



AFS

METALCASTING CONGRESS

125TH ANNIVERSARY

April 12-22, 2021 | Streaming Live & On-Demand

**MADE FOR TODAY
READY FOR
TOMORROW**

2021

**METALCASTING CONGRESS
PRE-SHOW GUIDE**



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125TH ANNIVERSARY

April 12-22, 2021
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On-Demand

MADE FOR TODAY READY FOR TOMORROW

New technology meets industry excellence at **Metalcasting Congress 2021**. For the first time in its **125-year history**, the premier conference and trade show for the metalcasting supply chain is going online, bringing the best in industry innovations, sales, and education to browsers worldwide.

From cutting-edge research to interactive exhibits, Metalcasting Congress 2021 is the best way to connect with suppliers, foundries, buyers, and peers. In the office, on the road, or at home — wherever you are, be ready for what tomorrow brings by joining **Metalcasting Congress 2021**.

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The **virtual Metalcasting Congress 2021** is your chance to connect with suppliers, peers, and customers. Catch new ideas to excel at your job and improve your business. Take advantage of the heralded technical and management sessions **PLUS** keynote speakers, the virtual exhibit floor, and designer & buyer-focused sessions.

METALCASTING CONGRESS 2021 DELIVERS:

OUTSTANDING KNOWLEDGE-SHARING

This year's show features dozens of technical and management sessions covering the latest research and best practices.

Learn from industry experts whose practical advice will help you improve operations, efficiency, quality, and sales.

TOPICS INCLUDE:

- Ferrous and non-ferrous alloys
- Additive manufacturing
- Engineering
- Environmental, health, & safety
- Molding
- Quality control
- Workforce development
- Marketing and sales

CUTTING-EDGE EXHIBITS

Experience fully interactive digital displays from leading suppliers and metalcasters.

Discover products and services to unlock your company's success. Chat with representatives, get answers to your questions and identify solutions to your manufacturing challenges.

DESIGN & BUYING EXPERTISE

Gain unique insights into casting design and purchasing with the Designers & Buyers Track, a series of informative sessions offered exclusively at Metalcasting Congress. Plus, connect with the best in metalcasting when you visit with Cast in North America exhibitors.

Do you work for an OEM?

Find your source for high-quality parts when you explore the **Cast in North America exhibit**, featuring top North American metalcasters.

WHO ATTENDS METALCASTING CONGRESS?

Attendees of **Metalcasting Congress 2021** include a wide range of industry professionals with enormous purchasing power.

ATTENDEES INCLUDE:

- Purchasing agents
- Consultants
- Metalcasting professionals
- Equipment suppliers
- Designers
- Engineers
- Production managers
- R&D personnel
- Human resources
- Future leaders of metalcasting
- Management
- Casting purchasers
- Marketing professionals
- Corporate executives
- Manufacturing staff
- Production personnel
- Quality personnel



@AmerFoundrySoc
@CastingSource
#CastingCongress



American Foundry Society



@americanfoundrysociety

REGISTER EARLY AND SAVE!

Early registration ends March 1.

ALL ACCESS EXPERIENCE

The complete Metalcasting Congress experience includes full access to all technical and management sessions, Hoyt Memorial Lectures, the keynote address, the Designers & Buyers Track, and the full virtual exhibit floor.

EXHIBITS PASS

Get total access to the virtual exhibit floor and the Designers & Buyers Track.

EARLY PRICING

(Until March 1, 2021)

\$10.00	Exhibits Pass AFS Member
\$15.00	Exhibits Pass Non-Member
\$250.00	All Access Experience AFS Member
\$300.00	All Access Experience Non-Member

STANDARD PRICING

(Effective March 2, 2021)

\$20.00	Exhibits Pass AFS Member
\$30.00	Exhibits Pass Non-Member
\$300.00	All Access Experience AFS Member
\$400.00	All Access Experience Non-Member

REGISTER ONLINE

www.MetalcastingCongress.org

EXPERT PRESENTERS

Every year, industry luminaries, top researchers, and business thought-leaders share their insights as speakers at Metalcasting Congress. From keynote addresses and lectures to research presentations and panel discussions, these experts explore the exciting present and promising future of metalcasting.

AWARDS PRESENTATIONS

Awards have always been a big part of Metalcasting Congress. Both the All Access Experience and Exhibits Pass will allow you to view the 2020 and 2021 AFS Awards Presentations. Enjoy fast-paced videos from several honorees upon receipt of their AFS Gold Medal, Service Citation or Scientific Merit Awards. It's a part of the show experience you won't want to miss.

KEYNOTE & HOYT MEMORIAL LECTURE SPEAKERS



MONDAY, APRIL 12TH HOYT LECTURE KEYNOTE SPEAKER SPONSORED BY LAEMPE REICH:
GREG MISKINIS
Retired, Waupaca Foundry

"Transformation of the Modern Foundry"

The foundry industry has been in a state of transformation for over 2,600 years. From shapes carved into stone, to topologically optimized and additive manufacturing-facilitated creations, the evolution of metalcasting is easily witnessed. Whether this change has come about by man, method, material or market is debatable. With the gradual shift from personal vehicles with internal combustion engines to semi- or fully autonomous electric vehicles, competing in these shrinking markets will likely require agile and novel foundry solutions. This Hoyt Lecture will examine how foundries have been transformed primarily by shifts in the workforce, market pressures brought by global flattening (competition), environmental, health and safety changes and even by disaster.



MONDAY, APRIL 19TH KEYNOTE SPEAKER:
HARRY MOSER
Founder, Reshoring Initiative

"How to Benefit from Shorter Supply Chains"

Reshoring and foreign direct investment (FDI) have brought back over 700,000 U.S. manufacturing jobs in the last 11 years. At the same time, the COVID crisis has demonstrated the risk of long supply chains. In fact, a recent BDO survey showed that 24% of companies are planning to change the country in which they source or produce, and 22% plan to reshore to the U.S.

Harry Moser, president of Reshoring Initiative, will explore how U.S. foundries can take advantage of the trend toward shorter supply chains and what that means for reshoring and FDI. Plus, discover how Reshoring Initiative's Total Cost of Ownership Estimator and the Import Substitution Program can help your company land contracts that otherwise would have gone overseas.



TUESDAY, APRIL 20TH HOYT LECTURE KEYNOTE SPEAKER:
TOM PRUCHA
President, MetalMorphosis LLC | Editor-in-Chief, *International Journal of Metalcasting*

"Metalmorphosis Change and Transition"

Change is constant, as nothing stays the same. Consider the words of the Chinese philosopher Lao Tzu, "Life is a series of natural and spontaneous changes. Don't resist them—that only creates sorrow. Let reality be reality. Let things flow naturally forward in whatever way they like." Some changes are the result of biology and the passage of time, within the natural cycle or order of things. Others are self-generated, under our own control and willful effort, or dependent upon encounters with significant others—family, friends, colleagues, and others close to us. Still, other changes occur because of circumstance or fate, a proverbial "date with destiny" and often beyond what we feel is our control. Whether it is our personal life or occupational, like metalcasting, this change can facilitate transition and transformation. Prucha has coined the term metalmorphosis, and this lecture is a reflection of how to embrace change and use it as a vehicle for new opportunities. Beyond the philosophical, this lecture looks at how we as metallurgists and metalcasters apply change (time, temperature, pressure, chemical reactions, etc.) to transform metals and create metalmorphosis.

ABRIDGED LIST OF SCHEDULED SPEAKERS



Franco Chiesa
Chief Scientist, Quebec Metallurgy Center
"Relation Between the Porosity Level and the Radiographic Quality in Aluminum A356 Castings"



Kumar Sadayappan
Research Scientist, CanmetMATERIALS
"Hot Tearing Susceptibility of Al-Zn Alloys"



Laura Bartlett
Associate Professor, Missouri University of Science & Technology
"Quantifying the Effect of Filling Conditions on 8630 Steel Casting Quality"



Cathrine Hartung
Senior R&D Engineer, Elkem Foundry Products
"The History and Evolution of Inoculants"



Patricio Gil
CEO, MAPPASA
"Honorary Lecture - Trends and Challenges for the Iron Foundries"



Kelley Kerns
Director of New Business Development, HA International LLC
"Panel: Research, Supplier, Operation: A Look at the Future of AM4MC"



Greg Kramer
Corporate Environmental Manager, ME Elecmetal
"Panel: EHS Hot Topics"



Jeet Radia
Senior Vice President, McWane Inc.
"Panel: EHS Hot Topics"



Marshall Miller
President, Tesserract4D
"3D Printed Lost Foam Aluminum, Titanium and Polymer Molds"



Jeremy Lipshaw
Product Development Engineer, Unaffiliated
"The Underutilized Competitive Advantage: Benefiting from Life Cycle Analyses"



Andrew Halonen
President, Mayflower Consulting LLC
"Trends in Reducing Weight with Metal Castings"



David Gilson
Sales Director, SinterCast Inc.
"Air Flow Variations Within a Corebox: A Study of Vent Open Area and Sand Variables"



Hathibelagal Roshan
Chief Metallurgist, Maynard Steel Casting Co.
"Potential Applications of Patented Lightweight Steel in Armored Vehicles"



Denny Dotson
Chairman, Dotson Iron Castings
"Foundry Executives Share Key Lessons: A Q&A Session"



Mark Mundell
Sales Manager, Lethbridge Iron Works
"Iron Casting Conversion Case Study"



Jerry Thiel
Director, University of Northern Iowa
"Wireless Foundry Process Sensors for IOT Applications"



Bryant Esch
Director of Environmental Engineering, Waupaca
"Community Engagement Strategies for the Proactive Metalcaster"



Robert Tuttle
Professor, Saginaw Valley State University
"Titanium Master Alloy Effect on 1030"



Dave Rittmeyer
Customer Care & Additive Manufacturing Manager, Hoosier Pattern Inc.
"3D Printing: From Prototype to Production"



Andy Mastalir
Sales & Customer Service Manager, CA Lawton
"Flawless Product Launch"

THANK YOU TO OUR PLATINUM SPONSORS!



SESSION SCHEDULE

Live session times to be announced. Sessions also available for on-demand streaming after live broadcast.

MONDAY, APRIL 12

WELCOME MESSAGE

Doug Kurkul
CEO, American Foundry Society

HOYT LECTURE: Transformation of the Modern Foundry

Greg Miskinis
Retired, Waupaca Foundry

ALUMINUM & LIGHT METALS DIVISION Relation Between the Porosity Level and the Radiographic Quality in Aluminum A356 Castings

Franco Chiesa
Chief Scientist, Quebec Metallurgy Center

ALUMINUM & LIGHT METALS DIVISION Hot Tearing Susceptibility of Al-Zn Alloys

Kumar Sadayappan
Research Scientist, CanmetMATERIALS

CAST IRON DIVISION Panel: Non-Silica Sands

Chris Barnes
Engineering Specialist, Caterpillar Inc.

Scott Giese
Professor, University of Northern Iowa

Jerrold Miller
Plant Metallurgist and Foundry Engineer,
Wear-Tek

CASTING DESIGNERS AND BUYERS Trends in Reducing Weight in Metalcasting

Andrew Halonen
President, Mayflower Consulting LLC

COPPER DIVISION Lead Contributors in Drinking Water and Beyond: What the Science is Saying

Justine Parker
Managing Health Scientist, Cardno ChemRisk

WOMEN IN METALCASTING 2020 Hindsight: Reflect on Diversity, Equality and Inclusion

Sandra Calabrese
Operations Manager, General Motors

TUESDAY, APRIL 13

ALUMINUM & LIGHT METALS DIVISION Sprue Bushing Filter Benefits in the Low-Pressure Casting Process

Rafael Gallo
Technical Consultant, Pyrotek Inc.

ALUMINUM & LIGHT METALS DIVISION Melt-Refractory Interactions During Aluminum Melt Processing

Emre Cinkilic
Researcher, The Ohio State University

CAST IRON DIVISION Effect of the Type of Inoculant on the Shrinkage Porosity of High Silicon SG Iron

Gorka Alonso
Azterlan

CAST IRON DIVISION The History and Evolution of Inoculants

Cathrine Hartung
Senior R&D Engineer,
Elkem Foundry Products

RESEARCH DIVISION Data Driven Design and Intelligent Manufacturing

Jiten Shah
President, PDA LLC

CASTING DESIGNERS AND BUYERS Working with Your Foundry in Design for Manufacturing

Andy Mastalir
Sales & Customer Service Manager,
C.A. Lawton Co.

COPPER DIVISION Investigating the Effects of Turbulent Gating on C89833 Material

Andy Shea
Director of Quality Assurance,
A.Y. McDonald Mfg. Co.

FUTURE LEADERS OF METALCASTING Foundry Executives Share Key Lessons: A Q & A Session

J.B. Brown
CEO, BCI Solutions Inc.

Dana Cooper-Hayes
CEO/President, Cooper Hayes LLC

Denny Dotson
Chairman, Dotson Iron Castings

Henry Lodge
Chairman, Lodge Mfg. Co.

John Wiesbrock
Vice President-Supply Chain Management,
Waupaca

WEDNESDAY, APRIL 14

ALUMINUM & LIGHT METALS DIVISION Novel Approach to Thermal Processing Development for Precision Sand Casting Process in Aluminum 319 Alloy

Robert Mackay
Principal Metallurgist, Nemak Canada Corp.

ALUMINUM & LIGHT METALS DIVISION Machinability Characteristics of Aluminum Cast Alloys

Dr. Yasser Zedan

CAST IRON DIVISION Honorary Lecture: Trends and Challenges for the Iron Foundries

Patricio Gil
CEO, MAPPSA

CAST IRON DIVISION Understanding the Effect of Boron in Gray Iron

Suyash Pawaskar
Graduate Teaching Assistant, Missouri
University of Science and Technology

CAST IRON DIVISION Ductile Iron Front End Ultrasonic Nodularity Determination Using Standard Coupons

Mike Robles, Jr.
Quality Manager, Grede - New Castle

KEYNOTE SPEAKERS

TECHNICAL TRACK

MANAGEMENT TRACK

CASTING DESIGNERS AND BUYERS TRACK



CASTING DESIGNERS AND BUYERS
Finding a Solution With Lost Foam:
An Aluminum Case Study

Curtis Taylor
Quality Manager, BRP

GOVERNMENT AFFAIRS DIVISION
Key Metalcasting Issues Moving
Through the US Congress and Key Agencies

Stephanie Salmon
*Vice President of Government Affairs,
American Foundry Society*

Eric Meyers
CEO, Oil City Iron Works Inc.

THURSDAY, APRIL 15

STEEL DIVISION
The Value of Scrap, Rework
and Yield at Steel Foundries

Roy Stevenson
*Ferrous Applications Manager,
Magma Foundry Technologies Inc.*

STEEL DIVISION
Sand Casting of Surface-alloyed
Butterfly Valve with Improved Hardness
and Corrosion Resistance by Incorporating
Metal Powders In Mold Coatings

Kaustubh Rane
*Graduate Teaching Assistant,
University of Wisconsin-Milwaukee*

STEEL DIVISION
Titanium Master Alloy Effect on 1030

Robert Tuttle
*Professor,
Saginaw Valley State University*

STEEL DIVISION
Potential Applications of Patented
Lightweight Steel in Armored Vehicles

Hathibelagal Roshan
Chief Metallurgist, Maynard Steel Casting Co.

STEEL DIVISION
Quantifying the Effect of Filling
Conditions on 8630 Steel Casting Quality

Laura Bartlett
*Associate Professor,
Missouri University of Science & Technology*

ALUMINUM & LIGHT METALS DIVISION
Predictive Analysis of Water Wettability
and Corrosion Resistance of Secondary
AlSi10MnMg(Fe) Alloy Manufactured by
Vacuum Assisted High Pressure Die Casting

Swaroop Behera
Student, University of Wisconsin-Milwaukee

ALUMINUM & LIGHT METALS DIVISION
Thermodynamic Modeling of Solid Flux
Interactions with Molten Aluminum

Michael Moodispaw
*Graduate Research Associate,
Ohio State University*

CASTING DESIGNERS AND BUYERS
3D Printing: From Prototype to Production

Dave Rittmeyer
*Customer Care & Additive
Manufacturing Manager, Hoosier Pattern*

MARKETING DIVISION
Modern Day Prospecting &
Selling for Elite Performance

Rich Austin
Sales Associate, Sandler Training

ENGINEERING DIVISION
Casting Cooling Technology
New Solutions and Applications

Gaetano Coraggio
*Technical Sales Engineer,
Magaldi Technologies LLC*

**MOLDING METHODS &
MATERIALS DIVISION**
Cast Magnesium Foam for Energy
Absorbtion and Bone Regrowth

Hannah Ullberg
Student, University of Wisconsin-Milwaukee

**MOLDING METHODS &
MATERIALS DIVISION**
Root-cause Analysis and Problem Solving
of Shrink Defects in Aluminum Alloy by
Solidification Rate Study

Sritama Kar
*Research and Development Manager,
ASK Chemicals*

KEYNOTE SPEAKER
How to Benefit from Shorter Supply Chains

Harry Moser
President, Reshoring Initiative

ADDITIVE MANUFACTURING DIVISION
The Preferred Numerical Method for
Process Simulation of 3D Printed
Sand Mold Castings

Ken Siersma
Software Engineer, EKK Inc.

ADDITIVE MANUFACTURING DIVISION
Wireless Foundry Process Sensors
for IOT Applications

Jerry Thiel
Director, University of Northern Iowa

Eric MacDonald
*Engineering Professor,
The University of Texas at El Paso*

LOST FOAM DIVISION
How Any Foundry Can Diversify Into Lost
Foam Casting at Negligible Cost

Mark DeBruin
Plant Manager, Skuld, LLC

LOST FOAM DIVISION
Thin Walled Ductile Iron With Carbide Free
Microstructure Down to Under One
Millimeter In Lost Foam and Nobake Casting

Sarah Jordan
Product Manager, Skuld, LLC



CASTING DESIGNERS AND BUYERS
The Underutilized Advantage: Benefiting From Life Cycle Analysis

Jeremy Lipshaw
Product Development Engineer,
Unaffiliated

TUESDAY, APRIL 20

LOST FOAM DIVISION
Lost Foam Stainless Steel

Marshall Miller
President, Tesserract4D

LOST FOAM DIVISION
3D Printed Lost Foam Aluminum, Titanium and Polymer Molds

Marshall Miller
President, Tesserract4D

MOLDING METHODS & MATERIALS DIVISION
Silver Anniversary Lecture - Air Flow Variations Within a Corebox: A Study of Vent Open Area and Sand Variables

David Gilson
Sales Director, SinterCast Inc.

ADDITIVE MANUFACTURING DIVISION
Panel: Research, Supplier, Operation: A Look at the Future of AM4MC

Travis Frush
Project Manager, University of Northern Iowa,
Cedar Falls

Kelley Kerns
Director of New Business Development,
HA International LLC

Brandon Lamoncha
Director of Additive Manufacturing,
Humtown Products

HOYT MEMORIAL LECTURE
Metalmorphosis: Change and Transition

Tom Prucha
President, MetalMorphosis LLC
Editor-in-Chief,
International Journal of Metalcasting

CASTING DESIGNERS AND BUYERS
Iron Casting Conversion Case Study

Mark Mundell
Director of Sales,
Lethbridge Iron Works Co. Ltd.

ENGINEERING DIVISION
Do you have Energy Leeches in your Plant? (Interactive Jeopardy Session)

Bob Baird
Energy Sustainment Manager, General Motors

Zach Meadows
Business Development Specialist, Electric Controls & Systems Inc.

ADDITIVE MANUFACTURING DIVISION
Characterizations of 3D Printed Polymethyl Methacrylate for Expendable Tooling Applications

Nathaniel Bryant
Materials Scientist,
University of Northern Iowa

ADDITIVE MANUFACTURING DIVISION
Evaluation of a Low-Cost Material Extrusion Printer for Investment Casting Applications

Tom Mueller
President, Mueller AMS

ADDITIVE MANUFACTURING DIVISION
Lightweighting an Aircraft Casting: A Case Study

Tom Mueller
President, Mueller AMS

ADDITIVE MANUFACTURING DIVISION
3D Printed Sand Precision Casting Process Experience and Dimensional Tolerance Assessment Update

Tyler Nooyen
Assistant Plant Manager/Manager of Research & Process Development, Waupaca Foundry

Jiten Shah
President, Product Development and Analysis LLC

WEDNESDAY, APRIL 21

MELTING METHODS & MATERIALS DIVISION
Panel: Coreless Induction Furnace Maintenance

Moderator:
Bradley Meibers
Application Engineer, Saint-Gobain

Panelists:
Chuck Cushing
Installation Sales Manager,
EMSCO, Incorporated

Pete Satre
Manager of Corporate Engineering,
Allied Mineral Products, LLC

MOLDING METHODS & MATERIALS DIVISION
Revisiting the Dalton Chart: Predicting the Impact on Green Sand Properties as a Function of Carbonaceous Additive Concentration

Liam Miller
Technical Director, American Colloid Co.

MOLDING METHODS & MATERIALS DIVISION
Evaluating Foundry Molding Emission Reduction Through Use of Slurry From Dust Reclamation

Victor LaFay
Research and Technical Development Manager, Common Sense Applications

ENVIRONMENTAL, HEALTH, AND SAFETY DIVISION

Community Engagement Strategies for the Proactive Metalcaster

Bryant Esch
*Director of Environmental Engineering,
Waupaca Foundry*

Zeydi Guitierrez
Public Affairs Strategic Director, McWane Inc.

Jenny Pappalardo
*Environmental Compliance, Charlotte Pipe &
Foundry Co.*

ENVIRONMENTAL, HEALTH, AND SAFETY DIVISION

Engagement: Safety's Gold Standard

Dr. Ken Chapman
President, Ken Chapman & Associates

ENGINEERING DIVISION

Beyond the Buzz: A Practical Implementation and Result of Industry 4.0 in Working Foundries

Lizeth Medina- Balliet
*Quality & Technical Services Manager,
Neenah Foundry Co.*

Eric Nelson
Vice-President, Dotson Iron Castings

Jim Wenson
*Product Manager Sinto Analytics,
Sinto America, Inc.*

CASTING DESIGNERS AND BUYERS

Working With Your Casting Vendor to Reduce Defect Rate

James Bohlen
*Advanced Quality Engineer,
Allison Transmission*

MELTING METHODS & MATERIALS DIVISION

Environmentally Friendly Process for Fully Recycling Alkaline Batteries in Cupolas

Bruno Sokoloff
Associate, ECO'Ring

MOLDING METHODS & MATERIALS DIVISION

Sand Processing Methods Show Reduction of Respirable Silica for the Foundry Industry

Sairam Ravi
Project Manager, University of Northern Iowa

MOLDING METHODS & MATERIALS DIVISION

Machine-learning Based Dynamic Compactibility Set-point Control Solution for Improved Casting Outcomes

Deepak Chowdhary
Managing Director, MPM Infosoft Pvt. Ltd.

GOVERNMENT AFFAIRS DIVISION

Navigating Compliance & Enforcement of the Buy America and the Buy American Provisions

Christopher Weld
Partner, Wiley Rein LLP

THURSDAY, APRIL 22

MOLDING METHODS & MATERIALS DIVISION

Smoke Suppression in Phenolic Urethan-bonded Sand Systems Through Use of Sand Additives

Paula Vivas
*Research & Development Manager,
ASK Chemicals*

MOLDING METHODS & MATERIALS DIVISION

Flash Prediction through Mold Distortion Simulations

Johnathan Corkery
Software Engineer, EKK Inc.

MOLDING METHODS & MATERIALS DIVISION

Automated Impact Testing using an AFS Standard Disc-Shaped Specimen

Owen Herner
General Motors

MELTING METHODS & MATERIALS DIVISION

Panel: Channel Induction Furnace Refractory Troubleshooting

Pat Leper
CEO, Saveway USA Corp.

Tim Hoyt
*Manager, Product Services Engineering,
Allied Mineral Products Inc.*

ENVIRONMENTAL, HEALTH, AND SAFETY DIVISION

Panel: EHS Hot Topics

Greg Kramer
*Corporate Environmental Manager,
ME Elecmetal*

Jeet Radia
Senior Vice President, McWane Inc.
Stephanie Salmon
Vice President of Government Affairs, AFS

CASTING DESIGNERS AND BUYERS

Should You Cast It?

Jiten Shah
President, PDA LLC, Naperville, IL

ENGINEERING DIVISION

Strategic Energy Management Opportunities for Foundries

Michael Stowe
Senior Energy Engineer, Advanced Energy

MELTING METHODS & MATERIALS DIVISION

Statistical Comparisons of 4 Different Thermal Analysis Sample Cup Types for Chemistry Control of Ductile Base Iron

Isaiah Grybush
Process Engineer, Grede-New Castle

KEYNOTE SPEAKERS

TECHNICAL TRACK

MANAGEMENT TRACK

CASTING DESIGNERS AND BUYERS TRACK

Schedule is subject to change.



American Foundry Society

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