A3TS
Association de Traitement Thermique et de Traitement de Surface

VWT
Vereniging voor Warmtebehandelingstechniek

ECHT2020

European Conference on Heat Treatment

CARBURIZING, CARBO-NITRIDING AND C-BASED SURFACE ENGINEERING

Including Opportunities for industry 4.0

NEW DATE : NOV 30-DEC 2, 2020

FMCC

ANTWERP – BELGIUM

www.echt2020.com

Sponsored by :

ECM TECHNOLOGIES · P2i Partner Development Industry International · PETROFER · United PROCESS CONTROLS · Bodycote · bonGROUP EXPERTISE IN HEAT TREATMENT · BURGDORF OSMIROL NÜSSLE · Chromin MAASTRICHT 1977 2017 40 YEARS of innovation, development and quality · Dominial Hart voor staal · HAUCK HEAT TREATMENT · HEF GROUPE · mesa electronic · oerlikon balzers

Exhibitors :

AIR PRODUCTS · HÖSEL EMO CLEANING SYSTEMS · CAMECA SCIENCE & METROLOGY SOLUTIONS · FLUKE Process Instruments · DAM Härtetechnik www.dam-gmbh.de System supplier for heat treatment · ISSERSTEDT Prüfmaschinen GmbH & Co.KG · LATZKE · MEAPFORM · NIPPON KORNMEYER CARBON GROUP · PhoenixTM Phoenix Temperature Measurement · SECO/WARWICK · sentenso Strahlprozesstechnik · 2S Service & Specialties · sirris · Thermo-Calc Software

PROGRAMME

Carbon is an essential element in steel and has been used for centuries to improve steel properties.

The 2020 edition of ECHT will bring the focus back on this essential element. Its role is well established in the treatment of steel as well as in the treatment of tools and for obtaining special properties under specific conditions. The technological and environmental evolution put new challenges for the further development.

The conference will address all aspects of carburizing and carbonitriding, from structural process conditions to properties and applications, including modelling and simulation. Sessions will also be dedicated to carbon-based surface engineering methods including DLC coatings and graphene-based treatments.

Next to the sessions dedicated to carbon-based treatments, other aspects of heat treating of materials will be discussed, such as control of distortions, environmental impact, failure analysis and, most significantly, integration of heat treatments in industry 4.0.

Monday, Nov 30

11.00: Welcome - Registration

12.00: LUNCH

13.00 : OPENING OF THE CONFERENCE

Key-note session

13.15: Carburizing and Carbonitriding : actual status and future developments.
Matthias Steinbacher *(Leibniz Institute for Materials Engineering - IWT Bremen)*

14.00: Surface engineering with carbon; from diamond to graphite.
Marcel A.J. Somers *(Technical University of Denmark , Department of Mechanical Engineering)*

14.45: Data are AI's best friend – how to apply machine learning to heat treatment.
Yannick Lingelbach *(Robert Bosch GmbH)*

15.30: COFFEE BREAK AND POSTER PRESENTATIONS

Carburizing in Industry : Trends and Drivers (I)

16.20: A new approach for case hardening steels.
Renzo Valentini (Università di Pisa), **Valentina Colla** (TeCIP Institute), **Linda Bacchi** (Letomec s.r.l.)

16.45: Substitution of atmosphere heat treatments by LP C, LPCN and vacuum quenching: integrability, energy gains and strong cut of CO2 footprint
Alfred Rallo (ECM Technologies)

17.10: Latest trends and developments in quenching-oil technology.
Thorsten Beitz *(Petrofer Chemie H. R. Fischer GmbH)*

17.35: Future Heating of Atmospheric Carburizing Furnaces.
Joachim Wuenning *(WS Wärmeprozesstechnik GmbH)*

18.00: FREE EVENING

Tuesday, Dec 1

08.00: Welcome

Carburizing in Industry : Trends and Drivers (II)

08.30: Light-Weight powertrain components.
Eva Troell, Albin Stormvinter *(RISE IVF)*,
Sven Haglund *(Swerim)*

08.55: Low pressure carburizing as a promising technique.
Sven Curé *(VCST)*

09.20: Effects of superfinishing operation on the fatigue limit of carburized components for powertrain application.
Enrico Morgano *(FCA CRF)*

09.55: Reproducibility of the hardness depth determination CHD - SHD – NHD
Arnold Horsch *(Arnold Horsch e.K.)*

10.20: COFFEE BREAK AND POSTER PRESENTATIONS

Numerical simulation

11.00: Numerical simulation of full carburizing process of an automotive gear.
Patrice Lasne *(TRANSVALOR S.A.)*

11.25: Case Hardening Simulation of a Complex Spur Gear.
Jwalant Kagathara, Thomas Lubben *(Leibniz-Institut für Werkstofforientierte Technologien-IWT)*

11.50: In situ HEXRD determination and numerical simulation of internal stresses during heat treatment of carburized and carbonitrided low-alloyed steels.
Julien Teixeira *(Institut Jean Lamour)*

12.15: Process chain investigation for distortion control of case hardened drive shafts.
Thomas Waldenmaier, Lothar Förster, Tatjana Miokovic *(Robert Bosch GmbH)*

12.40: LUNCH

Industry 4.0

14.00: What You Need to Know About Industry 4.0 in Heat Treating – An Overview.
Karl-Michael Winter *(NITREX Metal Inc.)*

14.25: Is the gas carbonitriding process ready for industrie 4.0?
Heinrich Klümper-Westkamp *(Leibniz Institute for Materials Engineering- IWT)*

14.50: Validation of the weak coupling approach in the modelization of thermo-mechanical-metallurgical behavior of steel during quenching process
Damien Barbier *(Vallourec)*

15.15: Carbo-nitriding of CVT pushbelt components for further optimization of wear and fatigue properties.
Bert Pennings *(Bosch Transmission Technology b.v.)*

15.40: COFFEE BREAK AND POSTER PRESENTATIONS

Microstructure and Internal Characteristics

16.30: High Temperature Austenitic Grain Stability: from Theory to Industry.
Simon D. Catteau *(Ascometal France Holding)*

16.55: Laser Induced Breakdown Spectroscopy (LIBS) for C-profile measurements.
Christian Gierl-Mayer *(TU Wien)*

17.20: The microstructure control of Carbide Dispersion Carburized low-alloy steels using low pressure carburizing technique.
Marcus Türling *(IHI Machinery and Furnace Co.,Ltd)*

17.55: Unusual microstructures and failures at case-hardened components.
Peter Sommer *(Dr. Sommer Werkstofftechnik GmbH)*

18.20: Study of the mechanical properties of DLC films on tools and stainless steels.
R. Castañeda, J. Guamanga, C. Bohórquez *(Universidad Distrital Francisco José Caldas, Colombia)*, **M. Ramírez** *(Universidade do Vale do Paraíba, Brasil)*

20.00 : DINNER GALA

Wednesday, Dec 2

08.00: Welcome

C-based COATINGS

08.30: BALIQ CARBOS - beyond Diamond-Like-Carbon (DLC).
Georges Volders *(Oerlikon Balzers Coatings Benelux N.V.)*

08.55: Formation of carbon containing MAX phases in massive TiAl and in cold-spray deposited layers by plasma-assisted diffusion treatments.
Thierry Czerwiec *(Institut Jean Lamour)*

09.20: The development of smooth ta-C coatings for automotive components.
Geert-Jan Fransen, Ruud Jacobs *(IHI Hauzer Techno Coating BV)*

09.45: The latest ta-C coatings and investigations on piston pins for internal combustion engines.
Romain Montélimard *(HEF Group)*

10.10: COFFEE BREAK AND POSTER PRESENTATIONS

Low Pressure Carburizing

10.50: Carbon at steel surfaces: you like it or not.
Elke Leunis, Nele Van Steenberge, Laura Moli Sanchez *(OCAS NV)*

11.15: Low pressure carburizing treatment: influence of carbon-bearing gas.
Elena VYAZMINA *(Air Liquide)*

11.40: Implementation of carburizing processes for helicopter gas turbine engines**.**
Cyril Vernault *(Safran Helicopter Engines)*

12.05: Current trends in Low Pressure Carburizing and High Pressure Gas Quenching.
Volker Heuer *(ALD Vacuum Technnologies GmbH)*

12.30: Investigation particles after LPC with Acetylene/Nitrogen on a forged rough surface.
Peter Wijlaars *(Bodycote Hardingscentrum)*

12.55: LUNCH

Diffusion Hardening of Stainless Steel

14.15: Low-temperature stainless steel & titanium surface hardening
Thomas Strabo *(Expanite)*

14.40: Development of low pressure carburizing/carbonitriding treatments on a martensitic stainless steel for bearing applications.
Philippe Jacquet *(ECAM Lyon)*

15.05: Chromium diffusion (Chromizing) in combination with low pressure carburizing leads to optimum heat-, corrosion and wear resistance layers.
Rob Jongbloed *(Chromin Maastricht BV)*

15.30: An improved method to diamond coating by chemical vapor deposition with hybrid power supply.
Paco Rodriguez-Alonso *(Diarotech S.A.)*

15.55: Process control in plasma nitrocarburizing treatment using solid carbon source in industrial-scale reactor.
Saeed Jafarpour *(TU-Freiberg, Institut für Werkstofftechnik)*

16.20: CONCLUSION

16.30: END OF CONFERENCE

INFORMATIONS

REGISTRATION

REGISTRATION FEES CONGRESS DATES : NOV 30 – DEC 2, 2020		
	Fees exclusive VAT	***Fees with VAT (20%)***
Participant - VWT or A3TS member	*615 €*	*738 €*
Participant - non-member	*695 €*	*834 €*
Presenting Speaker (oral or poster) Scientific Committee member	*515 €*	*618 €*
Student (*)	*340 €*	*408 €*
Accompanying to the gala evening (Dec 1)	*100 €*	*120 €*

(*) Students will have to provide valid proof of student status. The social event on Dec 1 is not included in the student registration fee.

CONFERENCE REGISTRATION FEES INCLUDE: Admittance to technical sessions and to the exhibition, Conference bag with electronic proceedings, Social event on December 1, Coffee breaks, Lunches

Everyone making an oral or poster presentation must be registered for the Colloquium (preferential rates)

More information and online registration : https://www.a3ts.org/echt2020/registration/

GENERAL INFORMATIONS

FLANDERS MEETING & CONVENTION CENTER

ELISABETH CENTER ANTWERP - Carnotstraat 4 - 2018 ANTWERP (BELGIUM)

Accessibility

The Flanders Meeting & Convention Center Antwerp is located in the heart of Antwerp and is within easy reach by public transport. Adjacant to Antwerp Central Station, it boasts easy train connections and many tram and busstops close by. Moreover, there is ample parking space in the immediate surrounding.

Antwerp is the largest city of Flanders with a long history, both cultural and economic.
Antwerp is the most important economic centre with the second largest European harbour, the largest Mondial trade centre for diamonds and important industrial activities in many sectors.
Antwerp has an imposing architectural patrimony of nice historical and classical buildings, houses and squares in harmony with trendy modern designed buildings.
Antwerp has also a long tradition in hosting many famous artists of all disciplines and the important work can be admired in one of the many museums. Also the fashion school is recognised over the world.
Antwerp is real multicultural city where you can taste in an pleasant way many of them by walking to the many picturesque squares and terraces.

For more information: https://www.visitantwerpen.be

CONFERENCES : Monday, Nov 30 to Wednesay, Dec 2, 2020

Oral presentations and scientific posters, welcome coffee, coffee breaks and lunches will all take place in the Flanders Meeting & convention center.

GALA EVENING – Tuesday Dec 1, 2020

More details to come

ACCOMODATION

List of hotels : https://secure.cubilis.eu/group/antwerpbookingdesk/extendedSearch?lang=fr