIOUR OF PEEK REINFORCED WITH DIFFERENT TYPES OF FIBRES. Enrique Casarejos, Miguel Castro, António Collazo, Maria Perez, Abraham Segade, José Vilan

09:30-10:15  KEYNOTES SESSION - 2

Serretta & Auditorium

A
(Room: Serretta)
Chair: Prof. Sergei Mileiko (RAS, Russia)

Professor Peter Hess
(University of Heidelberg, Germany)
ON THE USE OF GUIDED WAVES IN NONDESTRUCTIVE DIAGNOSTICS AND FAILURE ANALYSIS

B
(Room: Auditorium)
Chair: Prof. S.A. Meguid (U. Toronto, Canada)

Professor Ng Teng Yong
(NTU, Singapore)
EXTREME INSULATORS FOR EXTREME ENVIRONMENTS: UNDERSTANDING THE PROPERTIES OF ULTRALIGHT AEROGELS AND 2D MATERIALS
## PAPERS SESSION - 4

### 10:45-12:30

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<td>(Serreta-2) Symp-26 Chair&lt;br&gt;M* José Abreu</td>
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### Coffee-Break

**Lobby**

### All Rooms
### 12:30-14:00

**LUNCH**

**VIP Restaurant**

### 14:00-15:45

**PAPERS SESSION - 5**

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<td>Carlos C. António</td>
<td>Elżbieta Pieczyska</td>
<td>António Mourão</td>
<td>Reis Campos</td>
<td>Marcelo Moura</td>
<td>Ramiro Martins</td>
<td>Helena Navas</td>
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**All Rooms**
MULTIOBJECTIVE DESIGN OF AUTOMOBILE COMPOSITE STRUCTURES. Carlos C. António, Luísa Hoffbauer

MULTIJOINTIVE OPTIMIZATION AS ALTERNATIVE SEARCH OF SUSTAINABLE COMPOSITE STRUCTURES. Carlos C. António. (Invited Paper)

REF: 5644

SUSTAINABLE SOLUTIONS UNDER THE AXIOMATIC DESIGN PRINCIPLES: THE NEED FOR RESILIENCE. João Fradinho, António Santos, António Gonçalves-Coelho, António Mourão

REF: 5528

MULTIJOJECTIVE DESIGN OF AUTOMOBILE COMPOSITE APPLICATIONS BASED ON FEASIBILITY ROBUSTNESS. Carlos C. António, Luisa Hoffbauer

REF: 5602

ISOGEOMETRIC CONFIGURATION DESIGN OPTIMIZATION OF HEAT CONDUCTION PROBLEMS USING BOUNDARY INTEGRAL EQUATION. Minho Yoon, Myung-Jin Choi, Seonho Cho

REF: 5698

ANALYSIS OF THE STRESS FIELD IN PHOTOVOLTAIC MODULES DUE TO IMPACT LOADINGS. Mauro Corrado, Andrea Infuso, Marco Paggi

REF: 5624

APPLICATION OF BAYESIAN UPDATING AND STOCHASTIC FINITE ELEMENT METHOD TO THE LOAD AND RESISTANCE FACTOR DESIGN (LRFD) OF A ROUND BAR HAVING RANDOM GEOMETRY. Yuji Nakasone, Shun Miyazaki

REF: 5712

POLYMER DESIGN BASED ASSESSMENT OF OFFSHORE WIND TURBINE SUPPORT STRUCTURES. Konstantinos Salonitis, Athanasios Kolios

REF: 5768

BIOMECHANICS OF THE HUMAN STOMACH AFTER BARATRIC SURGERY. Noor M. Shami-Shokr, Roostam Miftakhov

REF: 5773

FRICTION TORQUE OF POLYMER GREASES FORMULATION | RHEOLOGY AND THERMAL AGING OF POLYMER GREASES. David Gonzalves, Samuel Pinho, Armando Campos, Beatriz Graça, Jorge H.O. Seabra

REF: 5752

TRIZ AS AN AMPLIFIER FOR CORPORATE CREATIVITY AND CORPORATE INNOVATION ABILITY. Barbara Grinauer

REF: 5735
**POSTERS SESSION - 3**

**Topic: B**
- Ref: 5372
  - STUDY OF WELDING LINE UNRIPPING TEST OF METAL BELLOWS. Zhongbin Tang, Yulong Liu, Tao Suo, Giong Deng
- Ref: 5456
  - ANALYSIS OF THE AIRCRAFT OPERATION IN THE CONTEXT OF SAFETY AND EFFECTIVENESS. Jozef Zurek, Antoni Jankowski, Jan Rajchel
- Ref: 5544
  - REMARKS TO TESTING OF STRENGTH AND FATIGUE LIFE. Miloslav Kepka, Jan Chvojan
- Ref: 5581
  - INFLUENCE OF HEAT TREATMENT IN THE MECHANICAL PROPERTIES AT HIGH TEMPERATURES OF P91 STEEL-PIPE WELDED JOINTS. Tatiane Chuvas, António Correia da Cruz, Manuel Gomes, Maria Cindra Fonseca
- Ref: 5645
  - VANE SEGMENT CASTING GEOMETRY IMPACT ON THE STRESS IN THE AIRFOIL SURFACE LAYER. Paweł Kocurek, Pawel Rokicki, Rafal Cygan, Jacek Nawrocki, Andrzej Nowotnik, Jan Sieniawski
- Ref: 5653
  - HEAT TREATMENT EFFECT ON MICROSTRUCTURE AND PROPERTIES OF SINGLE CRYSTAL CMSX-4® NICKEL-BASED SUPERALLOY. Andrzej Nowotnik, Pawel Rokicki, Grzegorz Jakubowicz, Daniel Kurkowski, Grazyna Mrowka-Nowotnik, Małgorzata Wierzbinska, Jan Sieniawski, Jacek Nawrocki
- Ref: 5674
  - FATIGUE BEHAVIOR AND CUMULATIVE DAMAGE OF NOTCHED GFR COMPOSITES. Alessio Carofalo, Vito Dattoma, Riccardo Nobile, Fania Palano, Francesco Panella
- Ref: 5693
  - INVESTIGATION OF THE MECHANICAL BEHAVIOUR OF ZIRCONIUM ALLOY AT DIFFERENT STRAIN RATES USING SUB-SIZE TENSILE SPECIMENS. Pavel Konopik, Martin Rund, Jan Dzugan
- Ref: 5775
  - TOOL CONDITION MONITORING IN DRILLING BASED ON SPINDLE AND FEED MOTOR CURRENT. Alfonso González, David Rodríguez, Justo Garcia Sanz-Calcedo, Inocente Cambero, José Herrera

**Topic: G**
- Ref: 5352
  - SMALL-SCALE STRAIGHT-BLADED DARRIEUS VERTICAL AXIS WIND TURBINE. Rafael de Almeida Alves, Carlos Alberto Gallo
- Ref: 5454
  - LIFE CYCLE ANALYSIS (LCA) AND RELIABILITY TECHNIQUES IN INDUSTRIAL DESIGN PROJECTS. Justo Calcedo, David Salgado, Alfonso Gonzalez, Inocente Rivero, José Herrera
- Ref: 5603
  - CONSIDERATIONS ON OPERATION OF A TURBOJET ENGINE WITH THE 'BYPASS' DESIGN. Mirosław Kowalski
- Ref: 5670
  - SPATIAL FACE RACK DRIVES: MATHEMATICAL MODELS FOR SYNTHESIS AND SOFTWARE ILLUSTRATIONS. Emilija Abadjieva

**Topic: H**
- Ref: 5410
  - THREE-DIMENSIONAL EFFECTS ON WELDED LAP JOINTS UNDER TENSILE-SHEAR LOADING. Filippo Berto, Alberto Campagnolo
- Ref: 5667
  - MEASUREMENT OF RESIDUAL STRESSES IN WELDED ELEMENTS AND STRUCTURES BY ULTRASONIC METHOD. Yuri Kudryavtsev, Jacob Kleiman, Lana Potapova

**Topic: K**
- Ref: 5554
  - MEASUREMENT OF INPUT ACOUSTIC IMPEDANCE OF HUMAN AUDITORY SYSTEM. Daniel Carmona, Leonardo Molsani, Maria Bellini
- Ref: 5696
  - ANALYSIS OF THE CORE STABILITY TO IMPROVE SINGLE LEG STANCE (CASE STUDY). Ana Couto, Mário Vaz, Sara Morais

**Symp: 6**
- Ref: 5618
  - NUMERICAL SIMULATION OF WALL DEFORMATION IN AN ANEURYSM MODEL. João Ribeiro, Rui Lima, Hernani Lopes, Mário Vaz, J.F. Silva Gomes

**Symp: 19**
- Ref: 5407
- Ref: 5420
  - MEASUREMENT OF RESIDUAL STRESSES IN WELDED ELEMENTS AND STRUCTURES BY ULTRASONIC METHOD. Yuri Kudryavtsev, Jacob Kleiman, Lana Potapova
- Ref: 5447
  - MINIATURED SAMPLES CREEP TEST AS A NON DESTRUCTIVE SOLUTION. Heloisa Furtado, Fernanda Santos, Luiz Almeida, Luisa Coutinho
- Ref: 5532
  - INFLUENCE OF SUPERALLOY CASTING STRUCTURE ON PROPAGATION OF ULTRASONIC WAVE. Jacek Nawrocki, Kamil Gancarczyk, Wojciech Manaj, Robert Albrecht, Rafal Cygan, Krzysztof Krupa, Jan Sieniawski
- Ref: 5661
  - EVALUATION OF FATIGUE PROPERTIES OF NICKEL BASED SUPERALLOY MAR 247 WITH ALUMINIDE COATING AND CRACK DETECTION BY NON-DESTRUCTIVE TECHNIQUES. Dominik Kukla

**Symp: 21**
- Ref: 5675
  - MACHINED SURFACE ANALYSIS AT HIGH CUTTING SPEED USING CARBIDE DRILL IN A AL-Si ALLOY. Paulo S. Martins, José R.G. Cameiro, Gilmar C. Silva, Pedro P. Brito
**WEDNESDAY, 29 JULY 2015**

**08:00-12:00**

**POSTERS SESSION - 4**

Lobby

**TOPICS: L, M, N**

**SYMPOSIA: 3, 4, 13, 18, 20, 22, 24, 29, 31**

**Symp: L, M & N**

Ref: 5378

CFD CONTRIBUTION TO OPTIMIZE THE LOCATION OF POLLUTANT EQUIPMENT IN VENTILATED ROOMS. Rui Pitarma, Miguel Lourenço, João Ramos

Ref: 5656

EVALUATION OF THE EFFECTS OF HIGH SPEED TRUCK CRASH INTO A BRIDGE COLUMN. Zdenek Vintr, Pavel Manas, Miroslav Vala

Ref: 5663

INTERACTION OF FLOWING LIQUID WITH DEFORMABLE BOUNDARY BY COUPLING SPH TO FE. Luděk Hyncík

Ref: 5657

NUMERICAL AND EXPERIMENTAL TESTING OF ANTI SHOCK PANELS. Grzegorz Sławinski, Tadeusz Niezgoda, Paweł Dziewulski, Paweł Bogusz, Marek Siewierczewski

Ref: 5658

NUMERICAL AND EXPERIMENTAL TESTING OF SELECTED CRASH CUSHION AND ROAD BARRIER. Tadeusz Niezgoda, Paweł Dziewulski, Wiesław Barnat, Andrzej Kiczkó, Grzegorz Sławinski, Sławomir Dzięnis

Ref: 5514

ANALYSIS ON DYNAMIC BALANCE OF SUSPENDED BASKET IN CENTRIFUGAL TUBE WITH CUBICAL CONTAINER. Shenghai Chen, Changchun Zhu

Ref: 5515

MECHANICAL PROPERTY RESEARCH OF DIFFERENT MATERIAL AND DIFFERENT SECTION SHAPE SUPPORTING RING. Zhang-hua Tang, Sheng-lai Chen

Ref: 5570

QUALITATIVE ANALYSIS ON THE PROTECTION OF INDUSTRIAL DESIGN IN EUROPE. Lourdes Liso

**Symp: 3 & 4**

Ref: 5513

A PIEZOELECTRIC BERNOULLI-EULER BEAM THEORY CONSIDERING MODERATELY CONDUCTIVE AND INDUCTIVE ELECTRODES. Juergen Schoeffner, Gerda Buchberger

Ref: 5604

ANALYSIS OF UNSTEADY OPERATION OF AIRCRAFT ENGINES AFTER SUCTION OF GUNPOWDER COMBUSTION GAS FROM MISSILE ENGINES. Miroslaw Kowalski

**Symp: 13 & 18**

Ref: 5629

RECONSTRUCTING STENOTIC CAROTID MODELS FROM ULTRASOUND IMAGES. Helena Henriques, Catarina Castro, Luisa Costa, Carlos C. António, Rosa Santos, Pedro Castro, Elsa Azevedo

Ref: 5651

EFFECT OF ANNEALING ON THE CORROSION RATE OF A NOVEL METALLIC AMALGAMATE FOR BIODEGRADABLE STENTS. Jennifer Frattolin, Luca Gottellini, Ranjan Roy, Olivier Bertrand, Rosaire Mongrain

Ref: 5366

INTRINSIC MECHANICAL PARAMETER ANALYSIS IN DIFFERENT SCAFFOLDS FOR CARTILAGE TISSUE ENGINEERING. Cátia Bandeiras, António Comelito, António Ramos

Ref: 5709

COMPOSITE MATERIALS AND BOVINE CORTICAL BONE DRILLING: THERMAL EXPERIMENTAL ANALYSIS. María Fernandes, Elza Fonseca, Renato N. Jorge, Mário Vaz, Maria Isabel Dias

**Symp: 20 & 24**

Ref: 5386

REPLACEMENT OF AN OLD CHP FOR A NEW ONE ON THE TOURISTIC SECTOR: ENERGETIC AND ECONOMIC ANALYSIS. Clíto Afonso

Ref: 5414

COMPARATIVE STUDY OF THE LEARNING PROCESS BETWEEN A COLD AND A HOT ENVIRONMENT. Mário Talaia, Marta Silva

**Symp: 22, 29 & 31**

Ref: 5393

NOVEL CERAMIC TILES PRODUCED WITH WOOD WASTE. Rui Novais, M.P. Seabra, João Labrincha

Ref: 5628

TENSILE STRENGTH OF PINE AND ASH WOODS - EXPERIMENTAL AND NUMERICAL STUDY. Délora Ferreira, Elza Fonseca, Cristina Pinto, Paula Borges

Ref: 5711

BALANCED SUMMATION MODEL FOR THE CALCULATION OF THE FIRE RESISTANCE OF PARTIALLY ENCASED STEEL SECTIONS: NEW PROPOSALS. Paulo Píloto, David Almeida, Ana Ramos-Gavilan, Luís Mesquita

Ref: 5743

TIMBER COVERED BRIDGES ON THE SLOVAK TERRITORY. Ivan Balaz, Zuzana Kamenicka, Yvona Kolekova

**08:45-09:30**

**KEYNOTES SESSION - 3**

Serreta & Auditorium

**A**

(Room: Serreta-1)

Chair: Prof. Mário Vaz (U.Porto, Portugal)

Professor J.C. Reis Campos

(University of Porto, Portugal)

MECHANICS AND MATERIALS APPLICATIONS IN PROSTHODONTICS AND DENTAL MEDICINE. CHALLENGES AND OPPORTUNITIES

**B**

(Room: Auditorium)

Chair: Prof. S.A. Meguid (U. Toronto, Canada)

Professor Han Xu

(University of Toronto, China)

CONVEX-MODEL-BASED NON-PROBABILISTIC UNCERTAINTY ANALYSIS AND RELIABILITY DESIGN FOR COMPLEX STRUCTURES
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<td>FIRE ANALYSIS OF REINFORCED CONCRETE PRECAST TUNNEL LINING CONSIDERING THE SPALLING EFFECT. N. Bettini, R. Felicetti, G. Liliu, A. Meda, P. Riva</td>
<td>ANALYSIS AND DESIGN OF THE PRINCIPAL AUXILIARY TESTING STRUCTURE OF A TOWER TESTING STATION IN PORTUGAL - PART I. Fabio Paiva, Jorge Henriques, Rui C. Barros</td>
<td>QUANTITATIVE DETECTION OF CONTACT FAILURES IN COMPOSITES USING INFRARED THERMOGRAPHY AND THE RECIPROCITY FUNCTIONAL APPROACH. Luiz Abreu, Marcelo Colapinto, Helcio Orlande, Carlos Ávies</td>
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<td>THE HUMAN UTERUS AS A SOFT BIOLOGICAL SHELL. Roustem Miftahov</td>
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13:00-15:00 | LUNCH & CONFERENCE CLOSURE | VIP Restaurant |
VIP Executive Azores Hotel  
(Floor-2)  
Location of M2D2015 conference Rooms
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<th>TUESDAY 28July</th>
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