ADVANCE PROGRAMME

ECHT
European Conference on Heat Treatment

HEAT TREATMENT & SURFACE ENGINEERING FOR AUTOMOTIVE

5–7 JUNE 2019

Bardolino
Garda Lake - Italy

Organised by
ASSOCIAZIONE ITALIANA DI METALLURGIA

Patronized by

In cooperation with

www.aimnet.it/echt2019.htm
Following the successful Conference organised in 2015 in Venice, the Italian Association for Metallurgy (AIM) is proud to announce the ECHT 2019 Conference, with focus on Automotive, that will be held in the beautiful Bardolino on Garda Lake on 5-6-7 June 2019.

*We would like to extend our warmest invitation to you to participate to ECHT 2019!*
CONFERENCE CHAIRMAN

Enrico Morgano
CRF - an FCA Company, Italy

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Università di Modena e Reggio Emilia, Italy

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Gearchem, Italy

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Hans Veltrop Consultancy, The Netherlands

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Mimete, Italy

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Michel Jeandin
A3TS / France

Danilo Petta
AIM / Italy

Klaus Löser
AWT / Germany
## Timetable

### Wednesday, 5 June 2019

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<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>9:30</td>
<td>Registration of attendees</td>
</tr>
<tr>
<td>11:00</td>
<td>Opening Session</td>
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<tr>
<td>12:40</td>
<td>Lunch</td>
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<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>14:00</td>
<td>Massive Heat Treatments I</td>
</tr>
<tr>
<td>16:00</td>
<td>Coffee Break</td>
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<tr>
<td>16:20</td>
<td>Cryogenic Treatment</td>
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### Thursday, 6 June 2019

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>8:50</td>
<td>Nitriding and Nitrocarburizing I</td>
</tr>
<tr>
<td>10:50</td>
<td>Coffee Break</td>
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<tr>
<td>11:20</td>
<td>Nitriding and Nitrocarburizing II</td>
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<tr>
<td>13:00</td>
<td>Lunch</td>
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<tr>
<td>14:20</td>
<td>Coatings I</td>
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<tr>
<td>16:20</td>
<td>Coffee Break</td>
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<tr>
<td>16:50</td>
<td>Coatings II</td>
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<tr>
<td>19:30</td>
<td>Social Event</td>
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### Friday, 7 June 2019

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>8:50</td>
<td>Carburizing Processes and Properties</td>
</tr>
<tr>
<td>10:50</td>
<td>Coffee Break</td>
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<tr>
<td>11:10</td>
<td>Stainless Steels</td>
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<tr>
<td>12:50</td>
<td>Closing Session</td>
</tr>
<tr>
<td>13:00</td>
<td>End of the Conference</td>
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</tbody>
</table>
09:30   Registration of attendees

OPENING SESSION

11:00   Welcome addresses
        Ing. Enrico Morgano - Conference Chairman
        Ing. Federico Mazzolari - AIM President

11:25   Overview on steels, heat treatments and shot peening in automotive field
        ECHT065  E. Morgano - FCA CRF, Torino, Italy

11:50   Bainitic transformation during the two-step Q&P process in a lean medium Mn steel containing silicon
        ECHT028  S. Kaar, R. Schneider - University of Applied Sciences Upper Austria, Wels, Austria
        D. Krizan - voestalpine Stahl GmbH, Linz, Austria
        C. Béal, C. Sommitsch - Graz University of Technology, Graz, Austria

12:15   Composition and stress profiles developing during low temperature surface hardening of stainless steel; experimental assessment and numerical prediction
        ECHT041  Ö.C. Kücükyıldız, T.L. Christiansen, G. Winther, M. A. J. Somers - Technical University of Denmark, Lyngby, Denmark

12:40   Lunch
MASSIVE HEAT TREATMENTS I
Chairperson: Reinhold Schneider

14:00 Specific air-blowing cooling pattern enhancing mechanical properties of bainitic steels in the as-forged state
V. Bordereau - ArcelorMittal Global R&D Bars & Wires, France

14:20 Ultra-fine-grained thermo-mechanically treated XTP steel bars with high toughness for cold forming and machining
M.D. Bambach, K. Helas - GMT mbH, Berlin, Germany
L. Oberli - Steeltec AG, Emmenbrücke, Switzerland

14:40 Heat treatment routes utilizing intercritical annealing of automotive medium-Mn steel sheets
A. Grajcar, M. Morawiec - Silesian University of Technology, Gliwice, Poland

15:00 Effect of titanium on the hardenability of boron-treated steels for higher abrasion resistance
R. Bruna, G. Ebri, A. Cerliani - Ternium, Argentina
C.I. Garcia - University of Pittsburgh, USA

15:20 Investigation on heat treatment of powder metallurgy carbon free Fe-Co-Mo alloy
D. Franchi, S. Roggero - Trattamenti Termici Ferioli & Gianotti spa, Caselette, Italy
D. Magistroni, A. Rivolta - Böhler, divisione della voestalpine High Performance Metals Italia spa, Milano, Italy

15:40 Innovative online steel tensile-structure properties evaluation by means of stress-strain analysis of cold rolling process data
A. Ferraiuolo - Marcegaglia Carbon Steel, Ravenna, Italy

16:00 Coffee break

CRYOGENIC TREATMENT
Chairperson: Massimo Pellizzari, Mattia Merlin

16:20 Influence of RT soaking on the stability of retained austenite in 72NiCrMo4-2 tool steel
E. Caldesi, D. Carlevaris, A. Dauriz, S. Lindholm, A. Ometto, M. Zampiccoli, M. Pellizzari - Università di Trento, Italy

16:40 Time-dependent transformation of retained austenite at sub-zero Celsius temperatures; from metallurgical understanding to application in practice
M. Villa, M.A.J. Somers - Technical University of Denmark, Lyngby, Denmark

17:00 Deep cryogenic treatment of metallic materials in automotive applications: a review
P. Jovičević Klug, B. Podgornik - Institute of Metals and Technology, Ljubljana, Slovenia and Jožef Stefan International Postgraduate School, Ljubljana, Slovenia

17:20 Effect of multistage cryogenic treatment (MCT) on wear resistant of Böhler K390 powder cold work tool steel
P. Nawrocki, T. Babul, A. Ciski - Institute of Precision Mechanics, Poland

17:40 Influence of cryogenic treatment on the mechanical properties of X45NiCrMo4 cold work tool steel
P. Nawrocki, T. Babul, A. Ciski - Institute of Precision Mechanics, Poland

18:00 Effect of deep cryogenic treatment on steel wear and corrosion resistance
B. Podgornik, M. Sedlaček, Č. Donik, A. Kocijan - Institute of Metals and Technology, Ljubljana, Slovenia
INDUSTRIAL HEAT TREATMENT EQUIPMENT AND PROCESS INNOVATION I

Chairperson: Klaus Löser

14:00  Inductive fixture hardening and tempering: A big step forward in gear manufacturing
ECHT073  F. Carutti - Carutti srl, Milano, Italy
         R. Jenne - EMA Indutec GmbH, Meckesheim, Germany

14:20  Use of ceramic hollow microspheres to reduce the thermal conductivity of unshaped dense refractories
ECHT048  R. Peri, A. Bertora, D. Bozano, L. Giacomelli - SANAC spa, Vado Ligure, Italy

14:40  Laser surface hardening of ferrous alloys: feasibility and applications
ECHT074  A. Ascari, A. Fortunato - Alma Mater Studiorum - Università degli studi di Bologna, Italy
         N. Pagano, R. Squatrito, I. Todaro - Nextema srl, Bologna, Italy

15:00  Residual stress measurement by hard X – Ray diffraction
ECHT083  D. Maestrini, G.P. Marconi, A. Benedetti - 2 Effe Engineering srl, Soiano D/L (BS), Italy

15:20  Design and installation of an APC system on a steel industry reheating furnace
ECHT082  G. Bartucci, G. Astolfi, S. Montironi, L. Orlietti, C. Pepe, C. Valzecchi - Alperia Bartucci spa, Soave (VR), Italy
         M. Fusato, F. Morandini, S. Salvagno, G. Politano, G. Mazzi, G. Forbice - Feralpi Group, Lonato del Garda (BS), Italy

15:40  The application of waste heat recover system and discussion of saving energy in strip continuous annealing furnace
ECHT005  L. Wang - Baosteel-NSC Automotive Steel Sheets Co.Ltd, Shanghai, China

16:00  Coffee break

MASSIVE HEAT TREATMENTS II

Chairperson: Silvia Roggero

16:20  Studying the segregation pattern in hot rolled steel
ECHT006  W.M. Al-Othman, H. Bayati, A. Al-Shahrani, H. Al-Jabr - SABIC, Jubail, Saudi Arabia

16:40  Benefits and properties of laser-hardened tool steel surfaces
ECHT004  S. Němeček - Raptech, Zruc-Senec, Czech Republic

QUENCHING

Chairperson: Silvia Roggero

17:00  Automotive components heat treatments: isothermal annealing, quench and tempered and low pressure case hardening
ECHT091  M. Ferrando, V. Sisti, L. Cislaghi - T.T.N. spa, Italy

17:20  High pressure gas quenching: assessment of velocity experimental measurements and steps for model validation
ECHT050  E. Vyazmina - Air Liquide R&D, Jouy en Josas, France
         L. Bustamante-Valencia - Air Liquide, AL France Industrie, Bagneux, France
         V. Woimbbe - Faurecia, Brières les scellés, France
         G. Michel - IRT M2P, Metz, France
         A. Belhajria, Ch. David - Sciences Computers Consultants, Saint Etienne, France

17:40  Factors influencing spray quenching of steel products
ECHT071  M. Chabičovský, P. Kotrbáček, M. Raudenský - Brno University of Technology, Czech Republic
NITRIDING AND NITROCARBURIZING. APPLICATION AND COMBINED PROCESSES I
Chairperson: Hans Veltrop

08:50 Stainless steel & titanium surface hardening
ECHT014 T. Strabo Hummelshøj - Expanite A/S, Hillerød, Denmark

09:10 Future trends in surface hardening of stainless steels for automotive applications
ECHT016 U. Oberste-Lehn, A. Karl, V. Bordiga - Bodycote, Landsberg, Germany

09:30 Influence of gas nitriding conditions on layer structure formation on grey and white solidified cast irons (part I)
ECHT060 A. Holst, A. Buchwalder - TU Bergakademie Freiberg, Germany
R. Zenker - TU Bergakademie Freiberg, Germany and Zenker Consult, Mittweida, Germany

09:50 Material dependent aspects for the use of nitriding as a single or duplex treatment in improving the tribological load behavior of cast irons (part II)
ECHT061 A. Buchwalder, N. Klose, R. Zenker - TU Bergakademie Freiberg, Germany

10:10 Controlled Liquid Ionic Nitrocarburizing: key surfaces treatment for automotive applications in their design adaptation to new environments challenges
ECHT080 V. Monteux, M. Legrand - HEF Group, France / Techniques Surfaces Italia srl, Italy

10:30 New environmental-friendly developments and applications of the pulsed plasma heat treatment technology in the field of engine, transmission and power train engineering
ECHT012 A. Gebeshuber, V. Strobl, T. Müller - Rübig GmbH&Co.KG, Wels, Austria

10:50 Coffee break

NITRIDING AND NITROCARBURIZING. APPLICATION AND COMBINED PROCESSES II
Chairperson: Carlo Dell’Oste

11:20 Cross-sectional gradients of residual stresses, microstructure and phases in nitrided and carburized steels revealed by 20µm synchrotron X-ray diffraction
ECHT032 S.C. Bodner, T. Ziegelwanger, M. Meindlhumer, J. Holcova, J. Keckes - Montanuniversität Leoben, Austria
J. Todt - Austrian Academy of Science, Leoben, Austria
N. Schell - Helmholtz-Zentrum Geesthacht, Geesthacht, Germany

11:40 Nitriding and ferritic nitrocarburizing controlled according to AMS 2759/10 and 2759-12A
ECHT078 J. Kalucki - Nitrex Metal Inc., Montreal, Canada

12:00 Effect of barrel nitriding on friction and wear characteristics of aluminum alloy
ECHT003 K. Nambu, K. Sayo, M. Okumiya - Toyota Technological Institute, Aichi, Japan

12:20 Nitriding kinetics of binary ferritic iron based alloys – role of regions of immiscibility
ECHT037 S.R. Meka, K.N. Sasidhar - Indian Institute of Technology Roorkee, India

12:40 Spinodal decomposition induced colossal N supersaturation in austenitic/ferritic stainless steels during low temperature nitridation
ECHT036 K.N. Sasidhar, S.R. Meka - Indian Institute of Technology Roorkee, India

13:00 Lunch
QUALITY AND ACCREDITATION
Chairperson: Bernard Vandewiele

08:50  “LPC – Outsourcing” – advanced distortion control as a service
ECHT031 V. Heuer, B. Reinhold - VACUHEAT GmbH, Limbach-Oberfrohna, Germany

09:10  Save handling of furnace fixtures and charging equipment – why CE marking is obligatory and what operators should consider
ECHT047 R. Ritzehoff - Friedr. Lohmann GmbH, Witten, Germany

09:30  Evaluation of the quality of weld lines in ERW steel pipe
ECHT025 M. Hua, Q. Wang - University of Pittsburgh, USA
A.J. DeArdo - University of Pittsburgh, USA and University of Oulu, Finland

09:50  Non-destructive hardness / microstructure testing of heat-treated parts by mass production, with multiple frequency magnetic induction method
ECHT049 A. Horsch - Arnold Horsch e.K., Remscheid, Germany

10:10  AreX family: an XRD solution to retained austenite quantification
ECHT042 L. Seralessandri, G. Siviero, A. Torboli - GNR srl, Agrate Conturbia (NO), Italy

10:30  Residual stress measurements in order to reduce non-conformity by distortion in machining
ECHT081 D. Magagnini, M. Bertoldi - RTM Breda, Italy

10:50  Coffee break

INDUSTRIAL HEAT TREATMENT EQUIPMENT AND PROCESS INNOVATION II
Chairperson: Alessandro Fiorese

11:20  Effect of cyclic thermal loading on the lifetime of furnace components
ECHT002 R. Schwing, S. Linn, C. Kontermann, M. Oechsner - Technische Universität Darmstadt – MPA-IfW, Germany
N.K. Karthik, N. Schmitz, H. Pfeifer - RWTH Aachen University - IOB, Germany

11:40  Green manufacturing exploration and practice of cold rolling strip continuous annealing furnace
ECHT029 J. He - Baoshan Iron&Steel Co. Ltd., Shanghai, China

12:00  New compact multipower port HF power supply for a wide range of induction heating applications
ECHT066 E. Dede - Smart Induction Converter Technologies, Spain
S.L. Jose Jordan - University Valencia Vicente Esteve and Smart Induction Converter Technologies S.L, Spain

12:20  Accurate infrared temperature measurement for metal strip processing
ECHT063 S. Fiona Turner - Land Instruments, Dronfield, United Kingdom
M. Hayk - Ametek GmbH, Meerbusch, Germany

12:40  Introduction of Toyo Tanso’s CFC material and recent furnace application
ECHT092 H. Machino, S. Tomita - Toyo Tanso Co. Ltd., Japan

13:00  Lunch
COATINGS I
Chairpersons: Paolo Buzzi, Carla Martini

14:20  Dry sliding behaviour of nanoceramic coatings deposited by electrochemical oxidation on the wrought AA6082 aluminium alloy
L. Ceschini, C. Martini, L. Tonelli, S. Toschi - Università di Bologna, Italy
P. Shashkov, S. Usov - Cambridge Nanolitic Ltd, Haverhill, United Kingdom

14:40  Surface modification of steels by application of tungsten compounds coatings in high-frequency discharge
L.G. Petrova, V.A. Aleksandrov, A.S. Sergeeva - Moscow Automobile and Road Construction State Technical University (MADI), Moscow, Russia

15:00  Modification of tribological properties of DLC through texturing
D. Romagnoli, F. Lavalle, P. Lavalle - STS srl, Cellatica (Bs), Italy
L. Montesano, M. Surfaro, L. Giorleo, G.M. La Vecchia - Università di Brescia, Italy

15:20  Thermochemical treatment of titanium alloys in controlled multicomponent gas media
O. Tkachuk, I. Pohrelyuk, V. Fedirko, R. Proskurnyak – Karpenko Physico-Mechanical Institute of National Academy of Sciences of Ukraine, Lviv, Ukraine

15:40  Characterization of thick t-aC coating deposited by novel arc source for automotive components
P. Lavalle, F. Lavalle, D. Romagnoli - STS srl, Cellatica, Italy

16:00  Thermo-physical properties of double layered suspension plasma sprayed thermal barrier coatings for light duty diesel engine
W. Uczak de Goes, N. Markocsan, M. Gupta - University West, Sweden
J. Somhorst - Volvo Car Corporation
T. Matsushita - Jönköping University, Sweden

16:20  Coffee break

COATINGS II
Chairpersons: Paolo Buzzi, Carla Martini

16:50  Nanostructured CVD W/WC coating prevents galling and adhesive wear of mechanisms under dry sliding conditions
Y. Zhuk - Hardide plc, United Kingdom

17:10  DLC coating on sliding finger follower
R. Montélimard, M. Legrand - HEF Group, France / TS Coatings Italy srl, Italy

17:30  A study on PVD coatings for reduction of friction and wear of swashplate axial piston pumps and motors
R. Sola, P. Veronesi, B. Zardin, M. Borghi - Università di Modena e Reggio Emilia, Italy

19:30  Social event
INDUSTRIAL HEAT TREATMENT PROCESS AND SIMULATION
Chairpersons: Alessandro Fiorese, Cristian Viscardi

14:20 Simulation of heat treatment on Jominy specimen to improve quality of automotive gear box components
E. Morgano - FCA CRF Metals Bulk, Italy
L. Valente, C. Viscardi - ECOTRE VALENTE srl, Italy

14:40 Investigation of the influence of proximal radiation on the thermal stresses and lifetime of metallic radiant tubes in radiation-dominated industrial furnaces
D. Büschgens, N.K. Karthik, C. Schubert, N. Schmitz, H. Pfeifer - RWTH Aachen University (IOB), Aachen, Germany

15:00 Distortion of gears as consequence of lightweight construction
T. Lübben, J. Kagathara - Leibniz-Institute for Materials Engineering – IWT, Bremen, Germany

15:20 A posteriori reconstruction of the temperature distribution in surface hardened tempering steel
D. Mevec, P. Raninger, P. Prevedel, V. Jászfi - Materials Center Leoben Forschung GmbH, Austria
T. Antretter - Montanuniversitaet Leoben, Austria

15:40 Aluminium heat treatments simulation solutions with FORGE®
S. Grosso, J. Barlier - Transvalor S.A., Mougins, France

16:00 New numerical approach for enhancing non-conventional energy absorbing capacity of plastically buckled tubular structure
H. Haileleoul Sahle, A. Abdul-Latif - UniversitéParis8, Tremblay-en-France, France

16:20 Coffee break

19:30 Social event
CARBURIZING PROCESS AND PROPERTIES
Chairperson: Danilo Petta

09:10 Control of austenitic grain size in standard steel grades of transmission market
ECHT018 V. Smanio, F.X. Hoche - ArcelorMittal Global Research and Development Bars&Wires, France
S. Jansto - CBMM, Brazil

09:30 Grain size control in process chains of cold and hot forged drive train components
ECHT021 I. Ortlepp - ZF Friedrichshafen AG, Germany

09:50 How Low Pressure Carburizing evolutions will face the new car industry challenges
ECHT051 N. Vanoise - ECM Technologies, France
A. Rosso - Silco srl, Italy

10:10 Heat treatment of automotive components in the age of digitalization
ECHT062 K. Löser, K. Ritter, G. Schmitt - ALD Vacuum Technologies GmbH, Hanau, Germany

10:30 Low pressure carburizing and Kolsterising the Bodycote proposal to the automotive industry
ECHT043 A. Magnacca - Bodycote sas, Italy
V. Bordiga - Bodycote S3P, Italy

10:50 Coffee break

STAINLESS STEELS
Chairperson: Marcel A.J. Somers

11:10 High temperature solution nitriding of stainless steels; current status and future trends
ECHT052 T.L. Christiansen, M. Villa, K.V. Dahl, M.A.J. Somers - Technical University of Denmark, Lyngby, Denmark

11:30 Wear solutions for stainless automotive components
ECHT053 A. Hunger, R. Berger - BorTec GmbH & Co. KG, Huerth, Germany

11:50 Wear solution for turbo charger applications up to 1.000°C
ECHT058 R. Hunger, R. Berger - BorTec GmbH & Co. KG, Huerth, Germany

12:10 Effect of low temperature carburization of austenitic stainless steels on residual stress and magnetic properties
ECHT076 P. Schuler, A. Hörttnagl, P. Gümpel - Institut für Werkstoffsystemtechnik Thurgau, Tägerwilen, Switzerland
K.V. Werner, M.A.J. Somers - Technical University of Denmark, Lyngby, Denmark

12:30 Deep rolling and its modification applied on martensitic stainless steel AISI 420
ECHT009 P. Juijerm - Kasetsart University, Bangkok, Thailand

12:50 Closing session
13:00 End of the Conference
NON FERROUS PROCESSES AND PROPERTIES
Chairperson: Giulio Timelli

08:50 Quenching of aluminium alloys in sodium silicate solutions of various silicate concentrations
ECHT059 P. Krug, T. Tenostendarp, W. Stips - Cologne Technical University of Applied Sciences, Köln, Germany

09:10 Aluminum brazing and additive manufacturing vacuum furnaces for automotive applications
ECHT077 A. Fiorese - TAV VACUUM FURNACES spa, Caravaggio (BG), Italy
S. Cecchel - Streparava spa, Adro (BS), Italy
G. Cornacchia, M. Gelfi - Università di Brescia, Italy

09:30 Surface treatment of aluminium alloys by Plasma Transferred Arc (PTA) of HSS30 Steel
ECHT015 K. Jirounkova, J. Cais - Jan Evangelista Purkyne University, Usti Nad Labem, Czech Republic

09:50 The effects of artificial ageing conditions on A356 aluminium cast alloys
ECHT064 O. Özaydin, E. Armakan, A. Kaya - Cevher Wheels, Izmir, Turkey
E. Dokumaci - Dokuz Eylul University, Izmir, Turkey

10:10 Investigations on the influence of electrochemical micromachining process parameters and end shape of micro tools on certain quality characteristics of Titanium parts through experiments and simulation
ECHT027 M.R. Pratheesh Kumar, K. Prakasan - PSG College of Technology, Coimbatore, India

10:30 Mechanical properties of the novel high-zinc aluminium cast alloy
ECHT020 P.K. Krajewski, W.K. Krajewski - AGH University of Science and Technology, Krakow, Poland
A.L. Greer - University of Cambridge, United Kingdom

10:50 Coffee break

APPLICATIONS
Chairperson: Fabio Massa

11:10 Neural-networks-based prediction of hardenability of high performance carburizing steels for automotive applications
ECHT085 V. Colla, M. Vannucci - Scuola Superiore Sant’Anna, Pisa, Italy
L. Bacchi - Letamech srl, Pisa, Italy
R. Valentini - Università di Pisa, Italy

11:30 UCI-hardness testing in the production industries – Experiences made from practical work
ECHT035 M. Tietze - NewSonic GmbH, Reutlingen, Germany

11:50 Superfinishing treatments in the automobile world
ECHT044 G. Samadello - Best Finishing, Gessate (MI), Italy

12:10 3D printing use for inductors and coils - techniques and applications overview
ECHT026 F. Marquis, M. Duran - GH Induction, San Antonio de Benageber, Spain

12:50 Closing session in Gardenia room
13:00 End of the Conference
POSTER SESSION

ECHT039  Effect of phase in surface compound layer on rotating bending fatigue strength for S45C steel after austenitic nitriding
Y. Hiraoka - Parker Netsusyori Kogyo Co. Ltd., Japan

ECHT086  Experimental and numerical analysis of the effects of ball-end milling process upon residual stresses
S. Belkacem Chebil, M. Bensaid, W. Bensalem - National Engineers School, Monastir, Tunisia

ECHT010  Effect of heat treatment temperature on tribological behaviour of forged steel balls
K. Bouhamla, M. Bourebia, A. Gharbi, H. Maouche, M. Chaour - Research Center in Industrial Technologies CRTI, Annaba, Algeria

ECHT088  Deposit testing in exhaust systems and deposit mapping strategy
İ.H. Savci, H. Bezci Zeren - Ford OTOSAN, Kocaeli, Turkey

ECHT046  Cross-sectional characterization of depth-dependent mechanical properties of surface treated steel
T. Ziegelwanger, S.C. Bodner, M. Meindlhumer, J. Keckes - Montanuniversität Leoben, Austria
M.J. Pfeifenberger - Austrian Academy of Sciences, Leoben, Austria

POSTERS WILL BE DISPLAYED FOR THE ENTIRE PERIOD OF THE CONFERENCE

NOTE OF THE PROGRAMME
This programme is a preliminary programme. It is not definitive and it may be slightly modified: title and authors, cancelled or added papers, chairperson, timetable or duration, etc.

Possible changes in the programme will be communicated before the beginning of the Conference.
GENERAL INFORMATION

CONFERENCE VENUE
The Conference will be held at the Hotel Caesius Thermae & SPA Resort in Bardolino (Verona), via Peschiera 3 (https://www.hotelcaesiusterme.com)

LANGUAGE
The official language of the Conference will be English.

PROCEEDINGS
The full text of the accepted papers will be published in the electronic proceedings and issued to attendees on arrival at the Conference. Certain papers may be considered for publication in the AIM journal La Metallurgia Italiana – International Journal of the Italian Association for Metallurgy, which is covered in the Science Citation indexed by Clarivate Analytics (formerly Thomson Reuters), and in Scopus by Elsevier B.V.
REGISTRATION INFORMATION

REGISTRATION FEES

EARLY BIRD REGISTRATION FEES (by May 8, 2019)

N.B: Speaker registration deadline: April 12, 2019

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<td>SPEAKER (PRESENTER)</td>
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<td>€ 630</td>
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<tr>
<td>STUDENT*</td>
<td></td>
<td>€ 360</td>
</tr>
</tbody>
</table>

Standard registration fees (after May 8, 2019)

<table>
<thead>
<tr>
<th>Role</th>
<th>MEMBER AIM, ASSIOT, ASSOFLUID, CICOF, UPIVEB</th>
<th>NON MEMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>SESSION CHAIRPERSON</td>
<td>€ 480</td>
<td>€ 580</td>
</tr>
<tr>
<td>COMMITTEE MEMBER</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PARTICIPANT (non.presenter)</td>
<td>€ 640</td>
<td>€ 740</td>
</tr>
<tr>
<td>EXHIBITOR / SPONSOR</td>
<td>€ 530</td>
<td>€ 630</td>
</tr>
<tr>
<td>STUDENT*</td>
<td></td>
<td>€ 400</td>
</tr>
</tbody>
</table>

Additional ticket for Social event for accompanying persons: € 122 (22% VAT included) (includes only the social event on June 6)

CONFERENCE REGISTRATION FEES INCLUDE

- Admittance to technical sessions and to the table-top exhibition
- Conference bag with electronic proceedings
- Social event on June 6
- Coffee breaks
- Lunches

For non-members the fee includes AIM Membership for the second half of 2019 and for the year 2020.

*Students will have to provide valid proof of student status. AIM membership and the Social event on June 6 are not included in the student registration fee.
PAYMENT AND REMITTANCE
• by bank transfer, to the order of Associazione Italiana di Metallurgia - AIM at “UBI Banca S.p.A.”, Branch no. 2 - Via Borgogna, 2/4 - 20122 Milano- Italy, account no. 000000022325 - cod. ABI 03111 - CAB 01604 - cin O, IBAN: IT49O0311101604000000022325, swift code BLOPIT22. The transfer order must specify the name of the participant and the reference “ECHT 2019”. A copy of the transfer order must be sent to AIM, together with the Registration Form.
• by credit card online (www.aimnet.it/echt2019.htm).

SPEAKERS REGISTRATION
Please be aware that only papers submitted on time and with presenting author regularly registered (registration fee paid) before April 12, 2019 will be included in the final programme and published in the Conference proceedings. Registration forms will not be processed without payment. A maximum of two papers will be accepted for each author registered in time.

SPEAKERS CANCELLATION AND REFUND POLICY
A refund, less 20% deduction for administrative costs, will be issued for written cancellations received before April 30, 2019. For speakers who notify their cancellation after April 30, 2019 or will not attend the Conference, a charge of 100% of the Conference fee will be withheld. Their papers will be published anyway in the proceedings and a copy of the proceedings will be sent after the event.

ADVANCED REGISTRATION
If you plan to attend, please register online on the Conference website www.aimnet.it/echt2019.htm or fill in the enclosed Registration Form and send it to the Organising Secretariat best before May 8, 2019 (early-bird registrations deadline).
Please use a separate form for each participant.
Please contact the Organising Secretariat by fax or e-mail, if possible.

CANCELLATION AND REFUND POLICY
A refund, less 20% deduction for administrative costs, will be issued for written cancellations received by May 8, 2019. For attendees who notify their cancellation after May 8, 2019 or will not attend the Conference, a charge of 100% of the Conference fee will be withheld and a copy of the proceedings will be sent after the event.

INSURANCE
The Organising Secretariat cannot assume any responsibility for personal accident, loss or damage to the private property of participants and accompanying persons, which may either occur during or arise from the Conference. Participants should therefore take whatever steps they consider necessary as regards insurance.
**VISA APPLICATION FORM**
If you need and official invitation please send your request to the Organising Secretariat best before May 20, 2019 complete with *Family and First name, Mr/Mrs, birth date, passport number, arrival and departure dates, nationality and fax number of the Italian Embassy for your Country.*

**EXHIBITION & SPONSORSHIP OPPORTUNITIES**
The Conference will feature a table-top exhibition that will represent many areas of industry with latest equipment, facilities and instruments, products and services in the field of heat treatment and surface engineering. Companies will be able to reinforce their participation and enhance their corporate identification by taking advantage of benefits offered to them as Contributing Sponsors of the Conference. Companies interested in taking part in the table-top exhibition or sponsoring the Conference may contact the Organising Secretariat (aim@aimnet.it)

**SOCIAL PROGRAMME**
AIM is planning a social event in the evening of June 6, which is included in the registration fee, in order to give participants the opportunity to meet informally and enjoy Bardolino’s atmosphere.

**MOBILE/CELL PHONE**
Mobiles must be kept turned off or in silent mode in all Conference rooms.
ACCOMMODATION

If you wish to book your staying at the Conference venue, we kindly invite you to contact directly, at your earliest convenience, the Hotel Caesius Thermae & SPA Resort:
https://www.hotelcaesiusterme.com

LIST OF HOTELS

HOTELS NEAR THE CONFERENCE VENUE

Hotel Gardenia & Villa Charme ★★★★
Piazza Serenissima, 12 - 37011 Bardolino (Verona) Italy
Phone: +39 045 6210882 - https://www.hotelgardenia.it/

Villa Katy Hotel ★★★
Via G. Rossini, 5 - 37011 Bardolino (Verona) Italy
Phone: +39 045 7210345 - https://hotelvillakaty.it

Hotel Ventaglio ★★★
Via Campagnola, 52 - 37011 Bardolino (Verona) Italy
Phone: +39 045 7210335 - https://hventaglio.it/

Hotel Eden ★★
Via Giacomo Puccini, 20 - 37011 Bardolino (Verona) Italy
Phone: +39 045 7210755 - http://www.hoteledenbardolino.it

Hotel Campagnola ★★★★S close until end of March
Via S. Cristina, 28 - 37011 Bardolino (Verona) Italy
Phone: +39 045 7210015 - http://www.hcampagnola.com/

HOTELS NEAR BARDOLINO CENTER

Hotel Du Lac et Bellevue ★★★★★
Località Santa Cristina - 37011 Bardolino (Verona) Italy
Phone: +39 045 6210355 - https://www.hoteldulacbellevue.com

Hotel Nettuno ★★★★★
Via Dante Alighieri, 41 - 37011 Bardolino (Verona) Italy
Phone: +39 045 6210123 - https://www.hotelnettunobardolino.com

Hotel Capri ★★★★
Via Madonnina - 37011 Bardolino (Verona) Italy
Phone: +39 045 7210588 - https://www.hotelsanpietro.eu

Hotel Capri ★★★
Via Mirabello, 21 - 37011 Bardolino (Verona) Italy
Phone: +39 045 7210106 - http://www.hotel-capri.com

GardaPass is a free booking service of the Hoteliers Association Federalberghi Garda Veneto – convenient, easy, safe – to book on-line or with our call center among 300 associated hotels and residences of Lake Garda – Olives Riviera. The team is glad to help you find accommodation for conferences, meetings, groups etc. Please visit the website:
LAKE GARDA AND BARDOLINO

Along the shores of Lake Garda the landscape is soft, cadenced by charming villages that maintained their typical characteristics and personality, and dominated by vines and olive groves. Bardolino land and the adjacent areas offer lots of attractions that vary from historical to cultural to natural attractions, all to be visited, while the beaches and the theme parks of Gardaland, Movieland and all others promise pure fun. You’ll have the chance to practice your preferred sport choosing among golfing, biking and mountain biking, walking, trekking, windsurfing, sailing, horseback riding, hang gliding, and playing tennis. Lake Garda influences also the local cuisine and the wine and food traditions. The most typical and characteristic element is the extra-virgin olive oil, famous for its light and delicate taste which combines perfectly with lake fish and with meats and polenta from the farming traditions. Excellent combination for every dish is the high quality wine produced by Garda wine-growers: Bardolino red and Lugana white.

There are different itineraries that run across the wine producing areas, leading visitors in a journey at the discovery of the flavours and fragrances of the land. The vicinity with Verona, which can be reached in less than 30 minutes, will allow you to be immersed in an atmosphere where art and history merge in a continuous and fascinating relationship: the Arena, Piazza delle Erbe, Castelvecchio and the Basilica of San Zeno. Other historical cities near Lake Garda with world unique monuments are Mantua, Vicenza, Padua and Venice.