AWT

Arbeitsgemeinschaft
Wärmebehandlung + Werkstofftechnik e.V.

Program

HK 2026

HeatTreatmentCongress

82nd HeatTreatmentCongress
31st IFHTSE World Congress
European Conference on Heat Treatment
Steel Innovation

13–15 October 2026
Koelnmesse

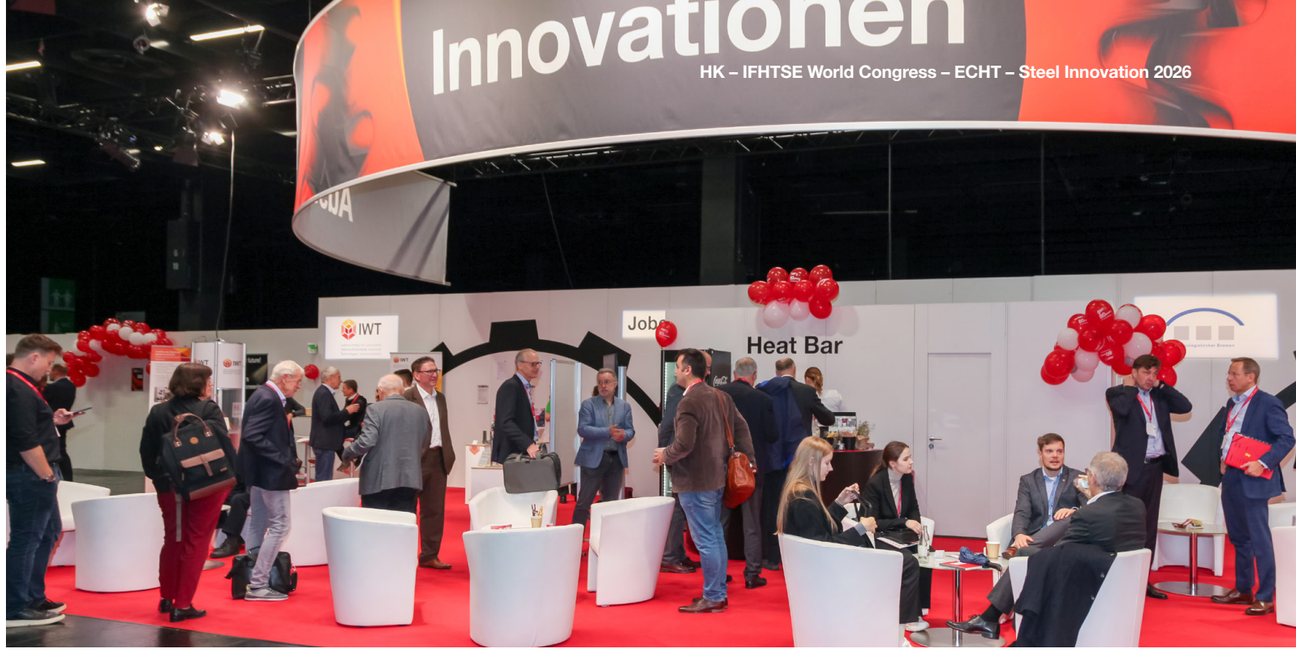
IFHTSE

ECHT
European Conference on Heat Treatment

SI Steel Innovation

Austausch. Wissen. Technik.
Exchange. Knowledge. Technology.

www.hk-awt.de



HK – IFHTSE World Congress – ECHT – Steel Innovation 2026

Dear colleagues, researchers, industry partners, and friends of the global heat treatment and surface engineering community,

With great enthusiasm, we invite you to join us in Cologne this October for one of the most comprehensive and international gatherings our field has ever seen: the 31st IFHTSE World Congress, the European Conference on Heat Treatment (ECHT), the 82nd HeatTreatmentCongress (HK), and Steel Innovation 2026 – four conferences united under one roof, together with one exceptional exhibition, and one shared vision for the future of materials, heat treatment and surface engineering.

This year's program brings together more than 100 expert contributions from leading universities, research institutes, and industrial innovators across the world. Covering thermochemical processing, quenching and distortion, AI & digitalization, simulation and modelling, additive manufacturing, sustainability, steel innovation, and advanced surface engineering, the sessions reflect the full breadth and dynamism of our community.

What truly sets HK/IFHTSE/ECHT/SI 2026 apart is the exhibition – the vibrant center of the entire event.

Here, companies present their latest technologies, digital solutions, furnace concepts, testing methods, and sustainable approaches. It is the place where ideas turn into collaborations, where researchers meet practitioners, and where innovations find their way into industrial reality.

The exhibition is the beating heart of the event – and we warmly encourage every participant to experience it fully.

Across three days, you will find:

- Plenary lectures from internationally renowned experts
- Focused technical sessions covering every major area of heat treatment, materials and surface engineering
- A lively poster session, offering young researchers a stage to present their work
- An international exhibition, bringing together equipment manufacturers, technology providers, and industrial partners
- Networking opportunities, including the Wednesday evening reception and the conference dinner
- And, of course, the unique atmosphere of Cologne – a city that welcomes innovation as warmly as it welcomes people.

Whether you are presenting research, exploring new technologies, seeking industrial partners, or simply looking to stay at the forefront of our field, this event offers an exceptional platform to connect, learn, and contribute.

We look forward to welcoming you – to the exchange of knowledge, to the celebration of innovation, and to the global community of heat treatment, materials and surface engineering.

Ph.D. Lesley Frame
(IFHTSE President)

Dr. Thomas Waldenmaier
(AWT Chairman)

Tuesday, 13.10.2026

Plenary Session Opening and Honors
Room Offenbach

Chair: Lesley Frame

09:00–09:20	**Welcoming Remarks,** **Organizational Notes of the Organizer**		Thomas Waldenmaier Robert Bosch GmbH, Chairman of AWT
	Welcoming Remarks from IFHTSE		Lesley Frame Associate Professor of Materials Science and Engineering, Director of the Center for Materials Processing Data at University of Connecticut, U.S.A. President of IFHTSE
09:20–09:30	**Reinhold Schneider:** **Laudation and Awarding of the IFHTSE Presidency to Scott Mackenzie**		
09:30–09:40	**Stefan Hock:** **Laudation and Awarding of the IFHTSE Vice Presidency to Thomas Waldenmaier**		
09:40–09:50	**Marcel Somers:** **Laudation and Awarding of the IFHTSE-Medal to Sabine Denis**		
09:50–10:35	**IFHTSE-Medal Awardee Lecture: Coupled thermal-phase transformation-stress models for the prediction of residual stresses and distortions in heat treatment of metallic alloys**		Sabine Denis Professor Emeritus, Institut Jean Lamour, Université de Lorraine RNM, Nancy, France
10:35–10:55	**Break**		

HK – IFHTSE World Congress – ECHT – Steel Innovation 2026

Tuesday, 13.10.2026

Room Offenbach

Thermochemical Heat Treatment
Chair: Masahiro Okumiya

10:55–11:20 **1** **Effect of Total Pressure on NH_3 Decomposition During Carbonitriding**

Kenta Tsujii – Daido Steel Co., Ltd., Nagoya, Japan

11:20–11:45 **2** **Comparison of characteristics of gas nitrocarburizing with and without subsequent sulfonitriding or oxidation**

Kazuki Kawata – Kawata PE Office, Saitama, Japan

11:45–12:10 **3** **Closing the Rare Earth Loop: Hydrogen Processing, Advanced Sintering, and Computational Design for Domestic NdFeB Magnet Manufacturing**

Thomas Wingens – Wingens Consultants, Pittsburgh, PA, U.S.A.

12:10–13:40 **Lunch Break**

Thermochemical Heat Treatment
Chair: Masahiro Okumiya

13:40–14:05 **4** **Effect of Pre-Heat Treatment on Prior Austenite Grain Size After Carburizing Microalloyed Steels**

Lucas Carrillo – Advanced Steel Processing and Products Research Center, Department of Metallurgical and Materials Engineering, Colorado School of Mines, Colorado, U.S.

14:05–14:30 **5** **Microstructure-Aware Case Hardening Simulation Using a Grain-Size-Dependent Approach**

Julius Möller – Robert Bosch GmbH, Corporate Sector Research and Advance Engineering, Renningen, Germany

14:30–14:55 **6** **Internal Oxidation Effects in Case Hardening: Fundamentals, Atmospheric Influences, and the Impact of Quenching on the Formation of the Internal Oxidation Zone**

Matthias Steinbacher – Leibniz Institute for Materials Engineering – IWT, Bremen, Germany

14:55–15:15 **Break**

Room Europa

Sustainability
Chair: Bojan Podgornik

13 **Decarbonizing Heat Treatment Through Intelligent Energy Scheduling**

Martin Hellwig – Hochschule Rhein-Waal, Kleve, Germany

14 **Decreased CO_2-Emissions by Adjusting CO-Concentration During Heat Treatment**

Sven Haglund – Swerim AB, Kista, Sweden

15 **Dynamic evaluation of carbon footprint in continuous heat treatment furnaces and methods to reduce part carbon intensity**

Paulina Kus – Air Products PLC, Chertsey, United Kingdom

Lunch Break

Sustainability
Chair: Bojan Podgornik

16 **Using energy intelligently: efficient cleaning concepts for heat treatment**

Florian Pasch – vapic GmbH, Neubulach-Oberhaugstett, Germany

17 **Energy-efficient tempering strategies for carbon-neutral 36CTR4 quenched and tempered steel**

Lorenzo Antonioli – University of Ferrara, Department of Engineering (DE), Italy

18 **Hydrogen Burners with Integrated Fuel and Air Preheating**

Joachim G. Wünning – WS Wärmeprozesstechnik GmbH, Renningen, Germany

Break

Room 4+5

Aluminum & Light Alloys
Chair: Olaf Kessler

25 **Comparative Study of T4, T6, and T8 Heat Treatments on Hardness of A20X Alloy**

Gilar Pandu Annanto – Department of Materials Science and Engineering, National Dong Hwa University, Hualien, Taiwan

26 **The influence of Ag on microstructure and mechanical properties for A20X Alloy**

Chou Ming Wei – Department of Materials Science and Engineering, National Dong Hwa University, Hualien, Taiwan

27 **N.N.**

Lunch Break

Quality Control
Chair: Andree Irretier

28 **The Effect of Microstructure and Hardness of 100Cr6 on Eddy Current Signals**

Hedieh Hosseini – ibg Prüfcomputer GmbH, Ebermannstadt, Germany

29 **Barkhausen Noise Analysis (BNA) for hardness control and heat treatment verification, a reliable and reproducible non-destructive testing method**

Michael Maaß – Stresstech GmbH, Rennerod, Germany

30 **Non-Destructive Tomographic Imaging of Surface Hardening Depth by Laser Ultrasound**

Wolfgang Haderer – Research Center for Non-Destructive Testing GmbH – RECENDT, Linz, Austria

Break

Room 3

Steel Innvation – Steel Design
Chair: N.N.

37 **A progress on bainitizing sheet hot stamping**

Ahmet Kalac – Leibniz Institute for Materials Engineering – IWT, Bremen, Germany

38 **The effect of tramp elements on the phase transformation behaviour of industrial low- and medium carbon steels**

Ulrich Krupp – IEHK – Institut für Eisenhüttenkunde, RWTH Aachen University, Germany

39 **Upscaling of high modulus steels for high performance lightweight applications**

Manuel Gathmann – Max Planck Institute for Sustainable Materials GmbH, Düsseldorf, Germany

Lunch Break

Steel Innvation – Microstructure Evolution
Chair: N.N.

40 N.N.

41 **Controlling pearlite banding via tailored spheroidization: A key to optimized forming behavior**

Sergey Guk – Institute of Metal Forming, TU Bergakademie Freiberg, Germany

42 **Modeling Transformation Induced Plasticity (TRIP) Caused by Precipitation During Aging of Maraging Steels: A Novel Predictive Method**

Niki Nouri – Institute for Applied Materials – Materials Science and Engineering (IAM-WK), KIT, Karlsruhe, Germany

Break

HK – IFHTSE World Congress – ECHT – Steel Innovation 2026

Tuesday, 13.10.2026

Room Offenbach

Thermochemical Heat Treatment
Chair: Marcel Somers

15:15–15:40 **7** **Investigation of Plasma Nitrocarburizing of 318L Duplex Steel Using a Solid Carbon Precursor**

Alina Kosmehl – Institute of Materials Engineering, Technische Universität Bergakademie Freiberg, Germany

15:40–16:05 **8** **Layer formation, growth kinetics and surface strenghtening on low potential gas nitriding of a carburized steel**
Quentin Roques – École nationale supérieur des Arts et Métiers (ENSAM), Mechanics Surface and Materials Processing laboratory (MSMP), Safran Transmission System, Safran Aircraft Engine, Aix-en-Provence, France

16:05–16:30 **9** **Surface Hardening Heat Treatment of Steel Using Plasma Austenitic Nitriding and Quenching**

Masahiro Okumiya – Toyota Technological Institute, Nagoya, Japan

16:30–16:50 h **Break**

Thermochemical Heat Treatment
Chair: Marcel Somers

16:50–17:15 **10** **High-Temperature Solution Nitriding of Al-Alloyed Stainless Steels: Process Window and Nitride/Oxide Surface Architectures**

Steffen Scherbring – University of Applied Sciences Osnabrück, Osnabrück, Germany

17:15–17:40 **11** **Thickness and Mechanical Properties of S-phase Formed in Small Thin Rolled Stainless Steel Plates by Active-Screen Plasma Nitriding**

Kenzo Sumiya – Hatta Kogyo Co. Ltd, Osaka, Japan

17:40–18:05 **12** **Influence of Low Temperature Carburising on the corrosion properties of stainless steels**

Susanne Gerritsen – Bodycote Specialist Technologies GmbH, Landsberg, Germany

19:00 **Meeting Point infront of the Cologne Catherdras for visit of the Früh-brewery (not included in the conference fee)**

Room Europa

Furnace Technology
Chair: Volker Heuer

19 **Improving Productivity and Energy Efficiency in Vacuum Furnaces Through Synergy Between Process and Equipment Design**

Davide Zacchetti – TAV Vacuum Furnaces, Caravaggio, Italy

20 **Perspectives of nitriding applications within modular furnaces: energy benefits, performance & challenges**
Marc Devienne – ECM Technologies, Grenoble, France

21 **Effect of Screen Material and Open Area Ratio on Nitrogen Diffusion during Screen-Assisted Plasma Nitriding of SUS430**

Akio Nishimoto – Department of Chemistry and Material Engineering, Kansai University, Osaka, Japan

Break

Laser Treatment
Chair: Volker Heuer

22 **Laser hardening of large components with laser power in the multi-10kW range**

Marko Seifert – Fraunhofer-Institut für Werkstoff- und Strahltechnik IWS, Dresden, Germany

23 **Microstructural regulation research of laser hybrid solid-state phase transformation**

Qunli Zhang – Zhejiang University of Technology, Hangzhou, China

24 **Tooth Root Load Carrying Capacity of Laser Hardened Gears**

Yves Johannes Barth – Technical University of Munich, Gear Research Center, Germany

Meeting Point infront of the Cologne Catherdras for visit of the Früh-brewery (not included in the conference fee)

Room 4+5

Quality Control
Chair: Volker Schulze

31 **Carbonaceous Residue Formation during Low-Pressure Carburizing: An Industrial Perspective on Surface Contamination and its Effects**

Ünsal Kizil – Bosch Sanayi ve Tic. A. Ş., Bursa, Turkey

32 **Nitrocarburized components – Nanodiffraction in combination with indentation for assessing mechanical performance**

Kristina Lindgren – RISE Research Institutes of Sweden AB, Mölndal, Sweden

33 **(De-)Nitriding of iron for nitrogen quantification using HR-µLIBS**

Sébastien Jégou – Arts et Métier – MSMP Laboratory, Aix-en-Provence, France

Break

AI & Digitalization
Chair: Volker Schulze

34 **From Alloy Composition to Hardness Distribution in Quenched Steels: A Hybrid Data-Driven and Control-Volume Simulation Approach**

Neven Tomašić – University of Rijeka, Faculty of Engineering Department of Materials Science and Engineering, Rijeka, Croatia

35 **Semantifying Heat Treatment Processes and Data with the Heat Treatment Ontology**

Felix Thonagel – Leibniz Institute for Materials Engineering – IWT, Bremen, Germany

36 **Process Monitoring in Parts Cleaning in the Era of Industry 4.0**

Jens Christoffel – SAFECHEM Europe GmbH, Düsseldorf, Germany

Meeting Point infront of the Cologne Catherdras for visit of the Früh-brewery (not included in the conference fee)

Room 3

Steel Innvation – Additive Manufacturing
Chair: N.N.

43 **Influence of Chromium Nitride Additions on the Microstructure of Additively Manufactured 17-4 PH Stainless Steel**

Basit Ali – Technical University of Denmark, Department of Civil & Mechanical Engineering, Produktionstorvet, Lynby, Denmark

44 **Tuning the Austenite Stability of Additively Manufactured Medium Manganese steel**

Pedro José de Castro
Leibniz-Instuite for Materials Engineering, IWT Bremen, Germany

45 **Integrated analysis of the combined manufacturing of H13 tool steel – Determination of interlinked factors over the process-chain of PBF-LB/M, milling and deep rolling**

Leonard Laabs – Institute of Materials Engineering, Department Metallic Materials, University of Kassel, Germany

Break

Steel Innvation – Steel Engineering
Chair: N.N.

46 **Multiscale Investigation of Copper-Induced Hot Shortness and Its Impact on Defect Formation and Fatigue Life in Recycled Steel Grades,**

Muthu Mathialagan – IEHK, RWTH Aachen University, Germany

47 **Development Progress of Virtual Intelligent Design System for Heat Treatment in China**

Jianfeng Gu – Institute of Materials Modification and Modeling, School of Materials Science and Engineering, Shanghai Jiao Tong University, Shanghai, China

48 **N.N.**

International Committee

Dr. Mischa Bachmann (Volkswagen AG, Germany)
Prof. Rafael Colas (Universidad Autónoma de Nueva Leon, Mexico)
Prof. Rainer Fechte-Heinen (Leibniz-Institut für Werkstofforientierte Technologien – IWT, Bremen, Executive Committee Member of IFHTSE, Germany)
Dr. Imre Felde (Óbuda University, Executive Committee Member of IFHTSE, Hungary)
Prof. Jianfeng Gu (Shanghai Jiao Tong University, Vice President of IFHTSE, China)
Bernard Kuntzmann (Listemann AG, Executive Committee Member of IFHTSE, Switzerland)
Sabrina Kuntzmann (Treasurer of IFHTSE, Switzerland)
Dr. Stefan Hock (Secretary General IFHTSE, Germany)
Dr. Scott Mackenzie (Quaker Houghton Inc, USA)
Enrico Morgano (Presidente del Comitato Tecnico AIM, Italy)
Prof. Masahiro Okumiya (Toyota Technological Institute, Executive Member of IFHTSE, Japan)
Prof. Massimo Pellizzari (University of Trento, Past President of IFHTSE, Italy)
Prof. Bojan Podgornik (Institute of Metals and Technology, Executive Committee Member of IFHTSE, Slovenia)
Prof. Reinhold Schneider (University of Applied Sciences Upper Austria, Executive Committee Member of IFHTSE, Austria)
Christophe Stocky (R&D Centre of ABS Acciaierie Bertoli Safau, Executive Committee Member of IFHTSE, France)
Dr. Eva Troell (RISE IVF Research Institutes of Sweden, Executive Committee Member of IFHTSE, Sweden)
Bernhard Vandewiele (General manager at BVDW consultancy, Belgium)
Filip Vráblík (ECOSOND s.r.o., President of ATZK, Czech Republic/Slovakia)
Prof. Mufu Yan (Harbin Institute of Technology, Executive Committee Member of IFHTSE, China)

Scientific/Program Committee

Prof. Thomas L. Christiansen (Worcester Polytechnic Institute, Department of Mechanical & Materials Engineering, USA)
Prof. Dr.-Ing. habil. Rainer Fechte-Heinen (Leibniz-Institut für Werkstofforientierte Technologien – IWT, Bremen, Executive Committee Member of IFHTSE, Germany)
Dr. Volker Heuer (ALD Vacuum Technologies GmbH, Germany)
Prof. Olaf Keßler (Lehrstuhl für Werkstofftechnik, Universität Rostock, Germany)
Prof. Ulrich Krupp (Director of IEHK – Institut für Eisenhüttenkunde, RWTH Aachen University, Germany)
Prof. Marcel Somers (Technical University of Denmark, Executive Committee Member of IFHTSE, Denmark)
Dr. Matthias Steinbacher (Leibniz-Institut für Werkstofforientierte Technologien – IWT, Bremen, Germany)
Dr. Isabell Toldo (Hilti AG, Liechtenstein)
Prof. Véronique Vitry (Université de Mons – Faculté Polytechnique, France)

Local Organizing Committee

Sonja Müller (Managing Director of AWT)
Dr. Thomas Waldenmaier (Robert Bosch GmbH, Chairman of AWT)
Dr. Rainer Tinscher (F&E Technologiebroker Bremen GmbH)
Prof. Dr.-Ing. habil. Rainer Fechte-Heinen (Leibniz-Institut für Werkstofforientierte Technologien – IWT, Bremen, Executive Committee Member of IFHTSE, Germany)
Dr. Stefan Hock (Secretary General of IFHTSE)

www.hk-awt.de

Wednesday, 14.10.2026

Awarding of the Adolf-Martens-Medal
Plenary Discussion - Room Offenbach

Chair: Thomas Waldenmaier

09:00–09:05	**Announcement of the Adolf-Martens-Medal**		Thomas Waldenmaier Chairman of AWT
09:05–09:15	**Laudation to Marcel Somers**		Thomas Christiansen Technical University of Denmark, Department of Civil & Mechanical Engineering, Section of Materials and Surface Engineering, Lyngby, Denmark
09:15–10:00	**Adolf-Martens-Medal awardee lecture:** **The pivotal role of nitrogen in exploring and exploiting heat treatment and surface engineering; from nitriding to cryogenic treatment**		Marcel Somers Technical University of Denmark, Department of Civil & Mechanical Engineering, Section of Materials and Surface Engineering, Lyngby, Denmark
10:00–10:30	**Break**		
10:30–12:00	**Plenary discussion: Models and Applications of AI tools in Materials Science and Heat Treatment** Moderation: Karl Michael Winter (Nitrex Inc., Montreal, Canada, UPC Marathon, Göppingen, Germany) Particpants: Henk Birkholz (Leibniz-Institute for Materials Science – IWT, Bremen, Germany) Lukas Fischer (ATM Qness GmbH, Austria), Oliver Schauerte (Volkswagen AG, Germany)	AI	
12:00–13:30	**Lunch Break – Poster Session**		

Program status September, 3, 2026 – Subject to change

HK – IFHTSE World Congress – ECHT – Steel Innovation 2026

Wednesday, 14.10.2026

Room Offenbach

Quenching and Distortion
Chair: Peter Haase

13:30–13:55 **49** **Modern quenching oils for low-pressure carburizing processes – requirements, properties, applications**

Rainer Braun – Burgdorf GmbH & Co. KG, Stuttgart, Germany

13:55–14:20 **50** **Sustainable solutions and innovations related with heat-treatment fluids**

Sebastian Kozdron – Quaker Houghton, Dortmund, Germany

14:20–14:45 **51** **Jominy revisited: calculation of heat transfer coefficients**

Scott MacKenzie – retired employee of Quaker Houghton, U.S.A.

14:45–15:05 **Break**

Quenching and Distortion
Chair: Scott MacKenzie

15:05–15:30 **52** **Effect of Phase Transformations on Distortion and Residual Stress in Welded Joints**

Jason Meyer – DANTE Solutions, Inc, Cleveland, OH, U.S.A.

15:30–15:55 **53** **Improvement of Dimensional Repeatability in Hardened Tubular Stabilizer Bars Through Coupled Individual Conductive Heating and Constraint-Assisted Quenching**

Frederico Martinez-Guerrero – Martz Ingenieurbuero, San Luis Potosi, Mexico

15:55–16:20 **54** **CFD simulation of an industrial case of air quenching**

Amandine Cardon –Safran Tech, Magny les Hameaux, France

16:20–16:40 **Break**

Room Europa

Thermochemical Heat Treatment
Chair: Reinhold Schneider

58 **Microstructural evolution and nanoscale characterization of the S-phase**

Suraya Binti Amad Mazni – Smart Manufacturing Research Institute, Universiti Teknologi MARA, Seremban, Malaysia

59 **Porosity formation during nitriding of iron revisited**

Louise M. Garnier – Technical University of Denmark, Lyngby, Denmark

60 **Correlation between nitrogen content and corrosion resistance in graded nitrogen-containing austenitic stainless steel**

Bo Wang – State Key Laboratory of Advanced Special Steel, School of Materials Science and Engineering, Shanghai University, China

Break

Simulation & Modelling
Chair: Reinhold Schneider

61 **Steel Properties from Ion Geometry: The Sphere Packing Model as a Physically Transparent Framework for Phase Transformation, Hardenability, and Tempering Behavior — from Practice to Theory and Back**

Karl-Michael Winter – Vice President R&D and Engineering, Nitrex UPC Marathon, Göppingen, Germany

62 **Numerical Prediction of Heat Treatment in Gears through CFD-Mechanical Coupling**

Sacha El Aouad – Sciences Computers Consultants, Saint-Etienne, France

63 **Gas quenching and modelling of steel components**

Johan Wendel – Research Institutes of Sweden AB, Mölndal, Sweden

Break

Room 4+5

Tempering / Cryogenic
Chair: Christophe Stocky

67 **Respecting Physical Structure in Heat Treatment Machine Learning: An Invariance-Constrained Study of Tempering**

Zachary Menard – Vanderbilt University, HRC Digital, Nashville, TN, U.S.A.

68 **Optimization of quenching and tempering heat treatment parameters in LPBF-produced 9%Cr ferritic-martensitic steel**

Francesco Sordetti – University of Udine, Polytechnic Department of Engineering and Architecture, Udine, Italy

69 **Carbo-austempering of new high-silicon case-hardening steels**

Gabriel Ebner – Leibniz Institute for Materials Engineering – IWT, Bremen, Germany

Break

Fatigue & Bainite
Chair: Christophe Stocky

70 **Microstructural Influence on the Low Cycle Fatigue Behavior of Carbide Free Bainite**

Mitchell Shields – Advanced Steel Processing and Products Research Center, Department of Metallurgical and Materials Engineering, Colorado School of Mines, Golden, CO, U.S.A.

71 **Experimental and Simulative Analysis of Structural Fatigue in Induction-Hardened Slewing Bearings for Service Life Prediction and Potential Material Optimization**

Johanna Eisenträger – Leibniz Institute for Materials Engineering – IWT, Bremen, Germany

72 **Enhancement of Impact Toughness in Bainitic Steels through Optimized Post-Forging Cooling Conditions**

Daniel Acevedo-Reyes – Acciaierie Bertoli Safau (ABS) Centre Métallurgique, Metz, France

Break

Room 3

Steel Innvation – Surface Treatments
Chair: N.N.

76 **Influence of Diamond Burnishing on the Surface Layer Modification of Hard Turned Bainitic Components**

Yurii Kotsun – Leibniz Institute for Materials Engineering – IWT, Bremen, Germany

77 **Extreme hardness through sustainable electroplating: The capabilities of iron-carbon coatings**

Karen Pantleon – Technical University of Denmark, Dept. of Civil and Mechanical Engineering, Lingby, Denmark

78 **N.N.**

Break

Steel Innvation – Processes
Chair: N.N.

79 **Ammonia-Based Direct Reduction of Natural Hematite**

Medard Turyasingura – Makerere University, Department of Mechanical Engineering, College of Engineering, Design, Art and Technology, Kampala, Uganda

80 **Enabling circular economy in high-speed steels through spray forming**

Vania Rodriguez Herrejon – Technical University of Denmark, Lyngby, Denmark

81 **Resistance Heating Alloys for Modern Heat Treatment**

Katja Fritzsche – BGH Edelstahlwerke GmbH, Freital, Germany

Break

HK – IFHTSE World Congress – ECHT – Steel Innovation 2026

Wednesday, 14.10.2026

Room Offenbach

Quenching and Distortion
Chair: Scott MacKenzie

16:40–17:05 **55** **Simulation and validation of a multi-physics model for through-thickness microstructure evolution using high-pressure vacuum gas quenching technology**

Nathan Dixon – Warwick Manufacturing Group, University of Warwick, Coventry, U.K.

17:05–17:30 **56** **Simulation of Heat Treatment Deformation due to Effect of Pre-Machining Condition**

Tsuyoshi Sugimoto – National Institute of Technology, Asahikawa College, Japan

17:30–17:55 **57** **Improving heat-treatment deformation prediction accuracy for the inner-diameter spline of CVJ inner races via simulation technology**

Hayato Ikeda – AIKOKU ALPHA Co., Ltd., Aichi, Japan

18:00–22:00 **Conference Dinner and Awarding of the Karl-Wilhelm-Burgdorf-Price and Poster Competition**

Room Europa

AI & Digitalization
Chair: Bernard Kuntzmann

64 **Ground truth in metallographic analysis: challenges for the development and evaluation of AI-based microstructure analysis in heat-treatment applications**

Jessica Schneider – MiViA GmbH, Freiberg, Germany

65 **Nitriding treatment of structural steels: AI-based modeling**

Patricia Razafimahefa – MSMP Laboratory, Aix-en-Provence, France

66 **Practical adaptation of artificial-intelligence tools in heat treatment**

Janusz Kowalewski – Ipsen USA, Cherry Valley, IL, U.S.A.

Room 4+5

Materials / Surface
Chair: Filip Vráblík

73 **Process and microstructure ptimisation for performance-enhanced medium carbon alloy steels**

Yulin Ju – Warwick Manufacturing Group, University of Warwick, Coventry, U.K.

74 **Resource efficient low series production of low alloy steel parts**

Moa Bertling – RISE Research Institutes of Sweden AB, Mölndal, Sweden

75 **Cooling behaviour using thermal form factors at geometric notches in rotationally symmetric machine elements for martensitic hardening steels**

Phyllis Ndugire – Faculty of Technology & Bionics, Hochschule Rhein-Waal, Kleve, Germany

Conference Dinner and Awarding of the Karl-Wilhelm-Burgdorf-Price and Poster Competition

Room 3

Steel Innvation – Technological properties
Chair: N.N.

82 **Innovative materials testing as a driver for implementing R-strategies to increase sustainability and resource efficiency**

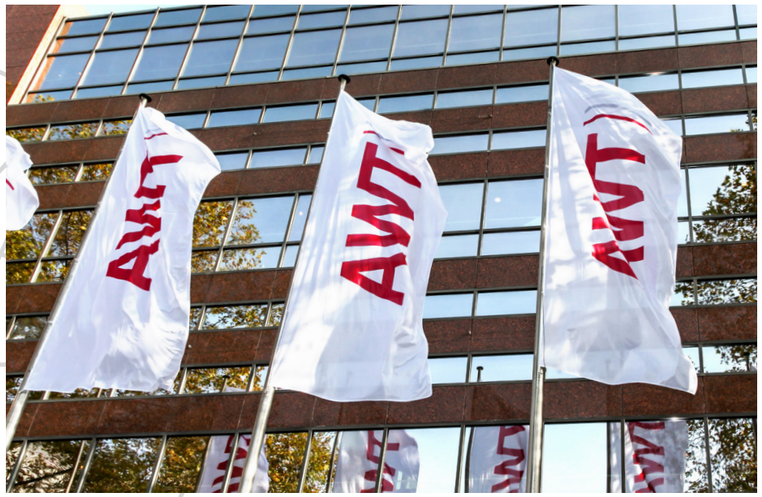
Fabian Weber – Department of Materials Science & Materials Testing at the University of Applied Sciences Kaiserslautern, Germany

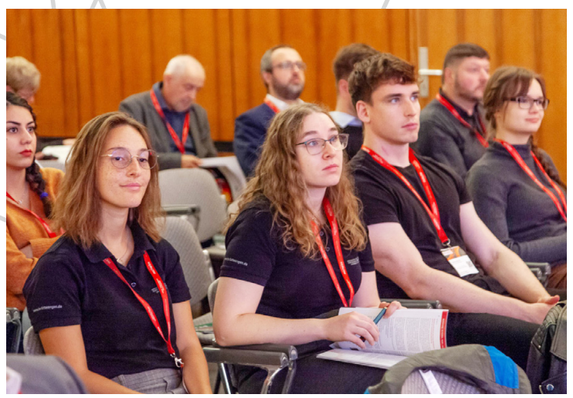
83 **Wear-resistant tool steels – from alloy design to industrial validation**

Anne Veronika Boehm – Leibniz-Institute for Solid State and Materials Research IFW, Dresden, Germany

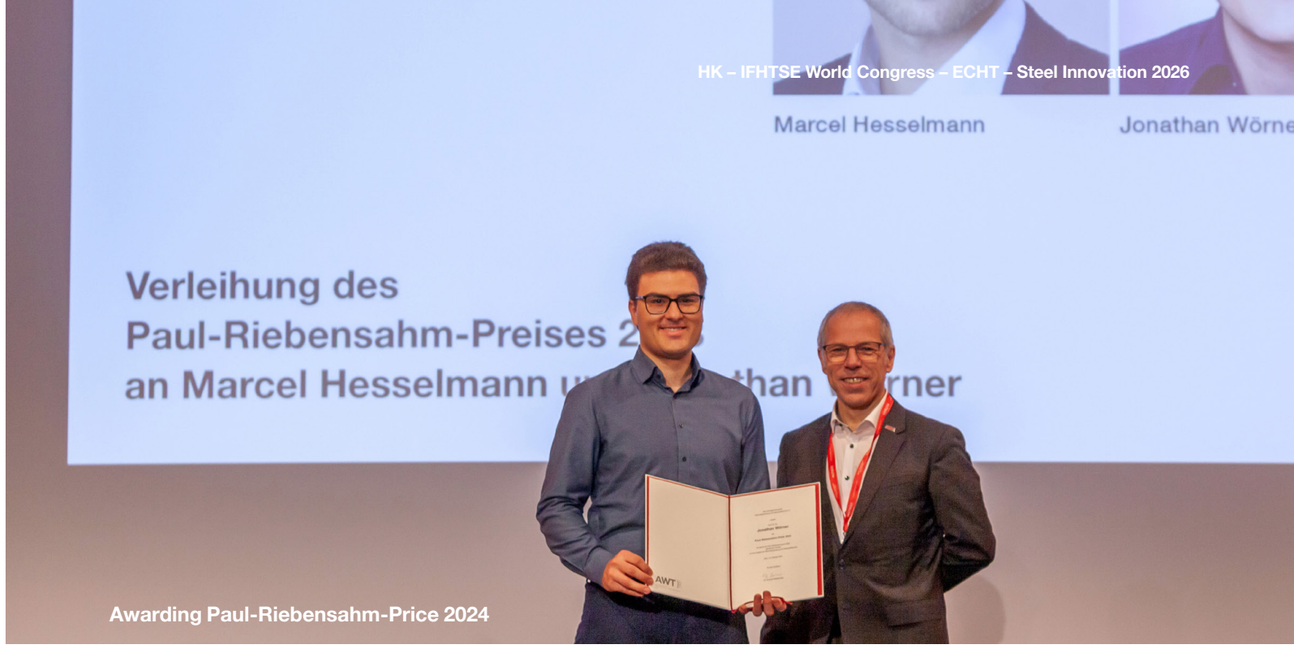
84 **Influence of self-tempering on the impact toughness of an air hardening steel**

Daniel David – FH OÖ Forschungs & Entwicklungs GmbH, Austria





HK – IFHTSE World Congress – ECHT – Steel Innovation 2026



Awarding Paul-Riebensahm-Price 2024

Thursday, 15.10.2026

Awarding of the Paul-Riebensahm-Price
Keynote lectures – Room Offenbach

Chair: Stefan Hock

09:00–09:10	**Awarding of the Paul-Riebensahm-Price 2025 to Y. J. Barth, Technical University of Munich, Germany**		Yves Johannes Barth Technical University of Munich, Gear Research Center, Germany
09:10–09:50	**Keynote Lecture: Digitalization and its role in materials engineering**		Evgeniya Kabliman Leibniz-Institute for Materials Engineering IWT, Bremen, Germany
09:50–10:30	**Keynote Lecture: Metal Additive Manufacturing – a Pre-Processing Step for Heat Treatment and Thermochemical Surface Engineering**		Thomas Christiansen Director, Center for Heat Treating Excellence (CHTE), Department of Mechanical & Materials Engineering, Worcester Polytechnic Institute, U.S.A.
10:30–11:00	**Break**		

HK – IFHTSE World Congress – ECHT – Steel Innovation 2026

Thursday, 15.10.2026

Room Offenbach

Additive Manufacturing I
Chair: Eva Troell

11:00–11:25 **85** **Mechanical Performance of LPBF-Processed Aluminium Composites: Effects of Heat Treatment and Microstructural Evolution**

Marco Bona – Department of Aerospace Science and Technology, Politecnico di Milano, Italy

11:25–11:50 **86** **Fatigue Behaviour of Ti-6Al-4V Produced by SLM and EBM: Influence of Material**

Niki Picco – Università di Udine, Dipartimento Politecnico di Ingegneria ed Architettura, Udine, Italy

11:50–12:15 **87** **Effect of Post-Processing Heat Treatments on the Mechanical Performance of Additively Manufactured AISI 316Ti**

Giovanni Coderani – University of Udine, Polytechnic Department of Engineering and Architecture, Udine, Italy

12:15–13:30 **Lunch Break**

Additive Manufacturing II
Chair: Eva Troell

13:30–13:55 **88** **Post Heat Treatment of H13 Tool Steel Repaired by Direct Energy Deposition Using a Lean-Hot-Work-Tool-Steel**

Massimo Pellizzari – University of Trento, Italy

13:55–14:20 **89** **Microstructure and Mechanical Properties of High-Silicon Stainless Steel Fabricated via Laser Powder ed Fusion**

Kenji Doi – Osaka Yakin Kogyo Co., Ltd., Osaka, Japan

14:20–14:45 **90** **Precipitation Evolution and Recrystallisation Behaviour in Non-Isothermally Heat-Treated Al-Mg-Sc-Zr Alloy rocessed by Laser Powder Bed Fusion**

Yuvaraj Ganpati Patil – Chair of Materials Science and Testing (LMW), Institute for Materials Engineering, School of Science and Technology, University of Siegen, Germany

14:45–15:00 **Plenary Closing Ceremony, Announcment HK 2027, Announcment P.-R.-Price, Tom Bell Award**

Room Europa

Materials
Chair: Véronique Vitry

91 **On the precipitation and transformation kinetics of precipitation-hardening steel X5CrNiCuNb16 4 in a wide range of heating and cooling rates**

Prof. Olaf Keßler – Department LL&M, University of Rostock, Germany

92 **Reducing CO_2 Emissions in Gas Carburizing Using Carbonization**

Mashiro Okumiya – Toyota Technological Institute, Nagoya Japan

93 **Comparative Analysis of Cast and Wrought Duplex Stainless Steels (UNS S32205 vs. UNS S32750): Microstructure Evolution, Secondary Phase Precipitation, and Corrosion Performance**

Asma Teghri – Department of Industrial Engineering, University of Padova, Italy

Carburizing / Cryogenic
Chair: Véronique Vitry

94 **Quantification of Retained Austenite Using Nitrogen Content: A Correlative Approach Beyond Conventional Metallography**

Varol Özgür Zühre – Bosch Sanayi ve Tic. A. Ş., Bursa, Turkey

95 **Impact of Grain Size on the Tooth Root Load Carrying Capacity of Case-Hardened, unpeened Gears with a regular Degree of Cleanliness**

Daniel Fuchs – Technical University of Munich – Institute of Machine Elements – Gear Research Center (FZG), Germany

96 **Potential of Cycling Deep Cryogenic Treatment in Optimizing Properties of Cold-Work Tool Steels**

Boja Podgornik – Institute of Metals and Technology, Ljubljana, Slovenia

Room 4+5

Surface Engineering
Chair: Thomas Christiansen

97 **Application-Driven Coating Design for Molds and Dies**

Dr. Mario Lessiak – RÜBIG GmbH & Co KG, Wels, Austria

98 **Warm peening at tempering temperature and its effect on the residual stress depth profile**

Benjamin Dollhofer – Karlsruhe Institute of Technology (KIT), Germany

99 **A Universal Platform for Plasma Nitrocarburizing: Decoupled Carbon Control and Surface Modification of Stainless and QT Steels**

Anke Dalke – Institute of Materials Engineering, Technische Universität Bergakademie Freiberg, Germany

Lunch Break

Challenges and Perspectives
Chair: Thomas Christiansen

100 **Same process, same results? – Ensuring reproducibility in (inductive) heat treatment**

Christine Tränkner – ITG Induktionsanlagen GmbH , Hirschhorn (Neckar), Germany

101 **An Overlooked Alternative for High-Hardness and Wear-Resistant Surfaces: Boriding**

Stefanie Spitz – Durferrit GmbH, Mannheim, Germany

102 **Effect of Divergent Nozzle Geometry on Particle Velocity and Peening Performance in Fine Particle Peening**

Koichiro Nambu – Ritsumeikan University, Shiga, Japan

Congress fees

Complete Event (3 days Tue., Wed., Thu.)	1059,30 €
Two days Tuesday/Wednesday	738,30 €
Two days Wednesday/Thursday	738,30 €
One day Tuesday or Wednesday or Thursday	524,30 €
Reduced fee for University employees/Speakers (whole event)	738,30 €
Retired AWT-members/Employees of Leibniz-IWT Bremen	90,00 €
Students, trainees	0,00 €

Personal AWT and DGM members benefit from a discount of 50 Euro for the complete program and daily tickets for the congress. The discount is not applicable to the transferable exhibitor tickets. The congress fee includes the participation of the congress, free entrance to the exhibition and free entrance to the reception on Wednesday, 14. October 2026.

There is no reduction for university employees and speakers on 1-day-tickets. For every exhibition stand only one transferable ticket will be available.

Prices for congress tickets incl. 7% VAT

Tickets exhibition

	Ticketshop	On-site cash point
Three day ticket	95,00 €	100,00 €
Tuesday	60,00 €	50,00 €
Wednesday	60,00 €	50,00 €
Thursday	60,00 €	50,00 €
Exihibitor ticket for 3 days (additional to the free tickets)	50,00 €	55,00 €
Customer invitation 1 day (voucher code submitted by exhibitor)	55,00 €	not available
Customer invitation 3 days (voucher code submitted by exhibitor)	75,00 €	not available

Free entrance to the exhibition will be granted to personal AWT members.

Exhibition prices incl. 19 % VAT.

Registration

Registrations for the event have to be made at the HK-Ticketshop on www.hk-awt.de or the ticket hotline. The terms of use and conditions for the HK-Ticketshop exclusively apply. Ticket hotline: +49 421 522 9339 39, from Monday to Friday, 8–13 o'clock. e-mail: ticket@hk-2026.de

Payment

The cashing will be provided by F&E Technologiebroker Bremen GmbH. Congress tickets can be purchased on account. Tickets for the fair must be paid by credit card. The handling of the purchase and the telephone hotline will be provided by the Arbeitsgemeinschaft Wärmebehandlung und Werkstofftechnik e.V. (AWT) and F & E Technologiebroker Bremen GmbH.

E-ticket, admission ticket

After registration and payment, customers receive an e-ticket by e-mail. Customers can either print the e-ticket, showing a bar code or save it on their mobile phone. The e-ticket is no entrance ticket. The entrance ticket will be obtained from the ticket vending machines near the entrance to the event by scanning the e-ticket. Please wear your ticket visible!

Cancellation of participation

For cancellation of the congress participation a written notification has to be sent to the ticket hotline by e-mail to ticket@hk-2026.de. In case of cancellation of the congress ticket before 15th September 2026 a fee of 25 % will be charged. There will be no reimbursement after this date. An alternative person can be named. A cancellation of tickets to the exhibition is not possible. The statutory consumers right of revocation shall remain unaffected thereby.

Hotel rooms

Hotel rooms can be booked through the service of Cologne trade fair with www.hk-awt.de. Please make your reservation of hotel rooms as soon as possible.

Location

Koelnmesse, Messeplatz 1, 50679 Köln, Germany
Entrance East, Directions at www.hk-awt.de

Organizer Congress

Arbeitsgemeinschaft Wärmebehandlung
und Werkstofftechnik e.V. (AWT)
Paul-Feller-Straße 1, 28199 Bremen, Germany
Phone: +49 421 5229339, info@awt-online.org, www.awt-online.org

Organizer Exhibition

F&E Technologiebroker Bremen GmbH,
Wiener Straße 12, 28359 Bremen, Germany

Scientific / Program Committee

Prof. Thomas L. Christiansen (Worcester Polytechnic Institute, Department of Mechanical & Materials Engineering, USA)

Prof. Rainer Fechte-Heinen (Leibniz-Institut für Werkstofforientierte Technologien – IWT, Bremen, Germany)

Dr. Volker Heuer (ALD Vacuum Technologies GmbH, Germany)

Prof. Olaf Keßler (Lehrstuhl für Werkstofftechnik, Universität Rostock, Germany)

Prof. Ulrich Krupp (Director of IEHK – Institut für Eisenhüttenkunde, RWTH Aachen University, Germany)

Prof. Marcel Somers (Technical University of Denmark, Executive Committee Member of IFHTSE, Denmark)

Dr. Matthias Steinbacher (Leibniz-Institut für Werkstofforientierte Technologien – IWT, Bremen, Germany)

Dr. Isabell Toldo (Hilti AG, Liechtenstein)

Prof. Véronique Vitry (Université de Mons – Faculté Polytechnique, France)

www.hk-awt.de