FNA 2018

Technical Education Sessions

OCTOBER 9 – PRODUCTIVITY & DATA – ROOM 120

TIME: 8:00 am – 8:35 am
TITLE: Applications Advantages of the All-Metal Vacuum Furnace Hot Zone
PRESENTER: Bill Jones & Re'al Fradette - Solar Atmospheres

The all-metal vacuum furnace hot zone was introduced into the commercial heat treating world in the 1960's, for processing special electronic metals like tantalum anodes for electrolytic capacitors, critical materials for the atomic energy industries and for the development of space and rocket engine materials, and "leading edge" surfaces. Today's applications center on medical uses, electric power interruptors, and processing of sensitive materials such as high alloy SS, titanium, and zirconium. We will present an overview of all-metal hot zone construction, proper design of the high vacuum pumping system, and integration of the argon gas cooling system with high vacuum isolation valves.

TIME: 8:50 am – 9:25 am
TITLE: Determining the Optimal Induction Process for Your Application
PRESENTER: David Lynch – Induction Tooling, Inc.

This presentation will discuss how to determine the optimum induction process for your application. Scanning or single shot, frequency, power, heat time, quench time, quench methods, and metallurgy will be discussed.

TIME: 9:40 am – 10:15 am
TITLE: Top 5 Ways to Use Data Analytics to Improve Performance
PRESENTER: Doug Cogswell – ADVIZOR Solutions and Cornerstone Systems, Inc.

Your operations generate a lot of data that can help you run your business better. But it's hard to get at, hard to understand, and causes a "cycle of pain". This talk is about how to access and make existing data easy to use so that your team can "see stories", discuss root causes, and collaborate to make better data-driven decisions.

TIME: 10:30 am – 11:05 am
TITLE: Data You Own, Data You Should Use To Improve Bottom Line
PRESENTER: Peter Hushek – Virtual Visual Surveys

VVS uses the data collected from TUS's to predict future uniformity problems in advance of occurrence. VVS will graphically display the data, static, as well as video in 3D. This data is being wasted due in part to its format. VVS is a tool to make it visual to assist Production by showing sweet spot of uniformity, quality to pin point future or current uniformity variation, and maintenance which likes pictures more than numbers.

OCTOBER 9 – FNC/NITRIDING – ROOM 121

TIME: 8:00 am – 8:35 am
TITLE: FNC & Post Oxidation
PRESENTER: Jim Oakes – Super Systems, Inc.

This presentation will provide data and analysis on the corrosion resistance provided by ferritic-nitrocarburizing and post oxidation of low carbon steel. Different FNC cycles will be evaluated along with different post-oxidation processes with comparison of the corrosion resistant results from the different type of oxidizing media used under a controlled environment.

TIME: 8:50 am – 9:25 am
TITLE: Furnaces for Gas Nitriding and Nitrocarburizing – How do I Know What to Use?
PRESENTER Mike Harrison - Gasbarre Furnace Group

The popularity of gas nitriding and nitrocarburizing processes continues to be on the rise. Achieving the desired results of these processes can be accomplished through any number of furnace types, each with their own advantages and drawbacks. This discussion will explore the types of furnaces that can be used in gas nitriding and nitrocarburizing applications, advantages, and drawbacks of each furnace type, and tips on selecting the most suitable style of furnace for an application.

TIME: 9:40 am – 10:15 am
TITLE: Carburizing to FNC and Back Again: Getting the Most Out of Your BIQ for CQI-9
PRESENTER: Surface Combustion, Inc.

Batch integral quench furnaces are the commercial heat treater's go to piece of equipment for versatility and reliable processing, and this flexibility makes BIQs their most productive asset. Gain more production capability because you can carburize and FNC in the same furnace, meet CQI-9, and grow your automotive business. Expand your existing operations to include FNC in your BIQ with a retrofit package. Learn more about transitioning from carburizing to FNC and back while maintaining CQI-9 compliance.

TIME: 10:30 am – 11:05 am
TITLE: Controlled Ferritic Nitrocarburizing and Post-Oxidation: Newest Research in Process Improvement, Versatility, and Controls
PRESENTER: Jack Kalucki - Nitrex Metal, Inc.

FNC and post-oxidation are commonly used to enhance mechanical and anti-corrosion properties of components. Controlled gas nitriding is recognized as one of the best available techniques considering dimensional stability and versatility. This presentation summarizes research applied to cases where Kn/Kc must be controlled, together with roughness, but also cases where the main object is corrosion resistance and chrome plating replacement. Aspects of process control such as FNC parameters, post-oxidizing and finishing technologies are described.

OCTOBER 9 – EMERGING TECHNOLOGIES – ROOM 122

TIME: 8:00 am – 8:35 am
TITLE: The Effects of Alloy Composition and Process Control Parameters on the Microstructure of the Compound Layer in Gas Nitrided Steels
PRESENTER: Mei Yang – Center For Heat Treating Excellence

The state of controlling the gaseous nitriding process is to measure and control the nitriding potential (Kn) in the atmosphere to define the nitrogen concentration and phase formation at the steel surface. The application of alloy specific Lehrer diagrams to determine the equilibrium composition and phases in the compound layer as a function of the process parameters of temperature and nitriding potential will be presented.

TIME: 8:50 am – 9:25 am
TITLE: High Volume Small Part Heat Treating: An Alternative to Mesh Belts
PRESENTER: Sam Stoner – Seco/Warwick Corporation

This facts and figures presentation shows the math behind why rotary retort furnaces are replacing mesh belts. Besides a cost/benefit analysis, this talk addresses the superior metallurgical results obtainable from this furnace. For high volume parts producers who have never heard of a rotary retort, or for those who remember rotary retorts of yesteryear, this presentation offers compelling reasons to consider a new rotary retort furnace.

TIME: 9:40 am – 10:15 am
TITLE: Horizontal Quench System Offers a High Tech Alternative to Drop Bottom Furnaces
PRESENTER: Doug Christiansen - Wisconsin Oven Corporation

Horizontal quench solution treatment systems offer a compact, cost effective alternative to drop bottom furnaces. They feature quench times as fast as 7 seconds, and a load capacity up to 6,000 pounds. Horizontal quench systems can be designed to the requirements of AMS2770, AMS2750, BAC5602, and others. Operation is fully automated to guarantee the required quench time.

TIME: 10:30 am – 11:05 am
TITLE: Leveraging Next Generation Technologies for Tomorrow's Operator
PRESENTER: Joe Clarke - Eurotherm by Schneider Electric

Compared to previous generations Millennials (and newer) are more socially conscious, more impatient, and value individuality. They are digital natives, born into the world where technology is ubiquitous. As their careers progress they are stepping into roles in which their decisions are significantly impacting their organization. Tasked with finding more efficient and effective ways of increasing production, minimizing downtime, and maximizing revenue, they will rely on the ideologies and practices behind Industry 4.0 and IIoT.

OCTOBER 9 – MAINTENANCE – ROOM 123

TIME: 8:00 am – 8:35 am
TITLE: Product Improvement and Predictive Maintenance Advancements Via The Application of the Industrial Internet of Things (IIoT)
PRESENTER: AFC-Holcroft

This presentation will review the process, identify stakeholders, and outline how everyone benefits from the quickly evolving utilization of equipment data telemetry to drive continuous improvement. We will discuss more advanced data accumulation and data processing methods that can directly or indirectly identify growing equipment performance issues as we continue to take advantage of the Industrial Internet of Things.

TIME: 8:50 am – 9:25 am
TITLE: Modern Gas Burners - High Efficiency & Low Emissions
PRESENTER: Steven R. Mickey - WS Thermal Process Technology, Inc.

This presentation will cover self-recuperative and self-regenerative burners as compared to conventional technology. It will provide an overview of different burner types and a discussion of the relationship between efficiency and emissions. It will also explain a correction factor based on combustion efficiency which can be used to calculate emissions concentrations.

TIME: 9:40 am – 10:15 am
TITLE: Using AI and Mobility to Utilize Your Thermal Process Data to Enhance Combustion Efficiency and Safety
PRESENTER: Jim Roberts – Honeywell Thermal Solutions

Join Honeywell Thermal Solutions as we discover the future of process heating in our session "Using AI and Mobility to Utilize Your Thermal Process Data to Enhance Combustion Efficiency and Safety." Learn how to bring together configurable safety and programmable logic that can be easily customized for almost any application. Discover how to monitor, manage, and maximize thermal process equipment to drive smarter business decisions, minimize unplanned downtime and costs, while increasing your plant safety.

TIME: 10:30 am – 11:05 am
TITLE: Operational Improvements Through Combustion Technology
PRESENTER: Michael Cochran – Bloom Engineering Company, Inc.

With a careful understanding of new burner hardware technology, emerging combustion controls strategies, and process optimization, it is possible to achieve increased productivity, decreased emissions, and/or increased fuel efficiency. This talk will explore these advancements and will present a brief case study.

OCTOBER 9 – HEAT TREAT BUSINESS – ROOM 124

TIME: 8:00 am – 8:35 am
TITLE: Best Wrought Fixtures and Factors on Deciding on a Fixture
PRESENTER: Marc Glasser – Rolled Alloys

We will discuss the current products available in wrought alloy form, the advantages of wrought fixtures, and economic factors not obvious in deciding to use a wrought fixture. What factors into a decision on alloys and important properties. You will learn how one particular alloy, RA 602 CA, has been successfully used for baskets in the most extreme temperatures in vacuum.

TIME: 8:50 am – 9:25 am
TITLE: 10 Top Heat Treat Sales & Marketing Mistakes and How to Avoid Them
PRESENTER: Doug Glenn – Heat Treat Today

This popular presentation, a version previously presented to a small IHEA group in 2017, earned very positive reviews from those in attendance. The presentation is non-technical and deals with the assumptions (many false and unfounded) that we adopt daily during the sales process. The things we think are true are not. This presentation covers 10 top sales and marketing mistakes and, most importantly, how to avoid them. Come learn; come laugh.

TIME: 9:40 am – 10:15 am
TITLE: 2019 Energy Market Outlook
PRESENTER: John Phillips/Jeff Clines – Stand Energy Corporation

The presentation will seek to show guidance and preparation for energy procurement strategies for the next year.

TIME: 10:30 am – 11:05 am
TITLE: Fundamentals of Developing a Marketing Strategy for Commercial Heat Treaters
PRESENTER: Ipsen USA

This presentation will examine common Marketing strategies, why they are important for commercial heat treaters and tips to begin developing a Marketing Plan.

OCTOBER 10 – QUENCHING & COOLING – ROOM 120

TIME: 8:00 am – 8:35 am
TITLE: Evaluation and Control Technique of Cooling Unevenness by Quenching Oil
PRESENTER: Greg Steiger - Idemitsu Lubricants America

In the heat treating process, it's important for parts to be cooled uniformly to reduce distortion. In this study, we investigated the influences of vapor blanket stage in the quenching process and its effects upon cooling unevenness and quenching distortion. The cooling unevenness and quenching distortion of parts quenched in an oil having a shorter vapor blanket stage length than quenching the same parts in an oil having a longer vapor blanket stage length.

TIME: 8:50 am – 9:25 am
TITLE: High Speed Gas Quenching -The Key to Long H13 Insert Life
PRESENTER: Don Marteeny - SECO/VACUUM

The requirements for acceptable H13 die insert life challenge the capability of today's most advanced casting and heat treating equipment. Although the material composition and casting processes are key factors in acceptable die insert life, proper insert hardening is essential. A discussion of the specifications, important die metallurgical considerations, process steps, and furnace equipment considerations for die hardening will be discussed.

TIME: 9:40 am – 10:15 am
TITLE: Oil Quenching with CFRC Material
PRESENTER: Jim McAllister - SGL Carbon

Recent advances in CFRC manufacturing methods have allowed for materials that are well suited for liquid / oil quenching. Driven by less mass, increased strength, and optimization of load capacity, CFRC is a suitable replacement for traditional furnace fixturing.

OCTOBER 10 – PROCESSES – ROOM 121

TIME: 8:00 am – 8:35 am
TITLE: Ecological and Practical Process Comparison of Plasma and Gas Nitriding for Users
PRESENTER: Thomas Müller – RÜBIG GmbH & Co KG

Nitriding processes have become of great significance in the heat treatment industry due to their diverse properties. When increasing capacities, the question in which nitriding technology to invest is crucial, especially considering the specificity of products and the determining factors quality, efficiency and environmental compatibility. In this session, gas nitriding and plasma nitriding technologies will be introduced with their unique properties and the advantages of each are compared. Special emphasis is placed on the environmental impact and practical application of both processes.

TIME: 8:50 am – 9:25 am
TITLE: Annealing and Normalizing of Steel
PRESENTER: Daniel H. Herring – The HERRING GROUP, Inc.

This presentation reviews two of the most common types of heat treatment processes, annealing and normalizing, and asking such penetrating questions as: why/how do we perform them to achieve an optimal microstructure for our subsequent manufacturing or heat treatment needs? We look at how we insure that they are done correctly and how are they similar, how are they different?

TIME: 9:40 am – 10:15 am
TITLE: Heat Treating and Post-Processing of Additive Manufactured Alloys
PRESENTER: Rick Sisson - Center for Heat Treating Excellence

Additive Manufacturing (AM) may revolutionize many industries due to the ability to form complex shapes to reduce weight and control stiffness. However, as-manufactured parts do not have the properties and performance usually specified for the application. Therefore, additive manufactured parts will require post-processing heat treatments to meet the requirements. The development of these heat treatments will provide opportunities and challenges for heat treaters.

OCTOBER 10 – EQUIPMENT – ROOM 122

TIME: 8:00 am - 8:35 am
TITLE: Implementing Low Pressure Gas Carburizing on the Shop Floor: A Case Study
PRESENTER: Daniel H. Herring – The HERRING GROUP, Inc.

How does one go about implementing an advanced technology such as low pressure vacuum carburizing on the shop floor? What are the factors that need to be considered and what tests/trials are necessary to make a successful transition from atmosphere to vacuum carburizing? This presentation addresses many of the most important issues.

TIME: 8:50 am – 9:25 am
TITLE: Carbon Availability, Transfer Coefficient, and Potential Control When Case Hardening Additive and Powder Metallurgical Manufactured Parts
PRESENTER: Karl-Michael Winter - United Process Controls, Inc.

When carburizing parts with high porosity, CO may drop as low as 15 Vol-% and occasionally lower. This creates a high amount of carbon dioxide and water vapor, making it nearly impossible to reach the set carbon-potential. To compensate, the controller needs to increase the enrichment gas flow, beyond recommended settings, and push the process gas to non-equilibrium. This presentation explains how a multi-parameter carbon-potential allows for such processes to perform in a regular manner.

TIME: 9:40 am – 10:15 am
TITLE: Pit Furnaces for Today's Heat Treating
PRESENTER: Bill St. Thomas - Lindberg MPH

Present the various type of Pit type furnaces for wide range of thermal processing applications. Illustrate how Pit furnaces are used to: carburize, harden, nitride, steam treating, tempering and alum heat treating. Provide recent changes in Pit type furnaces processing to meet today’s challenges. Illustrations of all types of Pit furnaces including: loading devices, new controls, optional features, and companion equipment. Also discuss the benefits of Pit furnace over other type of HT equipment.

OCTOBER 10 – STANDARDS & PYROMETRY – ROOM 123

TIME: 8:00 am – 8:35 am
TITLE: Versatility of Modular Furnaces: The Heartbeat of your Multiple Requirements and Expectations for Heat Treatment
PRESENTER: Vincent Esteve - ECM USA, Inc.

Achieving the best fit of heat treatment for your parts is the target of LPC modular furnaces by their sizes, their capacity to perform different processes at the same time, and the working range of temperature of the heating cells. This presentation will show how these furnaces suit your requirements for productivity, distortion control, metallurgical expectations, and working environment. Each process has its own solution according to the main objective of the heat treatment operation.

TIME: 8:50 am – 9:25 am
TITLE: The Aggregation of AMS2750E
PRESENTER: Jason Schulze – Conrad Kacsik Instrument Systems, Inc.

AMS2750E contains 3 types of tests that directly affect one another. At times, their relation is difficult to conceptualize causing potential Nadcap and/or customer findings. This presentation will reflect on how the different types of tests contained in AMS2750E relate to one another and the consequence of modifying the details of one test on another test.

TIME: 9:40 am – 10:15 am
TITLE: Tools for Accurate Pyrometer Temperature Measurement: How to Manage Changing Emissivity
PRESENTER: Mark Ritzheimer– Advanced Energy

Optical temperature pyrometers have become a necessity for critical thermal processes, but their accuracy and performance can be affected by changing environmental and material conditions. This session covers methods to optimize temperature measurement for materials with changing emissivity, as well as enabling closed-loop temperature measurement methods to improve energy use, reduce maintenance costs, and boost product quality by employing closed-loop control for critical thermal processes.

OCTOBER 10 – CONTROLS & MATERIALS – ROOM 124

TIME: 8:00 am – 8:35 am
TITLE: High Throughput Materials R&D Experimental Methodology
PRESENTER: Andy Huang – MTI Corporation

Development of next-generation materials including batteries and light metals requires a breakthrough. High Throughput and combinatorial experimentation, is an effective method to synthesize and characterize the huge amount of materials over a broader compositional region in a short time, which enables to greatly speed up the discovery and optimization of materials with lower cost.

TIME: 8:50 am – 9:25 am
TITLE: Heat Treat Abstract - Furnace Atmosphere Dew Point Control and Gas Recovery
PRESENTER: John McPhearson - Lectrodryer

A method is presented for dew point control of furnace atmospheres using the existing dryer outputs with a simple manifold and new instrumentation. The improved control can result in better part quality than when relying on a fixed or uncontrolled varying gas dew point which may not be optimal. This method has been proven to provide dew point control of +/- 1 degree F. The method is applicable to any furnace application that has a dryer installed on the existing gas supply. Gas supplies that are currently not dried can be controlled to the same accuracy with the addition of a dryer and the dew point control manifold.

TIME: 9:40 am – 10:15 am
TITLE: Understanding and Controlling Residual Stress and Distortion in Heat Treated Steels
PRESENTER: Haixuan Yu– Center for Heat Treating Excellence, Worcester Polytechnic Institute

Residual stress and distortion can be major issues when heat treating a variety of alloys and part designs. Distortion can lead to part rejection or major rework. Residual stress can result in early failure in service. In this presentation the effects of part design, alloy phase transformation parameters, and quenching process parameters as determined by simulations of a Navy c-ring distortion coupons using DANTE software will be presented and discussed.