

ADVANCE PROGRAMME



HEAT TREATMENT & SURFACE ENGINEERING FOR AUTOMOTIVE

5-7 JUNE 2019

Bardolino

Garda Lake - Italy

Organised by



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DI METALLURGIA

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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

SCIENTIFIC & STEERING COMMITTEES**Giovanni Bolelli**

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Klaus Löser

AWT / Germany

TIMETABLE

WEDNESDAY, 5 JUNE 2019

9:30 | Registration of attendees

GARDENIA ROOM

11:00 | OPENING SESSION

12:40 | LUNCH

GARDENIA ROOM

LILUM+IRIS ROOM

14:00 | MASSIVE HEAT TREATMENTS I

INDUSTRIAL HT EQUIPMENT AND PROCESS
INNOVATION I

16:00 | COFFEE BREAK

16:20 | CRYOGENIC TREATMENT

MASSIVE HEAT TREATMENTS II

QUENCHING

THURSDAY, 6 JUNE 2019

GARDENIA ROOM

LILUM+IRIS ROOM

8:50 | NITRIDING AND NITROCARBURIZING I

QUALITY AND ACCREDITATION

10:50 | COFFEE BREAK

11:20 | NITRIDING AND NITROCARBURIZING II

INDUSTRIAL HT EQUIPMENT AND PROCESS
INNOVATION II

13:00 | LUNCH

14:20 | COATINGS I

INDUSTRIAL HT PROCESS AND SIMULATION

16:20 | COFFEE BREAK

16:50 | COATINGS II

19:30 | SOCIAL EVENT

FRIDAY, 7 JUNE 2019

GARDENIA ROOM

LILUM+IRIS ROOM

8:50 | CARBURIZING PROCESSES AND PROPERTIES

NON FERROUS PROCESSES AND PROPERTIES

10:50 | COFFEE BREAK

11:10 | STAINLESS STEELS

APPLICATIONS

GARDENIA ROOM

12:50 | CLOSING SESSION

13:00 | END OF THE CONFERENCE

WEDNESDAY, 5 JUNE 2019 – GARDENIA ROOM

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. Kücükyildiz, T.L. Christiansen, G. Winther, M.A.J. Somers - Technical University of Denmark, Lyngby, Denmark

12:40 Lunch

WEDNESDAY, 5 JUNE 2019 – GARDENIA ROOM

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**
ECHT045 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**
ECHT069 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**
ECHT087 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**
ECHT075 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**
ECHT023 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**
ECHT001 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**
ECHT017 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**
ECHT034 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**
ECHT038 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**
ECHT089 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**
ECHT090 P. Nawrocki, T. Babul, A. Ciski - *Institute of Precision Mechanics, Poland*
- 18:00** **Effect of deep cryogenic treatment on steel wear and corrosion resistance**
ECHT067 B. Podgornik, M. Sedlaček, Č. Donik, A. Kocijan - *Institute of Metals and Technology, Ljubljana, Slovenia*

WEDNESDAY, 5 JUNE 2019 – LILIUM+IRIS ROOM

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 E. 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. Politanò, 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. Cislighi - *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. Woimbee - *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*

THURSDAY, 6 JUNE 2019 – GARDENIA ROOM

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

THURSDAY, 6 JUNE 2019 – LILUM+RIS ROOM

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. Ritzenhoff - *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

THURSDAY, 6 JUNE 2019 – GARDENIA ROOM

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**
ECHT019
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**
ECHT040
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**
ECHT007
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**
ECHT011
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**
ECHT022
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**
ECHT056
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**
ECHT024
Y. Zhuk - *Hardide plc, United Kingdom*
- 17:10** **DLC coating on sliding finger follower**
ECHT084
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**
ECHT072
R. Sola, P. Veronesi, B. Zardin, M. Borghi - *Università di Modena e Reggio Emilia, Italy*
- 19:30** Social event

THURSDAY, 6 JUNE 2019 – LILUM+RIS ROOM

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**
ECHT079
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**
ECHT008
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**
ECHT013
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**
ECHT057
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®**
ECHT033
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**
ECHT030
H. Haileleoul Sahle, A. Abdul-Latif - *UniversitéParis8, Tremblay-en-France, France*
- 16:20** Coffee break
- 19:30** Social event

FRIDAY, 7 JUNE 2019 – GARDENIA ROOM

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. Hörtnagl, 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

FRIDAY, 7 JUNE 2019 – LILIUM+IRIS ROOM

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 aluminum cast alloys**
ECHT064 O. Özeydin, E. Armakan, A. Kaya - *Cevher Wheels, İzmir, Turkey*
E. Dokumaci - *Dokuz Eylul University, İzmir, 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 - *Letomech 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** **3 D 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

	MEMBER AIM, ASSIOT, ASSOFLUID, CICOF, UPIVEB	NON MEMBER
SPEAKER (PRESENTER)		
SESSION CHAIRPERSON	€ 480	€ 580
COMMITTEE MEMBER		
PARTICIPANT (non-presenter)	€ 590	€ 690
EXHIBITOR / SPONSOR	€ 530	€ 630
STUDENT*	€ 360	

Standard registration fees (after May 8, 2019)

	MEMBER AIM, ASSIOT, ASSOFLUID, CICOF, UPIVEB	NON MEMBER
SESSION CHAIRPERSON		
COMMITTEE MEMBER	€ 480	€ 580
PARTICIPANT (non-presenter)	€ 640	€ 740
EXHIBITOR / SPONSOR	€ 530	€ 630
STUDENT*	€ 400	

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: IT4900311101604000000022325, 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 an 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:

<https://www.gardapass.com/index.cfm/en/>

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



ECHT 2019 ORGANISING SECRETARIAT

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Organising Secretariat



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