

NEW METHODS OF DAMAGE AND FAILURE ANALYSES OF STRUCTURAL PARTS

Building UA - 1st floor

Monday 12 9:00 10:00 Registration

Room - UA2 Opening Ceremony

10:00	11:00	Prof. Bohumír Strnadel Prof. Jana Kukutschová Assoc. Prof. Kateřina Skotnicová His Excellency Hideo Suzuki Prof. Osamu Umezawa (online) Mr. Go Shimuta	VŠB – TUO, Centre for Advanced Innovation Technologies VŠB – TUO, Vice-Rector for Science and Research VŠB – TUO, Faculty of Materials Science and Technology Ambassador Extraordinary and Plenipotentiary Embassy of Japan in Prague Yokohama National University Japan External Trade Organization
11:00	11:40	Plenary Lecture Tomoyuki Shimono (YNU) - Damage Analysis of Surgical Drill Bar Based on Force Sensing Technology	

Atrium

11:45 12:00 Photo of all participants

Coffee Break

MAIN SECTION

Room - UA4 (UA279)

Monday 12

IA-1: Indentation and Micro Testing

Chair: **T. Shibutani**

0:25:00	12:45	13:10	EVALUATION OF RESIDUAL STRESS, TENSILE PROPERTIES AND HARDNESS OF RAILWAY AXLE USING INSTRUMENTED INDENTATION METHOD D. Bartoněk, M. Négyesi, B. Strnadel
	13:10	13:35	MECHATRONICS DESIGN AND ARCHITECTURE OF EVALUATION SOFTWARE FOR A PORTABLE INSTRUMENTED INDENTATION SYSTEM PIIS3000TM D. Omacht, Y. Li, M. Sun
	13:35	14:00	MEASUREMENT OF TENSILE PROPERTIES ACROSS PRIMARY PIPING TO PRESSURE VESSEL NOZZLE JOINT USING INSTRUMENTED INDENTATION M. Négyesi, V. Žáková, V. Mareš, B. Strnadel
	14:00	14:25	CHARACTERIZATION OF MECHANICAL PROPERTIES IN WELDS AND HEAT-AFFECTED ZONES USING DIFFERENT SMALL-SIZED SPECIMEN AND P. Haušild, O. Kovářik, J. Čech, J. Siegl

Coffee Break

IA-2: Cyclic Loading and Fatigue

Chair: **J. Siegl**

0:25:00	14:45	15:10	FAILURE BEHAVIOR ANALYSES USING COMBINED HARDENING LAW OF PIPING SYSTEM WITH THINNED ELBOWS UNDER DYNAMIC M. Udagawa, T. Shibutani, I. Nakamura
	15:10	15:35	COMPARISON OF FATIGUE PROPERTIES OF 3D PRINTED STEEL WITH DIFFERENT HEAT TREATMENT M. Kraus, V. Mareš
	15:35	16:00	BENDING FATIGUE PROPERTIES OF CARBONITRIDED AND QUENCHED SCM420 STEEL SHEET M. Kim, K. Takahashi, O. Umezawa
	16:00	16:25	TAKING INTO ACCOUNT PLASTIC STRAINS IN FATIGUE BENDING AND TORSION OF STRUCTURAL PARTS T. ťagoda, A. Kurek
	16:25	16:50	ANALYSIS OF FATIGUE FRACTURES AFTER CYCLIC TORSION AND BENDING OF BRONZE RG7 J. Malecka, K. Zak, T. ťagoda
	16:50	17:15	EFFECT OF HIGH TEMPERATURE EXPOSURE ON FRACTURE BEHAVIOUR AND CRACK GROWTH RATE OF P91 AND P92 STEELS M. Dobiáš, J. Kander, Š. Stejskalová, Z. Kuboň, P. Čížek, L. Kander, P. Jonšta
	17:15	17:40	EFFECT OF PRE-EXISTING SURFACE DEFECTS ON THE CRACK INITIATION AND FATIGUE PROPERTIES OF HOT-DIP GALVANIZED STEEL S.T. Alweendo, M. Morita, K. Hasegawa, S. Motoda

STUDENT SECTION

Room - UA3

Chairs: **B. Smetana, M. Tkadlečková and K.P. Dědková**

12:30 - 18:30

M. Tkadlečková:

Metallurgical technology

Thermal Engineering and Fuels in Industry

Chemical metallurgy

**B. Smetana:
Process Engineering**

Chemical and Environmental Engineering

K.P. Dědková:

Nanotechnology

B. Smetana and K.P. Dědková:

Materials Science and Engineering

STUDENT SECTION

Room - UA2

Chair: **D. Noskiewiczová**

12:30 - 18:30

Industrial systems management

17:40 18:05 The possibility of grain detection using a neural network for routine and experimental grain size measurements in our NIS Elements software.
Vladimír Brand - Laboratory Imaging s.r.o.

Dinner

Tuesday 13

2A-1: Material Properties and Fracture

Chair: **M. Hasegawa**

0:25:00 9:00 9:25 DETERMINATION OF MATERIAL PROPERTIES FOR THE EVALUATION OF VVER-1000 REACTOR PRESSURE VESSEL INTEGRITY DURING SEVERE
P. Dymáček, O. Zobač, Z. Chlup, M. Pohanka, D. Gabriel, P. Gál

9:25 9:50 MICRO-SCALE MECHANICAL CHARACTERISTICS OF ELECTRODEPOSITED Ni-B ALLOYS COMPONENTS TOWARD DESIGN OF MEMS DEVICES
Y. Jiang, C.Y. Chen, T. Kurioka, D. Yamane, M. Mizoguchi, O. Kudo, R. Maeda, M. Sone, T.F.M. Chang

9:50 10:15 DAMAGE ANALYSIS OF SPLINED SHAFT AND HUP IN MAIN TRANSMISSION GEAR OF CONVEYOR
S. Lasek, P. Váňová, J. Hlinka, J. Smutek

10:15 10:40 FRACTURE TOUGHNESS OF S355 STEEL AND DETERMINATION OF J-R CURVES BY UNLOADING COMPLIANCE AND NORMALIZATION METHODS
R. Tomášek, V. Mareš, I. Dlouhý

Coffee Break

2A-2: Corrosion, Healing and Damage

Chair: **I. Dlouhý**

0:25:00 11:00 11:25 ADVANCED SELF-HEALING CERAMICS WITH CONTROLLED DEGRADATION AND REPAIR BY CHEMICAL REACTION
N. Sekine, W. Nakao

11:25 11:50 CORROSION RESISTANCE OF AUSTENITIC STAINLESS STEEL 08CR18NI10TI
A. Podepřelová, P. Matějkov, J. Hlinka, M. Javorský, V. Mareš, J. Bystranský

11:50 12:15 INFLUENCE OF MICROSTRUCTURE ORIENTATION ON CORROSION DAMAGE OF THE PIPELINE IN THE ENERGETICS
V. Mareš, J. Bystranský, P. Matějková, A. Podepřelová, M. Négyesi

12:15 12:40 SIMULATION PREDICTION OF WARPAGE DEFORMATION IN SEMICONDUCTOR DEVICE PACKAGING PROCESS
H. Aoyama, H. Shimada

Lunch

2A-3: Microstructure and Crack Resistance

Chair: **M. Sone**

0:25:00 13:15 13:40 CRACK RESISTANCE EVALUATION OF MICROALLOYED STEEL FOR HIGHLY LOADED AUTOMOTIVE COMPONENTS WITH REGARD TO THE EFFECT OF
I. Dlouhý, I. Heikkilä, T. Vuoristo, D. Herrero, P. Hutar

13:40 14:05 CONSOLIDATION BEHAVIOR OF ALUMINA PARTICLES IN AEROSOL DEPOSITION METHOD BASED ON PARTICLE KINETIC ENERGY
Y. Furuya, M. Hasegawa

14:05 14:30 NANOCOMPOSITES ENRICHED WITH NANOSILVER SYNTHESIZED VIA GREEN CHEMISTRY APPROACHES
G. Kratošová, V. Kubáň, S. K. Sathish, G. Simha Martynková

14:30 14:55 X-RAY LINE PROFILE ANALYSIS ON ANNEALED MICROSTRUCTURE OF SEVERELY DEFORMED Ti-0.35% ALLOY
Y. Nakao, O. Umezawa, J. Adámek, V. Vodárek

14:55 15:20 TEXTURE DEVELOPMENT OF Mg-Li-AL ALLOY BY HIGH TEMPERATURE PLANE STRAIN COMPRESSION
A. Suzuki, T. Yamaguchi, M. Hasegawa

MEDICINE SECTION

Room - UA3 (UA236)

M-A: Materials for biomedical applications

Chair: **K. Čabanová**

9:00 9:30 Evaluation of the effect of deformation on the corrosion characteristics of Ti-6Al-4V alloy in a simulated biological environment.
Hlinka J.

9:30 10:00 Overview of the results of osteosynthetic implants analysis after their extraction from patients.
Matějková P., Olšovská E., Čabanová K.

10:00 10:30 Qualitative and quantitative analysis of metal particles in tissues from the implants by SEM-EDS method.
Olšovská E., Matějková P., Čabanová K.

10:30 11:00 Use of supercritical fluid technology for preparation of PLA micro- and nanoparticles.
Zágora J., Plachá D.

11:00 11:30 Materials for stents on bases of polylactide.
Škrlová, K., Plachá D.

11:30 12:00 Nanostructured oxides of selected lanthanides for possible surface modifications of implants.
Dědková K., Cvejn D.

12:00 12:30 Texture formation and elastic modulus evaluation for Ti-Zr-Nb alloys under high temperature plain strain compression deformation.
Dafang Y., Kenitiro A., Hasegawa M., Umezawa O., Fukutomi H., Strnadel B., Kobayashi E.

12:30 13:00 Analysis of micro and nanoplastics in environment via molecular microscopy.
Šec K. - Nicolet CZ s.r.o.

Coffee Break

M-B: Interaction with a living organism

Chair: **K. Čabanová**

13:30 14:00 Interaction of osteosynthetic material with organism from the perspective of traumatologist.
Voves J., Madeja R., Pleva L.

14:00 14:30 Histopathological findings in tissues of patients with limb fracture after removal of osteosynthetic materials.
Škarda J., Židlík V.

14:30 15:00 Histological and immunohistochemical methods used in the examination of tissues exposed to osteosynthetic material.
Bielníková H., Židlík V., Škarda J.

15:00 15:30 Evaluation of biocidal effects of materials with potential use in medicine.
Stachurova, T., Rybkova Z., Malachova K.

15:30 16:00 Electromagnetic system for distal targeting of humeral nails - first clinical experience.
Madeja R., Voves J., Pleva L.

15:20 15:45 **EVALUATION OF DISLOCATION STRUCTURE IN MARTENSITE BY LINE PROFILE ANALYSIS**
 H. Dannoshita, O. Umezawa
 Coffee Break

16:00 16:30 **Development of foot rehabilitation device for patients with Ilizarov external fixation.**
 Tomášek R., Kalová M.
 16:30 17:00 **Implants before implantation**
 J. Koutecký - MEDIN, a.s.

2A-4: Structural Stability and Deformation

Chair: **P. Dymáček**

0:25:00 16:00 16:25 **NEW AUTOMATED IN-SITU FAILURE ANALYSES IN ELECTRON MICROSCOPY**
 A. Casares
 16:25 16:50 **EVALUATION OF STRUCTURE STABILITY OF AU-BASED MICRO CANTILEVERS EVIDENCED BY LONG-TERM VIBRATION TESTS**
 T. Kurioka, K. Tachibana, K. Nitta, C.Y. Chen, T.F.M. Chang, P. Chakraborty, D. Yamane, H. Ito, K. Machida, Y. Miyake, M. Sone
 16:50 17:15 **A NON-DESTRUCTIVE RESONANCE FREQUENCY METHOD TO DETERMINE EFFECTIVE YOUNG'S MODULUS OF 3-DIMENSIONAL MULTILAYERED Ti/AU**
 M. Sone, H. Watanabe, K. Nitta, H. Nakajima, T. Kurioka, C.Y. Chen, P. Chakraborty, D. Yamane, H. Ito, K. Machida, Y. Miyake, T.F.M. Chang
 17:15 17:40 **COMPLEX STUDY OF HOT FORMABILITY OF CR-MO STEELS**
 I. Schindler, P. Kawulok, M. Sauer, R. Turoň
 17:40 18:05 **WELDING & BRAZING, ADDITIVE MANUFACTURING AND MATERIAL TESTING BY IRNDT**
 D. Kuboš, V. Straka
 Dinner

Trip to the Františkovy Lázně

Wednesday 14

6:35 Departure from the campus to Františkovy Lázně (by university cars to Ostrava Svinov Rail station, then direct train to Františkovy Lázně and walk to the hotel (1 km))
 14:00 16:00 Accommodation in the hotel Tři Lilie
 16:00 18:45 Tour of the city
 19:15 20:45 Dinner (gala dinner with the city management)

Thursday 15

9:00 11:30 Round table discussion
 11:30 12:30 Lunch
 12:30 14:00 Round table discussion
 15:00 19:00 Spa Aquaforum *Please, bring your swimsuit.*
 Dinner (buffet tables)

Friday 16

9:00 11:00 Discussion, free program
 11:30 **Conference closing** *Attention - the return journey is not assured.*