

Heat Treat 2021

The Bridge Between Research and Industry in Heat Treatment

Matthew Jaster, Senior Editor

Heat Treat 2021 is a conference and expo for heat treating professionals featuring 2½ days of face-to-face networking opportunities with approximately 200 heat treat exhibitors/companies. All of the top heat treating companies will offer the latest research and industry insights during more than 100 technical presentations. This year's show includes a VIP-guided industry tour, as well as student/emerging professionals initiatives, including free college student registration, Fluxtrol Student Research Competition and the new ASM Heat Treating Society Strong Bar Student Competition. Heat Treat 2021 is co-located with Motion + Power Technology Expo 2021 with access to additional exhibitors. The event takes place September 14–16, 2021 at the America's Center, St. Louis, Missouri.

Bodycote — Booth #621

Bodycote offers an international network of plants, providing thermal processing services including heat treatments, metal joining, hot isostatic pressing and surface technology. The global network operates from over 180 locations, with customers benefiting from Bodycote's comprehensive range of services from multiple locations. Customers know that if their business expands, Bodycote has the capability to meet their needs. The same process at the same quality standards can be obtained from multiple locations.

Bodycote recently announced the opening of a new facility in Syracuse, New York.

The new Syracuse facility is the second new facility to be opened in North America in as many months, following on from the announcement of the opening of the new Elgin, Illinois facility in December 2020.

The Syracuse facility, encompassing 60,000 square feet of operating space, is now operational and offers a wide range of heat treatment processes. These include vacuum heat treating, atmospheric carburizing, low-pressure carburizing, carbonitriding, ferritic nitro carburizing, nitriding and aluminum heat treating. It is envisaged that the site will secure all major OEM approvals as well as Nadcap accreditation which it is already well on the way to achieving.

Bodycote also announced the opening of a new facility in Elgin, Illinois in December 2020.

The Elgin facility upgrades the company's capabilities and positions Bodycote as part of an ongoing strategy to provide the best possible capabilities and geographical network to better serve customers from the agricultural, mining, construction, automotive and various other manufacturing supply chains in the Upper Midwest region.

The facility is now fully operational and supporting customer requirements. Bodycote continues to provide all of the processes and capabilities which were previously offered at the

Melrose Park location. Additionally, the new state of the art facility in Elgin offers nitriding, Corr-I-Dur, nitrocarburizing and low pressure carburizing (LPC) solutions.

www.bodycote.com

ECM USA Inc. — Booth #1413

ECM Technologies is an innovative low pressure vacuum furnace manufacturer with headquarters in Grenoble, France. With subsidiaries and ventures around the world, ECM's global presence is well known in the automotive, aerospace, nuclear, energy, electronic, induction and 3D additive industries. With such versatile product lines and service capabilities, ECM is the ideal furnace system supplier for heat treatment processes ranging from rapid thermal processing (RTP) to low pressure vacuum carburizing (LPC). Our service capabilities include advanced automation, robotics, after sales, spare parts, on-site training and more.



ECM was recently recognized as one of the companies who is leading the way towards a better, brighter, greener future. ECM's ECO Furnace was presented the Green Business Award for accomplishing a cleaner, safer, and more efficient operation in the heat treat industry; more specifically the environment benefits from a low carbon footprint (energy consumption is minimal and CO₂ emissions are near 80% less).

www.ecm-usa.com

Ipsen — Booth #1906

Ipsen provides atmosphere and vacuum heat-treating systems and supervisory controls systems, which are used in many mission-critical applications. This advanced equipment is developed for aerospace, automotive, energy, medical, tool and die and various industries across the globe. Ipsen offers global modular platforms, as well as custom designs for specialized processes and requirements. Available in a wide range of sizes, our atmosphere and vacuum systems deliver versatility of processes, including annealing, brazing, hardening, low-pressure carburizing, solution nitriding, stress relieving and tempering.

Education: In addition to classroom-style trainings at their manufacturing facility, Ipsen offers on-site Ipsen U courses to accommodate large groups at customer facilities. Ipsen U is a course designed to teach heat treatment fundamentals, best practices and new methods. Attendees receive an extensive overview of vacuum furnace equipment, processes and maintenance.



For on-site trainings, customers can choose which topics to focus on, allowing for a customized, hands-on experience that follows safety protocols. Ipsen sends highly qualified technical resources, sometimes those who were directly involved with the build of the furnace they are training on.

Condition Monitoring: A feature on the PdMetrics dashboard monitors incoming three-phase utilities, voltage and frequency on Ipsen's Titan 2.0 vacuum furnaces. This addition offers further diagnostics for the diffusion pump heater assembly.

By adding these parameters, PdMetrics adjusts the expected kilowatt usage based on incoming line voltage, reporting precise diagnostic data, avoiding the potential for false alarms. Ipsen has nearly 100 Titan 2.0 furnace installations with the software.

Ipsen's predictive maintenance software for vacuum furnaces was developed in 2016 and helps customers minimize high-cost events and maximize up time. The software is available on any model of Ipsen furnace new or old.

www.ipsenusa.com

Seco/Vacuum Technologies — Booth #1607

Seco/Vacuum Technologies (SVT) is the North American arm of Seco/Warwick Group focusing on vacuum furnaces, gas nitriding furnaces, and related professional services. SVT is the North American sales, applications engineering and service support team for Seco vacuum furnaces.



CaseMaster Evolution

Seco/Warwick CaseMaster Evolution vacuum furnace and BREW atmosphere furnace will make up a new production line in the specialized commercial hardening plant of Aalberts Surface Technologies Heat in Kalisz (Poland).

Last year, the Dutch branch of Aalberts Surface Technologies Heat (formerly Hauck) in Eindhoven received a furnace, operating under high vacuum, with the working chamber of 1200 × 1200 × 2000 mm, which is not only the largest furnace with an all-metal heating chamber but also the largest device of this kind to be operated in the Benelux Region of Europe (Belgium, the Netherlands and Luxembourg). Now the Polish, Kalisz-based branch of the heat treatment systems and services provider will expand its production line getting a solution that can only be described with “the most” prefix.

The new furnaces will create a production line that will be used for successive vacuum carburizing (LPC) and gas quenching (CMe-T furnace), followed by annealing (BREW furnace) to reduce the internal stress of the treated metals. Performing so many processes is possible thanks to the combination of vacuum technology with atmosphere technology.

Gas Nitriding

A process that has been known for more than a century, gas nitriding, has seen a technology breakthrough that is a real game changer in the field of metal heat treatment. The ZeroFlow method introduced to global industry by Seco/Warwick in cooperation with scientists from one of the best technical universities in Poland, Poznan University of Technology, reduces process costs with performance that is far more ecologically friendly.

LPC Technology

LPC technology is applied wherever carburizing is used as a process improving the mechanical properties of elements and parts of machines as well as power and movement transmission systems. In short, wherever the drivers include cost reduction, efficiency, quality and reliability, exploitation flexibility and environmentalism. The LPC technology made in SECO/WARWICK is especially popular amongst the manufacturers carburizing massive or longitudinal elements like gears, bearings, drilling tools and other elements requiring thick carburizing layers.

For example, atmosphere retort furnaces have long avoided LPC due to their unique feature which is the ability to expose work to air at the process temperature, a design that classic vacuum furnaces could not replicate. The Pit-LPC solution has overcome this barrier and currently presents an advanced and comprehensive alternative to pit furnaces and their functions, bringing all of the LPC technology-related advantages into this application area. The LPC equipment can be tailored in such a fashion that allows Seco/Warwick to assemble the new equipment in the existing atmosphere furnace bay. Such a non-standard approach impacts the continuous expansion of the sectors interested in the furnaces equipped with LPC technology and the Pit-LPC furnace.

www.secovacusa.com

Solar Manufacturing — Booth #1313

Solar Manufacturing is a privately held, U.S.-based company providing technologically advanced vacuum heat treating furnaces. The company offers designs for heat treating processes such as hardening, brazing, stress relieving, normalizing, annealing, tempering, carburizing, nitriding, and sintering as well as durable and energy-efficient graphite and molybdenum hot zones. Highlights include the SolarVac Polaris advanced and interactive control system with remote access offers preventive maintenance diagnostics and the ConserVac energy management system.

Solar Manufacturing recently shipped and installed a vacuum heat treating furnace for NexGen Advanced Fuel Systems, an Allied Power Group Company, based in Houston, Texas.

NexGen, a premier gas turbine component overhaul facility,



ordered Solar Manufacturing's new HFL-7472-2IQ furnace to help increase their capacity and reduce turnaround time for their heat treating and brazing operations. Built specifically to heat treat land-based turbine equipment, with attention to specific cooling requirements required by NexGen's customers, the furnace features a Solarvac Polaris Control System and a graphite hot zone accommodating loads up to 48" wide x 48" high x 72" deep. The furnace has a maximum load weight capacity of 6,000 pounds.

Additionally, Solar recently shipped a Mentor vacuum furnace to a medical device and implant manufacturer in the Southeast United States. The Model HFL-2018-2IQ features an all-metal insulated hot zone, a load weight capacity of up to 250 lbs., and a maximum operating temperature of 2400°F. The Mentor vacuum furnace will be used to age harden and anneal medical devices and implants.

Solar Manufacturing recently shipped an external quench vacuum furnace to a West Coast aerospace manufacturer. The Model HFL-7472-2EQ features an all-metal hot zone, a load weight capacity up to 10,000 lbs., a maximum operating temperature of 2400°F, and a 2-bar quench system optimized for argon with a 150 HP quench motor and a variable frequency drive. The furnace working zone measures 48"W x 48"H x 72"D, includes the SolarVac Polaris control system, and is AMS2750F compliant.

solarmfg.com

Educational Opportunities

The show features 100+ technical presentations including the following: (Please note that sessions and times are subject to change).

Tuesday September 14, 2021

8:30 – 9:50 a.m.

Applied Technology I

Session Chair: Rozalia Papp and Dr. Jerzy Barglik

Microstructural Development and Characterization

Session Chair: Prof. Robert L. Cryderman and Eva Troell

Residual Stress I

Session Chair: Prof. Lesley D. Frame and Collin Russell

10:30 – 11:50 a.m.

Applied Technology II: Energy Consumption and Efficiency

Session Chair: Dennis Beauchesne and Dr. Bernardo Hernández-Morales

Residual Stress II

Session Chair: Prof. Lesley D. Frame and Collin Russell

Vacuum Processes and Technology

Session Chair: Roger Jones and Dr. Emilia Wolowiec-Korecka

1:00–2:20 p.m.

Additive Manufacturing I

Session Chair: Michael Pershing

Induction Heat Treating I

Session Chair: Robert C. Goldstein and Prof. Bernard Nacke

Quenching Technologies I: Simulation

Session Chair: David A Guisbert and Dr. Imre Felde

4:00–5:30 p.m.

Fluxtrol Student Research Competition - Phase I - Posters

Session Chair: Mr. Robert C. Goldstein
Poster Session

Wednesday September 15, 2021

9:00–10:20 a.m.

Industry Internet of Things/Automation and Control

Session Chair: Jim Oakes

Quenching Technologies II

Session Chair: Andrew L. Banka, P.E. and Dr. Kyozo Arimoto

1:30–3:10 p.m.

Induction Heat Treating II

Session Chair: Dr. B. Lynn Ferguson and Dr. Egbert Baake

Process Simulation / CALPHAD

Session Chair: Dr. Zhichao (Charlie) Li

Quality Control

Session Chair: Dr. Olga Rowan

4:00–5:40 p.m.

Additive Manufacturing II

Session Chair: Mr. Thomas Wingens and Prof. Reinhold S. E. Schneider

4:00–6:00 p.m.

Atmosphere Technology and Surface Engineering

Session Chair: Ms. Larissa Vilela and Dr. Satyam S. Sahay

Thursday, September 16, 2021

8:30–9:50 a.m.

Materials Durability/Mechanical Testing I

Session Chair: Dr. Mohammed Maniruzzaman

Quenching Technologies III

Session Chair: Dr. Thomas Lübben

10:10–12:30 p.m.

Applied Technology III

Session Chair: Prof. Mei Yang

Materials Durability / Mechanical Testing II

Session Chair: Dr. Lee M. Rothleutner

For additional information, visit

www.asminternational.org/web/heat-treat.

