

# 2<sup>nd</sup> MEDITERRANEAN CONFERENCE & NEW CHALLENGES ON HEAT TREATMENT AND SURFACE ENGINEERING

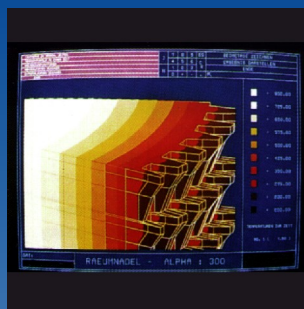
## HEAT TREATMENT



## SURFACE ENGINEERING



## MATHEMATICAL MODELLING



## PHYSICAL METALLURGY



11 - 14 June 2013, Dubrovnik - Cavtat, Croatia



**CSHTSE**  
Croatian Society  
for Heat Treatment  
and Surface Engineering



**SSHT**  
Slovenian Society  
for Heat Treatment

# FINAL PROGRAMME



**IFHTSE**  
International Federation  
for Heat Treatment and  
Surface Engineering

## INTRODUCTION

Many of the most significant developments that have occurred in technological general knowledge in recent years, together with economy globalization, have introduced new challenges into the field of heat treatment and surface engineering.

This three-days conference will provide a forum within which engineers, scientists, researchers and production managers can review and discuss new challenges, recent progress and emerging topics in the fields of advanced heat treatment and surface engineering technology. It should also offer an opportunity to examine the present state and perspectives in theory and practice of heat treatment and surface engineering of metals. Various R&D efforts related to heat treatment and surface engineering will be covered at the conference. The conference will also cover most of physical metallurgy aspects of heat treatment and surface engineering with emphasis on alloy development, microstructure/property relationships and engineering performance. In addition, new engineering processes, mathematical modelling, virtual processing, intelligent systems, modern equipment and management of heat treatment and surface engineering will be considered at the conference.

From 68 abstracts received from 20 countries, 37 abstracts have been selected for oral presentation and 20 for posters.

## CHAIRMAN: Božo Smoljan, CSHTSE, Croatia

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Institute of Metals and Technology  
Ljubljana, Slovenia

# TIMETABLE OF THE PROGRAMME

Hour	Tuesday 11. June	Wednesday 12. June	Thursday 13. June	Friday 14. June
9,00		OPENING CEREMONY	Invited lecture	Invited lecture
10,00		Keynote lecture	HEAT TREATMENT	PHYSICAL METALLURGY
11,00		SURFACE ENGINEERING	Invited lecture	MATHEMATICAL MODELLING
12,00				
13,00	REGISTRATION	POSTER SESSION	POSTER SESSION	CLOSURE
14,00		Lunch break	Lunch break	
15,00	WORKSHOP led by Imre Felde <b>LQD - Liquid Quenchant database</b>		Excursion to Dubrovnik	
16,00		Invited lecture		
17,00	IFHTSE Executive Committee	SURFACE ENGINEERING		
18,00		COMMERCIAL PRESENTATION		
19,00	IFHTSE Governing Council Assembly REGISTRATION			
20,00				
21,00	WELCOME RECEPTION		Banquet	



## Conference Secretariat

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## Hotel information

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Internet : [www.hoteli-croatia.hr](http://www.hoteli-croatia.hr)

# PROGRAMME

WEDNESDAY, June 12, 2013.	
09,00 - 09,30	<p style="text-align: center;"><b>OPENING CEREMONY</b></p> <p style="text-align: center;">Session: SURFACE ENGINEERING</p>
09,30 - 10,00	<p><b>Keynote lecture</b>  <b>ELECTRON BEAM SURFACE TECHNOLOGIES- TECHNICAL DEVELOPMENT, STATE OF THE ART AND PROSPECTS</b>            Prof. Dr. Ing. habil. Rolf Zenker, - <i>Zenker Consult, Mittweida, GERMANY</i></p>
10,00 - 10,45	<ul style="list-style-type: none"> <li>• <b>DUPLEX SURFACE TREATMENT PHYSICAL VAPOUR DEPOSITION (PVD) + ELECTRON BEAM HARDENING (EBH)</b>  <i>Gundis Grumbt, Rolf Zenker, Kai Weigel, Klaus Bewilogua, TU Bergakademie Freiberg, Institute of Materials Engineering, Freiberg, Germany</i></li> <li>• <b>POTENTIAL OF A COMBINED TREATMENT ELECTRON BEAM ALLOYING AND PVD HARD COATING FOR IMPROVED SURFACE PROPERTIES OF AL ALLOYS</b>  <i>Anja Buchwalder; Rolf Zenker, Marco Klemm, Gundis Grumbt, TU Bergakademie Freiberg, Institute of Materials Engineering, Freiberg, Germany</i></li> <li>• <b>LOW-TEMPERATURE PLASMA SURFACE ALLOYING AND CHARACTERISATION OF DUPLEX STAINLESS STEELS</b>  <i>X. Li and H. Dong, The University of Birmingham, School of Metallurgy and Materials, Edgbaston, Birmingham, UK</i></li> </ul>
10,45 - 11,15	<b>Coffee break</b>
11,15 - 12,30	<ul style="list-style-type: none"> <li>• <b>COMBINED HEAT TREATMENT FOR IMPROVED LOAD-CARRYING PROPERTIES OF PACVD COATED TOOL STEEL</b>  <i>B. Podgornik, V. Leskovšek, Institute of Metals and Technology, Ljubljana, Slovenia</i></li> <li>• <b>PARADIGM CHANGE IN HEAT TREATMENT- MICROPLUS PLASMA TECHNOLOGY SUBSTITUTES SUCCESSFULLY TRADITIONAL METHODS</b>  <i>Robert Nöbauer, Rübiger GmbH &amp; Co KG, Wels, Austria</i></li> <li>• <b>STRUCTURE AND PROPERTIES OF HVOF SPRAYED AND PTA- WELDED CERMET HARD PHASE REINFORCED FE- MATRIX BASED COATINGS</b>  <i>Priit Kulu, Arkadi Žikin, Andrei Surženkov, Riho Tarbe, Tallinn University of Technology, Department of Materials Engineering, Tallinn, Estonia</i></li> <li>• <b>COMPARING COBALT AND IRON-BASED POWDERS FOR PTA CLADDING APPLICATIONS</b>  <i>Senad Dizdar, Sven Bengtsson, Alberto Poey, Höganäs AB, Global Development, Höganäs, Sweden</i></li> <li>• <b>A PROGRESS IN THE CONTROL OF THE NITRIDING POTENTIAL IN THE ASPN PROCESS</b>  <i>I. Burlacov, K. Börner, H.-J. Spies, H. Biermann, TU Bergakademie Freiberg, Institute of Materials Engineering, Freiberg, Germany</i></li> </ul>
12,30 - 13,30	<b>POSTER SESSION</b>
13,30 - 15,00	<b>Lunch break</b>
15,00 - 15,20	<p><b>Invited lecture</b>  <b>SURFACE ENGINEERING DEVELOPMENT PERSPECTIVES ON THE BASIS OF TECHNOLOGY FORESIGHT RESULTS</b> Leszek A. Dobrzański, Anna D. Dobrzańska-Danikiewicz, Tomasz Tański, Wojciech Sitek, <i>Silesian University of Technology, Gliwice, Faculty of Mechanical Engineering, Poland</i></p>
15,20 - 17,00	<ul style="list-style-type: none"> <li>• <b>LOW PRESSURE CARBURIZING (LPC) AND LOW PRESSURE NITRIDING (LPN) OF FUEL INJECTION NOZZLES MADE OF TOOL STEEL</b>  <i>Maciej Korecki, Piotr Kula, Emilia Wolowiec, Michal Bazel, Michal Sut, SECO/WARWICK, Poland</i></li> <li>• <b>NITRIDING OF ALLOYED STEELS UNDER NANO-DIMENSIONAL OXYDE LAYER</b>  <i>Larisa Petrova, Larisa Shestopalova, Moscow Automobile and Road Construction State Technical University (MADI), Moscow, Russia</i></li> <li>• <b>STRENGTHENING OF SHUT-OFF AND CONTROL VALVES SEALING SURFACES BY METHOD OF LIQUID OXICARBONITRIDING</b>  <i>Tsikh S.G., Lisitskiy V.N., Korneev A.A., Zmienko D.S., Sonts A.V., Tsikh M.V., PJSC RPA 'CNIITMASH', Moscow, Russia</i></li> <li>• <b>CONTACT FATIGUE STRENGTH NITRIDED AND PEENED STEEL</b>  <i>Aleksander Nakonieczny, Monika Grzegorz, Institute of Precision Mechanics, Warsaw, Poland</i></li> <li>• <b>COMERCILA PRESENTATION: THE FUTURE OF FIXTURE SYSTEMS - CARBON / CARBON IN HEAT TREATING APPLICATIONS</b>  <i>SCHUNK WIEN GmbH, Wien, Austria</i></li> </ul>

THURSDAY, June 13, 2013.

Session: HEAT TREATMENT

09,00 - 09,20	<p><b>Invited lecture</b> <b>MECHANISM OF QUENCH OIL DEGRADATION</b> D. Scott MacKenzie, <i>Houghton International, Valley Forge, PA, USA</i></p>
09,20 - 10,20	<ul style="list-style-type: none"><li>• <b>SOME NEW APPROACHES IN GLOBAL DATABASE DEVELOPMENT FOR LIQUID QUENCHANTS</b> Nikolai Kobasko, <i>Intensive Technologies Ltd, Kyiv, UKRAINE and IQ Technologies Inc., Akron, USA</i></li><li>• <b>HYBRID INVERSE APPROACH FOR RECONSTRUCTION OF THERMAL BOUNDARY CONDITIONS</b> I. Felde, <i>Obuda Univeristy, Budapest, Faculty of Informatics, Hungary</i></li><li>• <b>UNDERSTANDING OF POLYMER QUENCHANT (POLYALKYLENE GLYCOL) CHARACTERISTIC DURING QUENCHING PROCESS ON TOOL STEEL</b> Mert Onan, H.Ibrahim Ünal, Cenk Onan, <i>Kocaeli University, Faculty of Engineering, Department of Metallurgical and Material Engineering, Umuttepe Campus, Kocaeli, Turkey</i></li><li>• <b>APPLICATION OF ACTIVE POWDERS AT FUIDIZED BAD HEAT TREATMENT TECHNOLOGIES</b> Tomasz Babul, Natalia Kucharieva, <i>Institute of Precision Mechanics, Warsaw, Poland</i></li><li>• <b>INFLUENCE OF ADDITIVE CHEMISTRY ON THE PHYSICAL-CHEMICAL AND COOLING PROPERTIES OF QUENCHING OILS</b> Božidar Matijević, Ljiljana Pedišić, Domagoj Augusta, <i>University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia</i></li></ul>
10,20 - 10,50	<p><b>Coffee break</b></p>
10,50 - 11,10	<p><b>Invited lecture</b> <b>INFLUENCE OF HEAT TREATMENT AND SURFACE ENGINEERING ON THERMAL FATIGUE BEHAVIOUR OF TOOL STEEL</b> M. Pellizzari, D. Ugues, G. Cipolloni, <i>University of Trento, Department of Industrial Engineering, Trento, Italy</i></p>
11,10 - 12,40	<ul style="list-style-type: none"><li>• <b>REPLACING PIT FURNACE FANS WITH HIGH-SPEED GAS INJECTORS</b> Akin Malas, Sreenivas Viyyuri, Paul Stratton, <i>Linde Gas, Unterschleissheim, Germany</i></li><li>• <b>ADVANCED HOT ZONE AND COOLING-GAS STREAM DESIGN AND INTEGRATION OF THE "SUBZERO" TREATMENT IN VACUUM FURNACE TECHNICS</b> A. Dappa, B. Zieger, <i>SCHMETZ GmbH, Menden - Germany</i></li><li>• <b>IN-SITU INVESTIGATION OF MARTENSITIC TRANSFORMATION IN AISI 52100 STEEL AT SUB-ZERO CELSIUS TEMPERATURE</b> Villa Matteo, Pantleon Karen, Somers Marcel A.J., <i>Technical University of Denmark, Department of Mechanical Engineering, Kongens Lyngby, Denmark</i></li><li>• <b>MULTI-FUNCTIONAL KIC-TEST SPECIMEN FOR ASSESSMENT OF DIFFERENT TOOL AND HIGH-SPEED STEEL PROPERTIES</b> Vojteh Leskovšek, Bojan Podgornik, <i>Institute of Metals and Technology, Ljubljana, Slovenia</i></li><li>• <b>INFLUENCE OF ELECTRO SLAG REMELTING ON MECHANICAL PROPERTIES OF 51CrV4 SPRING STEEL</b> Sanja Šolić, Bojan Senčič, Vojteh Leskovšek, Matjaž Godec, <i>University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia</i></li><li>• <b>INTELLIGENT VACUUM PUMPS REDUCE OPERATING COSTS AND INCREASE RELIABILITY IN VACUUM METALLURGY</b> Simon Bruce, <i>EDWARDS Ltd., Sussex, UK</i></li><li>• <b>THE EFFECTS OF TEMPERING TEMPERATURE, TIME AND CARBON CONCENTRATION ON THE HARDNESS OF ALLOY STEELS</b> R. D. Sisson Jr, Lei Zhang and Mei Yang, <i>Center for Heat Treating Excellence; Worcester Polytechnic Institute; Worcester, MA, USA</i></li></ul>
12,40 - 13,00	<p><b>POSTER SESSION</b></p>
13,00 - 14,00	<p><b>Lunch break</b></p>

FRIDAY, June 14, 2013.

Session: PHYSICAL METALLURGY/MATHEMATICAL MODELLING

09,00 - 09,20	<p>Invited lecture</p> <p><b>LASER ALLOYING OF C45 STEEL WITH NICRBSI POWDER ALLOY</b> Zoran Bergant, Imre Felde, Janez Grum, <i>University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia</i></p>
09,20 - 10,20	<ul style="list-style-type: none"><li>• <b>ELECTRON BACKSCATTER DIFFRACTION (EBSD) CHARACTERISATION OF METALS</b> Matjaž Godec, <i>Institute of Metals and Technology, Ljubljana, Slovenia</i></li><li>• <b>HEAT TREATMENT RELATED FAILURE OF NAVAL ARRESTING HOOK</b> D. Scott MacKenzie, <i>Houghton International, Valley Forge, PA, USA</i></li><li>• <b>MODELING OF UNAVOIDABLE RESIDUAL STRESSES AFTER TRANSFORMATION-FREE COOLING</b> Darko Landek, Dragutin Lisjak, Thomas Lübben, Friedhelm Frerichs, <i>University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia</i></li></ul>
10,20 - 10,50	<p><b>Coffee break</b></p>
10,50 - 12,35	<ul style="list-style-type: none"><li>• <b>DEVELOPMENT OF SCIENCE INTENSIVE RESOURCE-SAVING METHODS FOR SURFACE STRENGTHENING OF STEEL PRODUCTS BY DESIGNING METASTABLE PHASE-STRUCTURAL MODIFICATIONS</b> Cheiliakh Oleksandr, Cheiliakh Yan, Sheychenko Galina, Kolodyazhna Irina, Voytsekhovskyy Kostyantyn, Shimizu Kazumichi, <i>Priazovskyi State Technical University, Mariupol, Donetska obl., Ukraine</i></li><li>• <b>RESEARCH AND DEVELOPMENT PROGRAMS IN HTSE FOR AUTOMOTIVE INDUSTRY IN HUNGARY</b> M. Kocsis Baán, I. Felde, <i>Univeristy of Miskolc, Faculty of Mechanical Engineering, Hungary</i></li><li>• <b>THE MATHEMATICAL MODELLING OF 21NiCrMo2 LOW ALLOY STEEL CARBURIZING IN LESS COMMON CARBURISING MEDIA</b> Daniela Dragomir, Mihai Ovidiu Cojocar, Leontin Nicolae Druga, <i>UTTIS Industries, Vidra, Ilfov, Romania</i></li><li>• <b>ESTIMATION OF COEFFICIENT OF HEAT CONDUCTIVITY AND HEAT TRANSFER COEFFICIENT IN THE NUMERICAL MODEL OF THE STEEL QUENCHING</b> Božo Smoljan, Dario Iljkić, Hrvoje Novak, <i>University of Rijeka, Faculty of Engineering, Department of Materials Science and Engineering, Rijeka, Croatia</i></li><li>• <b>TEMPERATURE DEPENDENCE OF HEAT TREATED ALUMINIUM ALLOYS</b> Alma G. Esmeralda, Andrés Rodríguez, José Talamantes-Silva, Rafael Cólás, <i>Universidad Autónoma de Nuevo León, México</i></li><li>• <b>CROATIAN STANDARDIZATION</b> Davorko Čehulić, Tatjana Brica Žilić, <i>Croatian Standards Institute, Zagreb, Croatia</i></li></ul>
12,35	<p><b>CLOSING CEREMONY</b></p>

# POSTERS SESSION

- **THE COMPARISON OF ANTIWEAR AND FATIGUE PROPERTIES IN HIGHER TEMPERATURE FOR PN+CrN AND PN+AlCrTiN LAYER COMPOSITES**  
Jerzy Smolik, Adam Mazurkiewicz, Joanna Kacprzyńska, *Institute for Sustainable Technology-National Research Institute, Radom, Poland*
  - **MULTI-POSITION MODULAR CRUCIBLE FOR THE CREATION OF DIFFERENT MULTILAYER TRIBOLOGICAL COATINGS BY ELECTRON BEAM PVD METHOD**  
Adam Mazurkiewicz, Jerzy Smolik, Andrzej Zbrowski, Joanna Kacprzyńska, *Institute for Sustainable Technology-National Research Institute, Radom, Poland*
  - **LASER COATING OF ALUMINIUM ALLOY EN AW-6082-T651 WITH TiB<sub>2</sub>/TiC/Al**  
Dunja Ravnikar, Narendra B. Dahotre, Janez Grum, *University of Ljubljana, Faculty of Mechanical Engineering, Laboratory for Metals Testing and Heat Treatment, Ljubljana, Slovenia*
  - **RESEARCH OF BORIDE LAYERS GROWTH KINETICS ON C15 CARBON STEEL**  
Andrijana Milinović, Dragomir Krumes, Ivica Kladarić, *University of Osijek, Mechanical Engineering Faculty in Slavonski Brod, Slavonski Brod, Croatia*
  - **INFLUENCE OF NITRIDING ON CORROSION RESISTANCE OF MARTENSITIC STAINLESS STEEL X17CRNI16-2**  
Cajner, F., Kovačić, S., Rafael, H., Vugrinčić, A., Šimunović V., *University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia*
  - **INVESTIGATION OF CORROSION BEHAVIOUR OF AL ALLOY SUBJECTED TO LASER SHOCK PEENING USING ELECTROCHEMICAL METHODS AND SEM/EDS ANALYSIS**  
U. Trdan, J. Grum, *University of Ljubljana, Faculty of Mechanical Engineering, Ljubljana, Slovenia*
  - **INFLUENCE OF DEEP CRYOGENIC TREATMENT OF THE HSS SUBSTRATE ON THE PVD TiAlN COATING PROPERTIES**  
Sanja Šolić, Peter Panjan, *Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb Zagreb, Croatia*
- **COOLING CHARACTERISTICS OF WATER BASED NANOFLUID WITH AGITATION**  
Josip Župan, Darko Landek, Tomislav Filetin, *University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia*
  - **THE DEVELOPMENT OF INDUCTION COIL AND NEW POWER SUPPLIES FOR MODERN INDUCTION HARDENING PROCESSES**  
Darko Landek, Branko Petrič, Franjo Cajner, *University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia*
  - **THE EFFECTIVENESS OF INNOVATIVE EQUIPMENT FOR HARDENING FROM A NOBLE GAS ATMOSPHERE**  
Mladen Stupnišek, Sandra Matijević, *FELIKS METAL, Zagreb, Croatia*
  - **INFLUENCE OF HEAT TREATMENT PARAMETERS ON THE MECHANICAL PROPERTIES AND WEAR RESISTANCE OF HS10-2-5-8 HIGH SPEED STEEL**  
Darko Landek, Franjo Cajner, Hrvoje Rafael, Saša Kovačić, *University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia*
  - **POSTWELD HEAT TREATMENT INFLUENCE ON MICROSTRUCTURE AND HARDNESS OF WELDMENT BETWEEN DISSIMILAR METALS: S235JR STEEL AND X6CrNiMoTi17-12-2**  
Štefanija Klarić, Dragomir Krumes, Radojka Marković, Vladimir Pecić, Slavica Kladarić, *University of Osijek, Mechanical Engineering Faculty in Slavonski Brod, Slavonski Brod, Croatia*
  - **EFFECT OF AGING ON HARDNESS OF SOLUTION ANNEALED 7449 ALLOY**  
Danko Ćorić, Vera Rede, Marija Magić, *University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia*
  - **SELECTED HISTORY OF VEGETABLE OIL AND ANIMAL QUENCHANTS**  
Rosa L. Simencio Otero, Lauralice C.F. Canale, George E. Totten, *Universidade de Sao Paulo, Escola de Engenharia de Sao Carlos, Sao Carlos, SP, Brazil*
  - **THE INFLUENCE OF DEEP COOLING TREATMENT ON THE PROPERTIES OF X155CrVmo 12-1 STEEL**  
Cajner, F., Kovačić, S., Kumić, I., Cajner, H., *University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia*
- **SOL-GEL TiO<sub>2</sub>-ZrO<sub>2</sub> FILMS ON STAINLESS STEEL: PREPARATION, CHARACTERIZATION AND CORROSION PROPERTIES**  
L. Ćurković, I. Bačić, A. Vugrinčić, L. Levačić, H. Otmačić-Ćurković, S. Jakovljević, Lidija Ćurković, Amalija Vugrinčić, Helena Otmačić Ćurković, Ivana Bačić, Suzana Šegota, Lidija Levačić
  - **REVIEW ON THE HEAT TREATMENT SIMULATION OF GEAR MANUFACTURING**  
C. Simsir, I. Felde, *Department of Manufacturing Engineering of Atılım University, Turkey*
  - **COMPARISON OF TWO DEPTH PROFILING METHODS FOR ANALYSIS OF SOL-GEL TiO<sub>2</sub>-ZrO<sub>2</sub> FILMS ON STAINLESS STEEL**  
Lidija Ćurković, Amalija Vugrinčić, Zdravko Siketić, Ivana Bačić, Lidija Levačić, *University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia*
  - **THE INFLUENCE OF RESIDUAL STRESSES ON FATIGUE CRACK GROWTH RATE IN STIFFENED PANELS**  
Željko Božić, Siegfried Schmauder, Hinko Wolf, *University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, Croatia*
  - **TENDENCIES OF IMPROVEMENT AND EXPERIENCE OF DEVELOPMENT OF MATERIALS FOR STEAM PIPELINES AND BOILERS OF ADVANCED POWER EQUIPMENT**  
A. V. Dub, V. N. Skorobogatykh, I. A. Schenkova, P. A. Kozlov, *PJSC RPA "CNIITMASH", Moscow, Russia*
  - **SIMULATION AND MEASUREMENT OF ALUMINUM-NITRIDE PRECIPITATION IN HOT ROLLED AL-KILLED LOW CARBON STEEL COIL**  
I. Felde, A. Mucsi, *Obuda University, Faculty of Informatics, Budapest, Hungary*
  - **NUMERICAL MODELLING OF LASER SURFACE HARDENING**  
M. Bojinović, N. Mole, B. Štok, *TIC-Lens laserske tehnologije d.o.o, Celje, Slovenia*



## GENERAL INFORMATION

### VENUE

**2<sup>nd</sup> MEDITERRANEAN CONFERENCE ON HEAT TREATMENT AND SURFACE ENGINEERING** will be held in hotel Croatia, Cavtat-Dubrovnik, CROATIA, June 11 – 14, 2013, 6 km from Dubrovnik International Airport. The climate in the Dubrovnik region in June is excellent and will provide a suitable environment for promoting interactions among participating specialists.

**LANGUAGE:** The official language of the Conference is English.

REGISTRATION FEES	After 01. 05. 2013.
Participants and authors (includes: Proceedings, refreshments in breaks, two lunches, welcome reception, excursion and banquet)	550 EUR
Young scientists and students (includes: Proceedings, refreshments in breaks, welcome reception)	300 EUR
Accompanying persons (includes: welcome reception, excursion and banquet)	300 EUR

A refund, less 20% deduction for administrative costs, will be issued for cancellations received by 01.06.2013. Registered participants who do not cancel before 01. 06. 2013., or do not attend the Conference, will be charged 50% of the Conference fee and will be sent a copy of Proceedings after the event.

For registration please use interactive link at the Internet address [www.hdtoip.hr](http://www.hdtoip.hr) for REGISTRATION FORM, or send a copy of the overleaf REGISTRATION FORM.

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Swift code: ZABAHR 2X

IBAN: HR9723600001101498226

Account holder: Croatian Society for Heat Treatment and Surface Engineering.

### COMMERCIAL PRESENTATION

This Conference is going to be a world-wide gathering of Heat Treatment and Surface Engineering specialists from industry, research institutions and universities. Its purpose is especially to bring together the manufactures of equipment and components as well as new technology providers in the new opening markets of Middle and South-East Europe. If you wish to use this opportunity for exposure of your company, we offer you the following possibilities for company presentation:

1.	Exhibition Booth (4 square meters with a table, chairs and a panel)	500 EUR
2.	<b>Standard Sponsorship</b> -Sponsor Company logo printed on the Conference promotional material - Sponsor Company logo printed on the Conference Programme - Sponsor Company logo printed on the Conference Proceedings - Sponsor Company logo published on the Conference web site with link to the company's web site	1000 EUR
3.	<b>Special Sponsorship</b> As for Standard Sponsorship plus: - Sponsor Company brochure distributed in Conference bags - Full mailing list of Conference delegates for marketing purposes	1250 EUR
4.	<b>Advertisement</b> in the Proceedings of the Conference- full colour page	250 EUR
5.	Compulsory Registration Fee (including Proceedings)	200 EUR

## ACCOMMODATION

The accommodation is organised in Hotel Croatia\*\*\*\*\* and Hotel Supetar \*\*\* with special congressional prices.

Croatia Hotel is located in Cavtat at the very south of the Republic of Croatia; 18 kms from Dubrovnik and only 6 kms from Dubrovnik International Airport, 10 minutes walking distance from Cavtat.

Croatia Hotel lies in an exceptionally beautiful position and secluded location on a peninsula overlooking the Adriatic on one side and the picturesque old town of Cavtat on the other. The world famous medieval walled city of Dubrovnik can be seen from some hotel terraces.

There are special rates for participants of the conference and accompanying persons, valid also for pre/post stay in hotel.

	Hotel Croatia *****	Hotel Supetar ***
Room	Price per person / per day	
1/1 BB	€ 150	€ 95
1/2 BB with sea view	€ 85	€ 55

*City tax: EUR 1.00 per person/day, VAT included in the above prices.*

**Booking is possible** by logging on to the Hotel Croatia's web site: [www.hoteli-croatia.hr](http://www.hoteli-croatia.hr)

Please fill it out the reservation form indicating the access code: **CSHTSE2013**. Without providing this code, you will be charged with the regular room rate for the requested period and not the special congressional price granted to the participants of this event.

The accommodation reservation is valid after Hotel's confirmation. For any other information, please contact the Hotel.

For the participants who are not able to guarantee their reservation with credit card details, a deposit payment of one overnight is required. In order to make your reservation with this type-guarantee, please contact hotel directly at [lina.martinovic@alh.hr](mailto:lina.martinovic@alh.hr) and you will receive pro forma invoice for hotel services.

**Deadline** for submitting reservations: May 10th, 2013.



**Hotel Croatia,**  
Frankopanska 10,  
20 210 Cavtat-Dubrovnik,  
Croatia  
Phone: + 385 20 475 555  
Fax: + 385 20 478 213  
e-mail: [info@hoteli-croatia.hr](mailto:info@hoteli-croatia.hr)  
<http://www.hoteli-croatia.hr>

## SOCIAL PROGRAMME

A social programme has been designed to give the delegates and accompanying persons the opportunity to meet informally and enjoy in Dubrovnik regions.

## WELCOME COCTAIL

A welcome coctail will be offered on the evening 11 June 2013, at 20.00 to allow participants to meet friends and fellow profesionals from around the world.

## BANQUET

On the evening of 13 June 2013, at 21.00 a Conference dinner will be served.

## EXCURSION TO DUBROVNIK

Dubrovnik, a medieval aristocratic republic from the 12th-19th centuries and the best preserved walled city in the Mediterranean, is one of Croatia's main tourist attractions and one of only three European cities ranked as a World Heritage Site of zero category by UNESCO, which the English poet Lord Byron named the "pearl of the Adriatic".

The enchanting landscape, including the nearby islands, the beeches, the numberless historical sites, the colours, the shapes, the scents, the warmth of the climate and people...

will all provide for an unforgettable experience.



The Galleon Tirena is a replica of merchant ship from the 16th century commonly used for sea trade in Dubrovnik Republic. Many European nations by far remember large and solid merchant ships-galleons transporting large quantities of salt, wool, spices and other necessities of that time.

Galleon Tirena is 31 meters of lenght, 7 meters of widht and has capacity up to 200 passengers.

The ship is made of Croatian wood accordinf to the original drawings from Dubrovnik Maritime Museum, with sails, cannons an crew, retaining galleon essential character.

# REGISTRATION FORM

## 2<sup>nd</sup> MEDITERRANEAN CONFERENCE & NEW CHALLENGES ON HEAT TREATMENT AND SURFACE ENGINEERING

11 - 14 June 2013, Dubrovnik - Cavtat, Croatia

Family name:  Mr.  Ms.   
First name:  Title: Prof.  Dr.  Mr.   
Institute/Company:   
Mailing address:   
Postcode:  City:  Country:   
Phone:   
E-mail:

REGISTRATION FEES	Number of persons	Amount
Participants and authors (includes: Proceedings, refreshments in breaks, two lunches, welcome reception, excursion and banquet)		550 EUR
Young scientist and students (includes: Proceedings, refreshments in breaks, welcome reception)		300 EUR
Accompanying persons (includes: welcome reception, excursion and banquet)		300 EUR
Total amount EUR :		

**The money transfer charge has to be paid by the sender.**

Name and surname of accompanying person:

Please, specify the name(s) of participants:

### Bank Transfer:

Zagrebačka banka d.d., Zagreb, Croatia

Swift code: ZABA HR 2X

Account number: 2500-3253112

IBAN: HR9723600001101498226

Account holder: Croatian Society for Heat Treatment and Surface Engineering

Please, specify the name(s) of participants.

### Fax or Mail to:

Croatian Society for Heat Treatment  
and Surface Engineering, CSHTSE  
HR-10000 Zagreb, Ivana Lučića 1, Croatia

Fax: ++385 1 6157 109

E-mail: [hdtoip@hdtoip.hr](mailto:hdtoip@hdtoip.hr)

Homepage: <http://www.hdtoip.hr>