

# 1<sup>st</sup> INTERNATIONAL CONFERENCE ON HEAT TREATMENT AND SURFACE ENGINEERING OF TOOLS AND DIES

## FINAL PROGRAMME

### HEAT TREATMENT



### SURFACE ENGINEERING



### PHYSICAL METALLURGY



### MATHEMATICAL MODELLING



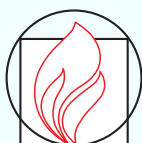
08 - 11 June 2005  
Hotel HISTRIA, Pula, Croatia



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



**ASMET**  
The Austrian Society for Metallurgy  
and Materials



**SSHT**  
Slovenian Society for Heat Treatment



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

## INTRODUCTION

This international three-day conference focused on the introduction of advanced systems in the field of heat treatment and surface engineering of tools and dies will be the first conference co-organised by three national associations: the Croatian Society for Heat Treatment and Surface Engineering (CSHTSE), the Austrian Society for Metallurgy and Materials (ASMET), and the Slovenian Society for Heat Treatment (SSHT), sponsored by the International Federation for Heat Treatment and Surface Engineering (IFHTSE).

The Conference will provide an international forum for researchers of industrial and academic backgrounds to discuss latest developments in heat treatment and surface engineering of tools and dies. It should offer an opportunity to examine the state of the art and a perspective of scientific and technological achievements in heat treatment, surface modification and coating of tools and dies.

Those interested in manufacturing processes, modelling and simulation, equipment and management, especially in the fields of advanced heat treatment and surface engineering of tool and dies, will find the Conference of great benefit.

### Chairman

Prof. Božo Smoljan, CSHTSE, Croatia

### Co-Chairman

Dr. Heimo Jäger, ASMET, Austria

### Co-Chairman

Dr. Vojteh Leskovšek, SSHT, Slovenia

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University of Zagreb, Croatia



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Ministry of Science, Education and Sports  
of the Republic of Croatia



Croatian Chamber of Economy



Faculty of Mechanical Engineering  
and Naval Architecture (FMENA),  
University of Zagreb, Croatia



Faculty of Engineering  
Rijeka, Croatia



Institute of Metals and Technology  
Ljubljana, Slovenia





The Austrian Society  
for Metallurgy and Materials



Istarska  
županija

## TIMETABLE OF THE PROGRAMME

Hour	Wednesday 08. June	Thursday 09. June	Friday 10. June	Saturday 11. June
9,00		OPENING CEREMONY	Keynote lecture	Keynote lecture
10,00		Keynote lecture	SURFACE ENGINEERING	PHYSICAL METALLURGY
11,00		HEAT TREATMENT	Break	Break
12,00		HEAT TREATMENT	SURFACE ENGINEERING	MATHEMATICAL MODELLING
13,00		Break	Break	CLOSURE
14,00		HEAT TREATMENT	SURFACE ENGINEERING	
15,00		POSTER SESSION	POSTER SESSION	
16,00		Lunch break	Lunch break	
17,00		Keynote lecture	Excursion to the National Park Brijuni	
18,00	REGISTRATION	SURFACE ENGINEERING		
19,00				
20,00	WELCOME RECEPTION		Banquet	
21,00				

### Conference Secretariat

Dr. Božidar Matijević  
 Croatian Society for Heat Treatment and  
 Surface Engineering, CSHTSE  
 HR-10000 Zagreb, Ivana Lučića 1, Croatia  
 Phone: ++385 /0/1 6168 365  
 Fax: ++385 /0/1 6157 109  
 E-mail: [hdtoip@fsb.hr](mailto:hdtoip@fsb.hr)  
 Homepage: <http://www.fsb.hr/hdtoip>

### Hotel information

ARENATURIST HOTELI D.O.O.  
 Splitska 1  
 HR-52100 PULA, CROATIA  
 Phone: ++ 385 /0/52 529 434  
 Fax: ++ 385 /0/52 529 401  
 E-mail: [ljubo@arenaturist.hr](mailto:ljubo@arenaturist.hr)  
 Internet : [www.arenaturist.hr](http://www.arenaturist.hr)

# PROGRAMME

THURSDAY, June 09, 2005

09,00 - 09,30	OPENING CEREMONY
<b>TECHNICAL SESSION</b>	
09,30	Session: <b>HEAT TREATMENT</b>
09,30 - 10,00	<b>Keynote lecture:</b> <b>PROVED TECHNOLOGIES AND INDUSTRIAL DEVELOPMENTS IN HEAT TREATMENT AND SURFACE ENGINEERING OF TOOLS AND DIES</b> J.Bach, F. Dambacher, K. Höck - <i>Härte und Oberflächentechnik GmbH &amp; Co. KG, Nürnberg, GERMANY</i>
10,00 - 11,00	<ul style="list-style-type: none"> <li>• <b>PROCESS OPTIMISATION FOR DEEP COLD TREATMENT OF TOOL STEELS</b> P. F. Stratton- <i>BOC, West Yorkshire, UK</i></li> <li>• <b>WEAR BEHAVIOUR OF DEEP CRYOGENIC TREATED HIGH SPEED STELS</b> M. Kalin, V. Leskovšek, J. Vižintin - <i>Center for Tribology and Technical Diagnostics, University of Ljubljana, SLOVENIA</i></li> <li>• <b>IMPROVING TOOL PRODUCT PERFORMANCE THOUGH THE USE OF INTENSIVE QUENCHING PROCESSES</b> M.A. Aronov, J.A. Powell, N.I. Kobasko- <i>IQ Technologies Inc, Ohio, USA</i></li> <li>• <b>VACUUM FURNACE INTEGRATED „SUB-ZERO“ TREATMENT</b> B. Zieger, R. Stein - <i>SCHMETZ GmbH, Menden, GERMANY</i></li> </ul>
11,00 - 11,30	Break
11,30 - 13,15	<ul style="list-style-type: none"> <li>• <b>THE MAIN PRINCIPLES OF INTENSIVE QUENCHING OF TOOLS AND DIES</b> N. I. Kobasko- <i>IQ Technologies Inc, Ohio, USA</i></li> <li>• <b>OPTIMIZING THE VACUUM HEAT TREATMENT OF HOT-WORK TOOL STEELS BY LINEAR ELASTIC FRACTURE MECHANICS</b> V. Leskovšek, B. Šuštaršič, G. Jutriša, D. Baksa, J. Kopač- <i>Institute of Metals and Technology, Ljubljana, SLOVENIA</i></li> <li>• <b>MICROSTRUCTURAL EVOLUTION OF RAPIDLY SOLIDIFIED HIGH-SPEED STEEL DURING HIGH TEMPERATURE ANNEALING</b> C. Stotter, H. Leitner, R. Ebner, P. Ramminger, E. Brandstätter- <i>Materials Center Leoben, Leoben, AUSTRIA</i></li> <li>• <b>HIGH TEMPERATURE BRAZING OF HIGH TEC COMPONENTS– A THERMAL PROCESSING WITH SPECIFIC REQUIREMENTS</b> I. Reinkensmeier, H. Buurssen- <i>Bodycote Wärmebehandlung GmbH, Menden, GERMANY</i></li> <li>• <b>IMPROVED PRODUCTION OF STEEL PARTS BY INTENSIVE QUENCHING</b> N.I. Kobasko, L.C.F. Canale, G.E. Totten- <i>IQ Technologies Inc, Ohio, USA</i></li> <li>• <b>THE USE OF A NEW TYPE OF LARGE VACUUM BATCH FURNACE FOR THE HEAT TREATMENT OF MOULDS AND DIES</b> Th. Wingens, B. Edenhofer, O. Irretier- <i>IPSEN International GmbH, Kleve, GERMANY</i></li> <li>• <b>SINGLE &amp; MULTI- CHAMBER VACUUM FURNACES FOR TOOLS AND DIES HEAT TREATMENT</b> D. Siniarski, M. Korecki- <i>Lodz Technical University, Lodz, POLAND</i></li> </ul>
13,15 - 13,45	<b>POSTER SESSION</b>
13,45 - 15,00	Lunch break
15,00	Session: <b>SURFACE ENGINEERING</b>
15,00 - 15,30	<b>Keynote lecture:</b> <b>MULTIFUNCTIONAL NANOSTRUCTURED HARD COATINGS FOR WEAR PROTECTION</b> C. Mitterer- <i>Montanauniversität Leoben, Leoben, AUSTRIA</i>
15,30 – 16,30	<ul style="list-style-type: none"> <li>• <b>EFFECTS OF DIFFERENT ALLOYING ELEMENTS ON THE HARDNESS PROFILE OF NITRIDED HOT-WORK TOOL STEELS</b> R. Schneider, H. Schweiger, V. Strobl- <i>University of Appl. Sciences- FH- Wels, Wels, AUSTRIA</i></li> </ul>

	<ul style="list-style-type: none"> <li>• <b>STUDY ON CORROSION OF CHROMIUM NITRIDE AND TITANIUM NITRIDE COATINGS IN LIQUID ALUMINIUM</b> G. Negrea, H. Vermesan, V. Rus- <i>Technical University of Cluj-Napoca, Faculty of Materials Science and Engineering, Cluj- Napoca, ROMANIA</i></li> <li>• <b>NITRIDED IRON ALUMINIDE- A NEW MATERIAL FOR HOT WORKING TOOLS</b> A. Fischer, H.J. Spies, H. Biermann, M. Staia- <i>University of Mining and Technology, Freiberg, GERMANY</i></li> <li>• <b>THE INFLUENCE OF BIAS AND IN-SITU CLEANING ON THROUGH CAGE (TC) OR ACTIVE SCREEN PLASMA NITRIDING (ASPN) OF STEELS</b> P. Hubbard, S. J. Dowey, E. D. Doyle, D. G. McCulloch- <i>Surface Technology Coatings, Thomastown, Victoria, AUSTRALIA</i></li> </ul>
16,30 - 17,00	Break
17,00 - 18,00	<ul style="list-style-type: none"> <li>• <b>INDENTATION FRACTURE TESTING OF NITRIDED LAYERS ON H11 TOOL STEEL</b> D. Nolan, V. Leskovšek, M. Jenko- <i>University of Wollongong, AUSTRALIA</i></li> <li>• <b>VACUUM OXYCARBONITRIDING OF ARTICLES OF X12 TOOL STEEL</b> P. Danev, D. Gospodinov, R. Radeva - <i>University of Rousse, MTM Department, Rousse, BULGARIA</i></li> <li>• <b>THE MECHANICAL PROPERTIES OF TOOL STEELS WITH DIFFUSION CARBON AND NITROCARBON LAYERS</b> T. Babul, N. Kucharieva, A. Nakonieczny, J. Senatorski- <i>Institute of Precision Mechanics, Warsaw, POLAND</i></li> <li>• <b>COMBINATION OF MILLING AND LASER BEAM MACHINING FOR MOULD MAKING</b> H. J. Pieper, E. Wolf, M. Krause- <i>Otto-von-Guericke University of Magdeburg, Institute of Manufacturing Technology and Quality Management, Magdeburg; GERMANY</i></li> </ul>

## FRIDAY, June 10, 2005

09,00 - 09,30	<p><b>Keynote lecture:</b> <b>TRIBOLOGY IN METALWORKING</b> Jože Vižintin, Bojan Podgornik- <i>Center for Tribology and Technical Diagnostics, University of Ljubljana, SLOVENIA</i></p>
09,30 - 10,45	<ul style="list-style-type: none"> <li>• <b>TRIBOLOGICAL PROPERTIES OF SURFACE ENGINEERED HOT-WORK TOOL STEEL FOR ALUMINIUM EXTRUSION DIES</b> M. Pellizzari, M. Zadra, A. Molinari- <i>University of Trento, Department of Materials Engineering and Industrial Technologies, Trento, ITALY</i></li> <li>• <b>HARD COATINGS TO PREVENT THE WASHOUT PHENOMENA IN HIGH PRESSURE DIE CASTING TOOLS</b> D. Ugues, E. Torres Miranda, M. Perucca, M. Albertinazzi, M. Rosso- <i>Politecnico di Torino, Dipartimento di Scienza dei Materiali, Torino, ITALY</i></li> <li>• <b>STATUS QUO OF TRD COATING APPLICATION IN THE WORLD</b> T. Arai- <i>Teikuro Corporation, Springfield, USA</i></li> <li>• <b>IMPROVEMENT WEAR RESISTANCE OF HOT-WORK TOOL STEEL BY PLASMA NITRIDING AND PVD COATINGS</b> L. A. Dobrzański, M. Polok, M. Adamiak, M. G. Faga- <i>Silesian University of Technology, Gliwice, POLAND</i></li> <li>• <b>IMPROVEMENT IN GALLING PERFORMANCE THROUGH SURFACE ENGINEERING</b> B. Podgornik, J. Vižintin, S. Hogmark- <i>Center for Tribology and Technical Diagnostics, University of Ljubljana, SLOVENIA</i></li> </ul>
10,45 - 11,15	Break
11,15 - 13,00	<ul style="list-style-type: none"> <li>• <b>ADVANCED APPLICATIONS OF PVD AND CVD COATINGS IN AUTOMOTIVE INDUSTRY: CUTTING TOOLS AND DIES</b> A. Durante, D. Franchi, M. Rostagno- <i>Centro Ricerche FIAT, (Dies and Machining), Torino, ITALY</i></li> <li>• <b>HARDIDE™ - ADVANCED CVD COATING FOR TOOLS AND DIES</b> Yuri Zhuk- <i>Hardide Ltd, Bicester, UK</i></li> <li>• <b>COMPARISON OF MECHANICAL PROPERTIES OF VARIOUS PVD HARD COATINGS FOR FORMING TOOLS</b> Đ. Gorščak, P. Panjan, M. Čekada, L. Čurković- <i>Končar- Tools, Zagreb, CROATIA</i></li> </ul>



	<ul style="list-style-type: none"> <li>• <b>TEST OF MATERIALS AND SURFACE TREATMENT TECHNOLOGIES ENHANCING THE LIFETIME OF FORMING TOOLS</b> J. Fait, Z. Łataś, P. Motyčka, Z. Rogalski, P. Šuchmann- Ško- Tools, Plzeň, CZECH REPUBLIK</li> <li>• <b>DIMENSIONAL ANALYSIS IN THE GROWTH KINETICS OF FeB AND Fe<sub>2</sub>B LAYERS DURING THE BORIDING PROCESS</b> R. Torres, I. Campos, O. Bautista, G. Ramirez, L. Zuniga- ITESM- CCM Mechanical Department, Mexico D. F., MEXICO</li> <li>• <b>THERMAL AND THERMOCHEMICAL TREATMENTS OF TOOL STEELS IN VACUUM</b> V. Toshkov, A. Ziumbilev- Technical University of Sofia, Department of Material Engineering, Sofia, BULGARIA</li> <li>• <b>DUPLEX LAYERS ON COLD WORKING STEEL</b> B. Škorić, D. Kakaš, D. Krumes, Z. Kolumbić- University of Novi Sad, Faculty for Technical Science, Novi Sad, SICG</li> </ul>
13,00 – 13,30	<b>POSTER SESSION</b>
13,30 – 14,30	Lunch break

## SATURDAY, June 11, 2005

09,00	Session: <b>PHYSICAL METALLURGY</b>
09,00 - 09,30	<b>Keynote lecture:</b> <b>STRUCTURAL CHANGES AND PROPERTIES MODIFICATIONS IN HEAT TREATING OF TOOL STEELS: THE DOMINANT ROLE OF PHYSICAL METALLURGY</b> M. Rosso- Politecnico di Torino, Dipartimento di Scienza dei Materiali e Ingegneria Chimica, Torino, ITALY
09,30 - 10,15	<ul style="list-style-type: none"> <li>• <b>INFLUENCE OF THE THERMOMECHANICAL AND THERMOPHYSICAL MATERIAL PROPERTIES ON THE THERMAL FATIGUE BEHAVIOUR OF HOT WORK TOOL STEELS EMPLOYING A PULSED LASER TESTING SYSTEM</b> I. Siller, H. Parizek- Böhler Edelstahl GmbH, Kapfenberg, AUSTRIA</li> <li>• <b>CORROSION RESISTANT PLASTIC MOULD STEEL WITH EXCELLENT POLISHABILITY</b> J. Perko, F. Russ, I. Siller- Böhler Edelstahl GmbH, Kapfenberg, AUSTRIA</li> <li>• <b>MODEL OF NON-ISOKINETIC TRANSFORMATION PROCESSES</b> T. Reti, I. Felde, B. Smoljan, R. Colas- Széchenyi Istvan University, Győr, HUNGARY</li> </ul>
10,15- 10,45	Break
10,45	Session: <b>MATHEMATICAL MODELLING</b>
10,45 - 12,15	<ul style="list-style-type: none"> <li>• <b>A NOVEL EVALUATION METHOD OF QUENCHANTS BY USING COMPUTER SIMULATION</b> I. Felde, T. Reti, J. Bodin, G. Sarmiento, B. Smoljan- Bay Zoltán Institute for Materials Science and Technology, Budapest, HUNGARY</li> <li>• <b>COMPUTER SIMULATION OF THE HARENABILITY OF HEAT TREATABLE STEELS</b> L. A. Dobrzański, W. Sitek- Silesian University of Technology, Gliwice, POLAND</li> <li>• <b>EFFICIENT OPTIMISATION OF MANUFACTURING PROCESSES WITH THE SIMULATION SOFTWARE DEFORM™</b> E. Reiss, J. Walters, W. T. Wu- S&amp;I Technology, Niklasdorf, AUSTRIA</li> <li>• <b>THE PROPERTIES AND DEFECTOLOGY OF TOOL STEELS AND TOOLS</b> J. Rodič- INTECO- Special melting technologies GmbH/ MINDOC C&amp;S, Bruck an der Mur, AUSTRIA</li> <li>• <b>AN APPLICATION OF MODIFIED JOMINY-TEST IN COMPUTER SIMULATION OF QUENCHING OF COLD WORK TOOL STEELS</b> B. Smoljan, D. Rubeša, N. Tomašić, S. Smokvina Hanza, D. Iljkić- University of Rijeka, Faculty of Engineering, Rijeka, CROATIA</li> <li>• <b>THE INFLUENCE OF METAL SURFACE ROUGHNESS ON TEMPERATURE MEASUREMENT BY THERMAL CAMERAS</b> W. Swiderski- Military Institute of Armament Technology, Zielonka, POLAND</li> </ul>

## POSTERS

HEAT TREATMENT	<ul style="list-style-type: none"> <li>• <b>INFLUENCE OF THE PRETREATMENT THERMAL TREATMENT ON THE MICROSTRUCTURE AND PROPERTIES OF X38CrMoV5-1 STEEL</b> J. Jasinski, R. Torbus, E. Kasprzycka, B. Bogdanski- <i>Czestochowa University of Technology, Czestochowa, POLAND</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>INFLUENCE OF QUENCHING OILS COMPOSITION ON COOLING RATE</b> Lj. Pedišić, B. Matijević, B. Perić, <i>INA-MAZIVA ZAGREB d.o.o., Zagreb, CROATIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>THE INFLUENCE OF MULTIPLE SOLUTION ANNEALING ON KINETICS OF STRUCTURAL TRANSFORMATION OF MARAGING STEELS</b> I. Kladarić, D. Krumes, R. Marković- <i>University of Osijek, Faculty of Mechanical Engineering, Slavonski Brod, CROATIA</i></li> </ul>
SURFACE ENGINEERING	<ul style="list-style-type: none"> <li>• <b>DIFFUSION CHROMIZED LAYERS PRODUCED ON IRON AND STEEL SURFACE BY MEANS OF CVD</b> E. Kasprzycka, B. Bogdanski- <i>Institute of Precision Mechanics, Warsaw, POLAND</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>FACTORS DETERMINING GROWTH OF DIFFUSION LAYERS ON IRON AND LOW-CARBON STEEL SURFACE DURING VACUUM CHROMIZING PROCESS</b> E. Kasprzycka- <i>Institute of Precision Mechanics, Warsaw, POLAND</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>ANTICARBURISING COATINGS APPLIED ON PARTS OF CARBURISING FURNACES</b> M. Garbiak, B. Piekarski- <i>Szczecin University of Technology, Szczecin, POLAND</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>NANO TECHNOLOGY FOR SURFACE TREATMENT OF FERROMAGNETIC MATERIALS</b> A. Makedonski, B. Makedonski, S. Troha- <i>Technical University of Sofia, Faculty of Mechanical Technology, Sofia, BULGARIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>LASER SURFACE TREATMENT OF TOOL STEELS AND HARD METALS FOR IMPROVEMENT OF PVD COATINGS ADHESION</b> Fernandes de Lima Milton Sergio, Neves Davi, Diniz Anselmo Eduardo- <i>IEAV- Aerospace Technology Centre, Sao Jose dos Compos, BRAZIL</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>METHOD AND A UNIT FOR NITRIDING, CARBONITRIDING AND OXYCARBONITRIDING IN VACUUM</b> P. Danev, D. Gospodinov, R. Radeva- <i>University of Rousse, MTM Department, Rousse, BULGARIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>IMPROVEMENT IN THERMO REACTIVE DEPOSITION OF CARBIDE LAYERS</b> B. Matijević, M. Stupnišek- <i>University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, CROATIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>GAS NITRIDING OF EN40B STEEL WITH HIGHEST GROWTH RATE OF THE CASE AND REDUCED WHITE LAYER FORMATION</b> S. Mridha- <i>Faculty of Engineering, Kuala Lumpur, MALAYSIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>EFFECTS OF THERMOCHEMICAL TREATMENTS ON MARAGING STEEL PROPERTIES</b> F. Cajner, D. Landek, H. Cajner, S. Šolić- <i>University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, CROATIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>LASER BEAM MACHINING OF HARD METAL</b> H. J. Pieper, E. Wolf, M. Krause- <i>Otto-von-Guericke University of Magdeburg, Institute of Manufacturing Technology and Quality Management, Magdeburg; GERMANY</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>EXPERIMENTAL RESEARCH CONCERNING THE THERMAL SHOCK BEHAVIOUR OF SOME ION NITRIDED STAINLESS STEELS</b> V. Rus, G. Negrea, H. Vermesan- <i>Technical University of Cluj- Napoca, Faculty of Materials Science and Engineering, Cluj- Napoca, ROMANIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>NITRIDING WITHOUT WHITE LAYER WITH CONTINUOUSLY CHANGE THE NITRIDING POTENTIAL DURING PROCESS</b> J. Michalski, A. Nakonieczny, J. Tacikowski, P. Wach- <i>Institute of Precision Mechanics, Warsaw, POLAND</i></li> </ul>

SURFACE ENGINEERING	<ul style="list-style-type: none"> <li>• <b>NEW TECHNOLOGY MO PVD-ARC MULTILAYER PRODUCING PLASMA ATMOSPHERE OF <math>Al(CH_3)_3</math></b></li> <li>• <b>PRECURSOR</b> M. Betiuk, K. Burdycski, H. Baum, A. Nakonieczny, A. Przywowski, M. Szudrowicz- <i>Institute of Precision Mechanics, Warsaw, POLAND</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>ABRASION RESISTANCE OF THERMAL SPRAYED LAYERS</b> K. Grilec, S. Jakovljević, V. Rede- <i>University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, CROATIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>MICROSTRUCTURE AND MECHANICAL CHARACTERISTICS OF DMLS TOOL- INSERTS</b> B. Šuštaršič, S. Dolinšek, M. Godec, M. Jenko, V. Leskovšek- <i>Institute of Metals and Technology, Ljubljana, SLOVENIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>INFLUENCE ON THE PARAMETERS OF PLASMA SPRAYING PROCESS AT THERMAL FATIGUE OF THERMAL BARRIER COATING - <math>ZrO_2/MgO</math></b> D. Kakaš, M. Mrdak, Z. Kolumbić, D. Krumes- <i>University of Novi Sad, Faculty for Technical Science, Novi Sad, SICG</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>EFFECT OF LASER HPDL SURFACE MODIFICATION OF X40CrMoV5-1 HOT-WORK TOOL STEEL</b> L. A. Dobrzański, M. Bonek, E. Hajduczek- <i>Silesian University of Technology, Gliwice, POLAND</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>LOW FRICTION NANOCOMPOSITE Cr-C/a-C:H COATINGS</b> J. Kiefer, G. Gassner, P.h. Mayrhofer, C. Mitterer- <i>TCE Technical Coating &amp; Engineering GmbH, Kapfenberg, AUSTRIA</i></li> </ul>
PHYSICAL METALLURGY	<ul style="list-style-type: none"> <li>• <b>USE OF CONTINUOUSLY CAST IRON TO PRODUCE PARTS AFFECTED BY THERMOCYCLICAL IMPACTS</b> B. Stasys- <i>Kaunas University of Technology, Kaunas, LITHUANIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>PHYSICAL ENGINEERING OF ACICULAR FERRITE FORMATION AND ITS COMPARISON WITH BAINITE</b> E. Mazancova, Z. Jonšta, K. Mazanec- <i>Technical University of Ostrava, Ostrava- Poruba, CZECH REPUBLIC</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>TRANSFORMATION PLASTICITY OF HOT- WORK STEEL DURING HARDENING</b> R. Bendikiene, J. Zvinys- <i>Kaunas University of Technology, Kaunas, LITHUANIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>APPLICATION OF LOW-SILICON HOT WORK TOOL STEEL FOR THE DIE CASTING MOULDS OPERATING UNDER HIGH THERMAL LOAD</b> Đ. Gorščak, S. Vujnović, D. Kapudija, V. Rede, L. Čurković- <i>Končar- Tools, Zagreb, CROATIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>STRUCTURE AND PROPERTIES OF HIGH- SPEED STEELS AFTER AUSTEMPERING</b> J. A. Kaleicheva, G. S. Baharov- <i>Technical University of Sofia, Department of Materials Science and Engineering, Sofia, BULGARIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>INFLUENCE OF ELECTROSLAG REMELTING ON PROPERTIES OF STEEL GRADE X22CrMoV12-1</b> M. Greger, L. Čížek, S. Ruz- VŠB - <i>Technical University of Ostrava, Faculty of Metallurgy and Materials Engineering, Ostrava-Poruba, CZECH REPUBLIC</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>THE ROLE OF INTERCRITICAL JOMINY TEST IN THE DEVELOPMENT OF DP AND TRIP STEELS</b> M. Reger, B. Vero, Zs. Csepeli, C.H. GurM- <i>Budapest Polytechnic Department of Materials and Technology, Budapest, HUNGARY</i></li> </ul>
MATHEMATICAL MODELLING	<ul style="list-style-type: none"> <li>• <b>ESTIMATING THE ABRASION RESISTANCE OF STEELS USING FUZZY LOGIC</b> D. Lisjak, T. Filetin- <i>University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, CROATIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>USE OF FUZZY LOGIC FOR MODELING THE GROWTH OF PHASE <math>Fe_2B</math> BORIDE LAYERS DURING BORONIZING</b> M. Islas, I. Campos, E. Gonzalez, P. Ponce- <i>ITESM- CCM Mechanical Department, Mexico D. F., MEXICO</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>THE APPLICATION OF ARTIFICIAL INTELLIGENCE METHODS IN HEAT TREATMENT</b> T. Filetin, I.Žmak, D. Lisjak, D. Novak, D. Landek- <i>University of Zagreb, Faculty of Mechanical Engineering and Naval Architecture, Zagreb, CROATIA</i></li> </ul>
	<ul style="list-style-type: none"> <li>• <b>MONITORING AND ARCHIVING SYSTEM FOR CARBURIZING IN LIQUID ORGANIC COMPOUNDS ATMOSPHERE</b> J. Grzyb, S. Joszyk, T. Babul- <i>Institute of Precision Mechanics, Warsaw, POLAND</i></li> </ul>



## GENERAL INFORMATION

### VENUE

The 1<sup>st</sup> INTERNATIONAL CONFERENCE ON HEAT TREATMENT AND SURFACE ENGINEERING OF TOOLS AND DIES will be held in hotel HISTRIA, Pula, CROATIA, 10 km from Pula International Airport. The climate in the Pula 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

Participants and authors (includes: Proceedings, refreshments in breaks, two lunches, welcome reception, excursion and banquet)	400 EUR
Young scientists and students (includes: Proceedings, refreshments in breaks, welcome reception)	200 EUR
Accompanying persons (includes: welcome reception, excursion and banquet)	200 EUR

A refund, less 20% deduction for administrative costs, will be issued for cancellations received by 1<sup>st</sup> June 2005. Registered participants who do not cancel before 1st June 2005, 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 the Internet address [www.fsb.hr/hdtoip](http://www.fsb.hr/hdtoip) for REGISTRATION FORM, or send a copy of the overleaf REGISTRATION FORM.

The payment can be effected by bank transfer in favour of Zagrebacka banka d.d.,

Account number: 2500-3253112

Swift code: ZABAHR 2X

Account holder: Croatian Society for Heat Treatment and Surface Engineering (CSHTSE)

### COMMERCIAL PRESENTATION

This Conference is going to be a world-wide gathering of Heat Treatment and Surface Engineering of Tools and Dies 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:

<b>1. Exhibition Booth</b> (4 square meters with a table, chairs and a panel)	500 EUR
<b>2. 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
<b>3. 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
<b>4. Advertisement</b> in the Proceedings of the Conference- full colour page	250 EUR
<b>5. Compulsory Registration Fee</b> (including Proceedings)	200 EUR

## ACCOMMODATION

Hotel HISTRIA offers a first class accommodation (four stars ranking).

For accommodation please use interactive link at the Internet address: [www.fsb.hr/hdtoip](http://www.fsb.hr/hdtoip) HOTEL RESERVATION FORM. There are special rates for participants of the conference and accompanying persons, valid also for pre/post stay in hotel. For more information about accommodation and other useful information, please visit [www.arenaturist.hr](http://www.arenaturist.hr).



### Arriving in Pula

#### Arriving by car:

from the west: Trieste - Koper - Buje - Pula  
 from the north: Villach - Ljubljana - Koper - Buje - Pula  
 from the east: Zagreb - Rijeka - Tunnel Učka - Pazin - Pula

#### Arriving by sea:

maritime border crossing Pula.

[www.venezialines.com](http://www.venezialines.com)

#### Arriving by air:

International Airport Zagreb - Airport Pula.

[www.airport-pula.com](http://www.airport-pula.com)



### Distance from fther cities in Croatia & Europe:

Rijeka	100 km
Zagreb	290 km
Ljubljana	190 km
Graz	400 km
Vienna	600 km
Trieste	120 km
Milan	530 km

## SOCIAL PROGRAMME

A full social programme for delegates and accompanying persons will be organised, including a Conference Banquet and tours to places of cultural and historical interest. A choice of selected tours will be available for accompanying persons. Tours can be booked directly at the registration desk.

### TOUR THROUGH THE OLD TOWN OF PULA

While strolling through Pula you will come across numerous monuments of Roman architecture: the Triumphal Arch of the Sergi from the 1st century B.C., Hercules' Gate and Twin Gates, the Temple of Augustus, Arena and Small Roman Theatre in the town centre.

### VILLAGE PARTY

If you want to spend a wonderful evening, here's marvellous opportunity! Join us on our popular excursion to a picturesque village in the heart of Istria. Share with us the warmth of true Istrian hospitality. Feel the traditional welcome, taste the Istrian grappa and wine, clap yor hands to the folk dancers, but above all enjoy the delicious Istrian dinner.

### ONE DAY TRIP TO VENICE

On June 11 by catamarans ([www.venezialines.com](http://www.venezialines.com))

## HOTEL RESERVATION FORM

**for the 1<sup>st</sup> International Conference on Heat Treatment and Surface Engineering  
of Tools and Dies**

**8<sup>th</sup> - 11<sup>th</sup> June 2005, HOTEL HISTRIA, Pula, Croatia**

Surname:				Title:	
First Name:		Initials:		Male/ Female:	
Affiliation:					
Mailing Address:					
Postal Code:		City:		Country:	
Phone:		Fax:		E-mail:	
ACCOMPANYING PERSON (s): Surname:				First Name:	

SPECIAL RATES FOR PARTICIPANTS AND ACCOMPANYING PERSONS ARE:

	<b>HOTEL HISTRIA</b> (semi board)	<b>HOTEL PALMA</b> (semi board)	<b>APARTMENTS</b> <b>PUNTA VERUDELA</b>
IN DOUBLE ROOM	50,00 € <input type="checkbox"/>	32,00 € <input type="checkbox"/>	37,00 € (2-3 persons) <input type="checkbox"/>
IN DOUBLE ROOM 'SOLO USE'	63,00 € <input type="checkbox"/>	45,00 € <input type="checkbox"/>	48,00 € (4-5 persons) <input type="checkbox"/>

Please mark with 'x' your room choice with rate

For pre/post stay hotel will charge same special conference rate

### ARRIVAL / DEPARTURE

Date of arrival:		Flight number:		Time:	
Date of departure:		Flight number:		Time:	
Remarks:					

### CONFIRMATION:

Deadline for Hotel Reservation is 30. 05.2005., after this date reservation will be accepted on a rooms-available basis only but at the same (above mentioned) rates.

A guarantee via credit card or deposit is required.

No room can be confirmed until Hotel receives deposit or credit card information.

### METHOD OF PAYMENT:

A) Guaranteed by credit card: Amex  Diners  Master  Visa

Name on Card:	
Credit Card Number:	
Expiration Date:	
Signature:	

### B) Bank Transfer

Bank Details: HYPO ALPE ADRIA BANK D.D. ZAGREB

Account Name: ARENATURIST D.D. PULA

Account Number: 7001-2533

SWIFT: KLHB HR 22

With the following remark: 1st International Conference on

Heat Treatment and Surface

Engineering of Tools and Dies- HOTEL HISTRIA PULA

Net payment should be done in EUR.

Participant's name must be clearly specified.

RETURN THIS FORM TO:

ARENATURIST HOTELI D.O.O.

Splitska 1

Hr-52100 PULA, CROATIA

Phone: + 385 52 529 434

Fax: ...+ 385 52 529 401

E-mail: [ljubo@arenaturist.hr](mailto:ljubo@arenaturist.hr); [hdtoip@fsb.hr](mailto:hdtoip@fsb.hr)

Internet : [www.arenaturist.hr](http://www.arenaturist.hr)

# REGISTRATION FORM

## 1<sup>st</sup> INTERNATIONAL CONFERENCE ON HEAT TREATMENT AND SURFACE ENGINEERING OF TOOLS AND DIES

08 - 11 June, 2005., Pula, Croatia

Family name:.....

First name:..... Title: Prof.  Dr.  Mr.  Ms.

Institute/Company:.....

Mailing address:.....

Postcode:..... City:..... Country:.....

Phone:..... Fax:.....

E-mail:.....

Name and surname of accompanying person:.....

REGISTRATION FEES	Number of persons	Amount
Participants and authors (includes: Proceedings, refreshments in breaks, two lunches, welcome reception, excursion and banquet)	400 EUR	
Young scientist and students (includes: Proceedings, refreshments in breaks, welcome reception)	200 EUR	
Accompanying persons (includes: welcome reception, excursion and banquet)	200 EUR	
Total amount EUR		

*Za sudionike i autore iz Hrvatske kotizacija iznosi 1600 kn a za mlade istraživače i studente 800 kn te osobe u pratnji 1200 kn. Kotizacija se uplaćuje na žiro račun Hrvatskog društva za toplinsku obradbu i inženjerstvo površina, broj: 2360000-1101498226.*

### Bank Transfer:

Zagrebačka banka d.d., Zagreb, Croatia  
Account name: Croatian Society for Heat Treatment and Surface Engineering  
Account number: 2500-3253112  
Swift code: ZABA HR 2X

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 /0/1 61 57 109  
E-mail: [hdtoip@fsb.hr](mailto:hdtoip@fsb.hr)  
Internet: <http://www.fsb.hr/hdtoip>