



Final Program - MCHTSE 2016

Sunday 25.9.

17:00 – 19:00 Registration

Monday 26.9.

8:00 – 13:00 Registration

Opening Ceremony

9:00 – 9:30 Welcome address

Conference chairman and president of SSHT, V. Leskovšek

IFHTSE president, P. Jacquot

Head of research in Metal Ravne, B. Urnaut

Head of toolmaking in Gorenje, B. Nardin

Keynote lectures (Chairman: V. Leskovšek)

9:30 – 10:15 Keynote lecture: Advanced heat treatment processes and distortion - a competition between productivity and parts performance

H.W. Zoch (IWT Bremen, Germany)

10:15: 10:50 Invited talk – Heat Treatment: Fracture toughness measurement and heat treatment optimization in 300M aeronautic steel

L. Canale (University of São Paulo, Brazil)

10:50 – 11:10 Coffee Break

Session 1 – Heat Treatment (T. Babul)	Session 2 – Surface Engineering (Z. Kolozsvary)
11:10 – 11:30: About austenite reversion during heat treatment of 13%Cr-4%Ni martensitic stainless steel, <u>M. Pellizzari</u>	11:10 - 11:30: Energy and media efficient nitriding and nitrocarburizing, <u>H. Klümper-Westkamp</u>
11:30 – 11:50: Influence of Heat Treatment on Microstructure and Creep Resistance of a Martensitic Creep Resistant Steel, <u>B. Žužek</u>	11:30 – 11:50: Characterization of a plasma nitrocarburized Fe-31.2Mn-7.5Al-1.3Si-0.9C steel alloy, <u>G.S. Takeya</u>
11:50 – 12:10: A new method of heat treatment leading to produce steel with strength of over 2 GPa and high ductility, <u>W. Swiatnicki</u>	11:50 - 12:10 Heat treatment of nitrided layers, <u>P. Wach</u>
12:10 – 12:30: Influence of Heat Treatment on Fracture Toughness of Structural Forgings, <u>E.I. Saldana-Garza</u>	12:10 – 12:30: Research on morphology of boride layers obtained on C45 steel, <u>S. Kladaric</u>
12:30 – 12:50: Influence of the heat treatment processes on the properties of high entropy alloys based on Al-Cr-Fe-Mn-Ni system, <u>D. Mitrica</u>	12:30 – 12:50: Surface engineering of electro-centrifugal pump stages by liquid boriding, <u>V.N. Skorobogatykh</u>
12:50 – 13:10: Heat treatment for aluminum alloys: when, why and how, <u>S. Lombardo</u>	12:50 – 13:10: Effect of thermal oxidation temperature on the corrosion behavior of Ti6Al4V alloys for dental application, <u>A. Boucheham</u>

13:10 – 14:30 Lunch

14:30 – 17:30 Postojna Cave

18:30 – 21:30 Zemono (dinner)

Tuesday 27.9.

8:00 – 18:00 Registration

Invited talks (B. Smoljan)

9:00 – 9:35 Invited talk – Surface Engineering: Modern tool coatings and aspects seldom utilized
U. Wiklund (Uppsala University, Sweden)

9:35: 10:10 Invited talk – Modelling: Modelling Surface Engineering Processes in Steels
D. Cote (Worcester Polytechnic Institute, USA)

Session 3 – Heat Treatment (M. Pellizzari)	Session 4 – Surface Engineering (P. Jacquot)
10:10 – 10:30: Quenching oil selection based on cooling effects of different oils composition, <u>B. Matijević</u>	10:10 – 10:30: Tribological Characterization of Oxynitride PVD Coatings Designed for High Temperature Applications, <u>J. Nohava</u>
10:30 – 10:50: Comparative measurement and evaluation of the quenching intensity of a petroleum oil and canola oil based on temperature gradients, <u>G.E. Totten</u>	10:30 – 10:50: Wear resistance of multilayer PACVD coatings TiN/TiBN applied on cold work tool steels, <u>D. Landek</u>
10:50 – 11:10 Coffee Break	10:50 – 11:10 Coffee Break
11:10 – 11:30: On the influence of cryogenic steps in heat treatment processes, <u>L.A. Alava</u>	11:10 – 11:30: The role of nodular defects in magnetron sputtered hard coatings in tribological contact, <u>A. Drnovšek</u>
11:30 – 11:50: Deep cryogenic treatment – how effective it is in improving wear resistance of tool steels, <u>B. Podgornik</u>	11:30 – 11:50: Influence of steel substrate on the properties of PACVD gradient multilayer TiCN coating, <u>S. Kovačić</u>
11:50 – 12:10: The influence of the tempering temperature on the structure and properties of the X153CrMoV12 steel subjected to deep cryogenic treatment, <u>A. Ciski</u>	11:50 – 12:10: Influence of shape and surface texturing sequence on tribological properties of coated steel, <u>M. Sedlaček</u>
12:10 – 12:30: Tailoring the Microstructure of Austenitic Stainless Steel using Laser and Low-Temperature Nitriding, <u>M. Godec</u>	12:10 – 12:30: Surface hardening after hard coating deposition – combining TiAlN tribological coatings with subsequent electron beam treatment, <u>K. Weigel</u>
12:50 – 13:10: TBA, <u>R. Stein</u>	12:30 – 12:50: The impact of magnetron source power on mechanical properties and phase structure of TiB ₂ coatings, <u>M. Rydzewski</u>
12:30 – 12:50: Influence of Soaking Periods in Cryogenic Treatment on Wear Characteristics of Tungsten Carbide Material, <u>S. Dhande</u>	12:50 – 13:10: Heat treatments to improve the abrasive wear resistance of deposited layers by welding using hard alloys based on chrome and cobalt, <u>D.R. Pascu</u>
13:10 – 14:30 Lunch	13:10 – 14:30 Lunch

<p>Session 5 – Heat treatment (L. Canale)</p> <p>14:30 – 14:50: Application of ultrasound stirring for quenching in a liquid medium, <u>D. Landek</u></p> <p>14:50 – 15:10: Influence of austenitizing temperature on quenching cracks in hardening of high carbon steels, <u>S. Šolić</u></p> <p>15:10 – 15:30: Influence of chemical composition and heat treatment regime on tensile strength of 16MnCrS5 steel, <u>M. Kovačič</u></p> <p>15:30 – 15:50 Coffee Break</p>	<p>Session 6 – Surface Engineering (U. Wiklund)</p> <p>14:30 – 14:50: Cu-C composite coatings, <u>T. Babul</u></p> <p>14:50 – 15:10: Silica based coatings for corrosion protection of AA7075 aluminum alloy, <u>G.C. Rego</u></p> <p>15:10 – 15:30: Analysis of the transmission coefficient of chemical composition from arc plasma sources to chemical composition of multicomponent coatings, <u>J. Kacprzyńska-Gołacka</u></p> <p>15:30 – 15:50 Coffee Break</p>
<p>Session 7 – Modelling (D.S. MacKenzie)</p> <p>15:50 – 16:10: Numerical modelling of steel carburizing, <u>B. Smoljan</u></p> <p>16:10 – 16:30: Hardenability modelling - a review of mathematical tools, <u>W. Sitek</u></p> <p>16:30 – 16:50: Solution of 2D inverse heat conduction problem with graphic accelerator, <u>I. Felde</u></p> <p>16:50 – 17:10: Estimation of Spatially Dependent Heat Flux Transients during quenching of Inconel Probe in Molten Salt Bath, <u>K.M. Pranesh Rao</u></p> <p>17:10 – 17:30: Spatiotemporal heat flux transients during quenching of an inconel probe in TiO₂ and AlN aqueous nanofluids, <u>N. Prabhu</u></p>	<p>Session 8 – Characterization (D. Ugues)</p> <p>15:50 – 16:10: Dimensional stability of AlSi11 alloy, <u>Z. Zovko Brodarac</u></p> <p>16:10 – 16:30: Microstructure and hardness investigation on high entropy alloy matrix composite material reinforced with graphite particles, <u>M. Matara</u></p> <p>16:30 – 16:50: Microstructure and wear resistance FeNiCrMnCuAlSi and FeNiCrMnAl high entropy alloys – characterization, <u>G. Buluc</u></p> <p>16:50 – 17:10: Optimization of microstructures of hot work tool steels, <u>P. Kirbiš</u></p> <p>17:10 – 17:30: Effect of heat treatment on the microstructure of microalloyed steel and its effect on mechanical properties, <u>R. Mousavi</u></p>

17:00 – 19:00 Poster Session

19:30 – 22:00 Gala Dinner

Wednesday 28.9.

8:00 – 11:00 Registration

Invited talks (B. Podgornik)

9:00 – 9:35 Invited talk – Characterization: Characterisation of microstructure and mechanical properties of tool steels: from laboratory tests to industrial trials

D. Ugues (Politecnico di Torino, Italy)

9:35: 10:10 Invited talk – Applications: Application of surface engineering techniques in practice

O. Massler (DeMartin, Switzerland)

Session 9 – Characterization (M. Jenko)	Session 10 – Applications (O. Massler)
10:10 – 10:30: Optimized tool materials to increase life time for fine blanking processes of stainless sheet, <u>M. Demmler</u>	10:10 – 10:30: New technological perspectives of hot forming processes: Expanding heat treatment strategies for high thermal conductivity tool steels, <u>I. Valls</u>
10:30 – 10:50: Failure Analysis of Naval Aircraft Hook Shank, <u>D.S. MacKenzie</u>	10:30 – 10:50: A review of DCT applications of industrial and non industrial components, <u>W. Lausecker</u>
10:50 – 11:10 Coffee Break	10:50 – 11:10 Coffee Break
11:10 – 11:30: Evaluation of ASTM D6200 for the Characterization of Used Quenchants, <u>D.S. MacKenzie</u>	11:10 – 11:30: <i>Ipsen</i> ; Heat Treatment Limitations and Challenges for Parts Made by Additive Manufacturing (3 D-Printing) Methods (AM), <u>J. Kowalewski</u>
11:30 – 11:50: Characterization of nanometric-sized particles formed during heat treatment of aluminium alloy, <u>K. Matus</u>	11:30 – 11:50: <i>IVA Schmetz</i> ; Advanced hot-zone and cooling gas stream design in vacuum furnaces for automotive applications, <u>R. Stein</u>
11:50 – 12:10: The kinetics of boride formation layers in pure niobium, <u>F. Mariani</u>	11:50 – 12:10: <i>Rübig</i> ; Younger nitriding methods on trial: Decision criteria for or against plasma or gas nitriding from a modern perspective, <u>Keyan Liu</u>
12:10 – 12:30: Invar thin film micro hole machining using photoresist etching and electrochemical machining, <u>Woong-Kirl Choi</u>	12:10 – 12:30: <i>Plasmaterm</i> ; Shared glow discharge in plasma nitriding/nitrocarburizing, <u>Z. Kolozsváry</u>
12:30 – 12:50: A study on ultra precision electrochemical machining of invar sheet by micro pulse voltage control, <u>Seong-Hyun Kim</u>	12:30 – 12:50: <i>Ducom Instruments</i> ; High Temperature Erosion and Abrasion of Steels, <u>D. Veeregowda</u>

13:00 – 13:30 Closure of the conference

V. Leskovsek, B. Smoljan, M. Pellizzari

Poster session (Tuesday 27.9. 17:00 – 19:00, Exhibition area)

1. W. da Silva Mattos: Uphill quenching of aluminum alloys: a process overview and project update
2. R.L. Simencio Otero: Vegetable oil quenchants with substantially improved thermal oxidative stability: a review and proposal
3. L.M. Albano: Development and use of a small laboratory intensive quenching (IQ) system and the successful use to quench AISI 5160 steel
4. A. Leon: The effect of stress relieving heat treatment on the corrosion resistance of aluminium alloy obtained by 3D printing technology (SLM)
5. I. Matula: Effect of porosity on microstructure and properties of Ti35Zr biomedical alloy fabricated by elemental powder metallurgy
6. M. Jenko: Surface modification of NiTi Shape Memory Alloy for application in Medicine
7. P.V. Krot: Modeling of phase transformations in the rolls of the special alloy steels during quenching and deep cryogenic treatment

MCHT&SE 2016
**3rd Mediterranean Conference on Heat
Treatment and Surface Engineering**

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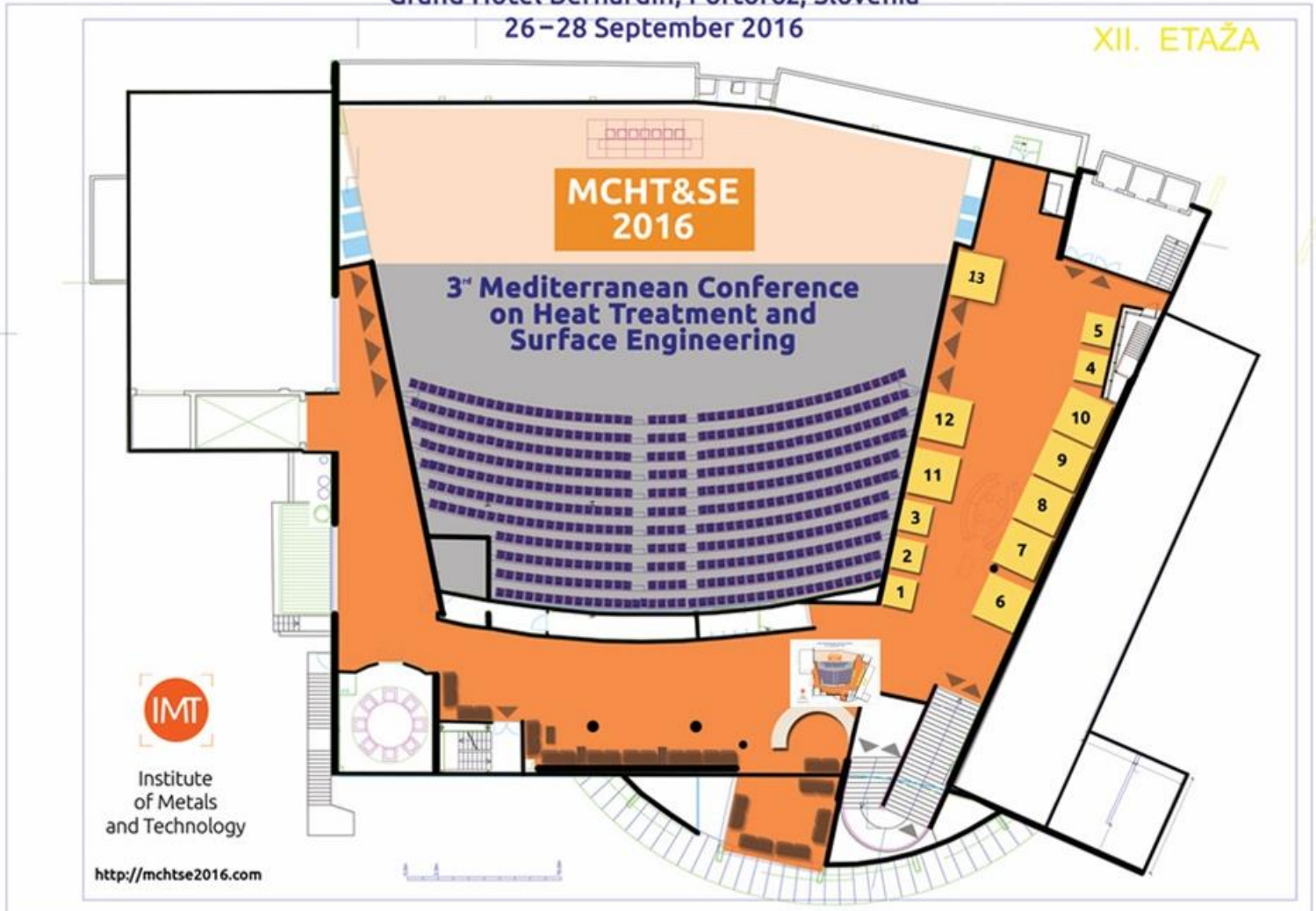
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EXHIBITORS

Grand Hotel Bernardin, Portorož, Slovenia
26–28 September 2016

XII. ETAŽA



1. **instruMentalia**

2. **Anton Paar**

3. **trokuttestgroup**

4. **alicona**

5. **DUCOM**
Material Characterization Systems

6. **Bodycote**

7. **metaling**

8. **INDUKTIO**

9. **SCHMETZ**

10. **Bosio**

11. **sij** | group

12. **Ipsen**

13. **AVL** & **TPV GROUP**