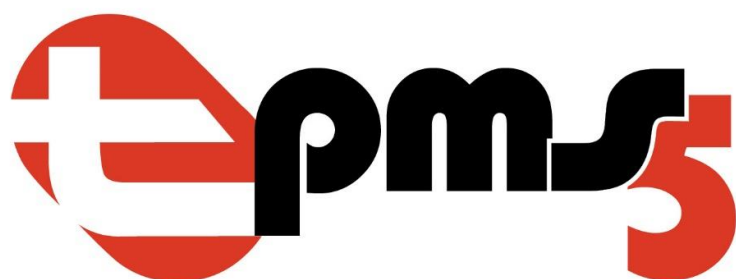




**4th Mediterranean Conference on
Heat Treatment and Surface Engineering**



**International Conference on
Thermal Process Modeling and Simulation**

LECCE • ITALY • 17-19 APRIL 2024

Organised by



**ASSOCIAZIONE
ITALIANA DI
METALLURGIA**



**UNIVERSITÀ
DEL SALENTO**

www.aimnet.it/mc-tpm.htm

Wednesday 17 April


	Y2 room
13:30	Registration
14:00	OPENING SESSION
15:30	COFFEE BREAK
15:50	HEAT TREATMENT OF IRON AND STEELS I
16:50	GEFRAN SPONSOR TECH TALK
17:00	TESTING & CHARACTERIZATION OF HEAT & SURFACE TREATED COMPONENTS
20:00	Welcome reception at Palazzo BN - Via XXV Luglio, Lecce

Thursday 18 April

	Y2 room	Y3 room
09:00	HEAT TREATMENT OF IRON AND STEELS II	MODELLING AND SIMULATION OF THERMAL PROCESSES AND SURFACE ENGINEERING I
10:40	COFFEE BREAK	
11:00	HEAT TREATMENT OF NON-FERROUS ALLOYS	MODELLING AND SIMULATION OF THERMAL PROCESSES AND SURFACE ENGINEERING II
12:00	SURFACE ENGINEERING I	PHASE TRANSFORMATION & ALLOY DESIGN
13:00	LUNCH	
14:00	SURFACE ENGINEERNG II	DEFORMATION & RECRYSTALLIZATION
15:00	PHYSICAL METALLURGY IN HEAT TREATMENT	
15:20		G.N.R. SPONSOR TECH TALK
15:40	COFFEE BREAK	
16:00	HEAT TREATMENT IN ADDITIVE MANUFACTURING I	MELTING & CASTING
17:30	Transfer to Otranto	
	Guided visit and Conference dinner in Otranto	

Friday 19 April

	Y2 room	Y3 room
09:00	HEAT TREATMENT IN ADDITIVE MANUFACTURING II	SPECIAL TREATMENTS
10:00		ENVIRONMENTAL ASPECTS IN HEAT TREATMENT AND SURFACE ENGINEERING
11:10	COFFEE BREAK	
11:30	COATING	ADDITIVE MANUFACTURING
12:10		RESIDUAL STRESS & DISTORTION
12:50		ARTIFICIAL INTELLIGENCE, PROCESS CONTROL AND RELIABILITY IN THERMAL PROCESSING AND SURFACE ENGINEERING
13:50	Closing remarks	
14:00	End of the Conference	



AIM is pleased to announce the 4th Mediterranean Conference on Heat Treatment and Surface Engineering (MCHTSE 2024) and the 5th International Conference on Thermal Process Modeling and Simulation (TPMS-5).

The two IFHTSE Conferences will be held together in Lecce – Italy on 17-19 April 2024.

The two conferences aim at providing a forum within which engineers, scientists, researchers and production managers can review and discuss fundamentals, new challenges, recent progress and emerging topics in the fields of advanced heat treatment and surface engineering technology.

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Wednesday, 17 April 2024 – Y2 room

13:30 Registration

OPENING SESSION

Chairperson: M. Pellizzari

14:00 Welcome addresses
IFHTSE Fellowship for Bojan Podgornik and Patrick Jacquot

14:30 **M4_022** *Opening lecture - 4th Mediterranean Conference on Heat Treatment and Surface Engineering (MCHTSE 2024) - Self-lubricating surfaces for hot forming of light-weight alloys*
B. Podgornik, M. Sedlaček, B. Šetina Batič - Institute of Metals and Technology, Slovenia
M. Čekada - Institut "Jožef Stefan", Slovenia
M. Rodriguez Ripoll - AC2T research GmbH, Austria

15:00 **T5_024** *Opening lecture - 5th International Conference on Thermal Process Modeling and Simulation (TPMS-5) - Physics-informed neural networks for heat treatment operations*
I. Felde - Óbuda University, Hungary

15:30 Coffee break

HEAT TREATMENT OF IRON AND STEELS I

Chairpersons: A. Grajcar, M. Villa

15:50 **M4_038** **Exploring the influence of pre-quenched martensite on bainitic transformation kinetics and microstructure in high silicon steel**
C. Garcia-Mateo, L. Morales-Rivas, J. A. Jimenez - MATERIALIA-Steel Research Group, National Center for Metallurgical Research, Spain
T. Sourmail, A. Philippot - Swiss Steel Group, Ascometal CREAS, France

16:10 **M4_040** **Microstructure evolution and mechanical properties of medium-Mn Quenching and Partitioning steels for automotive sheets and plates**
A. Grajcar, A. Kozłowska, A. Wojtacha - Silesian University of Technology, Poland

16:30 **M4_009** **Study of the effects of rapid tempering on 0.4 wt%C, Boron containing martensitic press hardening steel**
M. E. Palmieri, L. Tricarico - Polytechnic University of Bari, Italy
M. Villa - Technical University of Denmark, Denmark

16:50 **STT_001** **Sponsor Tech Talk Smart solutions for electric heat treatment processes**
P. Buzzi - Gefran, Italy

Wednesday, 17 April 2024 – Y2 room

TESTING & CHARACTERIZATION OF HEAT & SURFACE TREATED COMPONENTS

Chairpersons: B. Podgornik, C. Menapace

- 17:00
M4_028 **Effect of solution treatment on the microstructure and mechanical properties of UNS S32750 / F53 / 1.4410 Super Duplex Stainless Steel (SDSS) alloy**
V.D. Cojocaru, N. Serban, N. Zarnescu-Ivan, E.M. Cojocaru - University Politehnica of Bucharest, Romania
- 17:20
M4_033 **Exploring nitrided compound layers: characterization of the pore seam and effects of process parameters on its structure**
M. Sommer, S. Hoja, R. Fechte-Heinen - Leibniz-Institut für Werkstofforientierte Technologien – IWT, Germany
W.A. Kahl - Mapex, University of Bremen, Germany
- 17:40
M4_035 **Influence of post-process heat treatments on the friction and wear behavior under dry sliding condition of a hot work tool steel produced by PBF-LB**
L. Tonelli, C. Martini, L. Ceschini - University of Bologna, Italy
- 18:00
M4_018 **Comparison of As Cast and T6 heat treatment on high end-of-life-scrap secondary aluminium alloy for High-Pressure Die Casting automotive structural components**
A. Bongiovanni, A. Castellero - University of Turin, Italy
M. Da Silva - Fundació Eurecat, Spain
- 20:00 Welcome reception
at Palazzo BN - Via XXV Luglio, Lecce

Thursday, 18 April 2024 – Y2 room

HEAT TREATMENT OF IRON AND STEELS II

Chairpersons: C. Garcia, M. Franceschi

- 09:00
M4_014 **Effect of Ce addition on SAF2507 SDSS on Sigma phase precipitation and mechanical properties**
F. Sordetti, M. Miorini, M. Magnana, L. Fedrizzi, A. Lanzutti - University of Udine, Italy
C. Maranzana - Acciciera Fonderia Cividale S.p.A., Italy
- 09:20
M4_027 **Effect of thermo-mechanical treatment on EUROFER97 steel properties**
G. Stornelli, A. Di Schino - University of Perugia, Italy
R. Montanari, A. Varone - University of Rome "Tor Vergata", Italy
C. Testani - CALEF-ENEA CR Casaccia, Italy
- 09:40
M4_032 **Strategic approaches to enhance quenching and partitioning applicability: optimizing mechanical properties and microstructure of commercial low-silicon 20MnB5 steel**
M. Belfi, S. Barella, A. Gruttadauria, P. Cetto, T. Carrara - Politecnico di Milano, Italy
- 10:00
M4_002 **Microstructural characterization of a novel Si,Al-based medium carbon steels treated by quenching & partitioning**
M. Franceschi, L. Pezzato, M. Dabalà - University of Padova, Italy
A. Di Schino, G. Stornelli - University of Perugia, Italy
- 10:20
M4_050 **Influence of hot forging on the precipitation kinetics of secondary phases in UNS S32760 super duplex stainless steels**
M. Pigato, L. Pezzato, C. Gennari, I. Calliari - University of Padova, Italy
- 10:40 Coffee break

Thursday, 18 April 2024 – Y3 room

MODELLING AND SIMULATION OF THERMAL PROCESSES AND SURFACE ENGINEERING I

Chairpersons: S.D. Catteau, V. Colla

- 09:00
T5_025 **Modeling of gas carbonitriding of 100Cr6: from atmosphere to microstructure**
S. Thibault - NTN-Europe, Research & Innovation Direction, France
J. Dulcy, O. Skiba - Matériaux, Métallurgie et Procédés (IRT-M2P), France
J. Barlier, - Transvalor, France
- 09:20
T5_018 **Kinetics of strain aging in grade EN 1.4003 ferritic stainless steel**
T. Manninen - Outokumpu, Finland
P. Peura - Tampere University, Finland
- 09:40
T5_002 **Fixture hardening of aerospace gears: quenching and distortion analysis**
H. Birkhofer, D. Münter, M. Vidoni - Liebherr-Aerospace Lindenberg GmbH, Germany
M. Jordan - Wickert Maschinenbau GmbH, Germany
- 10:00
T5_009 **Thermo-fluid dynamic simulation of Hot Isostatic Pressure Quench (HIPQ) applied to aeronautical blades**
P. Brambilla, L. Bucchieri, N. Gramegna – EnginSoft, Italy
I. Mondino, M. Coppola, M. Sabella – GE Avio, Italy
- 10:20
T5_029 **Induction heat treatment development based on simulation and its effects during fatigue testing**
H. Torres, M. A. Delgado - Centro de Desarrollo Tecnológico y Humano CDTH, SISAMEX, México
O. Zapata, R. Colás - Facultad de Ingeniería Mecánica y Eléctrica, México
- 10:40 Coffee break

Thursday, 18 April 2024 – Y2 room

HEAT TREATMENT OF NON-FERROUS ALLOYS

Chairpersons: P. Leo, D. Ugues

- 11:00
M4_008 **Effect of different type of aging cycles on the tensile properties of a commercial 6060 Al alloy**
C. Menapace, F. Bernard, M. Lusa – Università di Trento, Italy
- 11:20
M4_011 **Impact of treatment time on single annealing thermal cycle performed on Ti-6Al-4V Titanium alloy specimens obtained using LPBF technology**
E. Ferrari, S. Gaiani, M. Gozzi, M. T. Di Giovanni, M. Lassinantti Gualtieri, F. Mantovani, G. Ponzoni, P. Veronesi - Università degli Studi di Modena e Reggio, Azienda Veca SpA, Italy
- 11:40
M4_047 **Effect of post processing heat treatments on the mechanical and corrosion behaviour of additively manufactured high strength aluminium alloys**
M. Cabrini, S. Lorenzi, D. Aspertì, L. Nani, T. Pastore - Università degli Studi di Bergamo, Italy

SURFACE ENGINEERING I

Chairpersons: M. Okumiya, S. Thibault

- 12:00
M4_048 **Effect of the carburizing route on microstructure, mechanical properties, residual stresses and distortion for transmission shafts**
M. A. Delgado, J. J. Ramirez, H. Torres - Centro de Desarrollo Tecnológico y Humano CDTH, SISAMEX, México
R. Colás - Facultad de Ingeniería Mecánica y Eléctrica, México
- 12:20
M4_025 **3D-printed 316 L stainless steel: optimization of low temperature plasma assisted carburizing**
A. Palombi, R. Montanari, A. Varone, C. Verona - University of Rome "Tor Vergata", Italy
E. Bolli, S. Kaciulis, A. Mezzi - ISMN-CNR, Italy
A. Lanzutti, F. Sordetti, E. Vaglio - University of Udine, Italy
- 12:40
M4_049 **Optimizing release properties in injection moulding: comprehensive study of PVD coatings for biobased polymers**
F. S. Gobber, D. Ugues, D. Battezzatore, A. Frache - Politecnico di Torino, Italy
A. Berté, P. Civardi – Lafer, Italy
- 13:00 Lunch

Thursday, 18 April 2024 – Y3 room

MODELLING AND SIMULATION OF THERMAL PROCESSES AND SURFACE ENGINEERING II

Chairpersons: H. Birkhofer, N. Gramegna

- 11:00
T5_011 **DFT Investigation of carbon-expanded α phase with different alloying element**
R.L. Liu, T.Y. Song - Chongqing Wangjiang Industrial Co., China
YX. Zhang, M.F. Yan - Harbin Institute of Technology, China
- 11:20
T5_015 **An integrated CFD-FEA approach for the service life extension of radiant tubes in galvanising plants**
M. Bertoli, J. Ferino, A. Meleddu - Astarte Strategies, Italy
M. Cocco, A. Ferraiuolo, S. Pantarotto - Marcegaglia Ravenna, Italy
- 11:40
T5_026 **Diffusion and precipitation of carbon and nitrogen during carbonitriding of hyper-eutectoid steels for automotive bearing applications**
S.D. Catteau - Ascometal CREAS, France – Institut de Recherche Technologique – Matériaux, Métallurgie et Procédés (IRT-M2P), France
L. Freund, F. Fovet - Ascometal CREAS, France
J. Dulcy, O. Skiba - Institut de Recherche Technologique – Matériaux, Métallurgie et Procédés (IRT-M2P), France
S. Thibault - Institut de Recherche Technologique – Matériaux, Métallurgie et Procédés (IRT-M2P), France – NTN Europe, France

PHASE TRANSFORMATION & ALLOY DESIGN

Chairpersons: G. Valsecchi, A. Gotti

- 12:00
T5_017 **Dependence of the residual deformations on the inherent strain parameters for simulated additive manufacturing of MS1 and 316L steel parts**
V. Gonda, I. Felde, R. Horváth, M. Réger, P. Varga - Óbuda University, Hungary
- 12:40
T5_013 **Multi-scale modeling of aging of waspaloy superalloy: prediction of microstructure evolution and coupling with mechanical properties**
B. Gövercin, C. Şimşir - Middle East Technical University - Simultura Material Technologies, Turkey
- 13:00 Lunch

Thursday, 18 April 2024 – Y2 room

SURFACE ENGINEERING II

Chairpersons: S. Hoja, M. A. Delgado

- 14:00
M4_007 **Thickness control of nitriding layer for creation of aluminum nitride powder for sintering**
M. Okumiya, R. Sakaguchi - Toyota Technological Institute, Japan
K. Nambu - Osaka Sangyo University, Japan
M. Yoshida, J. Miyamoto - Daido University, Japan
- 14:20
M4_034 **Impact of different quenching medias and its parameters: salt bath quenching, gas quenching and oil quenching at different temperatures, on the part microstructure, hardening and geometrical distortion. Application to an automotive part in 16MC5 and 20MnB5, previously carbonitrided or carburized**
V. Woimbee - Faurecia Forvia, France
- 14:40
M4_005 **Recent progress in advanced plasma-assisted thermochemical treatments of steels**
S. M. Jafarpour, A. Dalke, H. Biermann - Technische Universität Bergakademie Freiberg, Germany

PHYSICAL METALLURGY IN HEAT TREATMENT

Chairpersons: A. Di Schino, M. Belfi

- 15:00
M4_010 **Thermally activated martensite formation: an essential revision of the physical metallurgy of steel**
M. Villa, B. Ali, M. A. J. Somers - Technical University of Denmark, Denmark
- 15:20
M4_015 **Investigation of martensitic transformations in Ti-Nb-Zr alloys**
K. G.S. Souza, K. Pantleon, M. Villa - Technical University of Denmark, Denmark
M. Pellizzari - University of Trento, Italy
R. Caram - University of Campinas, Brazil
- 15:40 Coffee break

Thursday, 18 April 2024 – Y3 room

DEFORMATION & RECRYSTALLIZATION

Chairpersons: T. Manninen, C. Viscardi

- 14:00
T5_006 **Heterogeneous intragranular nucleation of ferrite in high strength low alloy steels**
V. Colla - Scuola Superiore Sant'Anna, TeCIP Institute, Italy
R. Valentini, M. De Sanctis, R. A. Ishak Nakhla, M. Castagnini - University of Pisa, Italy
- 14:20
T5_022 **Microstructure prediction during thermo-mechanical processes of metallic alloys with a full-field approach based on the level set method**
P. De Micheli, N. El Kosseifi, A. Gotti, M. Moreno - Transvalor, France
M. Bernacki - MINES ParisTech, PSL Research University, CEMEF-Centre de mise en forme des matériaux, France
- 14:40
T5_012 **Heat treatment guidelines of supermartensitic steel forgings by metallurgical modeling**
E. Anelli, S. Colosio - Franchini Acciai, Italy
P. E. Di Nunzio - RINA Consulting, Centro Sviluppo Materiali, Italy
- 15:00
T5_010 **Digitizing heat treatment with DEFORM software**
C. Viscardi - ECOTRE Valente, Italy
- 15:20
STT_002 **Sponsor Tech Talk Retained austenite and residual stress: non-destructive analysis by using X-ray diffraction (XRD)**
A. Torboli - G.N.R., Italy
- 15:40 Coffee break

Thursday, 18 April 2024 – Y2 room

HEAT TREATMENT IN ADDITIVE MANUFACTURING I

Chairpersons: L. Emanuelli, L. Tonelli

- 16:00
M4_046 **On the impact toughness of heat-treated AISI 430 stainless steel fabricated by laser powder bed fusion**
M. Merlin, C. Morales, A. Fortini, C. Soffritti, G. L. Garagnani - University of Ferrara, Italy
- 16:20
M4_037 **Influence of heat treatment conditions on the microstructure and mechanical properties of Inconel 738 alloy by EHLA 3D**
M. Sale, R. Sola - Tec Eurolab, Italy
T. Lorusso, E. Colombini, P. Veronesi, A. Mercati, A. Morri, L. Ceschini – Università di Modena e Reggio Emilia – Unimore, Italy
- 16:40
M4_019 **Coupled microstructural and thermal analysis investigation to study the aging behaviour of 12.2Cr-10Ni-1Mo-1Ti-0.6Al PH-SS manufactured by Laser Powder Bed Fusion**
F. Russo, M. Pellizzari - University of Trento, Italy
M. Zanni, A. Fortunato, A. Morri, L. Ceschini - Alma Mater Studiorum - University of Bologna, Italy
- 17:00
M4_012 **Additive manufacturing of carbide reinforced β titanium alloys for biomedical applications via in-situ alloying**
A. Ayiotis, M. Bourrigault, Z. Pan, K. G. de Souza, W. Tsitsishvili, V. K. Nadimpalli, M.A.J. Somers, M. Villa - Technical University of Denmark, Denmark
L. Emanuelli, M. Pellizzari - University of Trento, Italy
T. L. Christiansen - Worcester Polytechnic Institute, USA
- 17:30 Transfer to Otranto

Guided visit and Conference dinner in Otranto

Thursday, 18 April 2024 – Y3 room

MELTING & CASTING

Chairpersons: A. Del Prete, S. Barella

- 15:40
T5_023 **Microsegregation and fluid interaction with the electromagnetic field: essential features for realistic numerical simulation of industrial casting processes of metallic alloys**
S. Zhang, G. Puaux, F. Costes, A. Gotti - Transvalor, France
- 16:00
T5_003 **Comparison of mechanical performance and cracking mechanisms between primary and secondary (recycled) HPDC AlSi10Mg aluminum alloys**
R. Arcaleni, L. Ceschini - University of Bologna, Italy
L. Girelli, A. Pola - University of Brescia, Italy
T. Bogdanoff - Jönköping University, Sweden
- 16:20
T5_005 **Preliminary investigation on a 36-ton steel ingot: evaluation and analysis of defects by using numerical simulation**
A. Mantelli, A. Pola, M. Gelfi - University of Brescia, Italy
F. Ricchini - ECOTRE Valente, Italy
M. Svanera, F. Bergamaschi - ASONEXT, Italy
- 16:40
T5_016 **Leakage of impregnated castings**
M. Reger, R. Horvath, I. Felde, V. Gonda - Óbuda University, Hungary
- 17:30 Transfer to Otranto
- Guided visit and Conference dinner in Otranto

Friday, 19 April 2024 – Y2 room**HEAT TREATMENT IN ADDITIVE MANUFACTURING II**

Chairpersons: S. Amirabdollahian, M. Merlin

- 09:00
M4_004 **Improving multi-material structures of tool steel/copper-beryllium alloy via post-heat treatment in metal additive manufacturing**
Z. Zhao, M. Pellizzari - University of Trento, Italy
M. Perini - PROM Facility, Italy
- 09:20
M4_023 **Heat treatment effect on FeSi steel by Laser Powder Bed Fusion technology for ferromagnetic cores application**
A. Di Schino, B. Ramiro Rodriguez-Vargas, G. Stornelli - Università degli studi di Perugia, Italia
R. Montanari, A. Varone - Università di Roma "Tor Vergata", Italia
M. Sgambetterra - Italian Air Force - Aeronautical and Space Test Division, Italy
- 09:40
M4_016 **Dilatometric study of the phase transformations in two different titanium alloys produced by Laser Powder Bed Fusion**
L. Emanuelli - INSTM, Italy and University of Trento, Italy
M. Pellizzari, D. Lonardi, L. Pasquini - University of Trento, Italy
- 10:00
M4_013 **Evaluation of electrochemical behaviour and wet tribological resistance of Co based dental alloy produced by L-PBF**
A. Lanzutti, F. Andreatta, M. Magnan, E. Vaglio, G. Totis, M. Sortino, L. Fedrizzi - University of Udine, Italy
- 10:20
M4_036 **Repairing and surface modification of metal sheet bending tools through powder laser directed energy deposition**
S. Amirabdollahian, M. Perini - ProM Facility of Trentino Sviluppo, Italy
- 10:40
M4_030 **Characterization of AlCrN films deposited onto Selective Laser Melted Ti6Al4V substrates**
E. Cerri, E. Ghio - Università di Parma, Italy
G. Bolelli - University of Modena and Reggio Emilia, Italy
A. Bertè, P. Colombi - LAFER, Italy
- 11:00 Coffee break

Friday, 19 April 2024 – Y3 room

SPECIAL TREATMENTS

Chairpersons: A. Lanzutti, P. Jurci

- 09:00
M4_017 **Surface quality improvement of hot strip mill looper rolls by a new highly alloyed Fe-based coating**
M. Hajjhashemi, F. F. Amineh Mobarakeh - Steel Company (M.S.Co), Iran
- 09:20
M4_020 **Shot-peening – an effective tool for managing surface characteristics of aircraft parts operating under extreme conditions**
N. Șerban, M. L. Angelescu, V. D. Cojocaru, D. M. Șerban, E. M. Cojocaru - National University of Science and Technology Politehnica Bucharest, Romania
B. I. Văduva, E. Panainte, R. Crăciun - Turbomecanica, Romania
- 09:40
M4_044 **Exploring potential beneficial effects of cyclic cryogenic treatment on the microstructure and properties of AISI D2 tool steel**
V. Yarasu, B. Podgornik, M. Sedacek, B. S. Batic - Institute of Metals and Technology IMT, Slovenia

ENVIRONMENTAL ASPECTS IN HEAT TREATMENT AND SURFACE ENGINEERING

Chairpersons: A. Acquesta, E. Morgano

- 10:00
M4_006 **A comparison of modern vacuum furnaces designs for improved energy savings and CO2-reduction**
G. Valsecchi - TAV VACUUM FURNACES, Italy
- 10:20
M4_024 **The role of thermal and mechanical processes in sustainability and ecological transition**
E. Morgano - SILCO, Italy
- 10:40
M4_041 **Austempering as a sustainable and efficient alternative to QT-Treatment in nitriding of heat-treatable steels - influence of different bainitic pretreatment structures on the nitriding response of EN42CrMo4 and EN31CrMoV9**
S. Hoja - Leibniz-Institut für Werkstofforientierte Technologien - IWT, Germany - Universität Bremen, Germany
M. Brandt - Universität Bremen, Germany
M. Hunkel - Leibniz-Institut für Werkstofforientierte Technologien - IWT, Germany
M. Hunkel - Leibniz-Institut für Werkstofforientierte Technologien - IWT, Germany
R. Fechte-Heinen - Leibniz-Institut für Werkstofforientierte Technologien - IWT, Germany - Universität Bremen, Germany - MAPEX Center for Materials and Processes, Universität Bremen, Germany
- 11:00 Coffee break

Friday, 19 April 2024 – Y2 room

COATING

Chairpersons: E. Cerri, L. Pezzato

- 11:30
M4_003 **Wear and corrosion properties of glass-containing plasma electrolytic oxidation coatings produced on 6061 aluminum alloy**
L. Pezzato, L. Kostelac, H. S. Abdelwahab Elsayed, M. Dabala', E. Bernardo,
K. Brunelli - University of Padova, Italy
L. Tonelli, C. Martini - University of Bologna, Italy
D. Kajanek - University of Zilina, Slovak Republic
- 11:50
M4_001 **Modification of Diamond Like Carbon (DLC) to improve specific tribological characteristics for automotive applications**
D. Romagnoli, F. Lavallo - STS, Italy "
- 12:10
M4_026 **Synthesis, characterizations, and applications of LDHs grown on metals. A review**
M. Richetta, R. Montanari - University of Rome Tor Vergata, Italy
- 12:30
M4_029 **Nanocomposite Cr₂N-Ag thin films for tribological applications at elevated temperatures**
P. Jurci - Slovak University of Technology, Slovakia
- 12:50
M4_021 **Green surface treatment of additive manufacturing parts**
T. Monetta, A. Acquesta – University of Napoli Federico II, Italy
- 13:10
M4_039 **Innovative coating for Electroplated Hard Chromium replacement in severe environments**
L. Fabiocchi, N. Lecis, K. Mounir - Politecnico di Milano, Italy
- 13:30
M4_042 **A comparative study on Aluminum-Silicon coatings fabricated by ElectroSpark Deposition**
G. Renna, P. Leo - University of Salento, Italy
- 13:50 Closing remarks
- 14:00 End of the Conference

Friday, 19 April 2024 – Y3 room

ADDITIVE MANUFACTURING

11:30 **Microstructural simulation of components manufactured by SLM**
T5_008 A. Del Prete, T. Primo - University of Salento, Italy

11:50 **Layer-scale finite element model for laser powder bed fusion**
T5_004 M. Vanini, S. Saerle - B. Vrancken - KU Leuven, Belgium and Flanders Make@KU Leuven, Belgium
K. Vanmeensel - KU Leuven, Belgium

RESIDUAL STRESS & DISTORTION

Chairpersons: **D. Tong, V. Gonda**

12:10 **Macro-segregations and their role in distortions in case-hardened ring gears**
T5_028 E. Stålnacke - Swerim, Sweden
A. Olofsson - Scania, Sweden
J. Wendel - RISE, Sweden
P. Holm - Ovako Sweden AB, Sweden

12:30 **Computer modelling of residual stress development during selective laser melting of 17-4 PH stainless steel and experimental validation via contour method**
T5_019 Y. Alptuğ Polat, C. Şimşir - East Technical University, Turkey
E. Yasa - Eskisehir Osmangazi University, Turkey

12:50 **Modeling and Simulation of quenching crack of steel parts by FEM method**
T5_031 J. Gu, D. Tong, M. Gong - Shanghai Jiao Tong University, China

ARTIFICIAL INTELLIGENCE, PROCESS CONTROL AND RELIABILITY IN THERMAL PROCESSING AND SURFACE ENGINEERING

13:10 **Research on real-time simulation of heat treatment for digital twin application**
T5_021 D. Tong, J. Gu, J. Xu - Shanghai Jiao Tong University, China

13:30 **Data-driven digital twin applied to brazing, additive manufacturing and welding**
T5_020 D. Stocchi, S. Tiberi, A. Chiarello – Gruppo Ecor International, Italy
N. Gramegna, G. Borzi – EnginSoft, Italy

13:50 Closing remarks
14:00 End of the Conference

POSTER SESSION

- M4_031** **Determination of porosity map by destructive and non-destructive methods**
R. Horvath, M. Rager, I. Felde - Óbuda University
- M4_043** **Deformation behavior and predictive models of intercritically heat treated AISI 8620 steel**
P. Juijerm, V. Phatiwach - Kasetsart University, Thailand
- M4_045** **On the microstructural evolution and phase transformation in two medium carbon high silicon carbide free bainitic steels**
M. Franceschi, M. Dabalà - University of Padova, Italy
L. Morales-Rivas, C. Garcia-Mateo - CENIM-CSIC, Spain
- M4_051** **Triplehard® – drop-in-replacement of hexavalent hard chrome**
O. Jahkola – Savroc, Finland
- M4_052** **Cr-free no-rinse conversion coatings of Aluminum alloys**
T. Monetta, A. Acquesta - University of Napoli Federico II, Italy
- M4_053** **Enhancing SLM for 17-4 PH: Influence of Scanning Approaches and Ultrasonic Peening Treatment on Residual Stresses and Corrosion Resistance**
N. Soni, P. Leo, G. Renna, R. Nobile - University of Salento, Italy
- M4_054** **Microstructure and corrosion behaviour of Al-Si10-Mg powder processed by Selective Laser Melting considering building orientation effect and surface treatment**
P. Leo, G. Renna, N. Soni, C. Mele, S. Bagheri, R. Nobile - University of Salento, Italy
- T5_030** **Investigation of temperature conditions during friction of metal and polymer materials**
R. Kohlhéb, M. Réger, R Horváth - Óbuda University, Hungary
- T5_032** **Increase wear resistance of ferritic stainless steel with the improved corrosion resistance**
R.L. Liu, L.Z. Li, T.Y. Song - Chongqing Wangjiang Industrial Co., China
L.Z. Li, M.F. Yan - Harbin Institute of Technology, China

POSSIBLE CHANGES TO THE PROGRAMME WILL BE COMMUNICATED DURING THE CONFERENCE

CONFERENCE VENUE

The Conference will be held in Lecce at the University of Salento - Engineering School "Angelo Rizzo" building - Corpo Y (google map 40.33450, 18.11346)

>> SUGGESTED HOTELS

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

All above registration fees are Revenue Stamp Included

AIM member	EARLY by February 15, 2024	STANDARD after February 15, 2024	NON - member	EARLY by February 15, 2024	STANDARD after February 15, 2024
SPEAKER	520,00 €	550,00 €	SPEAKER	560,00 €	590,00 €
COMMITTEE MEMBER			COMMITTEE MEMBER		
CHAIRPERSON			CHAIRPERSON		
DELEGATE (NON-PRESENTER)	600,00 €	630,00 €	DELEGATE (NON-PRESENTER)	640,00 €	690,00 €
		by February 15, 2024		after February 15, 2024	
STUDENT STUDENTS WILL HAVE TO PROVIDE VALID PROOF OF STUDENT STATUS.		350,00 € + 22% VAT		390,00 € + 22% VAT	

Conference Registration fees include:

- ✓ ADMITTANCE TO BOTH CONFERENCES' TECHNICAL SESSIONS
- ✓ CONFERENCE BAG WITH BOTH CONFERENCES' DIGITAL PROCEEDINGS
- ✓ COFFEE BREAKS
- ✓ LUNCHES
- ✓ SOCIAL EVENTS (Welcome reception in Lecce on April 17 and Conference dinner in Otranto on April 18, 2024)

Non-member fees include AIM Membership for the year 2024.

Additional ticket for social events for accompanying persons: € 150 (plus 22% VAT)

(Includes only Social events: Welcome reception in Lecce on April 17 and Conference dinner in Otranto on April 18, 2024)

SPEAKERS REGISTRATION

Speakers are invited to regularly register (registration fee paid) **best before February 15, 2024** in order to pay a reduced registration fee and to have their presentations included in the advance programme. Registration forms will not be processed without payment. A maximum of two presentations will be accepted for each speaker registered in time.

SPEAKERS CANCELLATION AND REFUND POLICY

A refund, less 20% deduction for administrative costs, will be issued for written cancellations received **by February 15, 2024**. For speakers who notify their cancellation **after February 15, 2024** or will not attend the Conference, a charge of 100% of the conference fee will be withheld. Their papers will be included in the proceedings anyway, that will be sent to them after the Conference.

ADVANCED REGISTRATION

If you plan to attend, please register online on the Conference website <https://www.aimnet.it/mc-tpm.htm> or fill in the enclosed Registration Form and send it to the Organising Secretariat **best before February 15, 2024** (early-bird registrations deadline). Please contact the Organising Secretariat by e-mail, if possible.

CANCELLATION AND REFUND POLICY

A refund, less 20% deduction for administrative costs, will be issued for written cancellations received **by February 15, 2024**. For attendees who notify their cancellation **after February 15, 2024** or will not attend the conference, a charge of 100% of the conference fee will be withheld and the digital proceedings will be sent after the Conference.

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.

SPONSORSHIP OPPORTUNITIES

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. The detailed sponsorship packages are available at <https://www.aimnet.it/mc-tpm.htm>

For any further information please contact AIM:

secretariat@aimnet.it or met@aimnet.it

phone: +39.02.76397770

VISA APPLICATION FORM

If you need an official invitation, please send your request to the Organising Secretariat best before March 29, 2024, complete with:

- Family and First name • Mr/Mrs • birth date • passport number • arrival and departure dates • nationality • email of the Italian Embassy for your Country.

SOCIAL PROGRAMME

In order to give delegates the opportunity to meet informally AIM organized two Social events:

- **Welcome reception** in the evening of on **April 17th, 2024**, at Palazzo BN - Via XXV Luglio, Lecce (dress code: business / business casual);
- **Conference dinner** in the evening of **April 18th, 2024**, in Otranto, preceded by a guided visit of the city on foot (dress code: business casual – comfortable shoes are highly recommended). A roundtrip transfer service will be provided.

LECCE

Called “the Florence of the South”, Lecce is the provincial capital of the Salento area. The city enchants visitors with its stunning Baroque historic centre and the splendid sea right on its doorstep.



**4th Mediterranean Conference on
Heat Treatment and Surface Engineering****International Conference on
Thermal Process Modeling and Simulation**

Please complete and return this form by **February 15, 2024** to: **ASSOCIAZIONE ITALIANA DI METALLURGIA**
via F. Turati 8 - 20121 Milano · Italy - phone: +39 0276021132 - e-mail: met@aimnet.it - www.aimnet.it

	AIM member	NON-member	STUDENT
SPEAKER	520,00 €	560,00 €	350,00 € + 22% VAT
COMMITTEE MEMBER CHAIRPERSON	550,00 € after February 15, 2024	590,00 € after February 15, 2024	390,00 € + 22% VAT after February 15, 2024
DELEGATE (NON-PRESENTER)	600,00 €	640,00 €	STUDENTS WILL HAVE TO PROVIDE VALID PROOF OF STUDENT STATUS.
	630,00 € after February 15, 2024	690,00 € after February 15, 2024	

ALL REGISTRATION FEES ARE REVENUE STAMP INCLUDED

Conference Registration fees include:

- ✓ ADMITTANCE TO **BOTH CONFERENCES'** TECHNICAL SESSIONS ✓ CONFERENCE BAG WITH BOTH CONFERENCES' DIGITAL PROCEEDINGS ✓ COFFEE BREAKS ✓ LUNCHEES
✓ SOCIAL EVENTS (Welcome reception on April 17th and Conference dinner on April 18th 2024)

Non-member fees include AIM Membership for the year 2024

Additional ticket for social events for accompanying persons: € 150 (plus 22% VAT)

Includes only Social events (Welcome reception on April 17th and Conference dinner on April 18th 2024)

PERSONAL DATA

Please use **BLOCK** letters throughout form

FAMILY NAME _____

FIRST NAME(S) _____

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ONLY FOR ITALIAN SOCIETIES

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For statistic purposes, please indicate which of the two conferences series held together here has made you register ☐ **MCHTSE** ☐ **TPMS5**

I WILL ATTEND AS: ☐ **DELEGATE (NON-PRESENTER)** - ☐ **SESSION CHAIRPERSON** - ☐ **COMMITTEE MEMBER** - ☐ **STUDENT** (A valid proof of student status is required)

☐ **SPEAKER (PRESENTER)** PAPER NR. (N°) _____ AND (N°) _____ (EACH REGISTRATION COVERS A MAXIMUM OF TWO PAPERS)

☐ **AIM MEMBER** - ☐ **NON-MEMBER** EURO _____

☐ **N° _____ ADDITIONAL TICKET(S) FOR SOCIAL EVENTS FOR ACCOMPANYING PERSON** EURO _____

TOTAL AMOUNT BEING PAID EURO _____

PAYMENT AND REMITTANCE

- ☐ by bank transfer, to the order of Associazione Italiana di Metallurgia - AIM at "CREDITO EMILIANO SpA", Branch no. 052 Milano Sede – Via Andegari, 14 - 20121 Milano - Italy, account no. 010000480455– cod. ABI 03032– CAB 01600 - cin M IBAN: IT33M0303201600010000480455, swift code BACRIT22MIL. The transfer order must specify the name of the participant and the reference "**MCHTSE**". A copy of the transfer Order must be sent to AIM, together with the Registration Form.

- ☐ by credit card online

- ☐ against invoice

PRIVACY PRIVACY I, the undersigned, have read the Privacy notice at the following page and I accept that AIM processes my personal data in accordance with articles 13-14 of EU Regulation no. 679/2016 (GDPR). I agree that my personal data as collected for this registration are forwarded to IFHTSE for the purpose of the organization of the conference and the distribution of the IFHTSE Bulletin.

Furthermore, I authorize AIM:

- to send any invitations to events of interest from other worldwide metallurgical associations: ☐ yes ☐ no
- to insert my name in the list of event participants: ☐ yes ☐ no

DATE _____ SIGNATURE _____

Pursuant to artt. 13-14 EU REG. n. 679/2016 (GDPR)

AIM, Italian Association for Metallurgy (VAT number 00825780158), in person of the legal representative Mr. Silvano Panza (hereinafter the "Data Controller"), current in Milan, via F. Turati n. 8, informs you that, pursuant to art. 13 of the EU Regulation n. 2016/679 (hereinafter "GDPR"), your data will be processed in the manner and for the following purposes.

1. Personal Data.

The Data Controller processes personal identifying data (i.e.: name, surname, company name, address, telephone number, e-mail address, username, bank and payment details, hereinafter referred to as "Personal Data") that you have communicated on the occasion of the paper registration or through the website www.metallurgia-italiana.net.

2. Purpose of the treatment.

Your data will be processed by the Data Controller for the following possible purposes:

- transmission of periodic communications by e-mail;
- invitation to activities and/or events promoted by the Data Controller;
- in case of registration on the website www.metallurgia-italiana.net, registration on the site and creation of a user (username and password);
- in case of registration for events, inclusion in the list of participants at the event, receipt of invitations for relevant events from other worldwide metallurgical associations and invoicing of the fee for the participation at the event, if due;
- in case of association with AIM, sending of the membership card;
- in case of purchase of books or other material, delivery of the same and invoicing.

3. Processing methods.

The processing of your personal data is carried out by means of the operations indicated in art. 4 n. 2) GDPR and more precisely: collection, registration, organization, storage, consultation, processing, modification, selection, extraction, comparison, use, interconnection, blocking, communication, cancellation and destruction of data. Your personal data are subjected to both paper and electronic processing. The Data Controller will process personal data for the time necessary to fulfill the aforementioned purposes and in any case for no more than 10 years from the termination of the relationship.

4. Access to the Data.

Your data may be made accessible, for the purposes referred to in art. 2, to the employees and collaborators of the Data Controller, in their capacity as persons in charge and/or internal managers of the processing and/or system administrators.

5. Data communication and data transfer abroad.

The Data Controller may communicate your name, nationality and e-mail address to foreign associations, exclusively in the case of participation in itinerant congress editions.

The aforementioned associations, operating in countries located in or outside the EU, may not provide adequate data protection safeguards (a complete list of countries providing adequate data protection safeguards is available on the EU Guarantor's website for the Protection of Personal Data). In such cases, the transfer of your data will be carried out in compliance with the applicable international rules and agreements, as well as with the adoption of appropriate measures (e.g. standard contractual clauses).

Personal data are stored on servers located in Milan (IT), within the European Union. In any case, it is understood that the Data Controller, if necessary, will have the right to move the servers even outside the EU. In this case, the Data Controller hereby ensures that the transfer of non-EU data will take place in accordance with the applicable legal provisions, subject to the stipulation of the standard contractual clauses provided by the European Commission.

6. Rights of the Data Subject.

In your capacity as a Data Subject, you have the rights set forth in art. 15 GDPR and, precisely, the rights of:

- to obtain confirmation of the existence or not of personal data concerning you, even if not yet registered, and their communication in an intelligible form;
- to obtain the indication: a) of the origin of personal data; b) of the purposes and methods of the processing; c) of the logic applied in case of treatment carried out with the aid of electronic instruments; d) of the identification details of the Data Controller, the data processors and the designated representative pursuant to art. 3, paragraph 1, GDPR; e) the subjects or categories of subjects to whom the personal data may be communicated or who may become aware of it in their capacity as designated representative in the territory of the State, managers or agents;
- to obtain: a) updating, rectification or, when interested, integration of data; b) the cancellation, transformation into anonymous form or blocking of data processed unlawfully, including data whose retention is unnecessary for the purposes for which the data were collected or subsequently processed; c) the attestation that the operations referred to in letters a) and b) have been brought to the attention, also as regards their content, of those to whom the data have been communicated or disseminated, except in the case where such fulfillment is it proves impossible or involves a use of means manifestly disproportionate to the protected right;
- to object, in whole or in part, for legitimate reasons to the processing of personal data concerning you, even if pertinent to the purpose of the collection.

Where applicable, it also has the rights referred to in articles 16-21 GDPR (right of rectification, right to be forgotten, right of limitation of treatment, right to data portability, right of opposition), as well as the right of complaint to the Guarantor Authority.

7. How to exercise rights.

You can exercise your rights at any time by sending: a registered letter to AIM, Italian Association for Metallurgy, via Turati n. 8, Milan or an e-mail to info@aimnet.it.

8. Data Controller and person in charge.

The Data Controller is AIM, Italian Association for Metallurgy, via F. Turati n. 8, Milan. The person in charge of data processing is Dr. Federica Bassani, via F. Turati n. 8, Milan - e-mail info@aimnet.it.

The updated list of data processors is kept at the Data Controller's headquarters.

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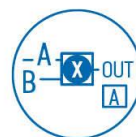
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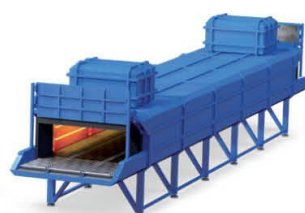
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