



APRIL 27-30, 2019

ATLANTA, GEORGIA

CASTEXPO

& METALCASTING CONGRESS

connecting SUPPLIERS | METALCASTERS | CASTING BUYERS



APRIL 27-30, 2019

CASTEXPO

SHOW GUIDE

At the core of great **foundries**SM





At the core of great machinesSM





METALCASTING SUCCESS STARTS HERE





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Welcome!

On behalf of **CastExpo 2019** and the **123rd Metalcasting Congress**, we are honored to have you as our guest.

Attendees and exhibitors from around the world gather every three years at **CastExpo**, North America's largest metalcasting trade show and conference. This year, we are thrilled to bring this event to the vibrant city of Atlanta.

The theme for **CastExpo 2019** is "**Metalcasting Success Starts Here.**" That's our promise to you. **CastExpo 2019** is your opportunity to make new business connections and strengthen existing ones, to learn from industry experts, to profit from new ideas, and to see the exciting future of metalcasting up close and in person.

The technical and management sessions offered here will be thought-provoking, useful, and on the leading edge of industry research and expertise. The speakers will be engaging and relevant. And our exhibitors will showcase the newest, best, and most impressive metalcasting technology and services.

We encourage you to take part in as much as possible at **CastExpo 2019**. Although there's far too much to list here, some of the highlights include:

- The exhibit show floor, where suppliers, metalcasters, and buyers connect
- Educational tracks tailored by profession and interest, including the return of the Casting Designers & Buyers Track
- Cast in North America, showcasing the capabilities of leading North American foundries
- Courses from the AFS Institute
- Keynote addresses from **Kaihan Krippendorff**, **Frank Abagnale**, and Hoyt Memorial Lecturer **Dr. Doru M. Stefanescu**
- The **HUB**, the focal point for meet-ups, **AFS** resources, e-Learning demonstrations, and the **AFS** Bookstore
- The Annual Banquet, Recognition Luncheon, and the President's Luncheon and Annual Business Meeting, where we recognize excellence in our industry

We are grateful to the exhibitors and sponsors who make **CastExpo 2019** and the **123rd Metalcasting Congress** possible, and to the thousands of attendees who support and enrich this event. We also recognize the work of **AFS** committee members, as well as their supporting companies. Thanks also to the **AFS** professional staff for their work in making **CastExpo 2019** a success.

We trust you will find **CastExpo 2019** educational, valuable, and of course, enjoyable!



Sincerely,


Doug Kurkul
Chief Executive Officer
American Foundry Society

TWO WAYS ARE BETTER THAN ONE

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MULTIPLE FURNACE CHARGER WITH HIGH TEMPERATURE STAINLESS STEEL SPOUTS

CHOICES. Everybody likes choices. Chicken or Beef. Light or Dark Beer. Forward or Reverse.  That is the case with the CDC Bi-Directional Vibratory Conveyor. Having the ability to choose direction provides flexibility when designing your material flow. Feed multiple furnaces, several shotblast machines or have different materials convey to different locations for the intended next process. The flexibility and choice is available with the Dyna Sync Dynamic Drive System® technology.



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AFS and the Institute	

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- Custom systems for optimization



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- Great for multiple alloys
- Extremely accurate
- Can treat & pour in same ladle



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- Custom designed or standard systems

**2019 CASTEXPO
Booth 2649**

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UNDERSTAND
METALS**



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CASTEXPO 2019
INFORMATION

GENERAL INFORMATION

LOCATIONS & HOURS

Registration

Four - Lobby Area - Hall A

Level

Onsite Registration Hours

Friday, April 269 a.m. – 6 p.m.
 Saturday, April 27.....7 a.m. – 5 p.m.
 Sunday, April 28.....7 a.m. – 5 p.m.
 Monday, April 29.....7 a.m. – 5 p.m.
 Tuesday, April 30.....8 a.m. – Noon

Exhibit Hall

Level One - Exhibit Hall A

Saturday, April 27.....9 a.m. – 5 p.m.
 Sunday, April 28.....9 a.m. – 5 p.m.
 Monday, April 29.....9 a.m. – 5 p.m.
 Tuesday, April 30.....9 a.m. – Noon

Exhibit Service Center (& Other Service Desks)

Level One - Exhibit Hall A (Back of Hall A)

Thursday – Friday
 April 25-26.....7:30 a.m. – 5 p.m.
 Saturday – Tuesday
 April 27-30.....8 a.m. – 5 p.m.

Keynote Presentations

Level Four - A411

Saturday, April 27.....10:30 – 11:30 a.m.
 Sunday, April 28.....10:30 – 11:30 a.m.
 Monday, April 29.....10:30 – 11:30 a.m.

Technical and Management Sessions

Level Three - A311, A312, A313, A314, A315

Saturday, April 27.....8 a.m. – 4:45 p.m.
 Sunday, April 28.....8 a.m. – 4:45 p.m.
 Monday, April 29.....8 a.m. – 4:45 p.m.
 Tuesday, April 30.....8 – 9 a.m.

Casting Designers & Buyers Sessions

Level One - Exhibit Hall A - The HUB - 3025

Saturday, April 27.....9:15 a.m. – 5 p.m.
 Sunday, April 28.....9:15 a.m. – 5 p.m.
 Monday, April 29.....9:15 a.m. – 5 p.m.

AFS Institute Courses

Level Three - A316

Saturday, April 27.....1:30 – 4:30 p.m.
 Monday, April 29.....1:30 – 4:30 p.m.

AFS Show Office

Level Three - A307

Friday, April 26Noon – 5 p.m.
 Saturday, April 27.....8 a.m. – 4:30 p.m.
 Sunday, April 28.....8 a.m. – 4:30 p.m.
 Monday, April 29.....8 a.m. – 4:30 p.m.
 Tuesday, April 30.....8 – 10 a.m.

Speaker Ready Room

Level Three - A303

Friday, April 261 – 5 p.m.
 Saturday, April 27.....7 a.m. – 5 p.m.
 Sunday, April 28.....7 a.m. – 5 p.m.
 Monday, April 29.....7 a.m. – 5 p.m.
 Tuesday, April 30.....7 – 10 a.m.

Excellence in Service Registration

The traditional book for registering your years of volunteer service in the metalcasting industry will be located in **The HUB - Booth 3025**. **AFS Members** who have served the industry for 5 or more years are invited to register and receive the **Volunteer Milestone Pin**.

Policy on Audio and Video Recording

AFS reserves the right to any audio and video reproduction of any part of **CastExpo 2019**. Recordings (audio, video, still photography, etc.) intended for personal use, distribution, publication or copyright without the express written consent of the association and the individual authors or exhibitors is strictly prohibited.

Minimum Age Restriction

Children under 16 are not permitted on the show floor.

Antitrust Policy

The Antitrust Policy Statement of the American Foundry Society is available to anyone attending **CastExpo 2019**. Copies are available in the **AFS Show Office**.

AMERICAN FOUNDRY SOCIETY CODE OF CONDUCT

The **American Foundry Society** invites attendees to participate in **AFS** conferences, courses, and other events in a spirit of collegiality, collaboration, professionalism, and respect as we endeavor to advance the **AFS** mission – to provide members of the metalcasting supply chain with advocacy support, technical and management education, and access to innovative shared research and technology.

When you attend an AFS event, you agree to:

- Treat all attendees – including registrants, guests, speakers, volunteers, exhibitors, staff, service providers, and others in attendance – with respect and consideration.
- Respect the boundaries of others.
- Be collegial and collaborative in your discussions, communicating openly and with civil attitudes.
- Respect confidentiality requests from speakers and other attendees.
- Obey all applicable laws, rules and policies. These include rules and policies of the meeting venue, hotels, or any other site where your AFS affiliation is likely to be displayed.
- Look out for one another. Immediately alert emergency services, meeting or property security personnel, AFS staff, or AFS leadership if you notice someone in distress or see a dangerous or potentially dangerous situation.

Unacceptable behavior at an AFS event includes:

- Physical or verbal abuse of any attendee.
- Being disruptive, stalking, following, threatening, or intimidating anyone.
- Drinking excessively or becoming intoxicated.
- Harassment of any kind, including unwelcome sexual attention and inappropriate physical conduct.
- Making comments or engaging in conduct that is racist, sexist, ageist, or otherwise discriminates against or is offensive to a group or class of people.
- Audio or video recording, or taking images of another's presentation, posters, or materials without permission.

Contact us to report an incident

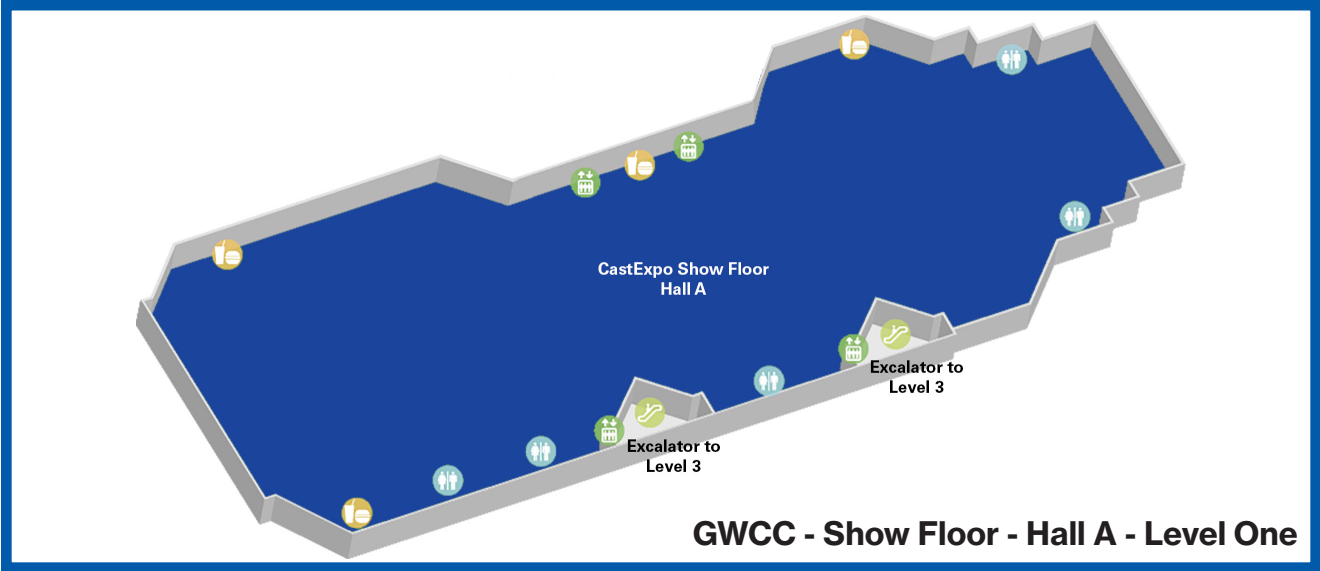
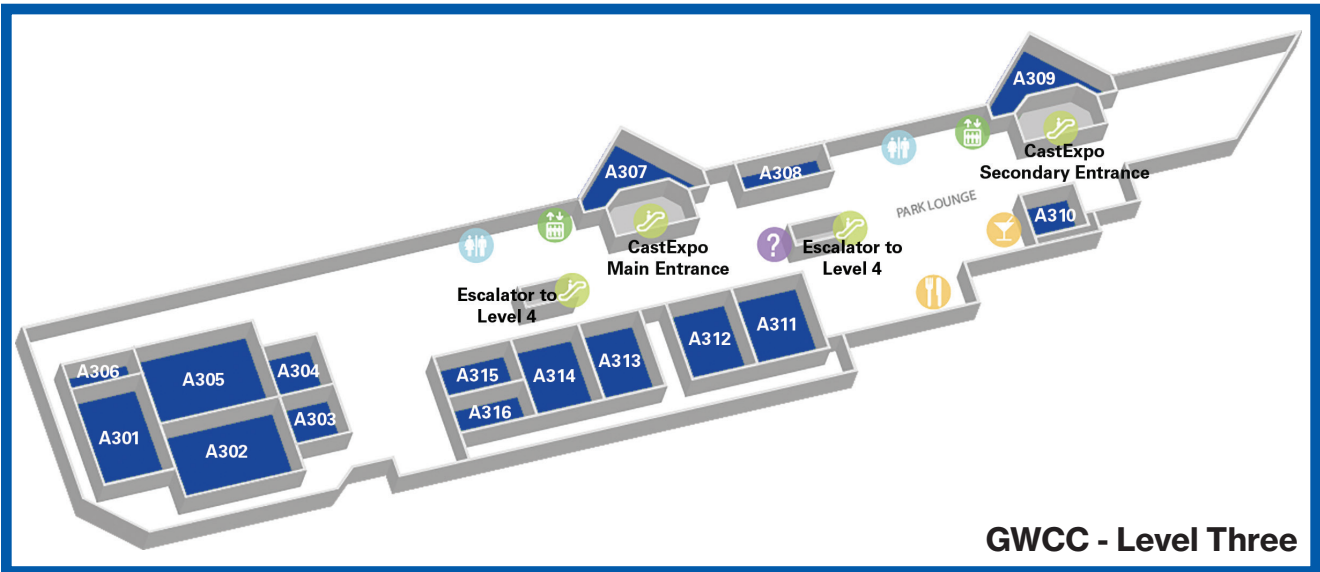
If, while at an AFS event, you are personally involved in an incident, or you witness an incident involving others, that violates this Code of Conduct, please let AFS staff know about it immediately. You can speak directly with a member of the AFS staff leadership concerning an incident, or you can use a name-optional reporting form on the AFS website, **www.afsinc.org**.

If you experience or witness behavior that is an imminent or serious threat to public safety or is a criminal act, you should take action to maintain your own personal safety and contact 911 emergency services immediately.

AFS's Commitment to Quality Member/Attendee Experiences

AFS is committed to providing our members and event attendees with a quality experience. We take any violation of the above standards extremely seriously. AFS reserves the right to bar any person who violates this Code of Conduct from further participation in the event without refund. AFS may also suspend or expel any person who violates this Code of Conduct from AFS membership or from attending or participating in future AFS events.

GEORGIA WORLD CONGRESS CENTER MAP





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Downtown Hotel Map

No. Name

- 1 **Atlanta Marriott Marquis**
265 Peachtree Center Avenue, Atlanta, GA 30303
- 2 **Embassy Suites by Hilton Atlanta at Centennial Olympic Park**
267 Marietta Street, Atlanta, Georgia 30313
- 3 **Fairfield Inn & Suites Atlanta Downtown**
54 Peachtree Street SW, Atlanta, GA 30303
- 4 **Hilton Atlanta**
255 Courtland Street NE Atlanta, GA 30303
- 5 **Hilton Garden Inn Atlanta Downtown**
275 Baker Street, Atlanta, GA 30313

No. Name

- 6 **Holiday Inn Express & Suites Atlanta Downtown**
111 Cone Street, Atlanta, GA 30303
- 7 **Omni Atlanta Hotel at CNN Center (HQ Hotel)**
100 CNN Center, Atlanta, GA 30303
- 8 **The American a DoubleTree by Hilton**
160 Ted Turner Drive NW, Atlanta, GA 30303
- 9 **Westin Peachtree Plaza Atlanta**
210 Peachtree Street NW, Atlanta, GA 30303



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Shuttle Service to Georgia World Congress Center

Hours of Operation	Bus Departs Hotels Every 15 Minutes	Bus Departs Congress Center Every 15 Minutes
Saturday, April 27th, 2019	7 - 10 a.m.	3:30 - 6:30 p.m.
Sunday, April 28th, 2019	6:45 - 9:45 a.m.	2:45 - 5:45 p.m.
Monday, April 29th, 2019	7 - 10 a.m.	3 - 6 p.m.
Tuesday, April 30th, 2019	7 - 11 a.m.	11 a.m. - 3 p.m.

Route 1 BLUE

1

Westin Peachtree Plaza

Board curbside on Ted Turner Dr.

Holiday Inn & Suites

Board at Westin Peachtree

The American - A Doubletree by Hilton

Board at Westin Peachtree

2

Atlanta Marriott Marquis

Board curbside on Peachtree Center Ave.

Hilton Atlanta

Board at Marriott Marquis



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Shuttle Service to Georgia World Congress Center

Route 2 YELLOW
Fairfield Inn & Suites
Board curbside on Peachtree St.

	Bus Departs Fairfield Inn	Bus Departs Georgia World Congress Center
Saturday, April 27, 2019	7:00 AM	3:30 PM
	7:30 AM	4:00 PM
	8:00 AM	4:30 PM
	8:30 AM	5:00 PM
	9:00 AM	5:30 PM
	9:30 AM	6:00 PM
	10:00 AM	6:30 PM
Sunday, April 28, 2019	6:45 AM	2:45 PM
	7:15 AM	3:15 PM
	7:45 AM	3:45 PM
	8:15 AM	4:15 PM
	8:45 AM	4:45 PM
	9:15 AM	5:15 PM
	9:45 AM	5:45 PM
Monday, April 29, 2019	7:00 AM	3:00 PM
	7:30 AM	3:30 PM
	8:00 AM	4:00 PM
	8:30 AM	4:30 PM
	9:00 AM	5:00 PM
	9:30 AM	5:30 PM
	10:00 AM	6:00 PM
Tuesday, April 30, 2019	7:00 AM	12:00 PM
	7:30 AM	12:30 PM
	8:00 AM	1:00 PM
	8:30 AM	1:30 PM
	9:00 AM	2:00 PM
	9:30 AM	2:30 PM
	10:00 AM	3:00 PM

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SPECIAL EVENTS

Ribbon Cutting Ceremony

Saturday, April 27 | 8:50 a.m. | Level Three – Main Entrance to Hall A

Celebrate the start of **CastExpo 2019** with a ceremonial ribbon cutting with incoming **AFS** President Peter Reich and the Executive Board.

Copper Division Luncheon

Saturday, April 27 | 11:45 a.m. | Level Three – A302 | *Ticketed Event*

The Copper Division will present their David Kunkel Distinguished Service Award and feature speaker David Mitchell of the Atlanta Preservation Center. The Copper Division Scholarship also will be presented. This event is open to everyone.

Management Division Luncheon

Saturday, April 27 | 11:45 a.m. | Level Four – A410 | *Ticketed Event*

Please join the newly formed Management Division for a fun, unique speed networking experience. Whether you're a seasoned networker or new to the industry, this event will offer an opportunity to meet fellow metalcasting professionals on a current level. **Space is limited.**

Welcome Reception

Saturday, April 27 | 5 p.m. | Level Four – Lobby near Registration | *Ticketed Event*

AFS welcomes all attendees to kick off **CastExpo 2019** with a reception in the Lobby near registration in the Georgia World Congress Center. The reception provides the opportunity to meet with customers, vendors, and other attendees. Cocktails and hors d'oeuvres will be served.

Sponsored by Blast Cleaning Technologies and Vulcan Engineering.

Women In Metalcasting Breakfast

Sunday, April 28 | 7:30 a.m. | Level Four – A410 | *Invitation Only*

This event is open to members of Women in Metalcasting and features a continental breakfast and networking with women who work in all facets of the metalcasting industry. Facilitated by Kristin Odell, owner of KLO LLC, a training, leadership and employee optimization consulting business, this event will focus on discovering strengths and maximizing potential.

Sponsored by American Colloid Company, AMERICAN Cast Iron Pipe Company, B&L Information Systems, Badger Mining Corporation, Bingham & Taylor, Denison Industries, Flow-3D Cast, Laempe Reich, Neenah Foundry, Sinto America, and Waupaca Foundry.

Division Recognition Luncheon

Sunday, April 28 | 11:45 a.m. | Level Four – A412 | *Ticketed Event*

This luncheon will feature the presentation of the Best Paper and Division Awards, as well as technical and research awards.

Reception and Annual Banquet

Sunday, April 28 | Reception 6 p.m. | Banquet 7 p.m. | Omni Atlanta at CNN Center – International Ballroom | *Ticketed Event*

Join us for the presentation of the highest honor from AFS, the Gold Medal, to Von L. Richards, professor emeritus of materials science at Missouri University of Science and Technology. The reception bar opens at 6 p.m. and only accepts credit cards. The awards presentation and banquet start at 7 p.m.

Past President's Luncheon

Monday, April 29 | 11:45 a.m. | Ray's in the City – Wine Cellar Room | *Must be a previous AFS President to attend*

This annual meeting luncheon is for all past **AFS Presidents**. Must be a previous **AFS President** to attend.

Spouse's Tour

Monday, April 29 | 11:45 a.m. | Swan Coach House | *Ticketed Event*

Spouses and guests of **CastExpo 2019** attendees will meet outside Lobby B at the bus pick-up area. A designated bus with signage will depart promptly at 11:45 a.m. for the Swan Coach House, located in suburban Atlanta. The tour will start with lunch in the Bellenita Room and Terrace, and guests are then encouraged to visit the art gallery and store located next door. The bus will be stationed where the drop-off was around 4 p.m. for transport back to the Georgia World Congress Center.

Alumni Dinner

Monday, April 29 | 6 p.m. | The World of Coca-Cola | *Must be AFS Alumni to attend*

Alumni will experience the World of Coca-Cola and the real stories behind the world's most famous and most loved beverage brand. See the rich heritage of Coca-Cola with artifacts from yesterday and today. A reception will start on the Hub Patio (weather permitting) followed by dinner and sightseeing.

Shuttle service will be available from the Georgia World Congress Center to the World of Coca-Cola and back. Shuttles will be outside Lobby B at the Bus Pick-up area. There will be designated shuttles with signage available starting at 5:45 p.m.

President's Luncheon and Annual Business Meeting

Tuesday, April 30 | 11 a.m. | Level Four – A412 | *Ticketed Event*

Join the annual meeting and luncheon, where the election of AFS officers and directors will be announced. In addition, the **AFS** Awards of Scientific Merit, Service Citations, Casting of the Year, Corporate Contribution Award and Millionaires Safety Awards will be presented.



LOOKING FOR THE **AFS BOOKSTORE**?

The **AFS Special Publications Bookstore** is now part of **The HUB**. We will have a wide selection of books, posters, art, **AFS** branded apparel and more!

Be sure to stop by **The HUB, Booth 3025** and take a look at what's in store for you!





BOOTH 3025

The HUB is a dedicated area for connecting with AFS staff and other attendees. This area features the **AFS Bookstore**, **AFS Products & Services**, **AFS Institute**, the **Casting Designers & Buyers Track** and **Foundry-in-a-Box**.

Ongoing features and activities include:

AFS Bookstore

The premier metalcasting industry bookstore offering practical and technical publications, signature clothing, and gift items.

AFS Products & Services

Whether you are a member of **AFS** or plan on becoming one, stop by and learn about the competitive edge an **AFS membership** provides. Learn more about this with **Ben Yates'** presentation, **How AFS Membership Can Support Your Business Success** on Tuesday, April 30 at 9:30 am.

Issues of *Modern Casting*, *Metal Casting Design & Purchasing*, *Global Casting Magazine*, and *Melting Point* will be available. Stop by and pick up the latest issue.

AFS Institute

Spend a few minutes with **The Institute** learning how quality education in various aspects of metalcasting can advance your company. Metalcasting workforce training just became more convenient and affordable. Tour and demo our newly enhanced e-Learning modules.

Casting Designers & Buyers Track

The Designers & Buyers Track, presented by *Metalcasting Design & Purchasing* magazine, returns to Cast-Expo 2019. The track will be presented **Saturday, April 27** through **Monday, April 29** in **The HUB Theater**.

Go to page 31 to see the full schedule of sessions.

AFS/FEF 2019 Student Technology Contest

Monday, April 29, from 11:30 a.m. - 12:30 p.m.

The HUB Theater will host the live judging of the **AFS/FEF 2019 Student Technology Contest**. Organized by **AFS** and the **Foundry Educational Foundation (FEF)**, the **AFS/FEF** Student Technology Contest is an opportunity for students to showcase their undergraduate research projects.

Foundry-in-a-Box

Get hands-on by making your own casting. See how **AFS** staff conducts outreach with their very own customized Foundry-in-a-Box kit.

Connect.

Like.

Tweet.

Post.

#CastExpo



AFS Events App



Casting Connection
castingconnection.afsinc.org



American Foundry Society



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**Foundry and Diecaster
Network / Metal Casting
Design and Purchasing**



American Foundry Society

CastExpo 2019 and the 123rd Metalcasting Congress is sponsored by the American Foundry Society (AFS), the leading metalcasting association in North America. Based in Schaumburg, IL, AFS provides members with advocacy, coordination and efforts in Washington, D.C., ongoing technical education through its Institute, as well as the transfer of innovative research and technology to the industry.



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2019 KEYNOTE SPEAKERS



Outthink the Competition

Kaihan Krippendorff

Saturday, April 27, 10:30 a.m.

A411 – Georgia World Congress Center

Kaihan Krippendorff is the founder of the Outthinker Roundtables with a reputation as a thought-leader and battle-tested consultant. He is a sought-after speaker on the topics of business strategy, growth, transformation, and innovation.

Krippendorff will speak about thriving in today's era of fast-paced technological change. Known for his ability to turn difficult concepts into easy-to-understand ideas, he has energized businesses and individuals all while generating over \$2.5 billion in revenue for many of the world's most recognizable Fortune 500 companies.



Catch Me If You Can

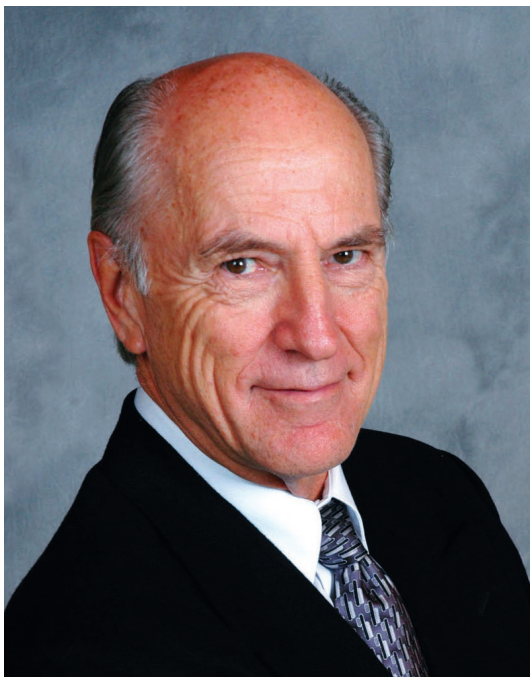
Frank Abagnale

Monday, April 29, 10:30 a.m.

A411 – Georgia World Congress Center

Frank Abagnale provides entertaining insight into his life as the notorious imposter of the 1960s; a thrilling story told in the award-winning movie and Broadway musical, *Catch Me If You Can*. By age 21, Abagnale was known as America's most gifted con man, successfully impersonating an airline pilot, pediatrician, stockbroker, college professor, and assistant attorney general, all while cashing \$2.5 million in forged checks. Audiences will experience an emotional roller coaster ride as Abagnale describes his escapades and reveals how he learned to live on the right side of the law.

2019 HOYT MEMORIAL LECTURE



The Meritocratic Ascendancy of Cast Iron from Magic to Virtual Cast Iron

Dr. Doru M. Stefanescu

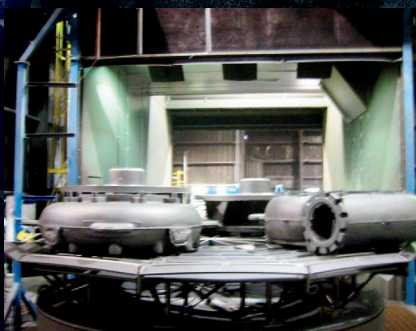
Sunday, April 28, 10:30 a.m.
A411 – Georgia World Congress Center

Unlike democracy, where selection criteria target equality between the category members, meritocracy means equality of opportunity rather than outcome. The world of sports is meritocratic as winning is crucial (imagine democratic basketball with players conforming to the national-average-height). So is the world of materials, as materials compete solely on performance. Cast iron, a longevous material going back to the 5th century B.C., survived in the materials competition based on merit. Ferrous alloys evolved from jewelry, to architectural, to culinary, to the high-tech materials used in modern applications. To remain competitive, cast iron had to be intricately connected to the knowledge-journey of humans. It started with empirical knowledge transferred from the tribe shaman

to his successor ("magic") and continuously evolved to reach the scientific stage of integrated simulation of current metalcasting processes, including the output of microstructure.



Table Blast
6ft, 8ft, 10ft, 12ft Diameter



14ft - 21ft Car Room Table Blast

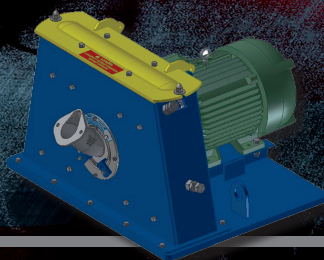


Tumble Blast
20 and 34 Cube

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SCHEDULE AT A GLANCE

SATURDAY, APRIL 27

	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon	1 p.m.
Reg Hall A	Registration 7 a.m. - 5 p.m.						
Exhibit Hall A		Ribbon Cutting Ceremony 8:50 - 9 a.m.	CastExpo Exhibits 9 a.m. - 5 p.m.				
The HUB			Rosemary Coates Designer/Buyer 9:15 - 10:15 a.m.				
Room	Author Chair Breakfast 7 - 8 a.m.					Copper Division Luncheon 11:45 - 1:15 p.m.	
Room	Speaker Ready Room 7 a.m. - 5 p.m.						
Room		AFS Show Office 8 a.m. - 4:30 p.m.					
Room A311							
Room			Lost Foam Division (19-186, 19-187) 9:15 - 10:15 a.m.				
Room		Copper Division (19-162) 8 - 9 a.m.	Copper Division (19-163) 9:15 - 10:15 a.m.				
Room		Melting Division (19-202) 8 - 9 a.m.	Melting Division (19-166) 9:15 - 10:15 a.m.				
Room		HR Division (19-176) 8 - 9 a.m.	Marketing Division (19-124) 9:15 - 10:15 a.m.				
Room							
Room						Management Division Luncheon 11:45 - 1:15 p.m.	
Room A411		Marketing Division (Carsten Kuhlitz) 8 - 9 a.m.		Keynote Speaker: Kaihan Krippendorff 10:30 - 11:30 a.m.			
Room A412							
Off Site							

KEY	Technical Session		Management	Designers/Buyers		Institute Course	
	Keynote Speaker		CastExpo	Special Event			
	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.	
Reg Hall A	Registration 7 a.m. - 5 p.m.						
Exhibit Hall A	CastExpo Exhibits 9 a.m. - 5 p.m.						
The HUB		Jim White Designer/Buyer 1:30 - 2:30 p.m.	Steve Metz Designer/Buyer 2:45 - 3:45 p.m.	Roundtables Designer/Buyer 4 - 5 p.m.			
Room							
Room	Speaker Ready Room 7 a.m. - 5 p.m.						
Room	AFS Show Office 8 a.m. - 4:30 p.m.						
Room A311							
Room		Lost Foam Division (19-188, 19-212, 19-213) 1:30 - 3 p.m.		Additive Manufacturing Division (19-198, 19-197) 3:15 - 4:45 p.m.			
Room		Copper Division (19-164) 1:30 - 3 p.m.		Metalcasting Research (19-183, 19-182, 19-184) 3:15 - 4:45 p.m.			
Room		Melting Division (19-167) 1:30 - 3 p.m.		Melting Division (19-010, 19-110) 3:15 - 4:45 p.m.			
Room		Marketing Division (19-143) 1:30 - 3 p.m.		HR Division (19-177) 3:15 - 4:45 p.m.			
Room	AFS Institute Class (19-130) 1:30 p.m. - 4:30 p.m.						
Room							
Room A411							
Room A412							
Off Site					Welcome Reception (Level Four Lobby Near Registration) 5 – 6:30 p.m.		

1 p.m.

2 p.m.

3 p.m.

4 p.m.

5 p.m.

6 p.m.

Reg
Hall ARegistration
7 a.m. - 5 p.m.Exhibit
Hall ACastExpo Exhibits
9 a.m. - 5 p.m.The
HUBJim White
Designer/Buyer
1:30 - 2:30 p.m.Steve Metz
Designer/Buyer
2:45 - 3:45 p.m.Roundtables
Designer/Buyer
4 - 5 p.m.

Room

Room

Speaker
Ready Room
7 a.m. - 5 p.m.

Room

AFS Show Office
8 a.m. - 4:30 p.m.Room
A311

Room

Lost Foam Division
(19-188, 19-212, 19-213) 1:30 - 3 p.m.Additive Manufacturing
Division (19-198, 19-197)
3:15 - 4:45 p.m.

Room

Copper Division
(19-164)
1:30 - 3 p.m.Metalcasting Research
(19-183, 19-182, 19-184)
3:15 - 4:45 p.m.

Room

Melting Division
(19-167)
1:30 - 3 p.m.Melting Division
(19-010, 19-110)
3:15 - 4:45 p.m.

Room

Marketing Division
(19-143)
1:30 - 3 p.m.HR Division
(19-177)
3:15 - 4:45 p.m.

Room

AFS Institute Class
(19-130)
1:30 p.m. - 4:30 p.m.

Room

Room
A411Room
A412Off
SiteWelcome Reception (Level Four
Lobby Near Registration)
5 - 6:30 p.m.

SCHEDULE AT A GLANCE

SUNDAY, APRIL 28

	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon	1 p.m.
Reg Hall A	Registration 7 a.m. - 5 p.m.						
Exhibit Hall A			CastExpo Exhibits 9 a.m. - 5 p.m.				
The HUB			Mike Gwyn Designer/Buyer 9:15 - 10:15 a.m.				
Room	Author Chair Breakfast 7 - 8 a.m.						
Room	Speaker Ready Room 7 a.m. - 5 p.m.						
Room		AFS Show Office 8 a.m. - 4:30 p.m.					
Room A311		Aluminum Division (19-028, 19-096) 8 - 9 a.m.	Aluminum Division (19-034, 19-069) 9:15 - 10:15 a.m.				
Room		Metalcasting Re- search (19-185, 19-193)	Cast Iron Division (19-179) 9:15 - 10:15 a.m.				
Room		EHS Division (19-173) 8 - 9 a.m.	EHS Division (19-174) 9:15 - 10:15 a.m.				
Room		Engineering Division (19-054) 8 - 9 a.m.	Molding Division (19-120, 19-121, 19-122) 9:15 - 10:15 a.m.				
Room		Government Affairs Division (19-195) 8 - 9 a.m.					
Room							
Room		WIM Breakfast 7:30 - 9 a.m.					
Room A411				Hoyt Speaker: Dr. Doru Stefanescu 10:30 - 11:30 a.m.			
Room A412						Division Recognition Luncheon 11:45 a.m. - 1:15 p.m.	
Off Site							

KEY						
	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.
	<div> <div>Technical Session</div> <div>Management</div> <div>Designers/Buyers</div> <div>Institute Course</div> <div>Keynote Speaker</div> <div>CastExpo</div> <div>Special Event</div> </div>					
Reg Hall A	Registration 7 a.m. - 5 p.m.					
Exhibit Hall A	CastExpo Exhibits 9 a.m. - 5 p.m.					
The HUB		Frank Headington Designer/Buyer 1:30 - 2:30 p.m.	Carl Soderhjelm Designer/Buyer 2:45 - 3:45 p.m.	Jiten Shah Designer/Buyer 4 - 5 p.m.		
Room						
Room	Speaker Ready Room 7 a.m. - 5 p.m.					
Room	AFS Show Office 8 a.m. - 4:30 p.m.					
Room A311		Aluminum Division (19-008, 19-039, 19-040) 1:30 - 3 p.m.	Aluminum Division Division (19-033, 19-015, 19-083) 3:15 - 4:45 p.m.			
Room		Cast Iron Division (19-157, 19-012) 1:30 - 3 p.m.	Cast Iron Division (19-089) 3:15 - 4:45 p.m.			
Room		EHS Division (19-023, 19-077) 1:30 - 3 p.m.	Steel Division (19-048, 19-115, 19-058) 3:15 - 4:45 p.m.			
Room		Additive Manufacturing Division (19-196) 1:30 - 3 p.m.	Molding Division (19-178, 19-127) 3:15 - 4:45 p.m.			
Room		Future Leaders of Metalcasting (19-175) 1:30 - 3 p.m.	Women in Metalcasting (19-125) 3:15 - 4:45 p.m.			
Room						
Room						
Room A411						
Room A412						
Off Site						Annual Banquet (Omni Atlanta) Reception 6 p.m. Banquet 7 p.m.

SCHEDULE AT A GLANCE

MONDAY, APRIL 29

	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon	1 p.m.
Reg Hall A	Registration 7 a.m. - 5 p.m.						
Exhibit Hall A			CastExpo Exhibits 9 a.m. - 5 p.m.				
The HUB			Vadim Pikhovich Designer/Buyer 9:15 - 10:15 a.m.		AFS/FEF 2019 Student Technology Contest		
Room	Author Chair Breakfast 7 - 8 a.m.						
Room	Speaker Ready Room 7 a.m. - 5 p.m.						
Room		AFS Show Office 8 a.m. - 4:30 p.m.					
Room A311		Aluminum Division (19-014, 19-068) 8 - 9 a.m.	Aluminum Division (19-109, 19-060) 9:15 - 10:15 a.m.				
Room			Cast Iron Division (19-087) 9:15 - 10:15 a.m.				
Room		Engineering Division (19-158) 8 - 9 a.m.	Engineering Division (19-159) 9:15 - 10:15 a.m.				
Room		Molding Division (19-050, 19-082) 8 - 9 a.m.	Molding Division (19-055, 19-070) 9:15 - 10:15 a.m.				
Room		Government Affairs Division (19-172) 8 - 9 a.m.	Marketing Division (19-201, 19-074) 9:15 - 10:15 a.m.				
Room							
Room							
Room A411				Keynote Speaker: Frank Abagnale 10:30 - 11:30 a.m.			
Room A412							
Off Site						Spouse's Tour Swan Coach House 11:45 a.m. - 4 p.m.	

KEY	 Technical Session	 Management	 Designers/Buyers	 Institute Course
	 Keynote Speaker	 CastExpo	 Special Event	

	1 p.m.	2 p.m.	3 p.m.	4 p.m.	5 p.m.	6 p.m.
Reg Hall A	Registration 7 a.m. - 5 p.m.					
Exhibit Hall A	CastExpo Exhibits 9 a.m. - 5 p.m.					
The HUB		Marshall Miller Designer/Buyer 1:30 - 2:30 p.m.	Panel Designer/Buyer 2:45 - 3:45 p.m.	Bob Mueller Designer/Buyer 4 - 5 p.m.		
Room						
Room	Speaker Ready Room 7 a.m. - 5 p.m.					
Room	AFS Show Office 8 a.m. - 4:30 p.m.					
Room A311		Aluminum Division (19-036, 19-094) 1:30 - 3 p.m.		Steel Division (19-111, 19-045, 19-098) 1:30 - 3 p.m.		
Room		Cast Iron Division (19-142, 19-059) 1:30 - 3 p.m.		Cast Iron Division (19-031, 19-079) 3:15 - 4:45 p.m.		
Room		Engineering Division (19-191) 1:30 - 3 p.m.		Engineering Division (19-192) 3:15 - 4:45 p.m.		
Room		Additive Manufacturing Division (19-057, 19-194) 1:30 - 3 p.m.		Molding Division (19-090, 19-207) 3:15 - 4:45 p.m.		
Room		Marketing Division (19-133, 19-156) 1:30 - 3 p.m.		Women in Metalcasting and Future Leaders of Metalcasting (19-099) 3:15 - 4:45 p.m.		
Room		AFS Institute Class (19-131) 1:30 p.m. - 4:30 p.m.				
Room						
Room A411						
Room A412						
Off Site						Alumni Dinner (World of Coca-Cola) 6 p.m.

SCHEDULE AT A GLANCE

TUESDAY, APRIL 30

	7 a.m.	8 a.m.	9 a.m.	10 a.m.	11 a.m.	Noon	1 p.m.
Reg Hall A		Registration 8 a.m. - Noon					
Exhibit Hall A			CastExpo Exhibits 9 a.m. - Noon				
The HUB			How AFS Membership Can Support Your Business Success 9:30 - 10:30 a.m.				
Room							
Room	Speaker Ready Room 7 - 10 a.m.						
Room		AFS Show Office 8 - 10 a.m.					
Room A311							
Room							
Room		Steel Division (19-066, 19-047) 8 - 9 a.m.					
Room		Molding Division (19-126, 19-063) 8 - 9 a.m.					
Room							
Room							
Room							
Room A411							
Room A412					President's Luncheon & Annual Business Meeting 11 a.m. - 1 p.m.		
Off Site							



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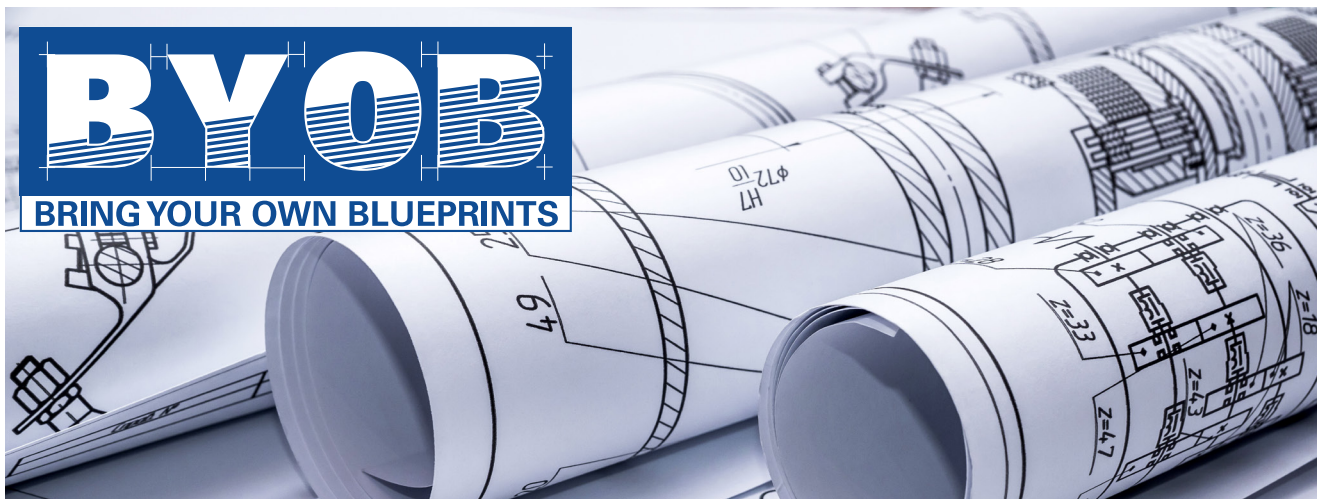
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BRING YOUR OWN BLUEPRINTS



Casting Designers and Buyers who brought blueprints in paper format or on laptop computers will be able to discuss their plans with representatives of nearly 40 North American foundries exhibiting in the Cast in North America area. AFS has provided areas for you to meet and discuss your blueprints. These areas can be found below of the Cast in North America (CINA) area in booths 315 and 415.

CASTING DESIGNERS AND BUYERS SESSIONS SCHEDULE (as of March 27, 2019)

The Casting Designers and Buyers sessions are returning to **CastExpo 2019**. These sessions are being held in **The HUB Theater, Booth 3025** on the show floor in Exhibit Hall A.

SATURDAY, APRIL 27

9:15 – 10:15 a.m.

What to Do Now – Sourcing and Manufacturing in America

Rosemary Coates, *Reshoring Institute*, Los Gatos, CA

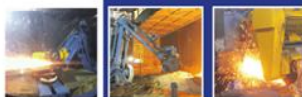
We live in turbulent global manufacturing times. Dealing with cost, tariffs, and trade wars is causing manufacturers to rethink their global manufacturing and sourcing strategies. Should you keep sourcing molds from China? Should you start sourcing parts from alternate countries? And the big question: Could you bring some manufacturing back to America? Explore the possibilities with the leader of the Reshoring Institute. Rosemary Coates is an Amazon.com best-selling author with five books, including *42 Rules for Sourcing and Manufacturing in China*, and *The Reshoring Guidebook*. She has been a management consultant for 25 years and is an expert witness for cases involving global manufacturing. Coates also teaches global supply chain strategy at UC Berkeley.

1:30 – 2:30 p.m.**Appraising Your Casting Supplier****Jim White**, *Consultant, Peoria, IL*

Use audits to look beyond the basics such as metal, casting process, and size ranges to find a supplier whose capabilities match the needs of your company. Jim White has more than 20 years of casting experience working as both a casting producer and purchaser for Caterpillar Inc., where he was responsible for developing processes for iron castings, advanced product quality planning (APQP), design for manufacturability, and continuous improvement. He also worked in Caterpillar's Purchasing Division, where he was responsible for \$200 million in worldwide casting spend.

2:45 – 3:45 p.m.**Casting Conversions****Steve Metz**, *Applied Process, Oshkosh, WI*

Learn the roles manufacturing methods, designs, cost reductions, quality improvements, and 3D printing technology play in converting to a cast component.

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4 – 5 p.m.

Metalcasting Supply Chain and Design Roundtable Discussion

Join other casting designers and buyers to network and learn from one another, including discussions about best practices, threats and opportunities, lead times, cost reduction strategies, emerging technologies, and rapid prototyping.

SUNDAY, APRIL 28

9:15 – 10:15 a.m.

Cost Effective Casting Design (19-148)

Mike Gwyn, *NoRedesign LLC, Mt. Pleasant, SC*

Designs that are easy to manufacture save time and money in the long run. Mike Gwyn will give several strategies to use to ensure your designs fulfill your requirements while also being easy to cast.

1:30 – 2:30 p.m.

Introduction to Ductile Iron (19-149)

Frank Headington, *AFS and the Institute, Schaumburg, IL*

Ductile iron's unique properties make it a great option for converting multiple-piece steel fabrications into single cast components at lower cost, inventory, and lead time.

2:45 – 3:45 p.m.

Alloy Design Strategies in Aluminum Alloys in High Temperature and High Stiffness Applications (19-150)

Carl Soderhjelm, *Advanced Casting Research Center, WPI, Worcester, MA*

As aluminum demand continues to grow, manufacturers have sought the ability to use aluminum in high temperature, high stiffness and high electrical conductivity applications. This session takes a look, at the how aluminum alloys are being developed and designed to meet these challenges.

4 – 5 p.m.

Casting Conversion and Additive Manufacturing (19-147)

Jiten Shah, *Product Development & Analysis LLC, Naperville, IL*

Casting conversion case studies from other processes such as fabrications will be presented. The conversion process will be explained with the use state-of-the-art computer aided engineering tools. Additionally, additive manufacturing for metalcasting technology will be presented with success stories as relevant to casting conversion and part consolidation opportunities it brings.

MONDAY, APRIL 29**9:15 – 10:15 a.m.****From Design to Production: Elements of Autonomous Engineering for Casting Process Improvement and Its Impact on Lifetime Product Quality and Costs (19-144)****Vadim Pikhovich**, *Magma Foundry Technologies Inc., Schaumburg, IL*

This session will provide a general overview of how casting suppliers use casting process simulation and assist OEM designers in having smart conversations with process foundry engineers about design-for-manufacturing (DFM) potential, quality and costs with the help of simulation.

1:30 – 2:30 p.m.**Tips and Trends in Casting Sourcing (19-180)****Marshall Miller**, *Flowserve, Irving, TX*

Marshall Miller, purchasing professional from a U.S. manufacturer, will describe his experiences and concerns in sourcing castings. Topics will relate to domestic options and how to foster relationships with suppliers to achieve cost-effective solutions.

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FEATURING **OPTIMULL** GREEN SAND ADDITIVE

2:45 – 3:45 p.m.**Panel: Casting Case Studies in Iron and Aluminum (19-200)**

Greg Miskinis, *Waupaca Foundry Inc., Waupaca, WI*; **Aaron Conner**, *Hitachi Metals America, Novi, MI*; **Oliver Johnson**, *Tooling & Equipment International, Livonia, MI*

What makes an engineered cast component successful? Suppliers will share case studies that show-case how a part's smart design for the casting process can lead to weight and cost reductions, as well as improved lead times and quality.

Panel Topics:

Miskinis/Conner: Cost-Effective Cast Iron Meets Lightweighting Objectives

Johnson: Technology Pushes Boundaries of Cast Aluminum Design

4 – 5 p.m.**Identifying Casting Sources (19-146)**

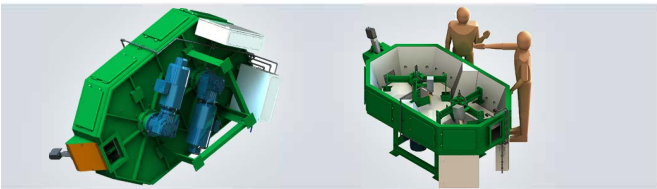
Bob Mueller, *P&H Mining Equipment, Milwaukee, WI*

A sourcing expert from a mining equipment manufacturer will share the lessons he's learned in his pursuit of quality metal casting suppliers in an ever-changing supply chain network.

**SIMPSON SOLUTIONS FOR SMALL FOUNDRIES**

See Highly Innovative Solutions & Brand NEW Technology At Booth #2111

Simpson is well known for our large Speedmullors, our continuous Simpson Multi-Mull with capacities of hundreds of tons per hour in a single machine and our large sand coolers but small foundries need effective sand preparation technologies too - at affordable prices. At CastExpo 2019 we will showcase smaller versions of our Multi-Cooler, Mix-Muller and Hartley product lines - suitable for a 20 t/h sand system - that have been totally redesigned to provide advanced performance within the budget of smaller foundries.

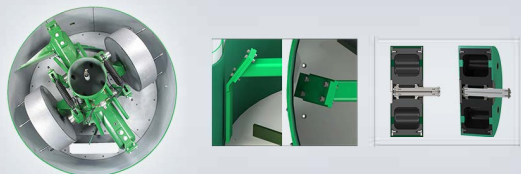


Maximize Performance with New Product Enhancements for the Model 2G Simpson Mix-Muller®

In many cases the best choice for a small 20 t/h sand system is the model 2G Simpson Mix-Muller. Learn what new product enhancements the Mix-Muller offers to maximize performance, versatility and lower operating costs at booth #2111.

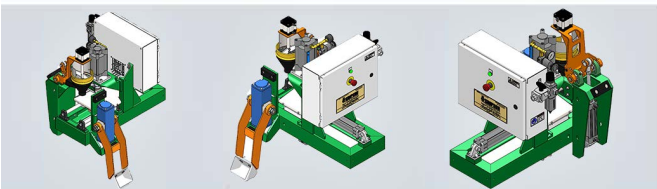
Improve Casting Quality by Cooling & Pre-Mixing your Sand with the Model MC-25 Simpson Multi-Cooler®

The Simpson Multi-Cooler is now operating with a fully integrated synchronized drive. This new design features two independent gearmotors that are electronically synchronized to eliminate mechanical alignment issues. Visit our booth to see this new feature along with many others!



Same Robust Control Technology at a Lower Price Point New Hartley 2502-L 1 On-Line Control System

The new Hartley 2502-L1 is specifically designed to provide two essential functions - complete muller automation and precise compactability control - at an affordable price. Stop by our booth to find out more about this new product!





APRIL 27-30, 2019

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SHOW SCHEDULE (as of March 27, 2019)

SATURDAY, APRIL 27

7 a.m.

Author/Chair Breakfast

Room: A302

This breakfast is for AFS speakers, session chairs, students, and staff to meet and coordinate details for the day's educational sessions.

8 – 9 a.m.

Copper Division

Room: A313

Session Chair: **Jeff Sorenson**, *I Schumann & Co, Bedford, OH*

Track: Technical

Panel: Silica Sand Alternatives in an Effort To Reduce Silica Exposure (19-162)

Nathan Wollenburg, *Prince Corp., Milwaukee, WI*; **Britni Snow**, *Clow Valve, Oskaloosa, IA*

A look into ceramic sands as an alternative to silica in an effort to reduce silica exposure limits.

Panel Topics:

Baier: Silica Alternatives

Snow: In-House Silica Sand Alternatives Testing: Useful, Shots in the Dark, and Mud

Human Resources Division

Room: A315

Session Chair: **Brian Lewis**, *FEF, Schaumburg, IL*

Track: Management

Panel: BRAVE – Branding, Retaining, Attracting, Value Propositions, Engagement (19-176)

Kirk Kallio, *Waupaca Foundry Inc., Waupaca, WI*; **Joey Leonard**, *HS Group HR Inc., Green Bay, WI*; **Sharon Calahan**, *Bremen Castings Inc., Bremen, IN*; **Russ Bradley**, *AMERICAN Cast Iron Pipe Co., Birmingham, AL*

This panel, brought to you by the AFS Human Resources Division, who will share creative ideas employers in the metalcasting industry are utilizing to build employer **Brand**, inventive ways to

Retain and **Attract** talent, the significance in defining **Value** propositions, and tips on creating **Engagement** within the metalcasting workforce.

Marketing Division

Room: A411

Session Chair: **Dennis Dotson**, *Dotson Iron Castings, Mankato, MN*

Track: Management

How Suppliers and Foundries Can Advance Technology Together (19-181)

Dr. Carsten Kuhlgatz, *Huttenes-Albertus Chemische Werke GmbH, Hannover, Germany*

Innovation is the only way companies can secure their long-term competitiveness to survive and thrive in the global market. More sophisticated customer requirements, expansion of knowledge, global competition, stricter regulations and new materials all create intense pressure to innovate and quickly implement new technologies as marketable products. It is almost impossible for individual companies to drive technological progress on their own – there are simply too many interrelated factors and parameters. Decisive innovative successes are best achieved through cooperation between partners and combining the contributions of different stakeholders.

The presentation will discuss innovation in the metalcasting industry and highlight case studies of collaborative advancements – a large automotive foundry that completely converted its core production from organic to inorganic in just one year, and an example of collaboration between a supplier and a foundry to provide core and component design and prototype production of new castings. **Session is open to all attendees.**



Melting Methods & Materials Division

Room: A314

Session Chair: **David Kasun**, *Kuttner LLC, Port Washington, WI*

Track: Technical

Panel: Fine Tuning Your Cupola (19-202)

Ron Stewart, *United Refractories Co., McMurray, PA*; **Gene Ritchie**, *Consultant, Greenwood, IN*; **Jim Wright**, *McWane Ductile, Coshocton, OH*

Panel presentation focused on improving cupola operations.

8:50 – 9 a.m.

Ribbon Cutting Ceremony

Level Three – Main Entrance to Exhibit Hall A

Celebrate the start of **CastExpo 2019** with a ceremonial ribbon cutting with incoming **AFS** President Peter Reich and the Executive Board.

9 a.m. – 5 p.m.

CastExpo Show Floor

Exhibit Hall A

KEY		Technical Session		Management		Institute Course
		Keynote Speaker		CastExpo		Special Event

9:15 – 10:15 a.m.**Copper Division****Room: A313**Session Chair: **Paul Clements**, *Sloan Valve Co., Augusta, AR***Track: Technical****Panel: Automation and/or Technology to Make Foundry Jobs Safer and Less Demanding (19-163)****Scott Shinn**, *3M Company, St. Paul, MN*; **Blake McGowan**, *Humantech, Ann Arbor, MI*

A closer look at advancements in technology and training can give foundries the tools to help ensure a safe and productive work environment.

Panel Topics:**Shinn:** Using Virtual Reality to Enhance Training Outcomes**McGowan:** Leveraging Technology to Reduce Injuries and Incident Rate**Lost Foam Division****Room: A312**Session Chair: **Glover Kerlin**, *BRP US Inc., Spruce Pine, NC***Track: Technical****Lost Foam Printed Tools vs. Subtractively Machined Tools (19-186)****Garrett Iverson**, *Scenic Industries LLC, Chattanooga, TN*

Lost foam process tooling has long been considered too expensive for many potential customers to enter the process, even though total cycle can exceed 400,000 without failure. The AFS Research Board has commissioned a project to reduce the cost of dies by the use of additive manufacturing of aluminum tools. Initial costs studies have shown that tool cost can be reduced 25% with more expected, even without designing for the additive process. At the same time, generative software was utilized to improve molding cycle time and reduce printed mass, yielding a tool that cannot be produced by subtractive methods. The target of half the cost and molding cycle time appear in reach. Future projects of high temperature polymers and titanium also will be discussed.

Lost Foam Printed Expendable Patterns (19-187)**Marshall Miller**, *Flowserve, Irving, TX*

When prototyping or high-mix low-volume work are required in the lost foam process, the method of machined foam patterns has been used. With finish not being as good as molded foam patterns, plus the necessity for fixtures and CNC equipment, the machined patterns and equipment can be expensive. This presentation will show the results of 3D filament printing with different materials and the positive results of those tests.

Marketing Division**Room: A315**Session Chair: **Rich Jefferson**, *American Foundry Society, Schaumburg, IL***Track: Management****Panel: Demystifying Surcharges (19-124)**Moderator: **Patrick McCreavan**, *B&L Information Systems, Bridgman, MI*

Panel: **Blair Lozza**, *Lethbridge Iron Works Co Ltd, Lethbridge, AB, Canada*; **Doug Bushey**, *ABB-Motors & Generators, Greenville, SC*; **Serhan Yener**, *Agco Corp., Duluth, GA*

Imagine quoting a job, only to have the primary material increase by 20% after the quote was accepted! Now imagine accepting an order, only to find out the order can't be fulfilled at the

quoted price, because of a 20% increase in the primary material. These are the real-world challenges of surcharges. Given the volatility of the metals and energy markets, surcharges are a necessary part of how metalcasters do business. The specifics of how surcharges are agreed to, defined, and invoiced, raise communication challenges between buyer and seller. This session is an opportunity for metalcasters and casting buyers to better understand the how and why of these challenges.

Melting Methods & Materials Division

Room: A314

Session Chair: **Dave Williams**, *ASI International, Cleveland, OH*

Track: Technical

Panel: Safety Concerns in Today's Cupola and Induction Melt Shops (19-166)

John Oneson, *Kohler Co., Kohler, WI*; **Johnny Hill**, *Martin Foundry, Dallas, TX*; **Alex Croll**, *Waupaca Foundry Inc., Tell City, IN*

Discussions about safety in coreless melting, cupola melting, and channel induction melting.

10:30 - 11:30 a.m.

Outthink the Competition

Kaihan Krippendorff, *Outthinker, Greenwich, CT*

Keynote Presentation

Room: A411

Session Chair: **Peter Reich**, *Laempe Reich Corp., Trussville, AL*

Krippendorff is the founder of the Outthinker Roundtables with a reputation as a thought-leader and battle-tested consultant. He is a sought-after keynote speaker on the topics of business strategy, growth, transformation and innovation.

Krippendorff will speak about thriving in today's era of fast-paced technological change. Known for his ability to turn difficult concepts into easy-to-understand ideas, he has energized businesses and individuals all while generating over \$2.5 billion in revenue for many of the world's most recognizable Fortune 500 companies. **Session is open to all attendees. Space is limited.**

11:45 a.m. - 1:15 p.m.

Copper Division Luncheon

Room: A302

The Copper Division will present their David Kunkel Distinguished Service Award, and feature speaker David Mitchell of the Atlanta Preservation Center. The Copper Division Scholarship will also be presented. This event is open to everyone with an interest in copper alloys. **(Ticketed Event)**

Management Division Luncheon

Room: A410

Please join the newly formed Management Division for a fun, unique speed networking experience. Whether you're a seasoned networker or new to the industry, this event will offer an opportunity to meet fellow metalcasting professionals on a different level. **(Ticketed Event)**

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1:30 - 4:30 p.m.**AFS Institute****Room: A316****Track: Technical****Metalcasting Process Basics (19-130)****Bo Wallace**, *AFS Institute, Schaumburg, IL*

This course provides participants with a basic overview of the metalcasting process. Students will trace the path of a casting from quoting through shipping. Common metalcasting terms are covered while highlighting the activities inside the major departments of a metalcasting production facility.

1:30 - 3 p.m.**Copper Division****Room: A313**Session Chair: **Eric Sivill**, *Neptune Technology Group Inc., Tallahassee, AL***Track: Technical****Panel: Melt Deck Safety and Passive Fire Protection (19-164)****Jack McMillin**, *Ajax Tocco Magnethermic Corp., Warren, OH*; **Bill Newbold**, *Inductotherm Corp., Rancocas, NJ*; **Samantha Peterson**, *3M, St. Paul, MN*

This session looks at best practices and technology as well as passive fire protection for critical electrical components.

Lost Foam Division**Room: A312**Session Chair: **Marshall Miller**, *Flowserve, Irving, TX***Track: Technical****X Bead Development (19-188)****Melissa Wallum**, *StyroChem Canada Ltd., Baie-D'Urfe, QC, Canada*

The potential of producing lost foam patterns/castings with improved surface finish and thinner wall sections is discussed in this presentation. The use of smaller "X-grade" sized EPS beads has obvious advantages for both of these desired attributes, but the smaller bead size has inherently resulted in processing obstacles that must be overcome. In this presentation, the material characteristics of expanded low density potential and expanded bead life are evaluated, along with summarization of formulation optimization efforts, focusing on the refinement of material processability, and resulting in improvements in surface smoothness, as well as depth, width and volume of interstitial bead spacing.

Status of and Developments in the China Lost Foam Industry (19-212)**Guo Peng**, *Huazhong University of Science & Technology, Wuhan, China*

China has more than 800 operating lost foam foundries. Dr. Peng will provide insight into the materials produced and methods used that have brought such a boom in lost foam technology to China.

Lost Foam Stainless Steel Development (19-213)**Marshall Miller**, *Flowserve, Irving, TX*

The lost foam process has been considered impractical for use in lower carbon stainless steels, such as CF8M, with upper limits on carbon of 0.08%. This presentation will provide the results of recent tests showing the progress being made towards success of lost foam stainless steel.

Marketing Division

Room: A315Session Chair: **Towanda Long**, *Charlotte Pipe and Foundry Co., Charlotte, NC***Track: Management****Panel: PR Crisis - Plan Before or Manage It After - The Choice Is Yours (19-143)****Towanda Long**, *Charlotte Pipe and Foundry Co., Charlotte, NC*; **Pete Smolowitz**, *Mower, Charlotte, NC*; **Jeet Radia**, *McWane Inc., Birmingham, AL*; **Ted Schorn**, *Enkei America, Inc., Columbus, IN*

When reporters call foundries asking for interviews, it's often because of a crisis. Join us for a 90-minute presentation of what you should know before facing the media. The presentation will also include a panel discussion from metalcasters.

Topics:

- Managing crisis communications
- Handling reporters' methods and question types
- Preparing key messages and learning how to highlight them effectively
- Understanding the media's behavior
- Helping improve the tone of media coverage

Melting Methods & Materials Division**Room: A314**Session Chair: **John Oneson**, *Kohler Co., Kohler, WI***Track: Technical****Panel: Innovations in High Power Coreless Melting Operations (19-167)****Tad Braun**, *Lodge Manufacturing, South Pittsburg, TN*; **Erik Storrer**, *Fritz Winter North America LP, Franklin, KY*; **Robert Hornsby**, *Neptune Technology Group Inc., Tallahassee, AL*; **James Sturgeon**, *Conbraco Industries Inc., Conway, SC*

Innovations in high power coreless melting operations will be shared.

Additive Manufacturing Division**3:15 - 4:45 p.m.****Room: A312**Session Chairs: **Tom Mueller**, *Mueller AMS, New Berlin, WI*; **Jason Walker**, *Youngstown State University, Youngstown, OH***Track: Technical****Direct Digital Investment Casting (19-198)****Suman Das**, *DDM Systems Inc., Atlanta, GA*

A new, potentially game-changing, additive manufacturing technology has been developed to enable 3D printing of ceramic shells and cores for investment casting. Originally developed for the investment casting of turbine blades, the technology can be used across all investment castings. The process eliminates all hard tooling and multiple process steps, dramatically reducing the cost and lead time for new castings. This new technology also enables advanced designs that are prohibitively expensive or impossible to make through traditional tooling and can dramatically reduce the overall overhead and footprint of a modern digital foundry. This presentation will cover the state-of-the-art technology and its versatility in producing complex and precision investment castings in various alloys, and how it is poised to disrupt a 3,000-year-old technology currently used for the most high-value components in the aerospace, biomedical, automotive, power generation and defense sectors.

Panel: Expendable Patterns (19-197)**K
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Session****Keynote
Speaker****Management****CastExpo****Institute
Course****Special
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Sharon Weaver, 3D Systems, Rock Hill, SC; **Jan Sumeral**, BASF USA, Florham Park, NJ; **Jerry LePore**, Spectra3D Technologies, Candler, NC; **Ben Wynne**, Intrepid Automation, Escondido, CA

This session will focus on the use of 3D printing in investment casting. Presentations will cover new advancements in 3D printing of investment casting shells and the printing of expendable patterns as a replacement for wax molds.

Human Resources Division

Room: A315

Session Chair: **Joey Leonard**, HS Group HR Inc., Green Bay, WI

Track: Management

Molten Hot Labor and Employment Legal Issues in the Workplace (19-177)

Mitch Quick, Michael Best Law Firm, Milwaukee, WI

It's never a dull moment for managers and HR professionals as they strive to comply with the myriad and ever-changing laws affecting the metalcasting workplace. This session will highlight the most pressing issues facing companies, including the #metoo movement and sexual harassment claims, medical marijuana, mandatory arbitration programs, disability discrimination claims under the ADA, and FMLA traps. This session will provide strategies and tips to avoid getting "burned" by the legal flames.

Melting Methods & Materials Division

Room: A314

Session Chair: **Scott Stiefvater**, ABP Induction LLC, Union Grove, WI

Track: Technical

Induction Melting of Scrap and Recycles to Determine the Iron Yield and Chemical Compositions (19-010)

Delin Li, CanmetMATERIALS, Natural Resources Canada, Hamilton, ON, Canada; **Lewyn Valladares**, Stelco, Nanticoke, ON, Canada

Scrap and recycles are the valuable resources for steelmaking and foundries. Generally, scrap can be divided into three categories: home scrap, process scrap, and obsolete scrap. Home scrap is generated in steel mills or foundries during the production, e.g., blast furnace slag or foundry returns. Process scrap is generated in the manufacturing of products made from steel, e.g., machining turnings and chips. Obsolete scrap consists of iron or steel products discarded after the end of their service life, e.g., post-consumer cans and shred steel. In the present work, induction furnaces were used for melting a series of scrap samples of up to 750 lb., with or without liquid iron heel. The iron yield and chemical compositions of scrap samples were determined. In addition to the major chemistry, the tramp elements such as tin, copper, sulfur, and phosphorus were analyzed.

Melting Automotive Scrap Iron by the Twin Chamber Cokeless Furnace at Low Emissions (19-110)

Baha Abulnaga, Mazdak International Inc (dBA Maztherm Cokeless Melting Inc.), Sumas, WA; **Edward deGraaf**, retired engineer, Bellingham, WA

Scrap iron and steel represent an important sector of the metalcasting industry. On average, the U.S. Economy recycles most of its scrap, exports 13 million tons but leaves 6 million tons unprocessed for landfills. While pig iron is an important constituent to the production of ductile iron, the U.S. economy imports 5 million tons, and demand is expected to increase by 1 - 1.5 million tons per year in the next decade. The twin chamber cokeless furnace (TCCF) uses natural gas and provides an opportunity to process scrap into useful pig iron at reasonable cost. Tests conducted while melting scrap into pig iron showed that the TCCF achieves low air pollutants while melting scrap iron from automotive sources. A model was developed to meet the EPA emissions standards for small foundries below 10,000 tons per year to allow recycling centers to process scrap iron using the TCCF.

Metalcasting Research

Room: A313Session Chair: **David Weiss**, *Eck Industries Inc., Manitowoc, WI***Track: Technical****Ultrasonic Cavitation Based Dispersion for Nano-Composites Casting (19-183)****David Weiss**, *Eck Industries, Inc., Manitowoc, WI*

This project is designed to increase the strength of castings by the cost-effective addition of nano sized reinforcements into the melt. Higher strength-castings and castings produced more effectively out of difficult alloys offer significant weight and cost advantages for military and other specialty castings.

Disruptive Inorganic Binder Innovations for Aluminum Casting (19-182)**Richard Riman**, *RRTC Inc., Belle Mead, NJ*

This session will preview a new technology binder system that could be used to make aluminum casting mold material. Initial testing has been done in no-bake molds and cores and investment cast shells for aluminum casting. Casting of steel and super alloys is under development.

Online Mechanical Property Database for Casting Design (19-184)**Jiten Shah**, *Product Development & Analysis LLC, Naperville, IL*

AFS has developed a web-based tool for casting design engineers and ICME professionals. This database provides validated material properties for most popular cast alloys, including the thermo-physical and thermo-mechanical properties required for accurate casting process simulation of filling, solidification, residual stress, and distortion. The site also includes data for the key mold and core materials.

5 – 6:30 p.m.**Welcome Reception****Level Four – Lobby Near Registration**

AFS welcomes all attendees to kick off CastExpo 2019 with a reception in the Lobby near registration in the Georgia World Congress Center. The reception provides the opportunity to meet with customers, vendors, and other attendees. Cocktails and hors d'oeuvres will be served. **(Ticketed Event)**

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SUNDAY, APRIL 28

7 a.m.

Author/Chair Breakfast

Room: A302

This breakfast is for AFS speakers, session chairs, students and staff to meet and coordinate details for the day's educational sessions.

7:30 – 9 a.m.

Women In Metalcasting Breakfast

Room: A410

This event is open to members of Women in Metalcasting and features a continental breakfast and networking with women who work in all facets of the metalcasting industry. Facilitated by Kristin Odell, owner of KLO LLC, a training, leadership and employee optimization consulting business, this event will focus on discovering strengths and maximizing potential. **(Invitation Only)**

Sponsored by American Colloid Company, AMERICAN Cast Iron Pipe Company, B&L Information Systems, Badger Mining Corporation, Bingham & Taylor, Denison Industries, Flow-3D Cast, Laempe Reich, Neenah Foundry, Sinto America, and Waupaca Foundry.

8 – 9 a.m.

Aluminum Division

Room: A311

Session Chair: **Adam Kopper**, *Brunswick Corp., Fond du Lac, WI*

Track: **Technical**

Microstructural Fineness in Aluminum Castings (19-028)

Devin Hess, Qigui Wang, *General Motors, Pontiac, MI*

In sand and permanent/semi-permanent mold casting processes, the hypoeutectic aluminum alloys of Al-Si-Mg and Al-Si-Cu-Mg solidify in a dendritic structure. It has generally been desired to have a fine dendritic structure for the best mechanical properties. The fineness of the dendritic structure is typically quantified by measuring the spacing between the secondary dendrite arms, referred to as the SDAS or DAS. While this is a widely accepted measurement technique no industry standard exists defining a consistent measurement process. This paper shows the variability identified between various laboratories and provides a method which significantly improves the repeatability in quantifying the fineness of the microstructure within these alloy systems and casting processes.

Modeling and Simulation of Microstructure and Mechanical Properties of Al-Si- and Al-Cu-Based Alloys (19-096)

Adrian Catalina, Liping Xue, *Flow Science, Inc., Santa Fe, NM*; **Charles Monroe, Robin Foley, John Griffin**, *University of Alabama at Birmingham, Birmingham, AL*

The mechanical properties of a cast component depend on the microstructural features that develop during the solidification process. In turn, the microstructure features (amount and size of precipitating phases and compounds) are dictated by the chemical composition of the alloy and the cooling conditions. Quantitative predictive models for microstructure evolution in Al-Si- and Al-Cu-based alloys have been developed by the authors and incorporated into a commercial general-purpose software package. Empirical relationships relating the mechanical properties to microstructure have also been developed based on experimental measurements. Details of the developed models as well as simulated

and experimental results obtained on a test casting for various alloy compositions will be presented and discussed.

Engineering Division

Room: A314

Session Chair: **Brandon Kruse**, *Roberts Sinto Corp., Lansing, MI*

Track: Technical

Managing Visual Inspection Operations to Maintain Effectiveness (19-054)

Ted Schorn, *Enkei America, Inc., Columbus, IN*

Visual inspection effectiveness in the cleaning room and in final inspection is critical to cast part quality at the customer. Significant effort has been placed on the individual inspector's effectiveness in published work in the last decade. This paper is focused on the management of visual inspection activities from a group perspective. This includes approaches for evaluating the collective effectiveness of the department or group and the establishment of certification programs to develop and maintain competence. An approach to setting and maintaining a consistent visual inspection standard (acceptance criteria) is also discussed.

Environmental Health & Safety Division

Room: A313

Session Chair: **Craig Schmeisser**, *Mad River Strategies LLC, New Bremen, OH*

Track: Technical

Panel: Environmental Issues That Keep You Up at Night (19-173)

Angela Dine Schmeisser, *St Marys Foundry Inc., St Marys, OH*; **Jeet Radia**, *McWane Inc., Birmingham, AL*; **Lennon Martin**, *Denison Industries Inc., Denison, TX*

Hear from a panel made up of a foundry executive, the EHS head of a large foundry and the EHS professional of a small foundry, who will discuss significant environmental issues that impact their operations.

Government Affairs Division

Room: A315

Session Chair: **Stephanie Salmon**, *AFS Washington Office, Washington, D.C.*

Track: Management

Key Federal Issues Impacting U.S. Metalcasters in the New 116th Congress (19-195)

Eric Meyers, *Oil City Iron Works Inc., Corsicana, TX*; **Stephanie Salmon**, *AFS Washington Office, Washington, D.C.*

The 2018 midterm elections resulted in a divided 116th Congress. Receive the latest updates and information about the key environmental, trade and labor issues facing U.S. metalcasters from the current Congress and Administration. Hear how AFS is actively engaging the 100 new lawmakers and their congressional staffs about the vital role of U.S. metalcasting industry. What can you do to promote metalcasting at the federal, state and local lawmakers?

Metalcasting Research

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Room: A312Session Chair: **Tom Prucha**, *MetalMorphosis LLC, Rochester Hills, MI***Track: Technical****Casting Design and Process Optimization for Intelligent Manufacturing (19-185)****Jiten Shah**, *Product Development & Analysis LLC, Naperville, IL*; **Frank Headington**, *AFS and the Institute, Schaumburg, IL*; **Jim Headington**, *Dotson Iron Castings, Mankato, MN*

Design optimization, process modeling, and performance prediction have been addressed by industry for many years. However, there has been little work on applying integrated computational materials engineering (ICME) to metalcasting. ICME addresses process-inherent variability that is present in a production manufacturing environment. The goal of this research project is to develop an effective ICME as an approach to make more efficient casting designs and improved manufacturing approaches. Current physics-based simulation tools are limited to simulate for a few, finite known process variabilities, but do not account for many more process variables, including dimensional, compositional and section thickness variability inherent to the metalcasting process. A comprehensive approach of physics-based simulation with probabilistic meta modeling using historic data is unique and will allow for rapid and more accurate predictions.

Cast Metal-Ceramic Composite Lattice Structures for Energy Absorbing Penetration Resistant Applications (19-193)**Alan Druschitz**, *Virginia Polytechnic Institute and State University, Blacksburg, VA*

Lattice structures are lightweight and have outstanding energy absorbing capability but are difficult to produce. New research is being conducted to incorporate monolithic cast metal-ceramic composite lattice structures and 3D printed sand molds and cores with cast ferrous and nonferrous alloys. This research includes a comprehensive program that addresses lattice structure design, metallurgical

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Element	Symbol	Percentage
Silicon	Si	3.32%
Carbon	C	3.45%
Sulfur	S	0.0138%
Manganese	Mn	0.48%
Phosphorus	P	0.0391%
Nitrogen	N	0.0064%
Molybdenum	Mo	0.38%

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Aluminum Division

9 a.m. – 5 p.m.

CastExpo Show Floor
Exhibit Hall A

9:15 – 10:15 a.m.

Room: A311

Session Chair: **Herbert Doty**, *General Motors, Pontiac, MI*

Track: Technical

Design of a HPDC Specimen for the Detailed Assessment of Shot Curve and Thermal Effects on the Mechanical Properties of HPDC Cold Chamber Castings as a Function of Flow Length (19-034)

Maximilian Rudack, Andreas Bührig-Polaczek, Uwe Vroomen, *Foundry Institute RWTH Aachen University, Aachen, Germany*

Parameter studies of the high pressure diecast (HPDC) process are a common tool. HPDC parts and their dies are highly individualized designs. Often it is not clear if the adjustment of a certain parameter is generally recommendable or if a change in casting quality is a specific result of the die design. The new HPDC specimen is a wavy geometry that allows the extraction of nine flat specimens for tensile, bending and fatigue testing. The first specimen is positioned roughly 30 mm from the ingate, whereas the ninth specimen is distanced 450 mm from the gate. Due to the wavy geometry of the specimen, the fluid-mechanical state in all samples for mechanical testing is highly similar. Therefore, the impact on the castings's mechanical properties is almost purely a function of the shot curve (e.g. air entrainment and cold flakes) and the die temperature. Extensive fill simulations validate this design.

Innovative Product Design and Robust Process Layout in Diecasting with Autonomous Engineering (19-069)

Deepika Gaddam, *Magma Foundry Technologies, Inc., Schaumburg, IL*; **Horst Bramann, Laura Leinewerber, Jorg Sturm**, *Magma Gießereitechnologie GmbH, Aachen, Germany*

Autonomous engineering extends the known virtual experiment of casting simulation by the definition of quantifiable objectives, critical variable process parameters, and their variations as well as relevant quality criteria. In addition to the identification of concrete technical solutions, this new approach allows the definition of the best compromise between quality and economic efficiency that the diecaster strives for day by day. Systematic knowledge can be generated without economic or productive risks, thus enabling early secured decisions in the development phase of robust, cost-efficient and resource-efficient die cast products and processes. This presentation uses the example of a structural diecast component and demonstrates how the new methodology of autonomous engineering contributes to the demands for faster product and process development, optimum process and tools design in terms of quality, yield and costs, as well as robust process layout with maximum reproducibility of quality better than ever before.

Cast Iron Division

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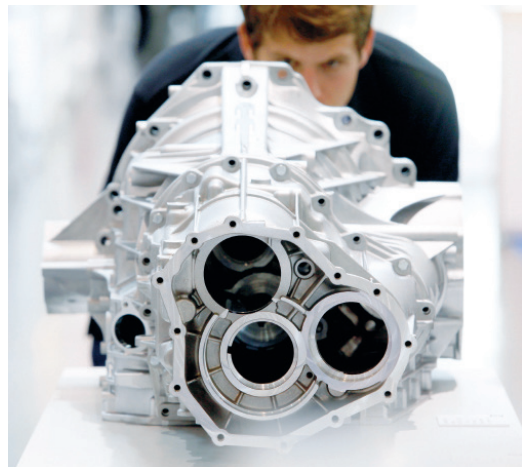
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Room: A312

Session Chair(s): **Eric Nelson**, *Dotson Iron Castings, Mankato, MN*; **Kevin McMahon**, *Elkem Foundry Products, Pittsburgh, PA*

Track: Technical

Honorary Lecture: Mentoring the Next Generation of Metalcasters - The Importance of Developing a Human Network (19-179)

Greg Miskinis, *Waupaca Foundry Inc., Waupaca, WI*

The current “graying” generation of metalcasters came into the industry having the luxury of a large mentoring pool that included notable and knowledgeable industry icons. Decades before the internet, Google, Wikipedia and YouTube, our continued education largely depended on published literature in addition to personal and social interactions that included AFS Congress presentations, chapter meetings and committees supported by hands-on experiences. Today, we can conjure up a suitable (sometimes questionable) video on one of our many “smart” devices to imitate the recorded actions and if so inclined, consign the lesson to our “favorites” for future reference. Is this lesson truly “hard-wired” into our brains or have we merely created an electronic trail of bread crumbs to get us back to the answer? We must be prepared to embrace all forms of education in order to prepare the next generation of metalcasters.

Environmental Health & Safety Division

Room: A313

Session Chair: **Jeet Radia**, *McWane Inc., Birmingham, AL*

Track: Technical

Panel: Health & Safety Issues That Keep You Up at Night (19-174)

Brent Charlton, *Metal Technologies Auburn LLC, Auburn, IN*; **Stephanie Salmon**, *AFS Washington Office, Washington, D.C.*

Critical issues facing the regulatory and real world.

Molding Methods & Materials Division

Room: A314

Session Chairs: **Bryan Kluge**, *IMERYS, Cincinnati, OH*; **Mark Ziegler**, *Casting Industry Suppliers Assoc., Rockford, IL*

Track: Technical

AFS Research: A Pulverization Index for Granular Media Used in Foundry Processing and Thermomechanical Reclamation (19-120)

Sam Ramrattan, *Mahdi Alsagour, Western Michigan University, Kalamazoo, MI*

The purpose of this study is to determine the durability of various foundry sands (granular media) in thermomechanical testing aimed at mimicking molding, melting, filling, shakeout and reclamation. Further, chemical analyses of the granular media were taken before and after elevated temperature exposure. Results provide information regarding the durability of granular media that is beneficial to reclamation and/or the use of granular media for foundry processing.

This presentation was developed in partial fulfillment of the AFS research project “Alternative Granular Media for Green Sand Casting” conducted at Western Michigan University. An AFS steering committee identified seven commercially available foundry sands to be used in the study. One of the sands is a typical silica sand used in the foundry industry and was identified as a control. Five sands were considered

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synthetic because the original media was heat processed to some degree and another was a natural mineral.

AFS Research: Baseline and Dynamic Green Sand Properties for Various Alternative Granular Media (19-121)

Sam Ramrattan, Dariush Moradinezhad, Mahdi Alsagour, *Western Michigan University, Kalamazoo, MI*

The purpose of this study is to determine baseline properties of various alternative green sands compared to conventional silica green sand. Non-standard dynamic green sand tests were used to evaluate the systems. Results provide information regarding the green properties of granular media that is beneficial to foundry molding processes. Dynamic green sand tests such as: modified cone jolt toughness, hot friability, wet tensile strength, and hot permeability were able to differentiate among various alternative green sand systems for the same compactability level (moisture content) and clay level. This paper focused on sodium bentonite (75%), calcium bentonite (25%) blend at 35% compactability that is typical in cast iron foundries. The dynamic tests provide more relevant data about these green sand systems compared to the baseline tests. The results present an opportunity to develop new green sand systems using data from both room and elevated temperature tests for alternative green sand systems.

AFS Research: A Casting Trial to Evaluate Alternative Green Sand Systems for Surface Finish and Erosion Defects (19-122)

Sam Ramrattan, Milan Raval, *Western Michigan University, Kalamazoo, MI*

This presentation addresses green sand erosion and surface finish issues for iron castings. Green sand erosion can occur when molten alloy dislodges grains of sand resulting in a rough as-cast finish. A new casting trial was developed and tested to evaluate erosion on multiple green sand specimens simultaneously. A gray cast iron recipe was delivered from a controlled head pressure and temperature to achieve a turbulent flow across green sand specimens prior to solidification of the casting. Flow and solidification simulation of the casting trial model was ran. The simulated predictions were evaluated along with results of iron casting trials and laboratory green sand testing. Results show there are surface differences among the alternative green sand systems studied.

The Meritocratic Ascendance of Cast Iron

10:30 – 11:30 a.m.

from Magic to Virtual Cast Iron (19-129)

Dr. Doru M. Stefanescu, *The Ohio State University and University of Alabama, Dublin, OH*

Hoyt Memorial Lecture

Room: A411

Session Chair: **Doug Kurkul**, *American Foundry Society, Schaumburg, IL*

Unlike democracy, where selection criteria target equality between the category members, meritocracy means equality of opportunity rather than outcome. The world of sports is meritocratic as winning is crucial (imagine democratic basketball with players conforming to the national-average-height). So is the world of materials, as materials compete solely on performance. Cast iron, a longevous material going back to the 5th century B.C., survived in the materials competition based on merit. Ferrous alloys evolved from jewelry, to architectural, culinary, and the high-tech materials used in modern applications. To remain competitive, cast iron had to be intricately connected to the knowledge-journey of humans. It started with empirical knowledge transferred from the tribe shaman to his successor ("magic") and continuously evolving to reach the scientific stage of integrated simulation of current metalcasting processes, including the output of microstructure. Exploring this journey is the goal of this lecture. **Session is open to all attendees. Space is limited.**

Division Recognition Luncheon

11:45 a.m. – 1:15 p.m.**Room: A412**

This luncheon will feature the presentation of the Best Paper and Division awards, as well as the Applied Research, Howard F. Taylor, and Ray H. Witt Awards. **(Ticketed Event)**

Additive Manufacturing Division**1:30 – 3 p.m.****Room: A314**

Session Chair(s): **Kirk Rogers**, Case Western University, Cleveland, OH; **Jerry Thiel**, University of Northern Iowa, Cedar Falls, IA

Track: Technical**Panel: Hard Tooling (19-196)**

Jerry LePore, Spectra3D Technologies, Candler, NC; **Garrett Iverson**, Scenic Industries LLC, Chattanooga, TN; **Alex Brown**, Seneca Foundry, Webster City, IA; **Jiayi Wang**, **Kapil Gangwar**, University of Northern Iowa, Waterloo, IA; **Jeremy Owen**, RP America, New Sharon, IA

The AFS 3D Printed Hard Tooling committee's goal is to develop technologies that produce printed foundry patterns and other tooling in half the time and at half the cost of conventional tooling manufacturing. This session will provide an update on new advances in 3D printing for hard tools and give case studies of how foundries have utilized these new technologies.

Panel Topics:

LePore: Printed Sand Patterns for Chemical Bonded Molds**Iverson:** Printed Polymer Disa Tooling Capabilities**Brown:** Utilizing 3D Printing to Compress Launch Schedules in the Foundry and Machining Processes**Wang/Gangwar:** Optimization of Printer Settings for Production of Foundry Tooling**Owen:** Printed Stereolithography Apparatus Sand Tools**Aluminum Division****Room: A311**Session Chair: **Adam Loukus**, REL Inc., Calumet, MI**Track: Technical****Reduced Silicon Alloys for Enhanced Casting Performance (19-008)****David Weiss**, Eck Industries, Inc., Manitowoc, WI

Aluminum alloys 357 and 356 are widely used "workhorse" alloys for military, aerospace and commercial applications. These alloys combine excellent casting characteristics with moderate strength. Silicon combines with the magnesium in these alloys to form Mg₂Si which strengthens the alloys. The Si levels exceed what is required for the strengthening mechanisms and excess Si is added to improve fluidity, hot tear resistance and feeding characteristics. Improvements in metal cleanliness and casting techniques over the years suggest the amount of Si can be reduced without significantly affecting casting characteristics. Mechanical properties of lower Si alloys show a significant increase in ductility without a reduction in either tensile or yield strength. Toughness also increases with lower Si content, making these alloys useable in a wider range of applications.

New High Strength 3xx Series Alloy Case Study:**K
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Y** **Technical Session** **Keynote Speaker****Management****CastExpo****Institute Course****Special Event**

Automotive Wheel Weight Reduction (19-039)**Francis Breton**, *Rio Tinto, Saguenay, QC, Canada*

A356.2 and 357.2 are the most common alloys in the foundry industry. They provide medium to high strength with excellent fluidity and corrosion resistance. Higher strength variants can be associated with formation of coarse iron bearing constituents which have a negative impact on the strength and ductility. Specific alloying additions were made to A356.2 and 357.2 to eliminate b and p phase formation and as a result improved the strength/ductility ratio. The influence of part thickness on the mechanical properties and iron phase morphology was studied. Industrial trials of the new alloy were performed using an optimized automotive wheel design. Due to the inherent higher mechanical properties, 7% weight reduction was obtained compared to the original design. Testing requirements were successfully met with 13° and 90° impact along with rotary/cornering fatigue. The new alloy can therefore allow automotive wheel weight reduction and be applicable to other market segments.

Clean A356 Shred as a Substitute or Addition to Primary A356.2 to Increase Competitiveness and Reduce Carbon Footprint of Castings (19-040)

Guy Morin, *CMQ - Quebec Metallurgy Center, Trois Rivières, QC, Canada*; **Martin Hartlieb**, *Viami International Inc., Beaconsfield, QC, Canada*; **Franco Chiesa**, **Gheorghe Marin**, *Quebec Metallurgy Center, Trois-Rivières, QC, Canada*

Eccomelt356.2 is produced by recycling A356.2 aluminum wheels using a proprietary crushing and cleaning process. Not being remelted, it has the lowest possible carbon footprint. It can replace primary A356.2 ingots (in part or completely) and with (often minor) chemistry adjustments other high quality aluminum alloys can easily be produced. The Quebec Metallurgy Center (CMQ) has assessed the quality of eccomelt356.2 through extensive analysis of the metal, its surface condition, melting and casting behavior. Best/necessary practices for foundries wanting to utilize this material were determined. Also test bars were cast in sand and permanent molds. Metal quality and tensile properties of castings made completely from eccomelt356.2 met or exceeded ASTM requirements for both casting methods. Fluxing did not improve these properties, which shows the metal is very clean and does not require extensive cleaning treatment.

Cast Iron Division**Room: A312**

Session Chairs: **Ryan Spaulding**, *Neenah Foundry Co., Neenah, WI*; **Angella Sell**, *Applied Process Inc., Livonia, MI*

Track: Technical**AFS Research: Effects of Metallurgical Factors on Microporosity in Ductile Iron Castings (19-157)****Simon Lekakh**, **Michael Khayat**, *Missouri University Science and Technology, Rolla, MO*

The objective of this study was complex evaluation of metallurgical factors affecting microporosity formation in ductile Iron castings. The design of experiment (DOE) test matrix included five variables at two levels: melt quality (with and without SiC in charge), nodulizer composition [(low vs high REM), inoculant addition and composition (foundry grade FeSi vs Ce-bearing inoculant) and pouring temperature (low (1280-13000C) vs high (1380-14000C)]. Four experimental heats with four variations in metallurgical parameters per heat were performed according to the DOE matrix. Each mold had a cone to study the total volume of shrinkage and a horizontal plate with attached vertical cylinders to study microporosity using Archimedes density method, metallography, SEM, optical profiler, and high-resolution 3D CT scan. MiniTab software was used for statistical analyses of individual and joint effects of studied metallurgical parameters on microporosity and microstructure. Optimal metallurgical parameters for the prevention of microporosity were discussed.

Shrinkage Analysis Considering Expansion and Contraction Behavior

KEY

 **Technical Session**
 **Keynote Speaker**
 **Management**
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 **Institute Course**
 **Special Event**

in Heavy Section Spheroidal Graphite Iron Castings (19-012)

Yutaka Miyamoto, *Ube Steel Co., Ltd., Ube, Japan*; **Haruki Itofuji**, *Adstefan Casting Solution Center, Ube, Japan*

A furan-sand molded casting with heavy section was poured, and the tendency of shrinkage cavities was surveyed in detail. Shrinkage cavity prediction simulation considering theoretical volume changes such as liquid shrinkage, austenite shrinkage and graphite expansion during solidification using the method of CAE analysis was attempted to adapt the phenomenon. The results showed good matching between phenomenon and calculation on the accuracy of shrinkage position and quantity. In practice, the analyzing method was applied to some castings. Their results satisfied foundry engineers.

Environmental Health & Safety Division

Room: A313

Session Chair: **Fred Kohloff**, *Keramida Inc., Indianapolis, IN*

Track: Technical

A Road Map for Improving Foundry Industry Safety (19-023)

Ted Schorn, *Enkei America, Inc., Columbus, IN*

AFS and other professional foundry associations have been striving to improve the safety statistics of the industry for many years now with less and less effect. The challenges to making an impact on foundry industry safety performance are described along with a strategy for action intended to facilitate progress toward improved safety metrics. The resources available to implement this strategy are described along with the core safety message that must be understood.

Safety Runway, Wear It Right – Better Informed Means Better Protected (19-077)

Dana Cooper, *Cooper Hayes LLC, Stevensville, MI*

Learn more about common workplace hazards and personal protection safety solutions driven by opportunities. Understand different ways of how we can effectively communicate and engage your teams to drive use of personal protective equipment. The engagement communications can assist with PPE product selection, creating workplace programs and more. New training methods can improve training and drive opportunities for change.

Future Leaders of Metalcasting Division

Room: A315

Session Chair: **Cathy Potts**, *American Foundry Society, Schaumburg, IL*

Track: Management

Response Agility: Authentic Leadership in a Changing World (19-175)

Margaret Graziano, *KeenAlignment, San Jose, CA*

Response agility is our keen ability to choose our response in each moment. Responses are based on thoughts, and thoughts are products of how we interpret the world around us. We have complete power to change our natural responses by altering our interpretation in real-time. Our response to unexpected, unanticipated and often unwanted challenges shapes the perception of who we are. With response agility, we respond in an appropriate, controlled manner – regardless of the current stress or breakdown we are experiencing. Agility in our response means we have purposefully chosen how we interpret the world and trained our self to think before reacting.

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Aluminum Division

Room: A311

3:15 – 4:45 p.m.Session Chair: **Brian Began**, *Foseco, Cleveland, OH***Track: Technical****Ultrasonic Technique for Inclusion Detection in Aluminum Foundries – Past, Present, and Future (19-033)****Rafael Gallo**, *Pyrotek Inc., Aurora, OH*

In the last three years, extensive online molten aluminum assessments, using the ultrasonic inclusion detection system, were conducted in several aluminum foundries (permanent mold, HPDC, and sand) in Canada, Mexico, and the U.S. During the trials, parallel evaluations with Prefil, Podfa, RPT, quality of actual castings, and SEM of casting defects were also performed. Inclusion assessments were conducted in different furnaces and transfer ladles under different charging mixes, and molten treatments. This session will discuss the status quo of the technology with emphasis on both the theoretical advancements made up to date and the practical relevance of the MV 20/20 system for aluminum foundry applications.

Degassing and Flux Grain Refining in a Continuous Well at Littlestown Foundry (19-015)**John Stonesifer**, *Littlestown Foundry, Littlestown, PA*; **Brian Began**, *Foseco, Cleveland, OH*

This presentation documents a project where a rotary degassing unit outfitted to perform periodic grain refinement treatments in A356 aluminum via a cleaning and grain refining flux was implemented into a continuous treatment well in a melting furnace-laundry-pouring well foundry floor plan. It will discuss the rationale for targeting the flux form grain refinement at Littlestown Foundry. Moreover, the process used to install the system and to verify the required cadence of grain refinement treatments will be shared. Finally, the presenter discusses the various benefits achieved during the first three months after implementation which include a reduction in grain refining spend of \$276 per production day, an improvement in elongation from 4% to 5%, a slight improvement in tensile and yield strength(s) and a 10-fold reduction in average monthly impregnation costs from more than \$1,500 to less than \$150 per month.

New Filter Design to Replace Ceramic Foam Filters (19-083)**Jay Fritzke**, *Pyrotek Inc., Spokane, WA*; **David Weiss**, *Eck Industries, Inc., Manitowoc, WI*

This presentation will describe the investigation into replacing ceramic foam filters (CFF) with a new filter style, rigidized glasweave (RGW). The ability to replace ceramic foam filters for in-mold filtration has numerous advantages for foundries. This session will outline the development of a new filter and the results from field trials and production castings. These filters have shown a reduction in pour time variation over CFF. This consistency in predicting pour time for mold filling is especially important when it comes to automatic mold filling systems. The ability to remelt gating with filters in place has economic benefits to most foundries as well. The design of this filter has the advantage of reducing metal bypass in the filter pocket of the mold. This bypass can contribute to unfiltered metal as well as metal jetting past the filter, causing turbulence on the downstream side.

Cast Iron Division**Room: A312**Session Chairs: **Marc King**, *Ferroglobe, Beverly, OH*; **Josh Keller**, *Bremen Castings Inc., Bremen, IN***Track: Technical****Panel: Cast Iron Process Committee – Iron Foundry Process Innovation (19-089)****Marc King**, *Ferroglobe, Beverly, OH*; **Josh Keller**, *Bremen Castings Inc., Bremen, IN*; **Ron Spencer**, *Rochester Metal Products Corp, Rochester, IN*; **David Kesse**, *Metal Technologies, Auburn, IN*; **David Yahl**,

KEY

**Technical Session****Keynote Speaker****Management****CastExpo****Institute Course****Special Event**

Honda Engineering of America Inc, Anna, OH

A diversified panel will present techniques that innovate foundry process, metallurgical control, quality control, defect analysis and scrap reduction.

Panel Topics:

King: Gas Defect Evaluation

Keller: 3D Sand Printing and Simulations

Spencer: Scanning Arm Technology

Kesse: Effect of Casting Temperature on Fracture Surface Coloration

Yahl: Metallurgical Improvements for Centrifugal Gray Iron Cylinder Sleeves

Molding Methods & Materials Division

Room: A314

Session Chairs: **Jeff Krause**, *HA International LLC, Westmont, IL*; **Stephen Neltner**, *Refcotec Inc., Orrville, OH*

Track: Technical

Silver Anniversary Lecture: Alternative Granular Media in the Past Quarter Century (19-178)

Sam Ramrattan, *Western Michigan University, Kalamazoo, MI*

An update of paper 96-113 "Study of Foundry Granular Media and Its Attrition" will be presented. This publication focused on alternative granular media for the foundry industry. An alternative molding media that can withstand breakdown and overcome the drawbacks of silica must be seriously evaluated as a way to control production costs in the foundry industry. Twenty-five years later, this subject remains fresh due to the 2018 Silica Rule and the quest for near-net shaped castings. This presentation will identify materials that are readily available as alternatives to silica sand, from a functionality

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standpoint. Specific benefits of an alternative media may counter the recognized shortcomings in silica sand. A solution to these problems means better quality of casting; and better quality means less scrap and increased productivity. The discussion will involve alternative granular media in both green and chemically bonded sand processes, molding technology, sand testing, process control and reclamation.

Principal Component Analysis on Thermal Distortion Data to Detect Process Shifts in Resin Coated Chemically Bonded Sands (19-127)

Prayag Patel, Lee Wells, Sam Ramrattan, *Western Michigan University, Kalamazoo, MI*

This presentation investigates the capability of monitoring sand binder systems TDT data. TDT is considered for this purpose because it provides coupled thermal-mechanical sand-binder system behavior at head pressures and temperatures that can be adjusted to represent actual casting scenarios. TDT produces a high-dimensional dataset, as it produces multiple time-series profiles, referred to as thermal distortion curves (TDCs). In order to effectively use this dataset, multivariate statistical analysis for process monitoring. More specifically, principal component analysis (PCA) is applied to the dataset for the purpose of dimension reduction and monitoring. The proposed monitoring scheme will be demonstrated through a case study. For this study, six resin coated sand (RCS) binder systems with the same sand and binder type but varying binder levels are analyzed. The ability of the proposed monitoring scheme to detect the shift from one sand binder system to another will be determined.

Steel Division

Room: A313

Session Chair: **David Van Aken**, *Missouri University of Science & Technology, Rolla, MO*

Track: Technical

A Quasistatic Uniaxial Compression Behavior of Selective and Variable Density Open Cell Foundry Steel Foam (19-048)

Tory Johnson, *University of Wisconsin-Milwaukee, Port Washington, WI*; **Ajay Kumar**, **Nick DiPasquale**, *University of Wisconsin-Milwaukee, Milwaukee, WI*; **Patrick Severson**, *University of Wisconsin-Milwaukee, Whitefish Bay, WI*; **Hathibelagal Roshan**, *Maynard Steel Casting Co., Milwaukee, WI*; **Pradeep Rohatgi**, *University of Wisconsin-Milwaukee, Milwaukee, WI*

In this presentation, low alloy steel foam plates were developed using a sand casting process that uses nobake sand molds and 3D printed sand cores to incorporate the desired porous structure in the steel with 20-50% less weight than solid steel. Quasistatic uniaxial compression tests were performed at a strain rate of 0.0005s⁻¹ - 0.002s⁻¹ to characterize developed steel foam. The focus of this study was to verify that new developed steel foam can absorb more energy per unit mass (kJ/Kg) than an identical alloy in solid form. Energy absorption relevant to structural needs of the components and fracture behavior was determined experimentally. Results showed an increase of energy absorption in steel foams calculated up to densification strain. This cost-effective process may open doors to many existing and some new engineering applications. Energy dissipation via compressive deformation at low and constant stress levels is useful for army, naval and civil applications.

A System for the Thermal Analysis of Steels (19-115)

Het Kapadia, Robert Tuttle, *Saginaw Valley State University, University Center, MI*

This session will discuss the bindings of a single thermocouple thermal analysis system for steel. This system can provide a method for grain refining process control of steels. Heats of 4130 were poured in a thermal analysis cup with a thermocouple. To determine the best method, the cups were uncovered,

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 **Keynote Speaker**

 **Management**

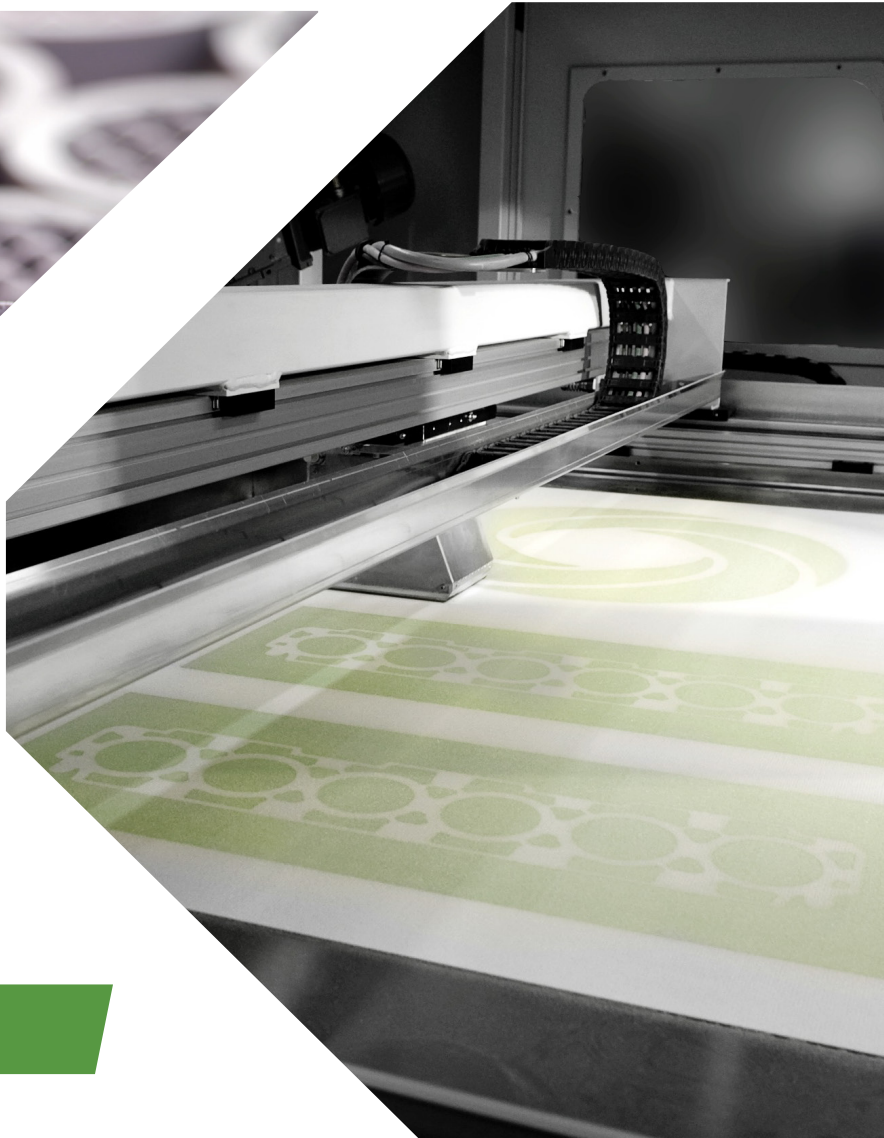
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covered at the top, and wrapped and covered to vary the cooling rate. A data acquisition system recorded the cooling curves and conducted data analysis. This data was then compared with data from thermodynamic predictions and reference data. The data obtained was close to the reference data for the liquidus, but the solidus and peritectic obtained did not match the data from thermodynamic predictions. This could be due to the size of the samples.

Development and Production of Ni-Cr-Mo Steel Castings for Low Temperature Applications (19-058)

Delin Li, Kumar Sadayappan, Peter Newcombe, Gabriel Birsan, *CanmetMaterials, Hamilton, ON, Canada*; **James Huang, Sylvain Morneau**, *Department of National Defence, Ottawa, ON, Canada*

Similar grades of Ni-Cr-Mo low alloy steels LC2-1, HY80, and Q1N are covered in the standards in ASTM A352, MIL-S-16216, and Q1 Navy Steel Canada. These steels can fulfill the requirements for low temperature applications including valves, flanges, and other components for pressure vessels, heavy construction equipment, and naval applications. In the present work, the efforts to optimize the composition and heat treatment of Q1N steel cast in chemically bonded sand molds are presented. Gating, riser design, deoxidation procedures, chemical compositions and heat treatment profiles were optimized to meet the casting quality and material properties.

Women in Metalcasting Division

Room: A315

Session Chair: **Sara Joyce**, *Badger Mining Corp., Berlin, WI*

Track: Management

Innovation Roundtables (sponsored by WIM) (19-125)

Alexandria Trusov, *B&L Information Systems Inc., Bridgman, MI*; **Sara Karp**, *Waupaca Foundry Inc., Waupaca, WI*; **Michelle Ring**, *American Colloid Co., Hoffman Estates, IL*; **Sandy Calabrese**, *General Motors, Defiance, OH*; **Emily Shedlarski**, *Mueller Co., Chattanooga, TN*; **Lizeth Alatorre**, *Neenah Foundry Co., Neenah, WI*; **Zeydi Gutierrez**, *McWane Inc., Oakland, CA*; **Sara Timm**, *Waupaca Foundry Inc., Waupaca, WI*

We all face challenges. The focus of these innovation roundtables is to arrive at meaningful, actionable solutions. Join us to discuss conflict resolution, how to ask for what you want (and get it); personal branding; management & supervision, sales & marketing, engineering, labor shortages and much more. Come with answers to share and bring your questions. Session moderators will have take-aways to share.

Reception and Annual Banquet

Omni Atlanta at CNN Center – International Ballroom



Join us for the presentation of the highest honor from AFS, the Gold Medal, to Von L. Richards, professor emeritus of materials science at Missouri University of Science and Technology. The reception bar opens at 6 p.m. and only accepts credit cards. The awards presentation and banquet start

6 p.m.

at 7 p.m. (**Ticketed Event**)

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MONDAY, APRIL 29

7 a.m.

Author/Chair Breakfast

Room: A302

This breakfast is for AFS speakers, session chairs, students, and staff to meet and coordinate details for the day's educational sessions.

8 – 9 a.m.

Aluminum Division

Room: A311

Session Chair: **Hideki Gabken**, *Standard Manufacturers Services, Winnipeg, Manitoba, Canada*

Track: **Technical**

Welding of Aluminum Castings: An Overview and Recommendations (19-014)

David Weiss, *Eck Industries, Inc., Manitowoc, WI*; **Mike Gwyn**, *NoRedesign LLC, Mt. Pleasant, SC*; **Keith Sturgill**, *ATI, Chester, VA*


In-process weld rework during finishing of as-cast surfaces on many kinds of castings is widely misunderstood by casting materials engineers, manufacturing engineers, and inspectors. In some cases, welding is prohibited, or restricted, or significant burdens are imposed to document welded casting. This session reviews current specifications and the results of testing done over the years on aluminum castings for aerospace, military and commercial applications. Proper welding technique and post processing recommendations also will be discussed for welding of aluminum alloy castings.



Rapid, Portable Residual Stress Quantification in Aluminum Diecastings With the Cos Alpha Method (19-068)

Joe Licavoli, *Gregory Beaudoin*, *Michigan Technological University, Houghton, MI*; **Alex Monroe**, *Mercury Marine, Fond du Lac, WI*; **Bill Traeger**, *Sinto America, Lansing, MI*; **Paul Sanders**, *Michigan Technological University, Houghton, MI*

During manufacturing, residual stress quantification is critical to performance optimization. Residual stress failures may occur during prototype development or design changes, and often are not discovered until machining or heat treating. X-ray methods such as $\sin^2\psi$ are commonly used for quantification purposes, but destructive sample preparation, long lead times, and high cost can lead to inadequate replication and slow issue resolution. A rapid and portable system is needed for prototype development and production quality control. The cos alpha method rapidly measures residual stresses to troubleshoot problems and avoid costly requalification of new tooling. Equipment utilizing this method is fast, nondestructive, and low cost. Residual stresses in a large aluminum diecasting were modeled. Residual stresses were previously quantified in production castings using neutron diffraction. Similar production castings were assessed using the cos alpha method, including a gage repeatability study. Stress measurement comparisons are made between the three methods.

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Engineering Division**Room: A313**Session Chair: **Chuck Kurtti**, Neenah Foundry Co., Neenah, WI**Track: Technical****Panel: Energy Reduction Solutions (19-158)**

Mike Meyer, AAM-Castings, Wauwatosa, WI; **Paul Smith**, Neenah Foundry Co., Neenah, WI; **Dave Paulsen**, Furness Newborge Inc., Versailles, KY; **Kyle Metzloff**, University of Wisconsin/Platteville, Platteville, WI

Panelists will share their experiences revitalizing Wisconsin foundries by evaluating and implementing energy saving emerging technologies (sponsored by Wisconsin Focus on Energy and Wisconsin Cast Metals Association).

Panel Topics:

Meyer: Automatic Thermal Moisture Analysis Equipment**Smith/Paulsen:** Mull-to-Energy**Metzloff:** The Next Step: The Application of Campbell Gating in Your Foundry for Yield and Quality Improvement**Government Affairs Division****Room: A315**Session Chair: **Stephanie Salmon**, AFS Washington Office, Washington, D.C.**Track: Management****Hot Topics in Labor and Employment Law for 2019 (19-172)****James Paretto Jr.**, Littler, Washington, D.C.

What's trending in the world of labor and employment law for metalcasters? 2019 is likely to bring further federal legislative and/or administrative developments, as well as more state and local



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regulatory efforts in key labor and employment areas. Jim Paretti, lawyer and shareholder at Littler law firm, has over two decades of experience working with federal legislators and policymakers, and senior level administration officials. Prior to joining Littler, Paretti was chief of staff and senior counsel to the acting chair of the Equal Employment Opportunity Commission. During this session, you'll gain the information necessary to ensure your company stays compliant with recent legal changes and learn about recent federal and state developments concerning the following key issues: overtime rule, joint employer, Affordable Care Act, immigration law/enforcement, paid family leave, marijuana laws, drug testing policies, wellness programs and more.

Molding Methods & Materials Division

Room: A314

Session Chairs: **Jay Zins**, *Dotson Iron Castings, Mankato, MN*; **DJ Couture**, *Retired, General Motors, Bay City, MI*

Track: Technical

Evaluation of Emissions in Green Sand and Casting Comparisons (19-050)

Vic LaFay, *Imerys Minerals, Cincinnati, OH*; **Sairam Ravi**, *Jerry Thiel, University of Northern Iowa, Cedar Falls, IA*

For many years, researchers in the foundry industry and universities have been developing testing protocols to evaluate the emission characteristics of prepared green sand during pouring, cooling and shakeout. The presentation will review the testing protocol and methods utilized in the collection and evaluation of these emissions. An important criteria is the quality of casting produced (defect free) when the emission characteristics are reduced. This presentation will also include the laser imaging evaluation of the castings that is the result of the green sand foundry emissions.

Predicting the Impact on Green Sand Emissions as a Function of the Concentration of Carbonaceous Additives (19-082)

Liam Miller, **Ray Vakili**, **Jason St. Onge**, **Zhen Wang**, *American Colloid Co., Hoffman Estates, IL*



Minerals Technologies Inc. (American Colloid Company) receives approximately 2,500 commercial green molding sands per year from its foundry customers for characterization at its corporate laboratory. These commercial sands contain different concentrations and ratios of carbonaceous materials and bentonite clays that a given facility uses to prepare their molding sands. Design of Experiment methodology was used in combination with Analysis of Variance (ANOVA) to show that carbonaceous additives seacoal and causticized lignite in the bentonite based pre-blend are statistically significant factors in predicting emissions output as measured using pyrolyzer Gas Chromatography Mass Spectrometry (pyrolyzer/GC-MS) analytical methods. Hazardous Air Pollutants (HAPs) were measured in a laboratory setting. A model was generated from the results of the ANOVA to predict emissions of molding sands as a function of their seacoal and causticized lignite concentrations.

9 a.m. – 5 p.m.

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Exhibit Hall A

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9:15 – 10:15 a.m.**Aluminum Division****Room: A311**Session Chair: **Ben Groth**, *Foseco, Pittsburgh, PA***Track: Technical****Molten Cleanliness Assessment in a Low-Pressure Foundry (19-109)****Rafael Gallo**, *Pyrotek Inc, Aurora, OH*

A project was conducted over several months to assess the molten aluminum cleanliness in a low-pressure foundry manufacturing aluminum wheels with the aim to further improve molten quality. The joint collaboration aimed to advance the comprehension of how inclusions in molten baths are affected by the daily melting, and the molten handling and treatment practices. The assessments were carried out by using three different technologies: MV 20/20 ultrasonic inclusion detection system, and Prefil (provided by Pyrotek), and PoDFA (provided by Superior). All the assessments were accomplished under standard production conditions. The metallurgical findings and technical explanations will be presented, and the concepts discussed can still apply to advance general molten metal processing understanding.

Characterization of Si and Cu Segregation in Al Alloy A356+0.5%Cu for Cylinder Head Applications (19-060)

Audrey Jean-Philippe, *Advanced Casting Research Centre, WPI, Worcester, MA*; **Harold Brody**, *University of Connecticut, Storrs, CT*; **Diran Apelian**, *Metal Processing Institute, WPI, Worcester, MA*; **Benoit Drieu**, *Montupet Laigneville, Laigneville, France*; **Denis Massinon**, *Montupet SA, Livonia, MI*

A356+0.5%Cu alloy is widely used for cylinder head applications in the automotive industry. The complex shape and multiple section variations influence the fluid flow during solidification and engender macro-segregation. Evaluating the impact of segregation of alloying elements on the solidification dynamics is a challenge for casters. The aim of this work is to analyze the contribution of Si and Cu on the resultant segregation. Experiments have been performed on binary alloys Al-7%Si, Al-4.5%Cu and on A356+0.5%Cu alloy. Measurements on test castings show that shrinkage induced flow overpasses the buoyancy forces, and the alloy elements tend to balance the segregation of each other in the A356+0.5%Cu alloy.

Cast Iron Division**Room: A312**Session Chairs: **David Gilson**, *SinterCast Inc., Naperville, IL*; **Brad Steinkamp**, *Dura-Bar, Woodstock, IL***Track: Technical****Structure of Spheroidal Graphite Nuclei and Spheroidizing Mechanism of Graphite in Mg-Treated Ductile Iron (19-087)****Jingjing Qing, Mingzhi Xu**, *Georgia Southern University, Statesboro, GA*

Spheroidal graphite in a Mg-treated ductile iron was studied using a transmission electron microscope (TEM) and an atom probe tomography (APT). The ductile iron was quenched to maintain early solidification structures. Non-carbon atoms were found in the graphite lattice using TEM and APT. Nuclei of the spheroidal graphite were made of magnesium oxide core surrounded by Al-Mg silicate lobes and Mg-Ca sulfide lobes. Atomic resolution TEM images revealed the semi-coherent interfaces between the graphite and the nuclei. Distortion of the graphite basal planes were observed near the nuclei. Energy Dispersive X-ray (EDX) analysis revealed presence of non-carbon atoms in the graphite lattice next to the nuclei. High sensitivity and high spatial resolution technique, APT, was utilized to understand the element distributions near the graphite/matrix interface for this ductile iron. Entrapment of large non-carbon atoms in the graphite lattice is proposed to account for the curvature formation of graphite basal planes.

Engineering Division

Room: A313

Session Chairs: **Brandon Kruse**, *Sinto America, Lansing, MI*, **Patrick McCrevan**, *B&L Information Systems Inc., Bridgman, MI*

Track: Technical

Panel: Dealing With New OSHA PEL Rules – A Study on Working Foundry Engineering Changes and Investigation Into Ceramic Sand Solutions (19-159)

Doug Smith, *Rochester Metal Products Inc., Rochester, IN*; **Tim Street**, *Bahr Bros Manufacturing Co., Marion, IN*; **Dave Fazakerley**, *Eagle Alloy Inc., Muskegon, MI*; **Greg Raudenbush**, *Regal Cast Inc., Lebanon, PA*; **Chris Prendergast**, *Clow Valve/McWane Foundry Group, Oskaloosa, IA*; **Wil Tinker**, *Tinker Omega Sinto LLC, Springfield, OH*

On March 25, 2016, OSHA published new, comprehensive Permissible Exposure Limits (PEL) silica standards and began enforcement on June 23, 2018. Many foundries have taken varying paths to address the new requirements that include significant engineering changes and/or the elimination of silica within their facility through the conversion to ceramic media. The panel features representatives from some of those foundries who will discuss their tactics and results and answer questions about the process of compliance.

Marketing Division

Room: A315

Session Chair: **Shannon Wetzel**, *American Foundry Society, Schaumburg, IL*

Track: Management

Casting of the Year: Good News Into New Business (19-201)

Oliver Johnson, *Tooling & Equipment International, Livonia, MI*

After winning the 2018 Casting of the Year, Tooling Equipment International used that success to build on its reputation of forward-thinking design and engineering for cast prototypes to mass production.

Building Buyer Answers Into Your Sales & Marketing Materials (19-074)

Dana Cooper, *Cooper Hayes LLC, Stevensville, MI*; **Alexandria Trusov**, *B&L Information Systems, Bridgman, MI*

Anticipating your buyer needs to provide data into your company's marketing materials allows you to advance quicker. We will discuss the process by which metalcasters create value for buyers/customers and build strong customer relationships in order to capture value from customers in return. A company's marketing decisions should consider buyers' wants, the company's requirements, consumers' long-run interests, and society's long-run interests. Industry examples will be included in the dialogue along with unique takeaways for the audience.

Molding Methods & Materials Division

Session Room: A314

Session Chairs: **Mitchell Patterson**, *HA International LLC, Westmont, IL*

Track: Technical

Case Studies on the Use of a Green Sand Additive to Optimize the Sand System (19-055)

Harry Seibel, *Stephen Neltner, REFCOTEC, Orrville, OH*

Adequate preparation of the molding sand has long been a priority for the green sand foundry to achieve the best possible green sand casting. Metalcasters realize that ultimately their castings are only as good as the molds in which they are poured. But there have always been factors that have limited the optimum mixing/mulling of the green sand. Among these factors are equipment wear, equipment calibration, hot sand, cold sand, varying quantities of core sand influx, pressure on shorter mulling cycles due to molding sand demand, and inconsistent return sand to name a few. This presentation is a summary of case studies of foundries that decided to use a liquid green sand additive to minimize the effects of variables that affect the mulling quality. Information from these foundries as well as laboratory data showing

the effectiveness of using this additive.

The Synergistic Effects of Refractory Coatings and Sand Additives in Controlling Veining, Metal Penetration and Surface Finish in PUCB Systems (19-070)

Paula Vivas, Matthew Shoffner, Marek Simon, Elis Rivera, Lee Horvath, ASK Chemicals LP, Dublin, OH

The development of more effective engineered sand additives and refractory coatings has significantly helped to reduce or eliminate casting defects such as veining, metal penetration and surface finish for castings made using chemically-bonded molds/cores. The goal here is to systematically understand/quantify the contribution that each of these materials has during the casting process. However, this process is a multi-variable one so in order to gain deeper insight of the overall effects of these materials, the individual variables/parameters need to be analyzed simultaneously. A design of experiments (DOE) was developed to show the impact of both materials and process together. The aim is to enhance our understanding of the synergistic effects between sand additives and refractory coatings to eliminate casting defects. This improved understanding will help facilitate the correct choice of materials used for foundry operations, eventually leading to reduced scrap rates in phenolic-urethane cold box applications.

Catch Me If You Can

10:30 – 11:30 a.m.

Frank Abagnale, Abagnale & Associates, Washington, D.C.

Keynote Presentation

Room: A411

Session Chair: Jean Bye, Dotson Iron Castings, Mankato, MN

Frank Abagnale provides entertaining insight into his life as the notorious imposter of the 1960, a thrilling story told in the award-winning movie and Broadway musical, *Catch Me If You Can*. By age 21, Abagnale was known as America's most gifted con man, successfully impersonating an airline pilot, pediatrician, stockbroker, college professor, and assistant attorney general, all while cashing \$2.5 million in forged checks. Audiences will experience an emotional roller coaster ride as Abagnale describes his escapades and reveals how he learned to live on the right side of the law.

Session is open to all attendees. Space is limited.

Additive Manufacturing Division

11:30 a.m. – 12:30 p.m.

AFS/FEF Student Technology Contest

The HUB

11:45 a.m. – 4 p.m.

Spouse's Tour

Swan Coach House

Spouses and guests of **CastExpo 2019** attendees will meet outside Lobby B at the bus pick-up area. A designated bus with signage will depart promptly at 11:45 a.m. for the Swan Coach House, located suburban Atlanta. The tour will start with lunch in the Bellenita Room and Terrace, and guests are then encouraged to visit the art gallery and store located next door. The bus will then be stationed where the drop off was around 4 p.m. for transport back to the Georgia World Congress Center.

(Ticketed Event. Space is limited.)

**K
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Technical Session

Keynote Speaker

Management

CastExpo

Institute Course

Special Event

1:30 – 4:30 p.m.**AFS Institute****Room: A316****Track: Technical****Training Best Practices Workshop (19-131)****Clarence Trowbridge**, *AFS Institute, Schaumburg, IL*

The purpose of this course is to provide operations and training leaders with tools and templates to support training efforts at their facilities. This course will provide a strategic view of industrial training with specific applications based on your company's situation. This workshop is highly interactive and you will be asked to share your experience and insight. This workshop will focus discussions around training strategies and solutions specifically for operations/production and maintenance employees.

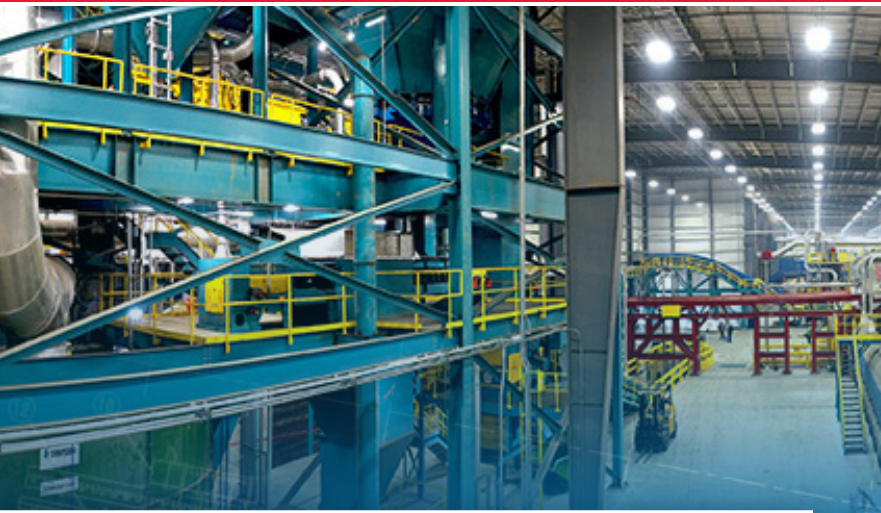
1:30 – 3 p.m.**Room: A314**Session Chairs: **Jiten Shah**, *Product Development & Analysis LLC, Naperville, IL*; **Brandon Lamoncha**, *Humtown Products, Columbiana, OH***Track: Technical****Sand Distribution Effect on 3D Printed Sand Properties (19-057)****Kip Woods**, *Emerson Automation Solutions, Marshalltown, IA*; **Scott Giese**, *University of Northern Iowa, Cedar Falls, IA*; **Sudhir Trikha**, *HA International, Westmont, IL*

The purpose of this study was to assess the impact screen distribution has on the final properties of 3D printed silica sand. The aggregates selected were 57-grain fineness number (GFN) and 70 GFN three screen sands. These Illinois St. Peters deposit sands were a high purity round grain silica and had low trace contaminants, to reduce any possible influence from contaminants. The resin system utilized in this investigation was a commercially available furan resin system. Sand printer settings were adjusted for four different resin contents on the printed test specimens. The test criteria to determine a difference between the selected screen distributions would be evaluated by the test samples: mass, tensile strength, scratch hardness, permeability, density, and loss of ignition. Sixteen trials were completed with eight being replicate trials. The analysis revealed at traditional foundry resin levels the 70 GFN retained higher tensile and scratch hardness than the 57 GFN.

Panel: 3D Sand Printing for Metalcasting: Current State, Business Opportunities and Future Trends (19-194)**Guha Manogharan**, *Pennsylvania State University, State College, PA*; **Dave Rittmeyer**, *Hoosier Pattern Inc., Decatur, IN*; **Mark Adamovits**, *ExOne, Irwin, PA*

Industry and subject-matter experts in the area of 3D sand-printing technology will share their experiences on state-of-current technology on foundry aggregates and various binders; 3D printed sand properties, practical examples, opportunities to re-think traditional design and success stories including a landscape of AM for metalcasting based on survey results from U.S. foundries.

Aluminum Division**K
E
Y** **Technical Session** **Keynote Speaker** **Management** **CastExpo** **Institute Course** **Special Event**



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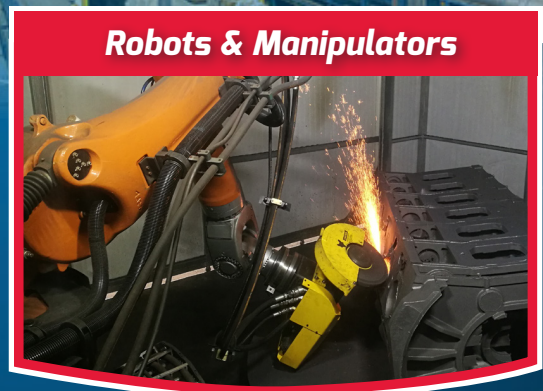
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Room: A311Session Chair: **David Weiss**, *Eck Industries Inc., Manitowoc, WI***Track: Technical****50 Years of Foundry-Produced Metal Matrix Composites and Future Opportunities (19-036)****Pradeep Rohatgi**, *University of Wisconsin-Milwaukee, Milwaukee, WI*; **David Weiss**, *Eck Industries, Inc., Manitowoc, WI*; **Ajay Kumar**, *University of Wisconsin-Milwaukee, Milwaukee, WI*

This is the Golden Anniversary paper of the 1969 AFS paper "Dispersion of Graphite Particles in Aluminum Castings through Injection of the Melt" and will review the progress in cast MMCs over 50 years. Property motivation and current use of MMC's components in automotive, railways, space, computer hardware, and recreational equipment are presented. Information on MMC industry including the total volume of MMC industry major producers of cast MMCs are listed. Some cast MMCs discussed will include aluminum-graphite, aluminum-silicon carbide, aluminum-alumina, and aluminum-fly ash. Current and future directions in Cast MMCs, including manufacture of foundry produced nano-composites, functionally gradient materials, syntactic foams, and self-healing and self-lubricating composites will be presented. Recent progress in manufacture of lightweight Self-lubricating cylinder liners for compressors, piston and rotary engines in Al-graphite and Al-graphite-SiC composites are discussed. Future foundry produced prospects of metal matrix composites will be presented.

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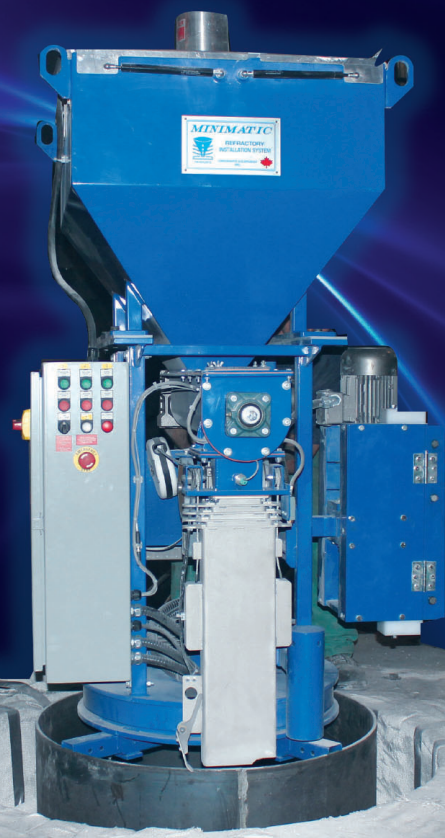
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Aluminum Matrix Nano-Composites (19-094)**Carl Soderhjelm, Jeremy Fedors, Brajendra Mishra**, *Worcester Polytechnic Institute, Worcester, MA*

Increasing the strength and stiffness of aluminum at elevated temperatures, around 230-300 C, is desirable for a multitude of applications, particularly for the lightweighting of automotive and aerospace cast components. One approach to achieving this is to disperse ceramic nanoparticles in the aluminum matrix, though effective and low-cost methods for doing so have not been demonstrated at an economical scale. Two promising processes to overcome this are the in-situ gas-liquid reaction (ISGR) and in-situ self-propagating high-temperature synthesis (SHS). AlN reinforcements from a nitrogen bubble reaction with aluminum are produced via ISGR, and TiC reinforcements from coarser Ti and C powders are produced via SHS, within aluminum melts. Updates to the progress of optimizing and scaling up nanocomposite production via these processes will be presented; as well as results of dilution of the nanocomposite material and ultrasonic dispersion of particles to allow for effective use in squeeze casting and high-pressure diecasting.

Cast Iron Division**Room: A312**Session Chairs: **Kathy Hayrynen**, *Applied Process Inc., Livonia, MI*; **Ryan Spaulding**, *Neenah Foundry Co., Neenah, WI***Track: Technical****AFS Research: Heat Treatments to Develop High-Strength Ferritic Ductile Iron (19-142)****Richard Gundlach**, *Gundlach Consulting Services, Farmington, MI*

The influence of grain size on mechanical properties of ferritic ductile was investigated. Alloys containing nominally 2%, 3% and 4% silicon were produced for this study. Various heat treatments were employed to produce a fine-grained ferritic structure. Hardness, tensile and Charpy impact properties were determined. Three alloys were austempered at 385 C (725 F). Austempered materials were annealed between 540 – 732 C (1,000 – 1,350 F) to produce a fine-grained, 100% ferrite matrix. Intercritical heat treatments were also performed to produce a fine-grained acicular microstructure. Samples were both air-cooled and oil-quenched from the intercritical temperature and subsequently annealed to ferritize the material and enhance toughness. Approaches to refine ferrite grain size were successful; the heat-treated alloys developed strengths comparable to the SSF 4.2% Si alloy. Based on the Charpy impact testing, the grain refined alloys displayed nil ductility temperatures below room temperature, while that of the 4.2% Si alloy was above room temperature.

AFS Research: Effects of Residual Copper and Manganese in High Silicon Solid Solution Ferritic Ductile Iron (19-059)**Julia Scruton, Dale Dewald, Paul Sanders**, *Michigan Technological University, Houghton, MI*

Transitioning from traditional grades of ductile iron to solution strengthened ferritic ductile iron grades can be difficult because of the need to reduce the amount of pearlite promoting elements, particularly copper and manganese, which are used in the traditional grades. Knowing the threshold of residual alloying elements will allow for more cost effective tailoring of the charge stream. Data was generated from a series of casting trials with the target grade of EN-GJS-600-10 where the levels of copper and manganese varied from 0.05% to 0.2% and 0.15% to 0.4%, respectively, while maintaining silicon in the 3.8-4.3% range. The pearlite content, tensile properties, and Brinell hardness were measured and analyzed. Using this data, a relationship connecting the copper, manganese, and silicon content in the iron to the pearlite content was developed and the effect of these high residuals on tensile properties was determined.

Engineering Division**K
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Y** **Technical Session** **Keynote Speaker****Management****CastExpo****Institute Course****Special Event**

Room: A313Session Chair: **Doug Starr**, *Saudi Mechanical Industries, Strongsville, OH***Track: Technical****Panel: Driving Down Costs Through Automation & Analytics (19-191)****Jim Wenson**, *Don Laundre, Roberts Sinto Corp., Lansing, MI*; **John Kuhn**, *Rimrock Corp., Columbus, OH*

As foundries strive to compete globally for business and domestically for labor, investments in automatic pouring systems and automation in the grinding room have become vital. Furthermore, Industry 4.0 and foundry analytics are transforming how foundries measure, control and maximize production by eliminating waste and predictive maintenance. This series of presentations seek to provide an overview of various technologies aimed at increasing foundries' productivity and competitiveness.

Panel Topics:

Wenson: Analytics**Laundre:** Automatic Grinding Systems**Kuhn:** Automatic Pouring**Marketing Division****Room: A315**Session Chair: **Wendy Pilcher**, *Magma Foundry Technologies Inc., Schaumburg, IL***Track: Management****Social Selling on LinkedIn (19-133)****Alzay Calhoun**, *Coveted Consultant, Atlanta, GA*

LinkedIn use has ramped up among B2B industries. Are you ready to cut through the noise, get noticed, and find ways to truly connect with others? Alzay Calhoun teaches B2B professionals how to make LinkedIn work for them. Social media like LinkedIn is meant to be social, yet so few people actually use it properly to connect! This session will help as attendees will:

- Understand how to use LinkedIn in a professional way
- Learn how to connect with contacts in a real, genuine way
- Get tips on managing their time on LinkedIn efficiently
- Learn how to cut through the noise by being a leader

Security and Compliance in Marketing (19-156)**Wendy Pilcher**, *Magma Foundry Technologies Inc., Schaumburg, IL*; **Chris Stewart**, *Knoebel & Associates, Menomonee Falls, WI*

This session will discuss the topic of security and compliance regarding marketing and social media for organizations in metalcasting. Session also will discuss General Data Protection Regulation (GDPR), policies and procedures in place at their organizations to ensure security and the correct use of social media.

Cast Iron Division**3:15 – 4:45 p.m.****Room: A312**Session Chairs: **Brad Steinkamp**, *Dura-Bar, Woodstock, IL*; **David Gilson**, *SinterCast Inc., Naperville, IL***Track: Technical****Evolution of Phases in a Graphitic White Iron (19-031)****Jie Wan**, *Missouri University of Science and Technology, Rolla, MO*; **Jingjing Qing**, *Georgia Southern University, Statesboro, GA*; **Perrin Habecker**, *Missouri University of Science and Technology, Rolla, MO*; **Mingzhi Xu**, *Georgia Southern University, Statesboro, GA*

Heat induced adhesive abrasion failure has often been found in metal-to-metal wear application, hence

interconnected flake graphite networks were deliberately generated in a white iron to increase its thermal conductivity, which is called graphitic white iron. An alloy with 11.03wt.% Cr was cast and investigated. Solidification sequence was determined based on microstructure and equilibrium calculation results. For the first time, it was found in the as-cast microstructure that M7C3 was formed during the eutectic reaction as a ledeburite-like structure and then transformed into cementite at a lower temperature. This unusual carbide reaction was verified by heating and holding the specimen at a temperature right below the solidus temperature and quenching in an agitated water bath. After the aforementioned heat treatment, M7C3-FCC two phase regions were found around the primary M7C3 carbides, as a result of carbon diffusion. Future work will focus on the kinetics of carbide transformation during heat treatment.

Effect of Filling Accuracy on Solidification Defects and Microstructures in Cast Iron (19-079)

Sung-Bin Kim, Dong-Hoon Roh, Young-Hoon Yim, AnyCasting Software Co., Ltd., Seoul, Republic of Korea

Numerical studies have been conducted to improve the accuracy of filling analysis in the complex and curved boundaries between casting and mold. The difference in the accuracy of the calculation of the melt flow acceleration near the wall at the boundaries leads to a large difference in the filling pattern and the initial temperature distribution of the melt. In this study, to verify the effect of such filling accuracy on solidification defects and microstructure, the sand casting of a real product, a bracket made of ductile cast iron using green sand mold and shell cores has been analyzed and its experimental and calculated results were compared. Depending on the accuracy of the filling analysis at the curved boundary, not only the flow-induced defects, such as gas entrapment and sand drops, but also the solidification-induced defects such as solidification shrinkage and crack sensitive areas have been changed considerably.

Engineering Division

Session Room: A313

Session Chair: **Brian McCarthy**, Versevo Inc., Hartland, WI

Track: Technical

Panel: Advancements in Engineered Castings – External and Internal Verification – Subtractive Sand Molds (19-192)

Wil Tinker, Tinker Omega, Springfield, OH; **Dirk Steiner**, YXLON, Hudson, OH; **Paul Oberle**, 3D Infotech, Inc., Irvine, CA

Panelists will discuss combining new technologies with existing to address quality, profitability, and the decrease in labor force.

Panel Topics:

Tinker: Robotic Machining of Molds and Cores - A Low-Cost Alternative to 3D Printing

Stein: 3D Scanning Castings Using Computerized Axial Tomography (CAT)

Oberle: Automated Inspection

Molding Methods & Materials Division

Room: A314

KEY		Technical Session		Management		Institute Course
		Keynote Speaker		CastExpo		Special Event

Session Chair: **Pete Gravunder**, *Badger Mining Corp., Berlin, WI*

Track: Technical

Panel: Reclamation of Foundry Sand for Reuse in Multiple Areas of the Foundry (19-090)

Chuck Gerth, *Amsted Rail, Granite City, IL*; **Annie Nelson**, *Waupaca Foundry Inc., Waupaca, WI*; **Jay Zins**, *Dotson Iron Castings, Mankato, MN*

This session covers reclamation and utilization of foundry sand and additives using different reclamation manufacturers' designs and equipment. Panel presenters will share their experiences and benefits using each of their systems' capabilities and share the requirements they need to be operated successfully.

Comparing Simulation With Gray Iron Casting Trials Using PUCB Disc-Shaped Sand Specimens (19-207)

Andrew Pike, *Mueller Co., Chattanooga, TN*

With today's emphasis on near-net-shape, thin wall iron castings, and with ever more stringent casting dimensional reproducibility requirements, there is a need for solidification simulations to predict the casting outcome. TDT has proven to be an efficient and effective laboratory technique for identifying anomalies and measuring distortion in various chemically bonded sand binder systems. However, the laboratory test is unable to address all the influences at the mold-metal interface. It is important to conduct casting trials to provide evidence of the actual mold-metal interfacial issues. Especially when laboratory testing supports the casting trials. An improved casting trial that allows several specimens to be wetted simultaneously from a given alloy chemistry, head pressure and temperature was developed and simulated. Comparisons between the simulation results and casting trials were made, which suggest a relationship between the two at least partially based on geometry and core properties.

Steel Division

Room: A311

Session Chair: **Robert Tuttle**, *Saginaw Valley State University, University Center, MI*

Track: Technical

Inclusion Characterization in Cr-Mo Alloy Steel Castings Using SEM/EDS Microanalysis and Hypermapping (19-111)

Daniel DeMiglio, *ME Global, Minneapolis, MN*

Inclusion characterization by scanning electron microscopy (SEM) and silicon drifted (SD) X-ray energy dispersive spectroscopy (EDS) was performed in this investigation on as-polished samples sectioned from Cr-Mo alloy steel castings on material that was the first and the last to solidify. SEM/EDS X-ray energy spectra were used to characterize size and composition for all inclusion types.

EDS Hypermapping - where an X-ray energy spectra is acquired at each pixel within a scanned area - was used to analyze inclusion clusters and metal carbides. EDS Hypermapping provides a permanent record of material composition that can be recalled after the live SEM session for re-analysis at specific locations within each map. This paper discusses how SEM/EDS Hypermapping can be a versatile tool to complement conventional examination of alloy steel microstructures by optical microscopy.

Mechanical Properties and Impact Wear Resistance of 540 Brinell Hardness Mn-Si-Mo-V Steel (19-045)

Viraj Athavale, *Missouri University of Science & Technology, Rolla, MO*; **Thomas Yaniak**,

Caterpillar, Inc., Mossville, IL; Mingzhi Xu, David Van Aken, Missouri University of Science & Technology, Rolla, MO

A Mn-Si steel was formulated to minimize solidification shrinkage porosity with the goal of obtaining a high strength, impact resistant steel. Three chemistries baseline, plus 2wt% nickel and with 1.5%Ni but without vanadium were produced keeping a manganese to carbon ratio of 5:1. Steels were heat treated to produce an average prior austenite grain size of 50-70 μm , a lath martensitic microstructure, and a Stage I tempered hardness of BHW 535-550. Average tensile strengths were unaffected by alloy formulation. Yield strength and ultimate tensile strength averaged 215ksi and 280ksi. Alloy III showed the least dependence of tensile ductility with distance from the chill and varied between 11 to 7%. Nickel additions proved effective in enhancing both tensile ductility and impact toughness. Impact wear was simulated using a gouging abrasion test and the alloys demonstrated about 27% to 46% reduction in wear relative to currently used steel.

Filtration Efficiency of Inclusions in Lightweight FeMnAl Steels (19-098)

Koushik Karthikeyan Balasubramanian, Laura Bartlett, Ronald O'Malley, Soumava Chakraborty, Mingzhi Xu, Missouri University of Science & Technology, Rolla, MO

The goal of this study is to understand the efficiency of ceramic foam filters in removing different inclusion populations in a Fe-30Mn-9Al-1Si-0.9C-0.5 Mo steel. A mold design was created using fluid flow and solidification software. The design used a common pouring cup attached to two different but balanced gating systems, one that utilized a filter while the other one was unfiltered. Metallographic samples revealed extensive Al and Mn rich oxide bi-films in samples taken before the filter. Samples sectioned after the filter did not contain any bi-films. AlN inclusions comprised more than 50% of all the inclusions. The size of inclusions in samples taken before the filter was highest in mold 3 compared to the other two molds. Samples sectioned from mold 1 and mold 2 showed an inclusion removal efficiency of 38% and 39%. The last poured mold showed the highest inclusion removal efficiency of 55%.

Women in Metalcasting and Future Leaders of Metalcasting Divisions

Room: A315

Track: Management

Connecting, Networking, Engaging for Collaboration (19-099)

Dana Cooper, Cooper Hayes LLC, Stevensville, MI

A growing number of groups and companies are understanding the value of keeping the bond between employer, individuals, and employee long after the initial meeting. It's a smart strategy for managing talent as company leaders grapple with the tightest job market in more than 15 years. Trade schools and colleges are using social media to smooth the transition from being a student to becoming an alumni by helping the two groups connect and collaborate with each other. Companies are using social media to assist individuals to engage. The group will learn many techniques to enhance collaboration through software tools, google platforms, social media and face to face activities at facilities. Each member in the audience will take away actions for implementation in their organization or career plan.



Alumni Dinner

The World of Coca-Cola

AFS Alumni will experience the World of Coca-Cola and the real stories behind the world's most famous and most loved beverage brand. See the rich heritage of Coca-Cola with artifacts from yesterday and

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 **Management**
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 **Special Event**

6 p.m.

today. A reception will start on the Hub Patio (weather permitting) followed by dinner and sightseeing.

Shuttle service will be available from the Georgia World Congress Center to the World of Coca-Cola and back. Shuttles will be outside Lobby B at the Bus Pick-up area. There will be designated shuttles with signage available starting at 5:45 p.m. (**Ticketed event. Must be AFS Alumni to attend.**)

TUESDAY, APRIL 30**8 – 9 a.m.****Molding Methods & Materials Division**

Room: A314

Session Chair: **Scott Giese, Jerry Thiel**, *University of Northern Iowa, Cedar Falls, IA*

Track: Technical

AFS Research: A Measure of Flow – Compactability for Green Sand (19-126)

Sam Ramrattan, Mayank Patel, Neeraj Jagtap, *Western Michigan University, Kalamazoo, MI*; **Brian Rachwitz**, *EJ, East Jordan, MI*

There is no AFS standardized test to measure the initial flowability of sand as it is applied to the pattern surface. A new technique was developed to measure the flow-compactability of green sand. The testing methodology directly measures the flow of green sand (static flow) through square openings of various sizes prior to conducting an AFS standard compactability (dynamic flow). In addition to testing procedures, the calculation for a flow-compactability index was developed. Data was analyzed for a variety of green sand systems using the flow-compactability ability index to show that the technique can be used to discriminate among various green sand systems at various moisture levels. This research has identified that green sand systems having the same compactability level can have a differing flowability indices.

Data Driven Dynamic Optimization of Foundry Sand Testing (19-063)

Deepak Chowdhary, *MPM Infosoft Private Limited, Chennai, India*

This presentation is motivated by the emerging vision of automated data-driven optimization of foundry sand testing, making it possible to exploit the power offered by modern analytics technologies and heralding an era of dynamic, self-adjusting methods to improve casting quality. A multiplicity of existing approaches to sand testing focuses on discrete legacy knowledge in the foundry. Building upon research of machine-learning approaches, software can accurately prescribe sand testing frequency and resource allocations. A study took a crucial step further by considering dynamic scenarios where influencing sand properties to rejections can change over time. An optimization model applies unconstrained and constrained minimization of multivariate scalar functions among other machine learning methods.

Steel Division**Room: A313**Session Chair: **Laura Bartlett**, *Missouri University of Science & Technology, Rolla, MO*

Track: Technical

Consideration of Material, Labor and Production Costs in the Steel Casting Tooling Design Process (19-066)**Roy Stevenson**, *Magma Foundry Technologies, Inc., Schaumburg, IL*

Traditionally, steel foundry engineers had the primary goal of designing tooling to make a sound casting. Often the costs to produce the casting using the designed tooling has not been taken into account sufficiently. This has led to less than optimal profit margins and lost revenue. While the use of casting process simulation has aided the engineer in the task of producing a sound casting, simulation has not traditionally been used to consider the costs related to producing the casting using the designed tooling. This presentation highlights a steel casting case study, utilizing material, labor and production costs, which were integrated into the casting process simulation software interface. Having the costs associated with producing the casting when using each tooling design, along with the predicted quality level of each tooling design, gives the foundry engineer a much better idea of the true overall costs associated with a given tooling design.

Effect of Deoxidation and Pouring Practice on the Mechanical Properties of Stage-I Tempered Cr-Ni-Mo Steel (19-047)**Viraj Athavale, David Van Aken, Mingzhi Xu**, *Missouri University of Science & Technology, Rolla, MO*

Cr-Mo steel was melted using high sulfur and high oxygen practices to control nitrogen pick-up aiming to produce cast steel with high strength (>200ksi) and high hardness (BHW 500-550). Zirconium (high sulfur) or aluminum (high oxygen) additions were used for deoxidation. Addition of zirconium (0.02 wt%) with ZrN formation was found to be detrimental to notch toughness and dynamic fracture toughness. A high oxygen practice, addition of 0.02 wt% Al and filter was successful in producing a low nitrogen content, as low as 55 ppm, and the best overall cleanliness.

9 a.m. – Noon**CastExpo Show Floor**

Exhibit Hall A

9:30 – 10:30**How AFS Membership Can Support Your Business Success**

The HUB

Ben Yates, *American Foundry Society, Schaumburg, IL***11 a.m. – 1 p.m.****President's Luncheon and Annual Business Meeting**

Room: A412

Join the annual meeting and luncheon, where the election of AFS officers and directors will be announced. In addition, the AFS Award of Scientific Merit, Service Citations, Casting of the Year, Corporate Contribution Award and Millionaires Safety Awards will be presented. **(Ticketed event)**

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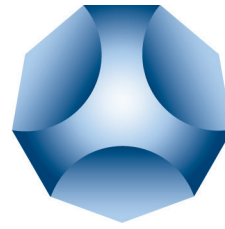
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SUPPLIER EXHIBITOR BOOTH LIST – ALPHABETICAL

(As of March 1, 2019)

A

ABP Induction LLC	Booth 1509
Abrasivestocks.com	Booth 950
Adams Burke & Associates LLC	Booth 2709
Advanced Foundry Specialists	Booth 821
Advanced Material Solutions	Booth 2925
Advanced Pattern Works	Booth 646
Air Products	Booth 1819
Ajax TOCCO Magnethermic Corp.	Booth 1117
Albarrie Environmental Services	Booth 904
Alcoa USA Corp	Booth 955
Allied Mineral Products	Booth 846
Allison Abrasives	Booth 2710
Altair Engineering Inc.	Booth 2149
Aluminum Alloy MFG LLC	Booth 1649
Aluminum Recyclers Council (ARC)	Booth 949
American Colloid Company	Booth 1737
American Foundry Society	Booth 3025
American Iron and Metal	Booth 918
American Pattern & CNC Works	Booth 721
AMETEK Foundry Products	Booth 2019
Anderson Global	Booth 2829
Angstrom Inc	Booth 1910
Anycasting Software Co. Ltd.	Booth 2245
Applied Foundry Solutions LLC	Booth 1855
Applied Process	Booth 547
Applied Spectra Inc.	Booth 1450
Asbury Graphite	Booth 615
ASCO Carbon Dioxide Inc.	Booth 2114
Asenjo Montenegro Vigo Soluciones S L	Booth 954
ASK Chemicals	Booth 2037
ATD Engineering & Machine	Booth 1144
ATI (AMC)	Booth 847
ATS Applied Tech Systems LLC	Booth 2456
Automation Systems & Design Inc.	Booth 1655

B

B&L Information Systems Inc.	Booth 1729
Badger Mining Corporation	Booth 1129
Bartley Crucible & Refractories Inc.	Booth 822
Belmont Metals Inc.	Booth 2729
Blast Cleaning Technologies	Booth 1837
Blastec Inc.	Booth 1919
Bloom Engineering Co. Inc.	Booth 2643
Brokk Inc.	Booth 2049
Bruker	Booth 2811
Bruks Siwertell	Booth 2246
Buckeye Abrasive Inc.	Booth 851
Buffoli North America, Inc.	Booth 809
Burleigh Industries LLC	Booth 1549
Busche Performance Group	Booth 1248
BYOB	Booth 314 & 215

C

C.A. Picard Inc.	Booth 804
Calderys	Booth 2619
Can-Eng Furnaces International Ltd.	Booth 718
Gangzhou Sefu Ceramic	
New Materials Co., Ltd.	Booth 2943
Capital Refractories Inc.	Booth 2344
Capture 3D	Booth 2237
CARBO Industrial Technologies	Booth 1629
Carpenter Brothers Inc	Booth 2615
Carrier Vibrating Equipment Inc.	Booth 2409
Castec Inc.	Booth 1246
Castool Tooling Systems	Booth 2720
CEC	Booth 1023
Champion Chisel Works Inc.	Booth 1813
Chemours Mineral Sands	Booth 2711
Chesapeake Specialty Products Inc.	Booth 1812
Clansman Dynamics USA	Booth 625
Cleveland Vibrator Company	Booth 2918

CMH Manufacturing	Booth 2742
CMI Novacast Inc.	Booth 1054
Cocan Graphite	Booth 1155
COGEBI Inc.	Booth 805
Combined Technologies Group Inc.	Booth 3015
Comptech AB	Booth 519
Consolidated Spectroscopy & Instrumentation, LLC	Booth 2310
Coticast-Hormesa LLC	Booth 649
Continental Aluminum Corp.	Booth 620
Conveyor Dynamics Corp.	Booth 1447
Cornerstone Foundry Supply	Booth 1255
Corona Cadinhos E Refractorios Ltd.	Booth 1925
Covia	Booth 1825
CPM DiPiu Systems	Booth 2920

D

D&E Ladles	Booth 2951
Daubert Cromwell	Booth 2044
Debaolai International Co., Ltd.	Booth 2655
Del Sol Industrial Services Inc	Booth 1109
Delfin Industrial Corporation	Booth 2455
Didion International Inc.	Booth 1447
Digitize Designs	Booth 2050
DISA	Booth 737
Diversified Pattern	Booth 648
DK Metals LLC	Booth 811
Dongguan Eontec Co., Ltd.	Booth 2848
DST Advisory Group	Booth 925
Ductile Iron Society	Booth 551
DustMASTER Enviro Systems	Booth 928

E

Eagle Group	Booth 947
Eccomelt LLC	Booth 2810
Eirich Machines, Inc.	Booth 1719
EKK Inc.	Booth 1751
Electric Controls & Systems Inc.	Booth 2637
Elementar Americas	Booth 1749
Elkem Foundry Products	Booth 1707
Empire Systems Inc.	Booth 1429
EMSCO Inc.	Booth 2311
EMSL Analytical, Inc.	Booth 2011
Engineered Lubricants	Booth 2244
Engis Corporation	Booth 812
EnvisionTec Inc.	Booth 2724
Epic Machine Inc.	Booth 2611
Equipment Manufacturers Intl.	Booth 1947
ERIEZ	Booth 1010
Ervin Industries	Booth 2319
ESI North America	Booth 2125
ETA Engineering Inc.	Booth 1016
Excellence In Metalcasting Display	Booth 529

ExOne	Booth 1906
EZG Manufacturing	Booth 1555

F

Fargowear Inc.	Booth 1245
FARO Technologies Inc.	Booth 2112
FATA Aluminum Inc.	Booth 2910
FCRI Import & Export Co. Ltd.	Booth 2740
FEF	Booth 3044
Ferrous Processing & Trading Co.	Booth 2348
Filtec Precision Ceramic Corp.	Booth 2947
Filter Sciences	Booth 2445
Finite Solutions Inc.	Booth 2929
Flexovit USA Inc.	Booth 1110
FLOW-3D CAST	Booth 1929
FOMET SRL	Booth 820
Foseco	Booth 2737
Foundry Solutions & Design	Booth 2419
Foundry Solutions Metallurgical Services Inc.	Booth 2822
Foundry Way Learning Center/Porosity Solutions	Booth 2546
Free Flow Technologies, Ltd.	Booth 2708
Freeman Manufacturing & Supply Company	Booth 2047
FROHN North America, Inc.	Booth 1007

G

G.N.R. SRL	Booth 713
Gaylord Family Enterprises Inc.	Booth 723
GEMCO Cast Metal Technology	Booth 2312
General Kinematics	Booth 1415
Gibson Centri Tech Ltd	Booth 1724
GIFA/Newcast 2019/ Messe Duesseldorf NA	Booth 1715
Goff Inc	Booth 2937
Gradient Lens Corporation	Booth 808
Gradmatic Equipment Inc.	Booth 1017
Green Diamond Performance Materials	Booth 2914
Green Packaging Inc.	Booth 745
Greensand Controls Inc.	Booth 1745
Griffin Tool, Inc.	Booth 807
GrindMaster Equipment and Machines USA LLC	Booth 2547
Guardian Software Systems	Booth 1918
Guardian Worldwide LLC	Booth 618
Gudgeon Thermfire Intl. Inc.	Booth 2329

H

HA International	Booth 1219
HarbisonWalker International	Booth 2357
HeatTek	Booth 711

Henschel Andromat, Inc.	Booth 607
Heraeus Electro-Nite Co.	Booth 1829
Herschel Products	Booth 2028
Herzog Automation Corp.	Booth 1846
Hickman Williams & Co.	Booth 2446
Hill & Griffith Co.	Booth 1519
Hiller Carbon	Booth 2912
Hitachi High-Tech Analytical Science	Booth 2351
Hi-Vac	Booth 643
Hoffman Foundry Service, Inc.	Booth 2346
Holmatro	Booth 1444
Hoosier Pattern	Booth 729
Houghton International	Booth 1104
HS Group HR, Inc.	Booth 3042
Humtown Products	Booth 1726
Hunter Foundry Machinery Corp.	Booth 1004

I

I2r Power	Booth 1945
IMERYS	Booth 2513
Impact NDT, LLC.	Booth 2024
Induction Iron Inc.	Booth 2715
Induction Technology Corp.	Booth 946
Inductotherm Corp.	Booth 1537
Industrial Air Technology Corp.	Booth 1454
Industrial Ceramic Products	Booth 2145
Industrial Vacuum Equipment Corp.	Booth 2150
Innovative Analytical Solutions	Booth 815
International Thermal Systems	Booth 813
Intertest, Inc.	Booth 1944
Italpresse Gauss	Booth 737
ITOCHU Ceratech Corp.	Booth 2148
IVI Inc.	Booth 1948

J

J Carpenter Environmental	Booth 2615
J.B. DeVenne Inc.	Booth 2749
JADCO Manufacturing, Inc.	Booth 1448
Jari Automation Company Ltd China	Booth 2945
Jiangsu Tianhong Machinery Industry Co., Ltd.	Booth 1227
Jilin HengYue Material Science Inc.	Booth 2524
Jingang New Materials Co., Ltd.	Booth 2849
Joest	Booth 2554
Joy-Mark, Inc.	Booth 829
Jung Instruments GmbH	Booth 2308

K

Kaeser Compressors	Booth 1105
KANTHAL Part of Sandvik	Booth 2155
Keramida Inc.	Booth 1111
King Tester	Booth 1850
KISTERS North America	Booth 1108
Kittyhawk Products	Booth 2707
Kloster Foundry Products	Booth 1807

Kodiak Group	Booth 2629
Kolene Corporation	Booth 849
Kurtz Bros Inc.	Booth 621
Kuttner LLC	Booth 3036

L

Laempe Reich	Booth 1236
Larpen Metallurgical Service	Booth 2830
LECO Corporation	Booth 2507
Legend Energy Advisors	Booth 3040
LGC/ARMI	Booth 945

M

Maco Industries	Booth 909
Magaldi Technologies LLC	Booth 2129
Magma Foundry Technologies Inc.	Booth 936
Magneco/Metrel Inc.	Booth 1204
MaiShi Foundry Machinery Co. Ltd.	Booth 1247
Mancuso Chemicals	Booth 1437
Matrix Sensors LLC	Booth 2350
Maumee Pattern	Booth 844
Maus North America Corp.	Booth 1955
MB Metal Technologies LLC	Booth 2551
MeltLab Systems	Booth 2820
Metaltec Steel Abrasive Co.	Booth 2055
MetalX	Booth 1228
Michigan Pneumatic Tool Inc.	Booth 910
Midvale Industries	Booth 913
Miller and Company	Booth 1619
Modern Equipment Co.	Booth 1147
Molten Metal Equipment Innovations (MMEI)	Booth 2523
Morgan Advanced Materials	Booth 637
MPM Infosoft Pvt. Ltd.	Booth 1811
Multi-Vac - a division of M & W Shops, Inc.	Booth 2526

N

Nabertherm, Inc.	Booth 2814
Nanjing Nianda Furnace Science & Technology Co. Ltd.	Booth 1154
New London Engineering	Booth 2449
Nicholas Industries	Booth 1149
Nilfisk	Booth 2013
Ningbo Tongda Precise Casting Co., Ltd.	Booth 2247
NOL-TEC SYSTEMS	Booth 2110
Non-Ferrous Founders Society	Booth 1818
Norican Group	Booth 737
NorthStar Products	Booth 714
Norton/Saint-Gobain	Booth 1005
NovaCast USA Inc.	Booth 1051
Novis Works LLC	Booth 2727
NT Ruddock Co/KBM Affilips	Booth 1849
Nutec Bickley	Booth 1011

O

OmniSource Corp	Booth 929
Otto Junker (Junker Inc.)	Booth 2649
Overseas Precision Castings Inc.	Booth 1249

P

Padnos	Booth 2721
Palmer Engineered Products Inc.	Booth 2537
Palmer Manufacturing & Supply Inc.	Booth 2537
Pangborn	Booth 1525
Peerless Metal Powders & Abrasive	Booth 2819
Peg Parts	Booth 2725
Perfect Patterns Inc.	Booth 523
Peter E. Macler Associates PLLC	Booth 2706
Pillar Induction	Booth 1117
Pinnacle X-ray Solutions Inc.	Booth 2812
Polyrix Inc.	Booth 2347
Power Adhesives	Booth 2712
Precimeter	Booth 2048
Premier Thermal	Booth 712
Prince International Corporation	Booth 1145
ProfitGuard LLC	Booth 2913
ProFound Alloys LLC	Booth 1723
Progelta S R L	Booth 1148
PureFlo	Booth 709
Putzmeister America Inc.	Booth 2719
Pyrotek	Booth 2428

Q

Quad City Safety	Booth 2650
Quintus Technologies	Booth 1845

R

RadComm	Booth 3024
RAMPF Group Inc.	Booth 845
RAYTEQ LLC	Booth 1029
REFCOTEC Inc.	Booth 1437
Refractory and Insulation Supply	Booth 1437
Reichmann & Sohn GmbH	Booth 612
Reliability Concepts	Booth 2813
Reno Refractories Inc.	Booth 1116
Resco Products, Inc.	Booth 2544
Rex Heat Treat	Booth 555
RHI Magnesita GmbH	Booth 710
Rimrock Corp.	Booth 2337
Rio Tinto	Booth 1625
Rizhao Hengqiao Carbon Co., Ltd.	Booth 720
RJ Lee Group	Booth 2255
Robocasting Enterprises	Booth 2736
RPB Safety	Booth 2919
RUF Briquetting Systems	Booth 619

S

Saint-Gobain	Booth 719
Schust Engineering Inc.	Booth 1912
Scientific Dust Collectors	Booth 2723
Scott Sales Co.	Booth 614
Selee Corporation	Booth 2029
Shengquan Group	
Share-Holding Co., Ltd.	Booth 1047
Sherpa Industries	Booth 1946
Simpson Technologies Corp.	Booth 2111
Sintex Minerals & Services	Booth 920
Sinto America	Booth 1209
Solex Thermal Science Inc.	Booth 622
Southeastern Foundry Products	
& Foundry Coatings	Booth 2806
Southwire Company, LLC	Booth 2429
SpaceVac USA	Booth 2454
Specialty Foundry Products, Inc.	Booth 2646
Spectro Alloys Corp	Booth 610
SPECTRO Analytical Instruments,	
a unit of AMETEK	Booth 2019
Springer Nature Publishers	Booth 911
STACKER	Booth 2425
Steel Grip Inc.	Booth 2718
STOTEK, Inc.	Booth 2548
StrikoWestofen	Booth 737
Struers Inc.	Booth 1022
Summit Foundry Systems Inc.	Booth 2437
Superior Graphite	Booth 1907
Sweet Manufacturing Company	Booth 850
Synchro ERP Ltd.	Booth 2529

T

TDJ Group Inc.	Booth 2623
The Foundry Group LLC	Booth 2826
The Nugent Sand Company Inc.	Booth 2356
The Schaefer Group	Booth 905
Thermal-Tec Roofing	Booth 2248
Thermbond Refractory Solutions	Booth 2354
Thermo Fisher Scientific	Booth 2821
Tinker Omega Sinto LLC	Booth 627
Titan Robotics, Ltd.	Booth 2818
Toner Machining Technologies	Booth 2355
Top Cat Air Tools	Booth 1127
Transmet Corporation	Booth 2447
TriALco, Inc.	Booth 2250
Triple M Metal LP	Booth 2713
TSI Inc.	Booth 2427

U**Ultraseal America****Booth 1210**

U-Metco Inc.

Booth 1008

United Erie

Booth 2257

United Refractories Co.

Booth 2448

University of Northern Iowa

Booth 515

Weifang Foundry Machinery Co. Ltd.

Booth 951

Weifang Kailong Machinery Co., Ltd.

Booth 751

Westmoreland Advanced Materials Inc.

Booth 827

Wheelabrator**Booth 737**

Whiting Equipment Canada

Booth 749

Wisconsin Oven Corporation**Booth 818****V****Verder Scientific Inc.****Booth 2119**

Versatile Equipments Pvt. Ltd.

Booth 2824

Viking Blast & Wash Systems

Booth 1755

Viking Technologies**Booth 1044**

VisiConsult X-Ray Systems

& Solutions GmbH

Booth 1113

VJ Technologies**Booth 705**

Volume Graphics Inc.

Booth 1251

Voxeljet America Inc.**Booth 1711****Vulcan Engineering Co****Booth 1037**

Vulkan Blast Shot Technology

Booth 1810

W

W Abrasives

Booth 917

Waltz-Holst Blow Pipe Company Inc.

Booth 2714

Washington Mills Hennepin Inc.**Booth 2828**

Webb-Stiles Company

Booth 706

X

Xiangtan Hexinsheng

New Material Co. Ltd.

Booth 1151

Y

Yancheng Saipu Metal

Products Co Ltd

Booth 1250

YXLON**Booth 1913****Z**

ZEISS X-ray Solutions

Booth 2825

Zerust Corrosion Solutions

Booth 1045

Zibo Taa Metal Technology Co., Ltd.

Booth 819

Zijiang Furnace Nanjing Co. Ltd.

Booth 2249

ZIRCAR Ceramics, Inc.

Booth 2146

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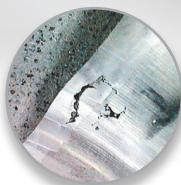


PRECISION BORESCOPIES

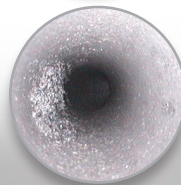
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Booth #808

Atlanta, GA

April 27 - 30, 2019



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EXHIBITORS

SUPPLIER EXHIBITOR BOOTH LIST – CATEGORY

(As of March 1, 2019)

ALLOYS/MATERIALS

Aluminum

Aluminum Alloy MFG LLC	Booth 1649
Anycasting Software Co. Ltd.	Booth 2245
ATI (AMC)	Booth 847
DISA	Booth 737
Electric Controls & Systems Inc.	Booth 2637
Hickman Williams & Co.	Booth 2446
Inductotherm Corp.	Booth 1537
OmniSource Corp.	Booth 929
Rimrock Corp.	Booth 2337
Triple M Metal LP	Booth 2713
Zerust Corrosion Solutions	Booth 1045

Copper-Base

Electric Controls & Systems Inc. (EC&S)	Booth 2637
Inductotherm Corp.	Booth 1537
OmniSource Corp.	Booth 929
Triple M Metal LP	Booth 2713

Iron

Ductile Iron Society	Booth 551
Electric Controls & Systems Inc.	Booth 2637
Elkem Foundry Products	Booth 1707
Engis Corporation	Booth 812
Hickman Williams & Co.	Booth 2446
Inductotherm Corp.	Booth 1537
NorthStar Products	Booth 714
OmniSource Corp.	Booth 929
Otto Junker (Junker Inc.)	Booth 2649
Triple M Metal LP	Booth 2713
Zerust Corrosion Solutions	Booth 1045

Magnesium

Inductotherm Corp.	Booth 1537
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Steel

DISA	Booth 737
ERIEZ	Booth 1010
Hickman Williams & Co.	Booth 2446
Inductotherm Corp.	Booth 1537
OmniSource Corp.	Booth 929
Otto Junker (Junker Inc.)	Booth 2649
Triple M Metal LP	Booth 2713
Verder Scientific Inc.	Booth 2119
Zerust Corrosion Solutions	Booth 1045

Superalloys

Hickman Williams & Co.	Booth 2446
Inductotherm Corp.	Booth 1537

Titanium

Hickman Williams & Co.	Booth 2446
Inductotherm Corp.	Booth 1537
Triple M Metal LP	Booth 2713
Verder Scientific Inc.	Booth 2119

Zinc

Inductotherm Corp.	Booth 1537
OmniSource Corp.	Booth 929

ENGINEERING/CAPITAL EQUIPMENT

Casting Design

ASK Chemicals	Booth 2037
ATI (AMC)	Booth 847
Ductile Iron Society	Booth 551
Joy-Mark, Inc.	Booth 829
Magma Foundry Technologies Inc.	Booth 936
Selee Corporation	Booth 2029
YXLON	Booth 1913

Cleaning, Finishing & Shipping

ASCO Carbon Dioxide Inc.	Booth 2114
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Blast Cleaning Technologies	Booth 1837
Blastec Inc.	Booth 1919
Carrier Vibrating Equipment Inc.	Booth 2409
Conveyor Dynamics Corp.	Booth 1447
Didion International Inc.	Booth 1447
DISA	Booth 737
Engineered Lubricants	Booth 2244
Engis Corporation	Booth 812
Foundry Solutions & Design	Booth 2419
Henschel Andromat, Inc.	Booth 607
Joest	Booth 2554
NorthStar Products	Booth 714
Sinto America	Booth 1209
Top Cat Air Tools	Booth 1127
Transmet Corporation	Booth 2447
Zerust Corrosion Solutions	Booth 1045

Engineering

ATD Engineering & Machine	Booth 1144
ATS Applied Tech Systems LLC	Booth 2456
Blast Cleaning Technologies	Booth 1837
CMH Manufacturing	Booth 2742
Conveyor Dynamics Corp.	Booth 1447
Del Sol Industrial Services Inc.	Booth 1109
Didion International Inc.	Booth 1447
Ductile Iron Society	Booth 551
Electric Controls & Systems Inc.	Booth 2637
Engineered Lubricants	Booth 2244
Equipment Manufacturers Intl	Booth 1947
ERIEZ	Booth 1010
ETA Engineering Inc.	Booth 1016
Foundry Solutions & Design	Booth 2419
Greensand Controls Inc.	Booth 1745
Henschel Andromat, Inc.	Booth 607
Hoosier Pattern	Booth 729
International Thermal Systems	Booth 813
Joest	Booth 2554
Joy-Mark, Inc.	Booth 829
Kuttner LLC	Booth 3036
Magaldi Technologies LLC	Booth 2129
Magma Foundry Technologies Inc.	Booth 936
Palmer Manufacturing & Supply Inc.	Booth 2537
Perfect Patterns Inc.	Booth 523
Peter E. Macler Associates PLLC	Booth 2706
Schust Engineering Inc.	Booth 1912
Selee Corporation	Booth 2029
Sinto America	Booth 1209

Environmental, Health and Safety

Albarrie Environmental Services	Booth 904
Blast Cleaning Technologies	Booth 1837
Conveyor Dynamics Corp.	Booth 1447
Didion International Inc.	Booth 1447
DustMASTER Enviro Systems	Booth 928
Electric Controls & Systems Inc.	Booth 2637
EMSL Analytical, Inc.	Booth 2011

ETA Engineering Inc.	Booth 1016
Foundry Solutions & Design	Booth 2419
Kurtz Bros Inc.	Booth 621
Kuttner LLC	Booth 3036
Peter E. Macler Associates PLLC	Booth 2706
Schust Engineering Inc.	Booth 1912

Heat Treatment

Ajax TOCCO Magnethermic Corp.	Booth 1117
Applied Process	Booth 547
Ductile Iron Society	Booth 551
International Thermal Systems	Booth 813
Joest	Booth 2554
King Tester	Booth 1850
Magaldi Technologies LLC	Booth 2129
Magma Foundry Technologies Inc.	Booth 936
Nutec Bickley	Booth 1011
Pillar Induction	Booth 1117
The Schaefer Group	Booth 905

Investment Casting Equipment & Accessories

Ajax TOCCO Magnethermic Corp.	Booth 1117
AMETEK Foundry Products	Booth 2019
ASK Chemicals	Booth 2037
International Thermal Systems	Booth 813
Nutec Bickley	Booth 1011
Pillar Induction	Booth 1117
Selee Corporation	Booth 2029
Verder Scientific Inc.	Booth 2119
Voxeljet America Inc.	Booth 1711

Maintenance

Ajax TOCCO Magnethermic Corp.	Booth 1117
Applied Process	Booth 547
ASCO Carbon Dioxide Inc.	Booth 2114
Conveyor Dynamics Corp.	Booth 1447
Engineered Lubricants	Booth 2244
ETA Engineering Inc.	Booth 1016
Greensand Controls Inc.	Booth 1745
Henschel Andromat, Inc.	Booth 607
International Thermal Systems	Booth 813
Magaldi Technologies LLC	Booth 2129
NorthStar Products	Booth 714
Pillar Induction	Booth 1117
Schust Engineering Inc.	Booth 1912
Top Cat Air Tools	Booth 1127

Patternmaking & Tooling

Hoosier Pattern	Booth 729
Perfect Patterns Inc.	Booth 523

Permanent Mold Equipment & Accessories

ATD Engineering & Machine	Booth 1144
CMH Manufacturing	Booth 2742
Equipment Manufacturers Intl.	Booth 1947

Software

Anycasting Software Co. Ltd.	Booth 2245
ASK Chemicals	Booth 2037
ATS Applied Tech Systems LLC	Booth 2456
B&L Information Systems Inc.	Booth 1729
Foundry Solutions Metallurgical Services Inc.	Booth 2822
Guardian Software Systems	Booth 1918
Magma Foundry Technologies Inc.	Booth 936
MPM Infosoft Pvt. Ltd.	Booth 1811

MELTING/MELTING QUALITY**Casting Quality & Testing**

Angstrom Inc.	Booth 1910
ATI (AMC)	Booth 847
EMSL Analytical, Inc.	Booth 2011
ERIEZ	Booth 1010
Foundry Solutions Metallurgical Services Inc.	Booth 2822
Innovative Analytical Solutions	Booth 815
Joy-Mark, Inc.	Booth 829
King Tester	Booth 1850
Magma Foundry Technologies Inc.	Booth 936
NorthStar Products	Booth 714
Selee Corporation	Booth 2029
SPECTRO Analytical Instruments, a unit of AMETEK	Booth 2019
YXLON	Booth 1913
ZEISS X-ray Solutions	Booth 2825

Ferrous Melt Quality

Angstrom Inc.	Booth 1910
Elkem Foundry Products	Booth 1707
Foundry Solutions Metallurgical Services Inc.	Booth 2822
Inductotherm Corp.	Booth 1537
Innovative Analytical Solutions	Booth 815
United Refractories Co.	Booth 2448

Ferrous Melting

Ajax TOCCO Magnethermic Corp.	Booth 1117
Capital Refractories Inc.	Booth 2344
Carrier Vibrating Equipment Inc.	Booth 2409
Elkem Foundry Products	Booth 1707
Inductotherm Corp.	Booth 1537
Kuttner LLC	Booth 3036
Otto Junker (Junker Inc.)	Booth 2649
Peter E. Macler Associates PLLC	Booth 2706
Pillar Induction	Booth 1117
United Refractories Co.	Booth 2448

Ferrous Pouring

AMETEK Foundry Products	Booth 2019
Capital Refractories Inc.	Booth 2344

Ductile Iron Society	Booth 551
Inductotherm Corp.	Booth 1537
Otto Junker (Junker Inc.)	Booth 2649
Rimrock Corp.	Booth 2337

Nonferrous Melt Quality

Aluminum Alloy MFG LLC	Booth 1649
Angstrom Inc.	Booth 1910
Foundry Solutions Metallurgical Services Inc.	Booth 2822
Inductotherm Corp.	Booth 1537
Innovative Analytical Solutions	Booth 815
Morgan Advanced Materials	Booth 637
United Refractories Co.	Booth 2448

Nonferrous Melting

Ajax TOCCO Magnethermic Corp.	Booth 1117
AMETEK Foundry Products	Booth 2019
Capital Refractories Inc.	Booth 2344
Inductotherm Corp.	Booth 1537
Joest	Booth 2554
Kuttner LLC	Booth 3036
Morgan Advanced Materials	Booth 637
Otto Junker (Junker Inc.)	Booth 2649
Pillar Induction	Booth 1117
The Schaefer Group	Booth 905
United Refractories Co.	Booth 2448

Nonferrous Pouring

Capital Refractories Inc.	Booth 2344
Inductotherm Corp.	Booth 1537
Morgan Advanced Materials	Booth 637
The Schaefer Group	Booth 905
United Refractories Co.	Booth 2448

MOLDING PROCESSES**Centrifugal**

Gibson Centri Tech Ltd	Booth 1724
REFCOTEC Inc.	Booth 1437

Chemically-Bound Sand

Del Sol Industrial Services Inc.	Booth 1109
Didion International Inc.	Booth 1447
Humtown Products	Booth 1726
Joy-Mark, Inc.	Booth 829
Palmer Manufacturing & Supply Inc	Booth 2537
Peter E. Macler Associates PLLC	Booth 2706
REFCOTEC Inc.	Booth 1437
Southeastern Foundry Products & Foundry Coatings	Booth 2806
Tinker Omega Sinto LLC	Booth 627

Continuous

DISA	Booth 737
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Diecasting

Anycasting Software Co .Ltd.	Booth 2245
ATI (AMC)	Booth 847
Carrier Vibrating Equipment Inc.	Booth 2409
CMH Manufacturing	Booth 2742
DISA	Booth 737
Engineered Lubricants	Booth 2244
Magma Foundry Technologies Inc.	Booth 936
Rimrock Corp.	Booth 2337
YXLON	Booth 1913

Green Sand

Anycasting Software Co. Ltd.	Booth 2245
Carrier Vibrating Equipment Inc.	Booth 2409
Del Sol Industrial Services Inc.	Booth 1109
Didion International Inc.	Booth 1447
Equipment Manufacturers Intl.	Booth 1947
ERIEZ	Booth 1010
Greensand Controls Inc.	Booth 1745
Joy-Mark, Inc.	Booth 829
Kurtz Bros Inc.	Booth 621
Kuttner LLC	Booth 3036
Magma Foundry Technologies Inc.	Booth 936
Perfect Patterns Inc.	Booth 523
REFCOTEC Inc.	Booth 1437
Sinto America	Booth 1209

Investment

Magma Foundry Technologies Inc.	Booth 936	Mag-
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Lost Foam

REFCOTEC Inc.	Booth 1437
Southeastern Foundry	
Products & Foundry Coatings	Booth 2806

Permanent Mold

ATD Engineering & Machine	Booth 1144
CMH Manufacturing	Booth 2742
Equipment Manufacturers Intl.	Booth 1947
Magma Foundry Technologies Inc.	Booth 936
Perfect Patterns Inc.	Booth 523
Southeastern Foundry	
Products & Foundry Coatings	Booth 2806

Vacuum Processes (sand or metal mold)

Anycasting Software Co. Ltd.	Booth 2245
ATD Engineering & Machine	Booth 1144
Humtown Products	Booth 1726
REFCOTEC Inc.	Booth 1437
Sinto America	Booth 1209
Southeastern Foundry	
Products & Foundry Coatings	Booth 2806

SAND MOLD/CORE MAKING**Additive Manufacturing**

ATI (AMC)	Booth 847
Engineered Lubricants	Booth 2244
Engis Corporation	Booth 812
HA International	Booth 1219
Hoosier Pattern	Booth 729
Humtown Products	Booth 1726
Joest	Booth 2554
Magma Foundry Technologies Inc.	Booth 936
Palmer Manufacturing & Supply Inc.	Booth 2537
Tinker Omega Sinto LLC	Booth 627
Verder Scientific Inc.	Booth 2119
Voxeljet America Inc.	Booth 1711

Core Machines

ATD Engineering & Machine	Booth 1144
Equipment Manufacturers Intl.	Booth 1947
Laempe Reich	Booth 1236
Palmer Manufacturing & Supply Inc.	Booth 2537
Tinker Omega Sinto LLC	Booth 627

Coremaking

ASK Chemicals	Booth 2037
HA International	Booth 1219
Hoosier Pattern	Booth 729
Humtown Products	Booth 1726
Laempe Reich	Booth 1236
Magma Foundry Technologies Inc.	Booth 936
Peter E. Macler Associates PLLC	Booth 2706
Southeastern Foundry	
Products & Foundry Coatings	Booth 2806
Tinker Omega Sinto LLC	Booth 627
Voxeljet America Inc.	Booth 1711

Rapid Prototyping

Hoosier Pattern	Booth 729
Humtown Products	Booth 1726
Magma Foundry Technologies Inc.	Booth 936
Voxeljet America Inc.	Booth 1711
YXLON	Booth 1913

Sand Molding Equipment

Del Sol Industrial Services Inc.	Booth 1109
Greensand Controls Inc.	Booth 1745
HA International	Booth 1219
Laempe Reich	Booth 1236
Palmer Manufacturing & Supply Inc.	Booth 2537
Sinto America	Booth 1209
Tinker Omega Sinto LLC	Booth 627
Voxeljet America Inc.	Booth 1711

A portrait of Dr. Paula Vivas, a woman with long brown hair and glasses, smiling. She is wearing a dark blazer over a white collared shirt. The background is a light-colored, textured wall.

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A PASSION FROM
OUR HEART.**

DR. PAULA VIVAS, RESEARCH & DEVELOPMENT MANAGER

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www.abpinduction.com



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Booth 1117

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A Sky View of Agile Casting Solutions – Humtown's 3D Printing Division



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Booth 2019

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South Korea
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www.anycastsoftware.com

AnyCasting is professional software for casting analysis that minimizes the defects by predicting various defects that can occur during casting based on filling and solidification of the casting process.

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Blast Cleaning Technologies***Booth 1837**

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West Allis, WI 53214
United States
877-355-7577
www.bct-us.com

Blast Cleaning Technologies is a team of experienced professionals bringing new and innovative solutions to the foundry industry. Our mission is designing equipment, components, and system upgrades that provide solutions to long-standing problems with blast equipment. Our newest technology includes our high-performance Twist LOK e-wheel, specifically designed for upgrading existing equipment and wheel units. The Twist LOK components are investment cast from a Super Alloy Tool Steel, providing improved performance, lower maintenance costs and improved motor life, making it the easiest wheel to maintain in the industry. Blast Cleaning Technologies designs and manufactures high efficiency magnetic separator systems and foundry duty blast machines including Drum Blasts, Tumble Blasts, Wire Mesh Belts, Spinner Hangers, Monorails, Tables, Car Tables and many more custom designs. The BCT service team

is one of the most experienced in North America and we understand the need to keep your blast equipment and operation running at peak efficiency. Please visit our website at www.bct-us.com. We proudly manufacture our products in the U.S.A. at our recently expanded manufacturing facility in West Allis, WI.

Blastec Inc.***Booth 1919**

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770-475-2700
www.blastec.com

Blastec® manufactures a full line of high productive, heavy duty machines for the foundry and forge industries, which are designed to minimize maintenance and lower your operating cost: Continuous Flow, Tumble Blast, Manganese Wire Mesh Belts, Single-Door In and Out, Spinner Hangers, Turnstiles, Pass-Through Monorails, Table Blasts, Car Rooms. New machines or equipment upgrades,

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Booth 2643

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Bloom Engineering is a combustion oriented company headquartered in Pittsburgh, Pennsylvania, serving basic industry with global energy and environmental solutions. The Bloom family of companies specializes in problem solving through custom engineering of industrial burners, combustion systems, controls, and refractory products. Our mission is to enable our customers' long-term success by providing combustion products, systems, and services that achieve optimal productivity, efficiency, and environmental performance. Our global team delivers this with industry-leading expertise and innovative solutions.

Brokk Inc.*

Booth 2049

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360-794-1277

www.brokk.com

Bruker

Booth 2811

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Madison, WI 53711
608-276-3087
www.bruker.com

Bruks Siwertell

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www.bruks-siwertell.com

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Buckeye Abrasive Inc., a McCoy Group Company Ohio based manufacturer of Hot-Pressed Cut-off Wheels, Snagging Wheels, and Foundry Cup Wheels. All products are custom made in the USA. Family owned since 1954.

Buffoli North America, Inc.**Booth 809**

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800-795-5536
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Buffoli Transfer is the premier manufacturer of CNC multi-spindle transfer machines specifically designed to machine precision parts from non-rotating bars or extrusions. Materials include brass, aluminum, steel and stainless steel. Capability range is 2-100 mm OD. Our transfer machines have up to 24 stations/clamping devices (collets or self-centering chucks) with up to 48 spindles or more. These machines are available in single or double production versions. Typical cycle times are 1.5-12 seconds per part. The advantages of Buffoli rotary transfer machines include:

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- High productivity
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BYOB***Booth 314 & 315**

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847-824-0181
www.afsinc.org / www.castexpo.com

Designers and buyers are invited to bring their own blueprints to foundries exhibiting in Cast in North America. The BYOB program lets metalcasters share their expertise and capabilities, and it allows designers and buyers to explore casting options, and learn about feasibility, costs, and materials. To participate, just bring your casting and machining drawings, in blueprint or digital format, to the CINA pavilion. CINA has dedicated space for private meetings.

C.A. Picard Inc.**Booth 804**

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www.capicard.com

C.A. Picard Inc. is an ISO registered manufacturer which specializes in producing highly wear-resistant precision replacement parts for various industries and applications. Operating globally with nine locations, our products are distributed to over 50 countries around the world. More information on C.A. Picard can be found on our web site www.capicard.com.

Calderys***Booth 2619**

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Jacksonville, AL 36265
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www.calderys.com

Can-Eng Furnaces International Ltd.**Booth 718**

6800 Montrose Rd., Box 628
Niagara Falls, ON L2E 6V5
CA
289-292-2028
www.can-eng.com

CAN-ENG Furnaces International Limited, is a lead-

ing global designer and manufacturer of thermal processing equipment for ferrous and non-ferrous metals. CAN-ENG focuses on the development of high-volume batch and continuous industrial furnace systems for challenging applications. CAN-ENG's reliable furnace designs have served automotive component producers, iron and steel industries, oil and gas industries, railcar manufacturers, aluminum and steel foundries, agricultural, construction and appliance manufacturers for over 55 years. We have gained an international reputation for design innovation, quality workmanship and dedication to service. Our highly innovative furnace systems provide the latest advancements in energy saving technology, material handling and automation, incorporating new technology to replace conventional designs and improve production flow and facility efficiencies. CAN-ENG will be showcasing its latest advancements in the processing of aluminum intensive automotive components for lightweighting. CAN-ENG's Batch and Continuous systems are manufactured for a wide range of processes including: preheating, homogenizing, annealing, solution heat treatment, hot water, polymer and precision air quenching (PAQ™) and artificial aging. CAN-ENG's process control and advanced material handling systems enhance each line to create the most flexible solution to complex alumi-

num thermal processing challenges.

Cangzhou Sefu Ceramic New Materials Co., Ltd.
Booth 2943

Guanting Industrial Park
Cangzhou City
Cangzhou City, Hebei 061034
China
0317-5221986
www.sefunm.com

Cangzhou Sefu Ceramic New Materials Co., LTD, is a professional manufacturer specializing in researching, developing, producing and selling ceramic foam filters and other foundry materials. It is approved by ISO9001 quality system certification. Relying on technology center, using advanced management method, Sefu company provides silicon carbide ceramic foam filters, zirconia ceramic foam filters, alumina ceramic foam filters, honeycomb ceramic filter, ceramic fiber products, outlet stop, investment casting pouring cup, exothermic- insulation riser & sleeves and transfer board, etc. The products are mainly used in iron casting, aluminum casting, steel casting, water treatment, air purification, temperature test of metal liquid and other fields. Which have been exported to India, USA, UK, Turkey, Thailand, Mexico, Vietnam, Malaysia, Brazil



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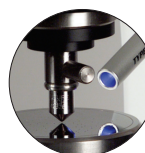
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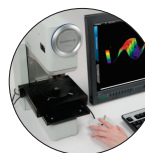
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Booth 1629

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CARBO is a leading manufacturer of ceramic media products that provide the foundry industry with an alternative to sand core and mold products. The

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Celebrating over 100 years serving industry, Carpenter Brothers, Inc. specializes in foundry supplies and equipment. Products include metals and ferro-alloys, molten metal sensors, sand additives, pre-blends, specialty sands, chemical binders, abrasives and refractories, and more. Our equipment line includes sand preparations, heaters and coolers, continuous mixers and mullers, automated core and molding machines, shake-out and material handling conveyors, sand reclaimers, and melting furnaces as well as turnkey foundry systems and engineering. Business development supplies products to sand processing, civil engineering, blast cleaning and surface finishing industries.

Carrier Vibrating Equipment Inc.*

Booth 2409

3400 Fern Valley Rd.
Louisville, KY 40213
502-969-3171
www.carriervibrating.com

Carrier Vibrating Equipment is the innovative leader for heavy-duty solutions for the metal casting industry and has been trusted by customers to solve foundry line problems for almost 70 years. Carrier offers custom designed equipment for use through every step of the foundry floor that is rugged, safe and dependable. The foundry equipment line includes the revolutionary Delta Phase® shakeout, to processing sand and castings, to fluid bed sand coolers, Barrel Horse™, and attrition mills, charge systems, automated feeding systems, preheaters, and conveyors. Our engineers have experience tackling unique processing problems and making sure equipment is engineered to improve cast-

ing quality, casting processes, reduce waste and inefficiency, and lower cost systems. Carrier is headquartered in Louisville, Kentucky, and can be found globally with facilities in Nivelles, Belgium and Shanghai, China. Representative offices are located in all major US cities and Mexico, Chile, Columbia, Argentina, Brazil, Korea, and Taiwan.

Castec Inc.

Booth 1246

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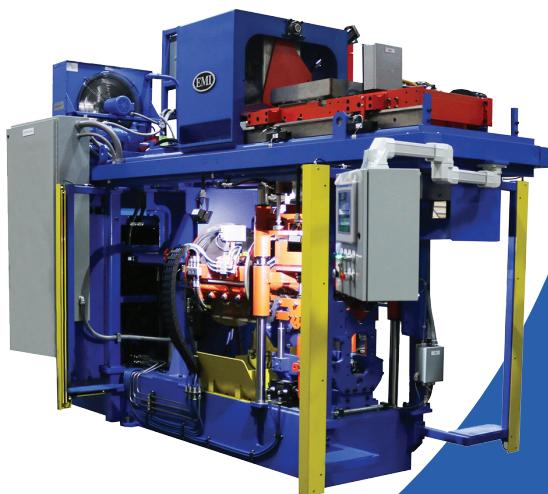
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Clansman Dynamics USA*

Booth 625

2530 Columbus Ave.
Springfield, OH 45503
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www.clansmandynamics.com

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Booth 2918

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Booth 2742

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Cocan Graphite***Booth 1155**

Xinguang Building 1804, Jianshe Ave. 976th
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Wuhan, Hubei 430010
China
86 2782654969
www.cocangraphite.com

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Combined Technologies Group Inc.**Booth 3015**

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Continental Aluminum Corp.***Booth 620**

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Conveyor Dynamics Corp.***Booth 1447**

7000 W. Geneva Dr.

St. Peters, MO 63376
636-279-1111
www.conveyordynamicscorp.com

Conveyor Dynamics will feature its line of Vibratory Foundry Equipment at Booth #1447 at the 2019 CASTEXPO. Furnace Charge Systems, Multi-Directional Feeders, Mold Dump Conveyors, Rotary Drum Feeders, Casting Cooling and Transfer Conveyors, Shot Blast Feed and Discharge Conveyors, Shakeouts & Screeners. Unique features include variable speed and our dynamically balanced and isolated design to isolate vibration and lower foundation and installation costs.

Cornerstone Foundry Supply

Booth 1255

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www.cornerstonefoundrysupply.com

Cornerstone Foundry Supply is the North American distributor for SEEIF Ceramic and Vemek precision engineering products. SEEIF Ceramic, a.s. is a producer of a wide range of refractory ceramic materials, including services and consultancy related to their use by the customer. Cornerstone currently stocks and supplies SEEIF ceramic hollowware for foundry gating and ladle closing systems. Vemek srl. offers an extensive range of consumables and chaplets for foundries. Together with you, Vemek will design a chaplet specifically designed for your needs, covering all steps of the process: from the design to the automatic construction of the equipment to realize it.

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Booth 1925

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Corona cadinhos e refratários Ltda - "crucibles from Brazil" - producer and supplier of silicon carbide, graphite and clay-graphite crucibles, electric, gas and oil furnaces and chemical products for non-ferrous metals casting.

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Booth 1825

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www.cpm.net

D & E Ladles

Booth 2951

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Aitkin, MN 56431
218-927-2200
www.teemarkmfg.com

Daubert Cromwell

Booth 2044

12701 S. Ridgeway Ave.
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Daubert Cromwell is a global manufacturer of VCI corrosion inhibitor packaging. For over 85 years, we have helped customers protect ferrous, non-ferrous, magnesium, aluminum & multi-metals - reducing costs and saving millions of dollars spent cleaning and reworking metal components due to rust. We offer safe, clean & effective VCI

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Debaolai International Co., Ltd.

Booth 2655

Rm 1-6-203, Yichengdongyuan Xueyuan Rd.
Haidian District, Beijing 100085
China

Debaolai International Co., LTD mainly exports mullebeads and refractory materials. Mullebeads is from Hunan Jiashunhua New Materials Co., Ltd. (JSH) which is a modern, high-tech and innovative enterprise with efficient energy saving, environment-friendly and automated production lines. Debaolai is the general export agent of JSH.

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Booth 1109

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www.delsolservices.com

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We offer innovative and efficient solutions customizable for all applications. With offering more than 140 different industrial vacuum cleaners, DELFIN can provide the right solution to any need. Guaranteed. Our mission is to be recognized as the number one manufacturer of industrial vacuums in every industrial field. Our commitment to be the very best requires 100% of our efforts to be customer-oriented. Our approach advocates professionalism and expertise, allowing us to always be ready to meet customer needs.

Didion International Inc.*

Booth 1447

7000 W. Geneva Dr.
St. Peters, MO 63376
636-278-8700
www.didion.com

DIDION will feature its new line of Rotary Foundry Equipment at Booth #1447 at the 2019 CASTEXPO. DIDION designs, engineers, and manufactures a full range of rotary processing equipment for foundries including: Rotary Media Drums, Rotary Sand Reclaimers, Rotary Sprue Crushers, Rotary Dross / Slag Metal Reclaimers, Rotary Sand / Casting Separators, Rotary Blending / Cooling Drums, and Rotary Sand Screens. Engineered to a strict calculus the patented design provides the lowest operating cost per ton making foundries more efficient and more profitable. DIDION® is the world leader in rotary foundry machinery with over 1,500 installations in 55 different countries.

Digitize Designs

Booth 2050

400 Birnie St.
Ste. I
Greenville, SC 29611
864-469-0093
www.digitizedesigns.com

Digitize Designs distributes several lines of hand-held and metrology grade 3D scanners as well as a variety of 3D software for applications including reverse engineering, quality control, 3D inspection, augmented reality, virtual reality, and many more. In addition to providing 3D scanning solutions, we

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Southeastern Foundry Products & Foundry Coatings, Inc. is one of the leading coating manufacturing companies for water and solvent, release agents, boron nitride releases, and a distributor for foundry product lines.

Our plant occupies 50,000 square feet with a maximum production capacity of 60 million pounds annually plus several warehouses for inventory.

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- Sand Coatings
- Permanent Mold Coatings
- Ladle Coatings
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Our company also distributes and warehouses all of the resin systems, insulation and exothermic sleeves along with hot topping, steel shot, and paint. We have the capability to match coating requirements for the customer at a competitive price. Our major commitment is customer service. You will be assured a timely and **reliable delivery** to meet today's **just-in-time** demands in a lean manufacturing world.

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also provide 3D scanning services. These services include general 3D scanning, reverse engineering, and CAD modeling.

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Booth 737

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Diversified Pattern

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260-897-3771
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DK Metals LLC

Booth 811

7378 Creeksbend Rd.
Lambertville, MI 48144
734-682-2486

Dongguan Eontec Co., Ltd.

Booth 2848

Yiquan Industrial District. Qingxi
Dongguan 44 523662
CN
86-769-87737777
www.e-ande.com

Dongguan Eontec Co., Ltd. (300328.SZ) was established in May 1993. As a leading force in the application of light alloy material, the company is equipped with in-house material R&D capability, high-end testing lab setting and professional engineering team which as more than 20 years' manufacturing experience.

DST Advisory Group

Booth 925

13100 Northwest Fwy

Ste 340
Houston, TX 77040
734-417-8701
www.dstadvisorygroup.com

DST Advisory Group offers Research Tax Credit services to the metal casting and related industries. Our founding partner, Diane Stogiannes, is a certified metallurgist and a patented co-inventor, in the field of structural engineering. Todd Sutherland is the second of two partners and has been a Research Tax Credit expert for over 20 years. Because of our vast experience with the casting industry, we know that most of the companies at CastExpo are eligible for this valuable credit. That experience also allows us to be extremely efficient in documenting that credit. Come talk to us for a free evaluation and estimate of the credit amount you could potentially be eligible for.

Ductile Iron Society

Booth 551

15400 Pearl Rd.
Ste. 238
Strongsville, OH 44136
440-665-3686
www.ductile.org

For 60 years, the Ductile Iron Society has been promoting the interests of the ductile iron industry through advertising, research, education, technological advancements and quality control. Made up of large corporations and small companies in North America and the world, the society is the only industry group devoted solely to the concerns of the producers and users of ductile iron castings. As a member of the DIS, your organization will enjoy the many advantages generated by the Society's efforts, including informative meetings and consultations, research findings, quality guidance, and certification. Plus, you'll receive access to the DIS's research activities online – the only site on the web that contains the latest technology advances in ductile iron. All while helping to advance the production standards of the industry.

DustMASTER Enviro Systems*

Booth 928

190 Simmons Ave.

P.O. Box 10
Pewaukee, WI 53072
262-691-3100
www.dustmaster.com

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Booth 947

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Eagle Group is a leading supplier of power tools for industrial markets. Whether you need tools for material removal, finishing, maintenance, automotive, or assembly - Eagle Group has your solution. Eagle Group has been a supplier of power tools for over 30 years throughout the United States, Mexico and South America. Located in Portland, Oregon, Eagle resides in AIMCO's corporate headquarters.

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Booth 2810

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www.eccomelt.com

Eccomelt LLC Eccomelt LLC, with locations in both the United States and Canada, is the market leader in the production of a chemically pure, eco-friendly substitute for A356.2 ingot. Since 2006, we have been providing OEMs, Tier 1's, and foundries in the U.S., Europe, Canada, and Mexico with Eccomelt356.2, the result of a patented process that is a revolutionary innovation in the aluminum industry.

Eirich Machines, Inc.

Booth 1719

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www.eirichusa.com

EIRICH Machines designs, manufactures & supplies individual mixers, dryers & reactors to complete turn-key plants for the processing of raw materi-

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EKK Inc.

Booth 1751

37682 Enterprise Ct.
Farmington Hills, MI 48331
248-624-9957
www.ekkinc.com

EKK Inc. is a global supplier of Casting Simulation Software and Consulting Services. Our automatic FEM mesh generator quickly provides a customized mesh of your part and mold. This singular mesh is utilized throughout the simulation of the entire process from Fluid Flow to Thermal Solidification and even Stress. Meanwhile, EKKcapcast provides a powerful integrated simulation environment to seamlessly navigate the setup and simulation of your process. The simulation results yield insight into your casting and are easily exported as high-quality images and animations for reports. Due to the efficiency of the software, store-bought computers are perfectly adequate for simulation work. Customers consistently cite our excellent customer support as a major benefit of using our software. We work closely with users to troubleshoot issues as well as provide guidance, answers, and advice. All training is done one-on-one with an engineer. EKK Inc. also provides simulation consulting services for all types of casting processes, such as our popular High Pressure Die Casting Gating Design service. Our experienced team of engineers regularly works with customers to help identify problems before they arise, optimize existing processes, and eliminate defects. Please visit www.ekkinc.com for more information regarding our capabilities and specific services.

Electric Controls & Systems Inc. (EC&S)*

Booth 2637

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EC&S is a turn-key heavy industrial construction company. We have decades of hands on experience engineering, designing and building for the foundry industry. Our core strengths revolve around electrical distribution, automation, cupola melt systems, silica & ceramic reclamation, dust collection and controls. Contact us to assist you with your

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Elementar Americas

Booth 1749

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www.elementaramericas.com

Elkem Foundry Products*

Booth 1707

P.O. Box 266
Pittsburgh, PA 15230
412-299-7234
www.elkem.com

Visit Elkem Foundry Products' booth to discuss solutions to technical problems found in castings made of gray, ductile, or compacted-graphite (CG) iron. As a major producer of high-performance inoculants, nodulizers, cover alloys, pre-conditioners, and ferrosilicon, Elkem's experienced technical personnel work with foundries to find the best product that meets individual foundry conditions. For ductile iron, Elkem's unique nodulizer and cover alloys increase magnesium recoveries with fewer emissions, improve nucleation and the graphite structure, reduce porosity, lower scrap rates, improve machinability, and reduce total costs. For gray iron, Elkem's specially-formulated inoculants and pre-conditioners eliminate chill in castings, reduce porosity, improve mechanical properties, lower scrap rates, improve machinability, and reduce total costs. Ask about Elkem's newest gray-iron inoculant that maximizes chill reduction, reduces casting porosity, increases tensile strength of castings, and minimizes slag build-up during inoculation. New high-performance, problem-solving materials are continually being developed and introduced based on Elkem's extensive R&D effort. Each Elkem foundry alloy meets high-quality standards during production in plants worldwide. During your visit to Elkem's booth, sign up for Elkem's Structure and Defects Wall Charts for gray and ductile iron. It's part of the technical expertise you get from Elkem ... your partner in finding innovative foundry solutions.

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Booth 1429

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www.empiresystemsinc.com

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Booth 2311

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EMSL Analytical, Inc.

Booth 2011

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www.emsl.com

EMSL Analytical, Inc. is one of the leading testing laboratories with over 45 locations throughout the United States and Canada. EMSL is a nationally recognized and locally focused provider specializing in fast laboratory results for mold, bacteria, Legionella, USP <797>, pathogens, asbestos, lead, soot, char & ash from fires, VOC's, odors, radon, formaldehyde, indoor air quality, microbiology, environmental, industrial hygiene, radiological, food, beverage & consumer products and material testing services for the identification of unknown substances. EMSL services both professionals and the general public. EMSL maintains an extensive list of accreditations from leading organizations as well as state and federal regulating bodies including, but not limited to A2LA, AIHA LAP, LLC. (AIHA EMLAP, AIHA IHLAP, AIHA ELLAP), NVLAP, CDC ELITE, CPSC, CA ELAP, NY ELAP, TX DOH, NJDEP and multiple other state accrediting agencies. Please visit our website at www.EMSL.com for a complete listing of accreditations. In addition, EMSL carries a wide range of Sampling Equipment and Investigative Products for environmental professionals.

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Booth 2244

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Tooling for the Metal Casting Industry. Epic Machine is a leading manufacturer of precision CNC machined components with diverse capabilities and expertise in all materials and value-added processes to provide customers a start to finish product. ISO 9001:2015 Certified

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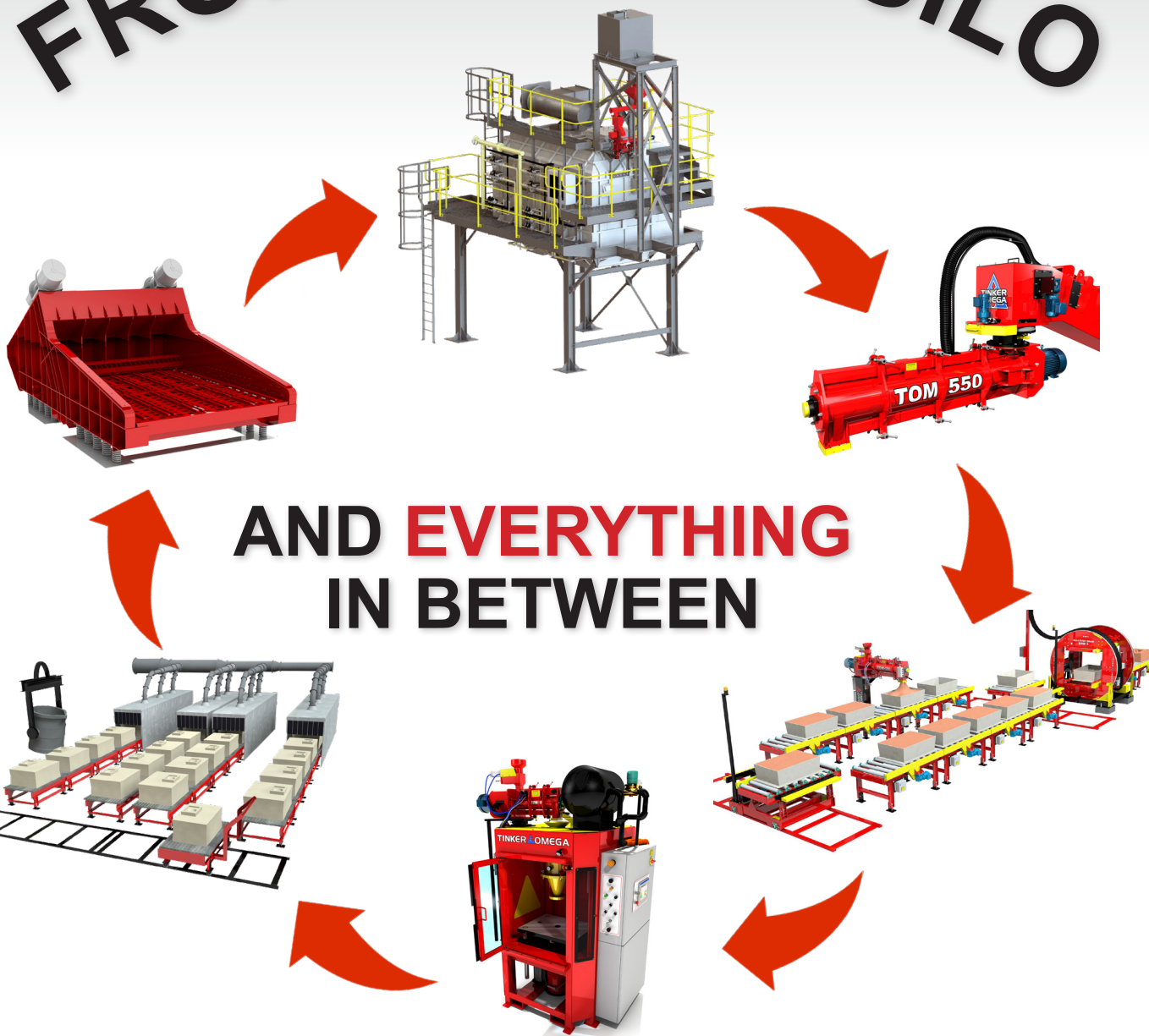
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patented improvements to these traditional equipment lines that bring longer life, lower maintenance, and higher productivity. We provide replacement OEM parts to exact original specifications for all our acquired brands. The acquisition of these companies has resulted in unmatched industry knowledge and experience. This has paved the way to allow EMI the experience to tackle every aspect of foundry design, engineering, and manufacturing. From the mold line and core room to the finishing department, EMI has the knowledge and expert resources to maximize your foundry operations.

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Ervin Industries

Booth 2319

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734-794-1248
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Excellence in Metalcasting Display*

Booth 529

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www.afsinc.org / www.castexpo.com

The Excellence in Metalcasting exhibit features the winner of the 2019 AFS/Metal Casting Design and Purchasing Casting of the Year Award, as well as winners in the categories of Rookie of the Year, Best Example of a Casting Conversion, Achievement in a Small Foundry Business, and Best Innovation/Prototype.

These are some of the best and most innovative castings to be produced by North American foundries in the past year.

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EZG Manufacturing**Booth 1555**

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FEF**Booth 3044**

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FEF is the metalcasting industry's link to the brightest and most passionate new technical talent from colleges and universities in North America. FEF provides scholarship support to students focused on entering our industry and provides program support that sustains world-class academic programs focused on metalcasting curricula. FEF students

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Ferrous Processing & Trading Co.
Booth 2348

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Filtec Precision Ceramic Corp.
Booth 2947

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www.filtec-corp.com

Filtec Precision Ceramics Co., Ltd. is specialized in manufacturing and marketing consumable ceramic and refractory products for foundry industry, metallurgical industry, etc. As an ISO-9001 certified enterprise, Filtec focus on providing ceramic consumables in consistent quality and continuous technical improvement. Nowadays, with worldwide sales network, our products have been exported to more than 30 countries with good performance. Product Offerings: * CF 200 Alumina Ceramic Foam Filters for aluminum filtration and aluminum casting. * CF-400 Silicon Carbide Ceramic Foam Filters for iron and iron alloy casting. * CF600 Zirconia Ceramic Foam Filters for casting steel and stainless steel filtration. * EC85 Series Ceramic Core (Sand Core) for investment casting.

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FLOW-3D CAST*
Booth 1929

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FLOW-3D CAST is an accurate and robust simulation software used by foundry and casting engineers to improve designs, decrease time-to-market, and lower scrap rate. FLOW-3D CAST's powerful solver engine accurately tracks the flow of liquid metal, entrained air, surface oxides, solidification, shrinkage porosity, and deformations, allowing metal casters to precisely predict defects on a cast part. FLOW-3D CAST v5.0 is a major leap forward in metal casting simulation. Metal casters will significantly streamline their design workflows with FLOW-3D CAST's robust simulation engine, process-based workspaces, What-You-See-Is-What-You-Need (WYSIWYN) interface and new defect prediction tools. Featured developments include thermal modulus and hot spot identification output for solidification simulations, and filling defect tools for identifying trapped gases and predicting venting efficiency. FLOW-3D CAST continues to lead the way in defect prediction, allowing metal casters to optimize their designs and processes to stay ahead of the competition.

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Booth 820

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www.fomet.com

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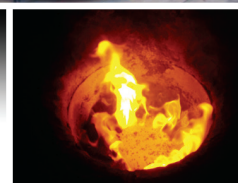
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Gibson Centri Tech Ltd.

Booth 1724

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Forming the "The Bright World of Metals", the four separate trade fairs GIFA, METEC, THERMPROCESS and NEWCAST will take place from June 25 – 29, 2019 at the fairgrounds in Düsseldorf, Ger-

many. The latest advancements for foundry technology, metallurgy, thermo process technology and castings will be on display. The range presented at GIFA2019 will cover the entire market for foundry plants and equipment, die-casting machinery and melting operations. METEC 2019 will present plant and equipment for iron and steel making, non-ferrous metal production and for casting and pouring molten steel as well as rolling and steel mills. Industrial furnaces, industrial heat treatment plants and thermal processes will be showcased THERMPROCESS 2019, while NEWCAST 2019 will focus on the presentation of castings. When last held in 2015, the four trade fairs attracted 78,000 visitors from more than 120 countries and 2,214 exhibitors.

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Subsidiary of Belloi & Romagnoli s.r.l. Modena Italy. GreenSand Controls Inc. is based in Fremont, WI, and was established in 2002. We are a worldwide supplier of green sand molding, preparation, cooling and control equipment with offices in USA, Italy and India.

Griffin Tool, Inc.

Booth 807

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GrindMaster Equipment and Machines USA LLC*

Booth 2547

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91 9049948833
www.grindmaster.co.in

GRIND MASTER NORTH AMERICA's ROBOFINISH center is a U.S. Wisconsin-based company headquartered in Milwaukee. A GLOBAL TECHNOLOGY LEADER providing state-of-the-art Robotic Casting Finishing Solutions for all metals. Grind Master has over 35 years of machine design and building experience, trademarked products, process

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Booth 1918

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HA International***Booth 1219**

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Booth 1945

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Booth 2024

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Tampa, FL 33618

813-969-3300

www.inductioniron.com

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Induction Technology Corp.**Booth 946**

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Innovative Analytical Solutions provides laboratory and field instruments for metal analysis. I.A.S. LLC represents Belec Spectrometer from Germany and Frontics America from South Korea. The Belec systems are Optical Emission Spectrometers capable of complete elemental analysis for certification and verification of analytical chemistry and alloy identification. The Frontics instruments are Micro Indentation Testers that can non-destructively measure Tensile, Yield, Hardness and Fracture Toughness.

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Jari Automation Co., Ltd. China is the subsidiary company of Jiangsu Automation Research Institute which was founded in 1965 as a comprehensive research institute of China Shipbuilding Heavy Industry Group. Jari Automation Co., Ltd. China is located in a coastal city in China, about 500 kilometers away from Shanghai, with branches in Shanghai and Qingdao. There are 220 employees in the company, most of them have college degree or above. As the first batch of industrial robot system integrators in China, Jari Automation Co., Ltd. China has many years experience in the field of metal processing and owns the core technology of industrial robot system, such as accurate positioning, real-time tracking, etc. We have launched in-depth cooperation with Fanuc and many other international robot manufacturers, aiming at tailored manufacturing automation solution for customers of automobile and other fields, based on the self-building research platform and rich experience at automated production lines with industrial robots. We have achieved abundant application success in the automation production solution for casting and die casting. We have provided automated solutions for more than 100 customers in Japan, Germany, India and China.

Jiangsu Tianhong Machinery Industry Co., Ltd.**Booth 1227**

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www.tianhong-group.com

Jiangsu Tianhong Machinery Industrial Co., Ltd is a private joint-venture company. Focused on high-tech equipment manufacture, it was founded in August 2007 and started to make the first machine on July 2009. It is located in Douzhuang Yingbin Avenue Industrial Park, Danyang city, Jiangsu Province. Company registration paid up capital of 14 million Yuan, covers an area of 26,600 square meters, factory area of 16,000 square meters, employs 185 people, mainly produce aluminum alloy melting equipment, casting equipment, auxiliary equipment and special alloy wheel manufacturing equipment, robotic integration(from 2012), services in the auto parts and components, high-speed rail parts and components, machinery and equipment manufacturing industry.

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Morgan Advanced Materials is a global engineering company that applies world-class material science and manufacturing expertise to solve the technical challenges that our customers face every day. We work in selected segments of the electronics, energy, healthcare, industrial, petrochemical, security and transport markets, typically in close and collaborative customer relationships. We are the recognized worldwide leader in the supply of crucibles to non-ferrous metals industries, and we specialize in providing melting solutions to foundries, die-casters and metal melting facilities covering applications including zinc, precious metals, aluminum, copper/brass/bronze and other non-ferrous metals.

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MPM Infosoft has been formed to distribute and market SANDMAN which is a unique world-class software invented by Deepak Chowdhary, who has 35+ years of experience in Foundry green sand control and management. Deepak is a first-generation Entrepreneur and the founder owner of MPM Private Limited, the pioneers of engineered Lustrous carbon additives and green sand control solutions and services. SANDMAN for the first time in the world, offers Foundries a Data Analytic driven software solution to gather, store, organize & validate data to optimize green sand process control using advanced data science and powerful mathematical modeling; with a view to reduce costly and repetitive rejections and optimizing additive consumption using unique "dose-by-need" algorithms. Bringing the power of Data analytics to Foundry Processes to achieve sustained, scalable and dynamically balanced green sand control which arguably is still one of the greyest areas in foundry, is a transformative step towards taking your esteemed Company towards Industry 4.0. The MPM Infosoft Team comprises very erudite and professional PhD holders in Systems Engineering and data scientists

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Nianda, established in 1973, is specialized in the production of industrial furnaces and ovens. Today, Nianda is a leading company in the design and manufacturing of heat treatment equipment for ferrous and non-ferrous industry, new energy field, and chemical industry. Nianda Industries has specialized in thermal processing for over 40 years and is actively using this technical expertise to provide innovative solutions to critical applications in a broad range of markets and advanced technology worldwide. Our equipment is installed in America, Europe, and Middle East, etc.

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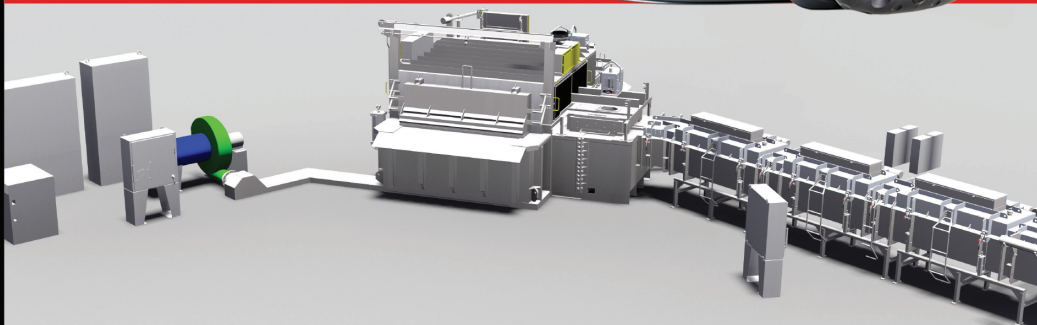
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precast shapes that are sold and distributed world-wide. Our company is privileged to have a group of dedicated employees continuously rising to the demands of our customers' refractory requirements. Our sales and customer service department, engineering department, research and development department and precast shapes department here at Reno Refractories, Inc. can provide a satisfactory solution for our customers that will meet or exceed their needs. Today we produce and distribute products for all major industries including: Aluminum, Integrated Steel and Mini-Mills, Cement, Lime Minerals Processing, Electric Power Generating Plants, Coke Plants, Boilers, Waste Incineration, Copper and Forging and Petro-Chemical Industries. Here at Reno Refractories, Inc., we are committed to satisfying or exceeding the increasing demands of our customers. As our company continues to grow, the basic principles of Honesty, Quality and Service remain. It is our belief that a long-lasting business relationship cannot survive without these simple but important principles.

Resco Products, Inc.**Booth 2544**

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www.rescoproducts.com

Resco Products is an American-owned company serving refractory markets for over 50 years. With 11 manufacturing plants in the UD and Canada, we manufacture a full line of brick, mortar, plastic and bagged monolithic products as well as precast shapes. Our sales and support staff work both directly with furnace and kiln operators as well as distributors and installers. Our experienced team has decades of refractory problem solving knowledge in all forms of metal casting and handling.

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www.rimrockcorp.com

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Canada
514-848-8587
www.riotinto.com

Rizhao Hengqiao Carbon Co., Ltd.

Booth 720

Room 1203, Zhongsheng Building, Haibin 2nd Rd
Rizhou City, Shandong 276800
China
86-633-3385366
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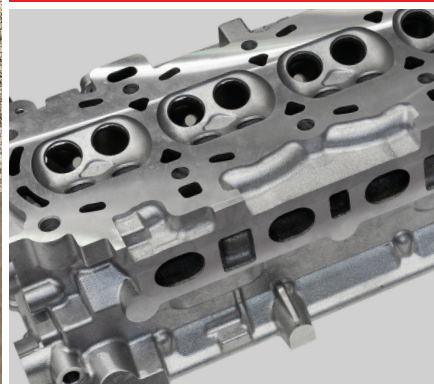
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Booth 2723

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708-597-7090
www.scientificdustcollectors.com

Scientific Dust Collectors is an autonomous divi-

sion of Venturedyne Ltd., a large diversified industrial manufacturing corporation with divisions involved with dust collection, indoor air quality, environmental test chamber and sub-micron particle counting for clean rooms. All dust collector design; manufacturing, applications and sales support are done in our Alsip (Chicago) location, providing close control over all key aspects of our business. Scientific Dust Collectors began business in 1981 when our first patented improvement for cleaning a filtering media was issued. Subsequent patents were issued in 1986, 1987 and 1988 that relate to further improvements in dust collector cleaning technologies. Patents for the next generation of nozzle technology were recently issued. In 1995 all operations of Scientific Dust Collectors were relocated to our current facility in Alsip, IL. The reasoning behind the move was to allow Scientific Dust Collectors more space to grow and reach its full potential. A major investment was made in new manufacturing and engineering design capabilities. The performance superiority of Scientific Dust Collectors is not just an idle claim. It is fact based on sound theory, solid engineering practices and extensive field experience.

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Booth 2111

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By continuously developing a full range of proven, integrated sand preparation and control technologies, Simpson Technologies can benefit any size or type of foundry by providing a complete solution from a single source that best: • provides consistently high-quality sand preparation system performance with minimal process variation • minimizes the total cost of operation in terms of supervision, energy, raw materials and maintenance • minimizes the total capital cost to acquire and install the equipment. These benefits create value for a foundry by enabling it to produce molding sand which maximizes the potential of their casting plant to produce high-value, high-profit metal castings.

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Sinto is a worldwide group of companies with an international reputation for excellence in the metal casting industry. Sinto provides services and products including foundry equipment, integration, engineering, system and plant layout, sand handling, and surface finishing.

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Solex Thermal Science Inc.*

Booth 622

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www.solexthermal.com

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Products & Foundry Coatings

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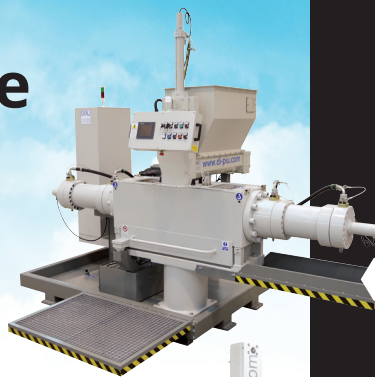
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Southeastern Foundry Products & Foundry Coatings, Inc. is one of the leading coating manufacturing companies for water and solvent based coatings, release agents, boron nitride releases, and a distributor for foundry product lines. We are the producer of: Lost Foam Coatings; Sand Coat-

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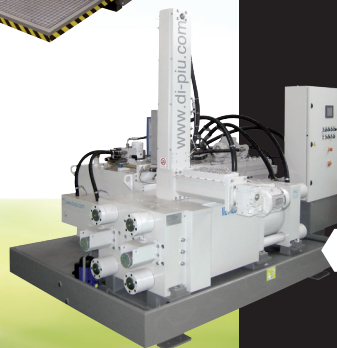
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Summit provides Sand Systems, Automatic Mold Handling Indexing Systems, Casting Handling Systems, and Turnkey Foundry Design Projects from Concept through Installation. Exhibit will highlight various projects for the Foundry Industry. Video Clips will illustrate the latest concepts in operation of Automatic Mold Handling Indexing Systems to integrate with the Automatic Molding Machines. COOLtech Sand Cooling Water Addition System will be featured. Summit provides individual components such as Conveyors, Bucket Elevators, Rotary Screens, Sand Feeder Bins, and Storage Bins. Visit with our knowledgeable Engineers to provide solutions to improve your foundry's productivity.

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The Foundry Group LLC

Booth 2826

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Our team has over 50 years of combined experience in the foundry, steel & recycling industry. Our combined experiences and relationships have allowed us to finally pursue our vision of providing better solutions for our industry. The Foundry Group will prove to be more than just another service provider. We're here to help customers find solutions for problems our competitors don't care about. Additionally, we will bring our industry into the 21st Century by developing modern platforms to do business on. We want to earn your business. Please contact us today to start finding solutions.



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Booth 2356

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www.theschaefergroup.com

The Schaefer Group, Inc. will be displaying their furnaces at booth 905 at the Congress in April. Schaefer will display gas and electric melting and holding furnaces, transfer ladles, heated launders, electric immersion element holding furnaces, tilting furnaces, crucible furnaces and filtration / degassing furnaces. Come see our new Virtual Reality System where you can walk around and sit in molten aluminum and not get burned! Schaefer Furnaces: Profitably Casting Your Bottom Line.

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Thermbond Refractory Solutions

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Tinker Omega Sinto LLC*

Booth 627

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937-322-2272
www.tinkeromega.com

Tinker Omega Sinto LLC, founded in 2001 by Wil Tinker and Mark Fenyes, is a leading manufacturer of chemically bonded sand equipment for the metal casting industry. We work with customers to create the best solution for their casting requirements ranging from a single machine to a complete casting facility. Our range of equipment and systems covers the handling and processing of sand from the delivery truck, through the foundry and then back to the storage silo for reuse.

Titan Robotics, Ltd.

Booth 2818

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Colorado Springs, CO 80907
719-822-1113
www.titan3drobotics.com

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Top Cat Air Tools

Booth 1127

38285 Pelton Rd.
Willoughby, OH 44094
440-954-7500
www.tcservice.com

The Top Cat brand of pneumatic power tools are proudly made in Willoughby, OH, USA. We offer a wide range of material removal and surface conditioning tools for applications in heavy industries. We serve industries such as steel, iron and aluminum foundries as well as heavy and light steel fabricators. Our products include grinders, sanders, percussive tools and saws in many forms (vertical, horizontal, extended, right angle and die grinders). Our industrial tools help companies increase production rates and reduce operator strain by opti-

mizing the material removal operation. Distributor inquiries are welcome.

Transmet Corporation

Booth 2447

4290 Perimeter Dr.
Columbus, OH 43228
614-276-5522
www.transmet.com

Transmet manufactures non-ferrous blast media. Cast zinc and aluminum shot leave bright and blended surfaces on light metals with no warping or opening of porosity. Zinc and aluminum medias are extremely durable and will not destroy blast wheels or blast machines cabinets. We also manufacture stainless steel grit when you need a non-ferrous option with a more aggressive profile. The high durability of our medias results in less dust in your workplace.

TriALco, Inc.

Booth 2250

900 E. Lincoln Highway
Chicago Heights, IL 60411
708-757-4200
www.trialco.net

Triple M Metal LP

Booth 2713

471 Intermodal Dr.
Brampton, Ontario L6T 5G4
Canada
905-793-7083
www.triplemmetal.com

TSI Inc.

Booth 2427

500 Cardigan Rd.
Shoreview, MN 55126
800-874-2811
www.tsi.com



TSI Chemlogix offers laser metal analysis and sorting tools that maximize the return on your scrap. The Chemlite measures your scrap in 1 second without all of the regulation headaches of an XRF. Automatically sort your Al scrap with capacities up to 5 TPH with the Chemline LIBS sorter.

Ultraseal America*

Booth 1210

4343 Concourse Dr.
Ste 340
Ann Arbor, MI 48108
734-945-7210
www.ultrasealamerica.com

U-Metco Inc.

Booth 1008

8651 E. 7 Mile Rd.
Detroit, MI 48234
313-550-3328
www.u-metco.com

U-Metco Inc. is a supplier of high-quality steel and stainless steel Melting Stock and Cover Steel Punchings for ferrous foundries throughout North America. They offer a wide range of consistent, guaranteed chemistry steel and stainless-steel alloys in the form of punchings, plate and bar. Materials are processed to be clean and dry and packaged for maximum efficiency in handling in charging. Chemical certificates of analysis are also provided with each shipment.

United Erie

Booth 2257

1432 Chestnut St.
Erie, PA 16502
262-689-0804
www.unitederie.com

United Erie is Customer Focused with Remarkable Capabilities. Large Enough to Supply North America and Small Enough to Truly Listen. We manufacture the following Foundry Resin Systems: Phenolic Urethane - Cold Box Phenolic Urethane - No-Bake Furan - No-Bake Modified Furan Blended - No-Bake Ester Cured Alkaline Phenolic - No-Bake Ester Cured Alkaline Phenolic CO2 - Cold Box Polyol Urethane - No-Bake - Standard System Polyol Urethane - No-Bake - 0% VOC Sodium Silicate - No-Bake Sodium Silicate - Cold Box CO2Alkyd Urethane - No-Bake Core Oil - Conventional & Emulsion With 8 Reactors Capable of Producing Standard or Custom Crafted Resin Formulas with uncompromising standards of quality and will contribute significantly to the quality of your castings. United Erie has the facilities, the know-how through 75 years of continuous operations, and the passion to help you produce better castings at a reasonable cost by providing an expansive selection of uniformly dependable resin systems to meet a wide variety of individual foundry needs. United Erie owns and operates a private truck fleet that includes more than 300 trucks, tankers and van trailers. With 18 North American warehouses, offering superior delivery and service.

United Refractories Co.

Booth 2448

264 Valley Brook Rd.
McMurray, PA 15317
724-941-9300
www.urc4u.com

United Refractories Company (URC) designs

innovative, value driven refractories for iron foundries and aluminum furnaces. Our technically driven products manufactured at our Brookville, IN facility include cutting edge cupola products, UNI-RAM VR Dry-Vibratables for induction furnaces, a wide range of customized plastic compositions, and a full line of Pump/Shot/Cast Products. URC provides 4U Service focusing on customized products, technical services, responsive support, and trustworthy data.

University of Northern Iowa
Booth 515

Department of Technology
Cedar Falls, IA 50614
319-273-7083
www.uni.edu

Verder Scientific Inc.
Booth 2119

11 Penns Tr.
Ste. 300
Newtown, PA 18940
267-431-1221
www.verder-scientific.com

Verder Scientific is a well-established German company, with subsidiary in the USA, with a long history of providing equipment and instrumentation to industry leaders, including the foundry and steel industries, as well as institutions, analytical labs and manufacturing facilities worldwide. Verder Scientific is a leading manufacturer of scientific equipment for quality control, research, and development of solid materials. Our engineers find high quality solutions for sample preparation, heat treatment, particle size analysis, elemental analysis, hardness testing, and materialography. Verder Scientific offers solutions for solids under the following renowned brands: Retsch: Grinding, milling, and sieving of raw materials and cast products for particle size reduction or analysis. Retsch Technology: Dynamic representative particle sizing and imaging via optical measurements of shapes and sizes of powders, granules, and bulk materials in the 0.3 nm to 30 mm range. Carbolite Gero: Standard and customized turnkey ovens from 30 to 3000°C. ELTRA: High throughput elemental analysis of carbon, sulfur, nitrogen, oxygen, and hydrogen content in raw materials and finished casts. ATM: Polishing, cutting, and mounting equipment for materialographic processes to ensure high quality finish for quality control. Qness: Rockwell and Vickers hardness testing to ensure robust properties in special casts, such as wear-resistant titanium or heat-resistant aluminum alloys. Verder Scientific will be showcasing a modern line of equipment and unveiling new technology for Retsch, Retsch Technology, Carbolite Gero, and ELTRA at Cast Expo 2019 as a one stop shop for the casting industry.

Versatile Equipments Pvt. Ltd.
Booth 2824

B69 MIDC Gokul Shirgaon
Kolhapur, Maharashtra 416234
India
www.sandtesting.com

Viking Blast & Wash Systems
Booth 1755

731 S. Industrial Ct.
Rose Hill, KS 67133
800-835-1096
www.vikingcorporation.com

Viking Technologies*
Booth 1044

25169 Dequindre Rd.
Madison Heights, MI 48071
586-914-0819
www.viking-technologies.com

VisiConsult X-Ray Systems & Solutions GmbH
Booth 1113

Brandenbrooker Weg 2-4
Stockelsdorf 23617
Germany
494512902860
www.visiconsult.de

VJ Technologies*
Booth 705

89 Carlough Rd.
Bohemia, NY 11716
631-589-8800
www.vjt.com

Volume Graphics Inc.
Booth 1251

415 Minuet Ln.
Ste. C
Charlotte, NC 28217
704-248-7736
www.volumegraphics.com

Volume Graphics develops high-end software for the analysis and visualization of industrial computed tomography (CT) data. Software like the extendable high-end solution VGSTUDIO MAX helps companies find out as much about their products as possible – and non-destructively at that. Recognized by independent research and consulting firm Frost & Sullivan as the market leader in the industrial CT software industry in 2018, companies worldwide in the automotive and electronics industries use Volume Graphics solutions for metrology, quality control, damage analysis, and product development. Industrial CT provides the basis for this, as CT scans reveal every aspect of a component. VGSTUDIO MAX offers options for tool and geometry corrections and a more meaningful assessment of mechanical effects of porosity. It even allows users to predict how much force a part could

theoretically withstand solely based on a CT scan. Whether users are using the all-encompassing technology of CT or other 3D-data formats such as point clouds, meshes, and CAD, VGSTUDIO MAX covers all requirements related to metrology, defect detection and assessment, material properties, or simulations in one software. Find out more at www.volumegraphics.com.

Voxeljet America Inc.*

Booth 1711

41430 Haggerty Cir. S.
Canton, MI 48188
734-808-0025
www.voxeljet.com

Voxeljet is a leading manufacturer of 3D printing systems for industrial applications and is specialized on Powder-Binder-Jetting of plastic and sand. With additive manufacturing we would like to ensure that our customers receive maximum efficiency and profitability by using innovative technology and comprehensive know-how in additive manufacturing. A perfectly adjusted product range always offers the right solution for different sectors, requirements and sizes – thus creating the best foundation for a faster and more flexible production.

Vulcan Engineering Co.*

Booth 1037

1 Vulcan Dr.
Helena, AL 35080
205-663-0732
www.vulcangroup.com

Vulkan Blast Shot Technology

Booth 1810

2-10 Plant Farm Blvd.
Brantford, Ontario N3S 7W3
Canada
800-263-7674
www.vulkanshot.com

For over 30 years, Vulkan Blast Shot Technology has been a leading manufacturer/distributor of specialty stainless steel shot and grit abrasives manufactured at their head office in Hattingen, Germany. We are committed to supplying our customers with the highest quality specialty abrasives as well as free on-site technical advice and equipment evaluations. We pride ourselves in our exceptional level of customer service from administration to shipping to outside sales and support. Chronital® is a stainless steel cast shot used for cleaning, deburring, descaling and surface finishing of a wide variety of aluminum, stainless steel and other non-ferrous alloy castings, forgings, fabrications, extrusions and stone products. Ferrous contamination is avoided

with a single step blast cleaning process and in many cases, pickling can be eliminated. Grittal® is an angular and aggressive DUST FREE stainless steel grit, primarily replacing aluminum oxide and garnet as well as some other mineral abrasives. Along with these premium products, Vulkan also distributes cut wire abrasives of various alloys. Vulkan products are available for direct purchase from our North American head office in Brantford, Ontario Canada, or from our distributors throughout the United States and Canada.

W Abrasives

Booth 917

1 Abrasive Ave.
P.O. Box 804
Bedford, VA 24523
800-207-4691
www.wabrasives.com

As the global leader in manufacturing steel abrasives, W Abrasives continues to improve and support all blasting needs with a dedicated approach to technical expertise, a focus on quality and performance, and a commitment to every customer. W Abrasives serves as a team of technical experts providing innovative solutions for all cleaning, surface preparation, and peening challenges faced during the blasting process. It is with this support W Abrasives can customize an approach to ensuring the greatest efficiencies for the customers abrasive use. W Abrasives' products and services include high carbon steel shot, grit and Premium solutions, stainless steel shot and grit, Technical services including optimization, maintenance, repairs and training. For more information, contact us at 800-207-4691 - www.wabrasives.com.

Waltz-Holst Blow Pipe Company Inc.

Booth 2714

230 Alta Dale
Ada, MI 49301
616-676-8119
www.waltzholst.com

Turn-key dust collection, ventilation and air pollution control systems. We design, engineer, fabricate and install our Leading "DUSTAR" baghouses and fans to suite your application. We provide preventative maintenance services, troubleshooting, bag changes for any brand collector, as well as fan inspections and wheel balancing.

Additional services include: Hood design/fabrication, sand transfer systems, silos, shakeout systems, furnace piping, abrasion resistant fittings, charge buckets, furnace liners, ladle forms, conveyor pans, cyclones and other general sheet metal work.

As family owned company since 1933, our dedicated staff, skilled union work force provide resources necessary to keep your metal castings operation running efficiently.

Washington Mills Hennepin Inc.*

Booth 2828

13230 Prairie Industrial Parkway
Hennepin, IL 61327
815-925-7302
www.washingtonmills.com

Washington Mills is one of the world's largest producers of abrasives and fused mineral products, offering an exceptionally wide line of products from its worldwide multi-plant locations. Washington Mills operates the last remaining silicon carbide furnace plant in North America. Our Carbolon MA metallurgical silicon carbide is widely used in the production of iron and steel. Visit our team of metallurgists at Booth 2828 to learn how Carbolon MA metallurgical silicon carbide can improve your melt operations.

Webb-Stiles Company

Booth 706

375 Liverpool Dr.
Valley City, OH 44280
330-225-7761
www.webb-stiles.com

Webb-Stiles is a major manufacturer of engineered conveyors and conveyor systems and have been in business for over 60 years. We have sales offices, engineering and manufacturing facilities in Ohio and Alabama. Webb-Stiles is fully capable of handling your most critical conveyor projects in a timely and professional manner. Webb-Stiles has earned a reputation as "innovators" in applying the latest technology and standards into our equipment. With a full complement engineering staff, we are capable of designing the most complex of systems. In addition to our custom conveyor equipment, Webb-Stiles has a complete line of industry standard overhead trolley, Power and Free and a full line of roller conveyors, systems and components.

Weifang Foundry Machinery Co. Ltd.

Booth 951

7997 QingYuan Road
Economic District WeiFang City
Weifang, Shandong
China
86-536-8663548
www.wffm.cn

Founded in 1951, focus on manufacturing weld/cast Molding Box, Pallet car, Pattern Bolster over 40 years. Become the only one supplier for Kunkel

Wagner company in global market. The one of the largest joint-stock companies specializing in foundry machinery research, development, manufacture in China. Produce a variety of FLASK according to customer drawings. Main products: molding box for air-flow high pressure squeeze molding line, accessory machine for molding line, casting conveyor. We did successfully provide over 1500 foundries with complete solutions as a turnkey projects. Flask for all kinds of machine according to drawings. Automatic molding lines include KW line, HWS line, DISA, line, BMD line, S AVELLI line, SINTO line, FA line, FH line, +GF+ line, etc. We are the pioneer in the field of producing conveyor in China and with good quality and reputation among our customers. Graphite lubrication system guarantee this conveyor can use 10 years without maintaining. We provide casting pieces material report and CMM inspection report to customers.

Weifang Kailong Machinery Co., Ltd.

Booth 751

No 11 Road, Economy Development Zone
Fanzi District
Weifang, Shandong 261200
China
86 536 8122876
www.klmachinery.com

As a professional foundry machinery manufacturer, Weifang Kailong Machinery Co., Ltd. is a technological innovation company located in Weifang City, Shandong Province. We are specialized in foundry machinery research and development, design, manufacture, sales and after-sales service. Products are Static Pressure Molding Line; Horizontal Flaskless Molding Line; Semi-Automatic Molding Line; Mold Flask & Pallet Car; Apron Conveyor; Pouring System; and Core Machine.

Westmoreland Advanced Materials Inc.

Booth 827

501 McKean Ave.
3rd Fl.
Chareroi, PA 15022
724-771-2161
www.westadmat.com

Wheelabrator*

Booth 737

1606 Executive Dr.
LaGrange, GA 30240
706-884-6884
www.wheelabratorgroup.com

Whiting Equipment Canada

Booth 749

350 Alexander St.
Welland, ON L3B 5P4
Canada
905-732-7585

www.whiting.ca

Whiting Equipment Canada is a wholly owned subsidiary of Whiting Corp., Monee, Ill., USA. The company and its subsidiary manufacture meltshop and material handling equipment, including electric arc furnaces, ladles, transfer cars, charge buckets, EAF control upgrades, tilting stands, AOD systems and overhead traveling cranes. The Whiting booth will be staffed with technical specialists ready to discuss the technical aspects of your future projects, along with Whiting's engineering and manufacturing capabilities.

Wisconsin Oven Corporation*

Booth 818

2675 Main St.
East Troy, WI 53120
262-642-3938
www.wisoven.com

Wisconsin Oven Corporation is located in East Troy, Wisconsin. WOC has been designing, engineering, and manufacturing industrial ovens and other heating equipment since 1973. Our custom and standard industrial ovens are used for a multitude of applications including heat treating, finishing, drying, or curing. Many of the industries we serve require specific temperature uniformity and equipment performance documentation. Our experienced design team is able to meet even the most stringent standards for our customers' equipment!

Xiangtan Hexinsheng New Material Co. Ltd.

Booth 1151

Rm. 504 Unit 1 Building No. 26
Wukuang Zuncheng Jiuhe
Demonstration District
Xiangtan, Hunan 4110
China
731-55599699
www.xthxxcl.cn.china.cn

Yancheng Saipu Metal Products Co. Ltd.

Booth 1250

A-13 Minhao Industrial Park She Yang
Yancheng 224300
China
8-515-69869677
www.superiorcutwireshot.com

We are manufacturer in China for all kinds of cut wire shot which used in shot blasting and shot peening! The main material including: Carbon Steel Shot, Stainless Steel Shot, Zinc Shot, Aluminum Shot, Ceramic Beads. We also can supply the blasting machine as your request!

YXLON*

Booth 1913

5675 Hudson Industrial Parkway
Hudson, OH 44236
847-987-0967
www.yxlon.com

Worldwide, YXLON International is a leading provider of 2D, 3D Computed Tomography (CT) and Digital Radiography (DR) X-ray inspection equipment for industrial applications. Whether operated manually, semi-automatically or on a fully automatic scale, we have the right solution to match nearly every application in foundry, die cast, automotive, aerospace and electronics industries.

ZEISS X-ray Solutions

Booth 2825

6250 Sycamore Ln.
Maple Grove, MN 55369
763-744-2400
www.zeiss.com/metrology

ZEISS ensures standards of quality wherever maximum precision is a must: with multidimensional measurement machines, metrology software and microscope systems for science, research and material inspection. ZEISS plays its part in ensuring that even the tiniest structures and processes become visible. Around 2,400 employees work for ZEISS Industrial Metrology at manufacturing sites in Germany, China, U.S. and India. In the U.S., ZEISS has Metrology Centers in Charlotte, Boston, Detroit, Chicago, Irvine, Minneapolis and Nashville.

Zerust Corrosion Solutions

Booth 1045

4201 Woodland Rd.
Circle Pines, MN 55434
763-225-6600
www.zerust.com

Proven Solutions from Zerust, the "Original" VCI Film Company. Zerust®/Excor® offers a full line of corrosion inhibitor packaging and rust solutions. Zerust is the inventor of Volatile Corrosion Inhibitor (VCI) poly technology and offers expert onsite support in over 70 countries worldwide. For over 40 years, Zerust has helped customers reduce the cost and problems associated with corrosion. Have a challenging corrosion prevention need, such as overseas shipping or storage in corrosive environ-

ments? Trust Zerust to help you manage corrosion in your operations. Zerust is a business unit of Northern Technologies International Corp. For more information, visit www.zerust.com.

Zibo Taa Metal Technology Co., Ltd.

Booth 819

No 288 Center Ave.
Mengshui Zhoucun
Zibo, Shandong 255318
China
86-533-6881687
www.taa.net.cn

Founded 1997, ZIBO TAA METAL TECHNOLOGY CO., LTD is a listed company in China. Taa has been devoted to the production and development of metal abrasives over the years, we are the surface treatment integrated service provider.

Zijiang Furnace Nanjing Co. Ltd.

Booth 2249

No. 58 Hengjing Rd.
Economic & Development Zone
Nanjing 210059
China
86 15150666619
www.njcjdl.com

Zijiang Furnace Nanjing Co., Ltd. is a large enterprise for designing and manufacturing various industrial furnaces, fuel furnaces and heat treatment equipments. Since the plant is built in 1975, we fully imported and absorbed the advanced technology from the western famous furnace company and gained rich experience on designing and manufacturing, during which we also developed a strong technical group and an impeccable quality assurance system. The main products are: new type no-basket roller type aluminum alloy steel wheel H/T production line, cantilever type steel cylinder solid solution furnace, aluminum bar heating furnace, aluminum wire annealing furnace, roller type continuous production line, walking beam type continuous production line, push type continuous production line, casting chain type continuous production line, mesh belt type continuous production line, protective atmosphere brazing furnace, stainless steel (steels) bright annealing furnace, vertical type aluminum alloy steel solid solution/ageing furnace, large well type carbon penetration furnace, large trolley type furnace, bell type furnace, oil/gas heating furnace and various standard and non-standard industrial furnaces.

ZIRCAR Ceramics, Inc.

Booth 2146

100 N. Main St.
Florida, NY 10921

845-651-6600

www.zircarceramics.com

ZIRCAR Ceramics offers high quality cast house consumable products including vacuum formed ceramic fiber boards and shapes for applications such as troughs, launders, ladles, filter boxes and furnace insulation; ceramic fiber paper and blankets in roll and die cut form for use as gaskets and mold wraps; machined graphite in several densities and grain sizes for use as degasser impellers, flow control valve parts and molds; vacuum formed ceramic fiber and dense refractory supported heaters for use as primary heat in electrically heated crucible and dosing furnace applications. Boron nitride, colloidal graphite and other refractory coatings combined with a machine shop equipped with 4 CNC milling systems for precision manufacturing of custom calcium silicate, microporous silica and soluble fiber products give ZIRCAR Ceramics the ability to help you make better metal. ZCI is a US based manufacturer and international marketer of a wide range of engineered high temperature materials and products bringing value to the metal casting operations served. Contact David Hamling / Owner at sales@zircarceramics.com. See the company's website www.zircarceramics.com.



APRIL 27-30, 2019

ATLANTA, GEORGIA

CASTEXPO

& METALCASTING CONGRESS

connecting SUPPLIERS | METALCASTERS | CASTING BUYERS

CAST IN NORTH AMERICA EXHIBITOR BOOTH LIST – ALPHABETICAL

(As of March 1, 2019)

A

AERO METALS Inc.	Booth 446
Alliant Castings - ODIN Division	Booth 522
Atlas Foundry Company	Booth 447

B

Badger Alloys Inc.	Booth 546
Betz Industries	Booth 337
Blackhawk de Mexico, S.A. de C.V.	Booth 326

C

Charlotte Pipe and Foundry	Booth 542
Craft Pattern & Mold Inc.	Booth 343

D

Decatur Foundry Inc.	Booth 425
Denison Industries	Booth 328
Designed Precision Castings Inc.	Booth 423
Dotson Iron Castings	Booth 439

E

Eagle Group Manufacturers	Booth 424
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F

Faircast Inc.	Booth 342
Ferroloy, Inc.	Booth 323

H

Harmony Castings LLC	Booth 438
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J

Jenkins	Booth 344
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K

Kimura Foundry America	Booth 331
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L

LeClaire Manufacturing	Booth 445
Lethbridge Iron Works	Booth 444

M

Monarch Industries Limited	Booth 429
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N

Northern Iron & Machine	Booth 442
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O

Osco Industries Inc.	Booth 437
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P

Pier Foundry & Pattern Shop	Booth 524
Poitras Foundry Ltd.	Booth 329
Premier Aluminum	Booth 345
Product Development & Analysis LLC	Booth 544

R

Renaissance Manufacturing Group	Booth 324
Rochester Metal Products Corp.	Booth 340

S

St. Marys Foundry	Booth 336
Stahl Specialty Co.	Booth 339

T

TB Wood's	Booth 346
TPI Arcade, Inc.	Booth 347

V

Victaulic Company	Booth 443
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W

Wabash Castings Inc.	Booth 325
Ward Corporation	Booth 436
Watry Industries	Booth 345
Waupaca Foundry Inc.	Booth 431
Webster Industries	Booth 322
Wisconsin Aluminum Foundry	Booth 422

CAST IN NORTH AMERICA EXHIBITOR BOOTH LIST – CATEGORY

(As of March 1, 2019)

ALLOYS/MATERIALS

Aluminum

AERO METALS Inc.	Booth 446
Craft Pattern & Mold Inc.	Booth 343
Denison Industries	Booth 328
Designed Precision Castings Inc.	Booth 423
Eagle Group Manufacturers	Booth 424
Harmony Castings LLC	Booth 438
Jenkins	Booth 344
LeClaire Manufacturing	Booth 445
Premier Aluminum	Booth 345
Stahl Specialty Co.	Booth 339
TPI Arcade, Inc.	Booth 347
Wabash Castings Inc.	Booth 325
Ward Corporation	Booth 436
Watry Industries	Booth 345
Wisconsin Aluminum Foundry	Booth 422

Copper-Base

AERO METALS Inc.	Booth 446
Badger Alloys	Booth 546
Designed Precision Castings Inc.	Booth 423
Wisconsin Aluminum Foundry	Booth 422

Iron

AERO METALS Inc.	Booth 446
Alliant Castings - ODIN Division	Booth 522
Atlas Foundry Company	Booth 447
Betz Industries	Booth 337
Blackhawk de Mexico, S.A. de C.V.	Booth 326
Charlotte Pipe and Foundry	Booth 542
Craft Pattern & Mold Inc.	Booth 343
Decatur Foundry	Booth 425
Dotson Iron Castings	Booth 439
Faircast Inc.	Booth 342
Ferroloy, Inc.	Booth 323
Kimura Foundry North America	Booth 331
Lethbridge Iron Works	Booth 444
Monarch Industries Limited	Booth 429
Northern Iron & Machine	Booth 442
Oscos Industries	Booth 437
Pier Foundry & Pattern Shop	Booth 524
Poitras Foundry Ltd.	Booth 329
Product Development & Analysis LLC	Booth 544
Renaissance Manufacturing Group	Booth 324
Rochester Metal Products Corp.	Booth 340
St Marys Foundry	Booth 336

TB Wood's	Booth 346
Victaulic Company	Booth 443
Waupaca Foundry Inc.	Booth 431
Webster Industries	Booth 322

Steel

AERO METALS Inc.	Booth 446
Badger Alloys	Booth 546
Designed Precision Castings Inc.	Booth 423
Eagle Group Manufacturers	Booth 424
Kimura Foundry North America	Booth 331

MOLDING PROCESSES

Additive Manufacturing

Alliant Castings - Odin Division	Booth 522
Product Development & Analysis LLC	Booth 544

Centrifugal

Charlotte Pipe and Foundry	Booth 542
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Chemically-Bonded Sand

Badger Alloys	Booth 546
Betz Industries	Booth 337
Blackhawk de Mexico, S.A. de C.V.	Booth 326
Craft Pattern & Mold Inc.	Booth 343
Decatur Foundry	Booth 425
Denison Industries	Booth 328
Eagle Group Manufacturers	Booth 424
Ferroloy, Inc.	Booth 323
Monarch Industries Limited	Booth 429
St Marys Foundry	Booth 336
TB Wood's	Booth 346
Victaulic Company	Booth 443

Green Sand

Atlas Foundry Company	Booth 447
Blackhawk de Mexico, S.A. de C.V.	Booth 326
Charlotte Pipe and Foundry	Booth 542
Dotson Iron Castings	Booth 439
Ferroloy, Inc.	Booth 323
Jenkins	Booth 344
LeClaire Manufacturing	Booth 445
Lethbridge Iron Works	Booth 444
Monarch Industries Limited	Booth 429
Northern Iron & Machine	Booth 442
Oscos Industries	Booth 437
Pier Foundry & Pattern Shop	Booth 524

Poitras Foundry Ltd.	Booth 329
Renaissance Manufacturing Group	Booth 324
Rochester Metal Products Corp.	Booth 340
TB Wood's	Booth 346
Victaulic Company	Booth 443
Wabash Castings Inc.	Booth 325
Ward Corporation	Booth 436
Waupaca Foundry Inc.	Booth 431
Webster Industries	Booth 322
Wisconsin Aluminum Foundry	Booth 422

Investment Casting

AERO METALS Inc.	Booth 446
Designed Precision Castings Inc.	Booth 423
Eagle Group Manufacturers	Booth 424

Lost Foam

Betz Industries	Booth 337
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Permanent Mold

Denison Industries	Booth 328
LeClaire Manufacturing	Booth 445
Premier Aluminum	Booth 345

Stahl Specialty Co.	Booth 339
Ward Corporation	Booth 436
Watry Industries	Booth 345
Wisconsin Aluminum Foundry	Booth 422

Rapid Prototyping

Alliant Castings - ODIN Division	Booth 522
Craft Pattern & Mold Inc.	Booth 343
Kimura Foundry North America	Booth 331
Premier Aluminum Product Development & Analysis LLC	Booth 345
Watry Industries	Booth 544
	Booth 345

V-Process

Harmony Castings LLC	Booth 438
TPI Arcade, Inc.	Booth 347



HILL AND GRIFFITH
Casting Solutions® Since 1896

Foundry Supplies

Help reach M.A.C.T. standards with our environmentally sound foundry release agents, coatings, partings, core pastes and coagulants.

Hydraulic Fluids

Griflube® hydraulic fluids and specialty lubricants (fire resistant and environmentally compliant) are formulated to work effectively at high temperatures and pressures.

Die Casting Lubricants

To handle wide temperature variations and control staining and soldering, Diluco™ is the industry's most consistent and highest quality water-based die lubricant.

Logistics

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Griflube® synthetic lubricants excel with all metal types for maximum tool life and exceptional finishes.



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With Quality
Products**



APRIL 27-30, 2019

ATLANTA, GEORGIA

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CASTEXPO
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CAST IN NORTH AMERICA EXHIBITOR DIRECTORY

Aero Metals Inc.*

Booth 446

1201 E. Lincolnway
LaPorte, IN 46350
219-326-1976
www.aerometals.com

Aero Metals, Inc. provides customers around the world with precision investment castings to their finished needs. We are one of the leading privately owned and operated metal investment cast foundries in the country. Since 1962, we've been helping customers in various industries achieve their goals by providing cast metal prototypes of their conceptual drawings through component part production, and assembly of finished product. Customers often turn to us when they discover they can't find anyone else who can manufacture their complex parts. Investment casting is a method that makes it possible to replicate complex parts to your exact specifications. We guarantee a level of quality other investment casters simply cannot match. Aero Metals, Inc. is ready to put our 50 years of experience in precision metal cast parts and casting-based assemblies to work for you. Contact us to start the informal engineering discussion about your project.

Alliant Castings – ODIN Division*

Booth 522

1200 W 3rd St
Winona, MN 55987
507-452-2932
www.odincasting.com

Digitally integrated, low-volume iron castings for legacy and prototype parts
Go from long lead-time, unpredictable castings – with expensive tooling – to castings made with digital technologies. All delivered in less time with our exclusive ODIN™ INTEGRATED DIGITAL

CASTING SYSTEM.

- In-House Digital Casting Expertise
- Design and casting simulation. 3D modeling, scanning and process simulation
- Reduce Tooling Cost
- Storage, Maintenance, and build
- Shorter Lead Times
- For prototype and legacy parts production
- Streamlined Casting Processes
- Near net shape parts and fast iterations
- Minimize Asset Loss Risk
- Capture your intellectual property digitally with the safety and security of cloud storage
- Technology Driven with a Human Touch

We are always a phone call away with a friendly expert to help you at every step in the process.

Atlas Foundry Company*

Booth 447

601 N. Henderson Ave
Marion, IN 46952
765-662-2525
www.atlasfdry.com

Atlas Foundry is a jobbing and production foundry specializing in Classes 25, 30 and 25 Gray Iron Castings weighing less than 50 pounds. We utilize Disamatic molding machines to produce mold for our castings. Production volumes range from 100 mold releases to several thousand molds per release. Our Foundry is located in Marion, Indiana, about 60 miles to the northeast of Indianapolis.

Badger Alloys Inc.*

Booth 546

5120 W. State St.
Milwaukee, WI 53208
414-258-8200
www.badgeralloys.com

"World-class castings delivered" has been our commitment to customers for more than 50 years. Badger Alloys is an award-winning, family-owned manufacturing group that includes an air-set foundry, dedicated pattern shop, complete machine shop, and on-site engineering team. We can meet your needs for simple to heavily cored, complex castings. Our customers – from small businesses to Fortune 500 Companies – typically represent the pump, valve, energy, water, chemical, industrial, food/beverage, marine and defense industries. We specialize in impellers of all sizes, up to 4,000 pounds. We regularly pour more than 200 different alloys, including high alloys, stainless steels, copper-based alloys and carbon/low alloy steels. We are conflict mineral-compliant, ISO 9001:2015 and PED-compliant, and environmentally sustainable. We offer all levels of NDT (non-destructive) inspections. Consistent investments in the latest technology keep us on the forefront of casting excellence. We offer prototyping, 3D molding and reverse engineering. Committed to lean manufacturing processes, our goal is to provide the highest value castings available. Visit us at Cast Expo 2019 booth #246!

Betz Industries***Booth 337**

2121 Bristol Ave NW
Grand Rapids, MI 49525
616-453-4429
www.betzindustries.com

Betz Industries, family owned and operated since 1933 and currently in the third generation. Producers of gray and ductile iron castings using the Full Mold Casting process (FMC). The FMC process allows for quicker delivery and reduced costs for prototyping and low- to mid-volume markets. With over 500,000 sq. feet of manufacturing space, continuous process improvements and capital investments, Betz Industries is committed to the FMC process and the future of the foundry industry in North America. The FMC process requires a pattern of superior quality, our pattern shop takes your solid model and creates a cutter path to CNC machine cut your part from foam blocks. Those layers are assembled and checked for dimensional accuracy before shipping to the foundry. The pattern is coated with our refractory wash, chemically bonded sand is packed around the coated pattern, no cores are needed. Iron enters the mold and takes the shape left behind by the evaporated

foam. Once cooled, the casting is blasted, cleaned and shipped to the final destination.

Blackhawk de Mexico, S.A. de C.V.***Booth 326**

Carretera a Villa de Garcfa Km 2.5 1-A
Col. El Palmar
Santa Catarina, Nuevo Leon 66350
Mexico
52-81-8151-0300
www.blackhawk.com.mx

Blackhawk is a ductile and gray iron foundry that produces castings from 10 to 880 lbs. We are located in Santa Catarina, Nuevo Leon, Mexico. Currently attending the following markets: heavy-duty trucks, off-highway and industrial. For further information, please contact us at ventas@blackhawk.com.mx.

Charlotte Pipe and Foundry***Booth 542**

1335 S. Clarkson St.
Charlotte, NC 28208
704-348-5528
www.charlottecastings.com

Charlotte Pipe is a family owned and privately held company that has been in the foundry business for over 100 years. We are a medium to high production green sand foundry, with Disamatic, FBO matchplate and automated HWS molding equipment. We offer on time delivery, short lead times and good quality.

Craft Pattern & Mold Inc.***Booth 343**

60 3rd St. South
Montrose, MN 55363
763-675-3169
www.craftpattern.com

Decatur Foundry Inc.***Booth 425**

1745 N. Illinois St.
Decatur IL 62526
217-429-5261
www.decaturfoundation.com

Denison Industries***Booth 328**

22 Fielder St.
Denison, TX 75020
903-786-6566
www.denisionindustries.com

Denison Industries is a producer of aluminum, magnesium sand and permanent castings for the Aerospace, Aviation, Defense and Commercial

industries. Denison Industries is NADCAP Accredited in Nondestructive Testing, Heat Treat and Welding. Denison Industries is also AS9100 & ISO 9001-2008 certified. We specialize in castings with a pour weight from 1-3,000 pounds in alloys 206, 319, 354, A 205, C355, A356, A357, D357, E357 and casting pour weight of 1-750 pounds in EV31A, ZE41, AZ91E and many others on a case by case basis. Denison Industries utilizes 3D sand printing for molds and cores, solidification modeling for development of pattern construction, gating, FAI inspection, including CMM and laser inspection. Denison Industries offers complete product processing including machining, impregnation, assembly and paint.

Designed Precision Castings Inc.
Booth 423

75 Eastern Ave.
Brampton, Ontario L6W 1X9
Canada
905-453-0421, Ext 24
www.designedprecision.com

Dotson Iron Castings*
Booth 439

200 W. Rock St.
Mankato, MN 56001
507-345-5018
www.dotson.com

Dotson Iron Castings is a one-stop shop for all your ductile iron casting, machining, painting and heat treatment needs. Along with value added services, Dotson also offers industry-leading lead times, top notch engineering, and unparalleled customer service. Our vision is to become the world's most agile ductile iron foundry.

Eagle Group Manufacturers*
Booth 424

5142 Evanston Ave.
Muskegon, MI 49442
231-788-7004
www.eaglegroupmanufacturers.com

The Eagle Group is a family. Collectively we can help your team with everything from part and process design to supply chain management. Eagle Group consists of four separately run companies to cover the full spectrum for your project: Eagle Alloy, Inc., Eagle Precision Cast Parts, Inc., Eagle Aluminum Cast Products, Inc. and Eagle CNC Technologies, Inc. Each was founded on the principle of superior customer service. We've been a leader, not a follower. Our foundries were among the first in the country to utilize methane gas from a local landfill to power our facility and one of the first to

incorporate solidification simulation to predict casting defects. We incorporated lean manufacturing concepts when others thought it was impossible to do so in a job shop with so many different part numbers. We consistently have the shortest lead times in the industry. Our companies are positioned for continued growth for years to come. Most of our key managers have been with the company for more than 20 years and work hard to uphold our traditions and our positive reputation in the industry. We look forward to helping you with your next project.

Faircast Inc.*
Booth 342

905 West Depot
Fairfield, IA 52556
641-209-4103
www.faircastinc.com

Ferroloy, Inc.*
Booth 323

515 E 29th St. N
Wichita, KS 67219
316-838-0897
www.ferroloyinc.com

Ferroloy, Inc. is an iron foundry in Wichita, KS, with machining, heat treating, coating and assembly capabilities. We make ductile and gray iron castings for agricultural machinery, industrial equipment, hydraulic valves and cylinders, construction equipment, and oil and gas equipment.

Harmony Castings LLC*
Booth 438

251 Perry Hwy.
Harmony PA 16037
724-452-5811
www.harmonycastings.com

Jenkins*
Booth 344

5933 Brookshire Blvd.
Charlotte, NC 28216
800-438-3003
www.jenkinselectric.com

Through casting in our foundry, parts that are obsolete or previously impossible to find can be created. Jenkins can manufacture new precision parts from a sample or print. From one-offs to small volume equipment parts production, our foundry is at the ready.

Kimura Foundry America*
Booth 331

789 Boomer Way
Shelbyville, IN 46176
317-604-5158
www.kimurafoundry.com

LeClaire Manufacturing
Booth 445

3225 Zimmerman Dr.
Bettendorf, IA 52722
319-759-5541
www.leclairemfg.com

LeClaire Manufacturing is a single-source sand and permanent mold aluminum casting company. We offer a streamlined, vertically integrated process that eliminates the middleman – and the markup – and lets you source your entire project through a single shop, LeClaire Manufacturing. From molds and patterns to leak testers and machining fixtures, we make them all in-house and subsequently produce the sand castings, permanent mold castings, CNC machining, and ship parts to print to our customers. Bring us your ideas, projects and even transfer tooling – and let us solve your aluminum casting challenges.

Lethbridge Iron Works*
Booth 444

720 32nd St. N
Lethbridge, Alberta T1H 5K5
Canada
403-329-4242
www.lethiron.com

Lethbridge Iron Works was founded in 1898 and produces iron castings for multiple industries throughout North America. Located in Lethbridge, Alberta, Leth Iron is proud to be Canada's leading iron foundry. Using 5 automated molding lines, Leth Iron produces castings from under 1lb to over 500lbs, pouring ductile iron, grey iron, chrome white iron, austempered ductile iron, and carbide austempered ductile iron. Six robotic grinding cells clean all castings to a perfectly consistent final product. In-house engineering allows for fast and effective casting conversions, using foundry expertise to engineer costs out of projects. No matter your iron casting needs, Leth Iron sets the standard for consistent top quality competitively priced castings.

Monarch Industries Limited
Booth 429

51 Burmac Rd.
PO Box 429
Winnipeg, Manitoba R3C 3E4
Canada
204-786-7921
www.monarchindustries.com

Founded in 1935, Monarch Industries is a privately owned, vertically integrated manufacturer of hydraulic cylinders and custom iron castings with expertise in weld-to-cast conversions. Gray and ductile iron sand castings ranging from 1 to 1,000 pounds are manufactured in North America on our greensand (16x20, 26x20, and 32x30) and nobake (45x66) molding lines along with partner machine shops and are marketed throughout North America as well as globally into South America, Europe and Asia. Employing over 450 people, Monarch has attained ISO 9001 quality and ISO 14001 environmental registration and, more recently, received SAFE Work Manitoba "Made Safe" certification, awarded to manufacturers who achieve and maintain safety standards modeled after the OHSAS 18001 international standard. Monarch is committed to providing outstanding products, services, and support to our customers, to being an outstanding employer and a responsible corporate citizen. View our "virtual factory tours" at www.monarchindustries.com.

Northern Iron & Machine*
Booth 442

867 Forest St.
St Paul, MN 55106
651-778-3320
www.northernim.com

Ductile and gray iron foundry and machine shop. Medium volume, green sand foundry. Castings from 5 to 250 lbs. ISO 9001-2015 certified.

Oscos Industries Inc.*
Booth 437

PO Box 1388
Portsmouth, OH 45662
740-354-3183
www.oscoind.com

Pier Foundry & Pattern Shop*
Booth 524

51 State St.
St. Paul, MN 55107
651-222-4461
www.pierfoundry.com

Pier Foundry & Pattern Shop is passionately committed to providing you with the highest level of service, support and value which you expect from a grey iron and ductile iron casting manufacturer. We are an ISO certified provider of grey iron, ductile

iron and austempered ductile iron castings of superior quality, at a competitive price with one of the shortest lead times in the industry. We can produce pattern tooling and sample castings in as short as 2 weeks. We offer over 128 years of manufacturing experience, a knowledgeable and friendly sales staff and a full complement of engineering support and technical services. We encourage our customers to get us involved early in the design process and offer design and castability assistance from concept through production. Let Pier Foundry be the one stop shop for all of your casting needs. Pier Foundry & Pattern Shop - Est. 1889.

Poitras Foundry Ltd.*
Booth 329

168 Nilus-leclerc Blvd.
L'islet, Quebec G0R 2C0
Canada
418-247-5041

Premier Aluminum*
Booth 345

3633 S. Memorial Dr.
Racine, WI 53403
262-554-2100
www.premieraluminum.com

Product Development & Analysis LLC
Booth 544

1776 Legacy Cir.
Ste 115
Naperville IL 60563
630-505-8801
www.pda-llc.com

Providing casting, rigging and process design, development and validations using FEA, CFD, Casting Simulations for Mold Filling, Solidification, Residual Stress and Porosity predictions and Additive Manufacturing. PDA LLC has been providing for 25 years, engineering support including alloy selection for new product development, redesign and reverse engineering; contract research; 3D scanning for reverse engineering; contract manufacturing using Additive Manufacturing toolingless process; scrap reduction and quality improvement consulting; wax injection modeling; new alloy, process & design tools development to over 160 small, medium and large OEMs, metalcasters, tool & die makers globally. Member of Manufacturing Innovation Institutes with Contract Research Projects – America Makes focused on 3D printing; DMDII focused on Digital Manufacturing & Design Innovations and LIFT (Lightweight Innovations for Tomorrow) focused on thin wall casting technologies. Visit us at www.PDA-LLC.com.

Renaissance Manufacturing Group*
Booth 324

1401 Perkins Ave.
Waukesha, WI 53186
262-548-1600
www.ren-mfg.com

Ductile iron metal caster specializing in commercial vehicle, industrial, and agriculture. Casting operations in Waukesha, WI and Anniston, AL, along with machining operations in Grafton, WI.

Rochester Metal Products Corp.*
Booth 340

616 Indiana Ave.
PO Box 488
Rochester, IN 46975
574-223-3164
www.rochestermetals.com

Rochester Metal Products Corp. has been producing quality gray and ductile iron castings since 1937. Our 200,000-square-foot facility is designed to serve a wide range of casting requirements from .75 pounds to 40 pounds. We offer casting design assistance for new products, from original concept to prototyping and final production. Rochester Metal Products Corp. takes great pride in our more than eight decades of commitment to meeting our customers' needs through short cycle times and on-time deliveries, joined by consistent quality and competitive prices.

St. Marys Foundry*
Booth 336

405 E South St.
St. Marys OH 45885
419-394-3386

www.stmfoundry.com

We succeed where others fail. That's the level of excellence and commitment you'll find at St. Marys Foundry. We've built our reputation on our ability to produce intricately-cored, complex castings that other foundries can't or won't tackle. By combining modern technology with skilled American craftsmanship, St. Marys Foundry has become the industry leader in providing castings ranging from the very basic to the most complicated, highly-engineered design. As part of our commitment to quality, we strictly adhere to our Quality system which surpasses industry standards.

Stahl Specialty Co.*

Booth 339

111 E Pacific St.
Kingsville MO 64061
816-597-3322
www.stahlspecialty.com

Stahl Specialty Company is one of the largest permanent and semi-permanent mold foundries in the country. The combined facilities cover approximately eleven acres under roof. We cast anywhere from .5 lb up to 400 lb castings. Stahl Specialty is a unique supplier offering customers a single point of contact for casting, heat treatment, machining, and full assembly. We are ISO-14001/ISO-9001/TS-16949 Certified. Since our humble beginnings in 1946 where Glenn Stahl pioneered the permanent mold tilt pour process, we have continued to lead in the aluminum casting industry.

TB Wood's*

Booth 346

440 N 5th Ave.
Chambersburg PA 17201
717-217-3879
www.tbwoods.com

TPI Arcade, Inc.*

Booth 347

7888 Route 98
Arcade, NY 14009
585-492-0122
www.tpicast.com

Victaulic Company*

Booth 443

4901 Kesslersville Rd.
Easton, PA 18040
616-559-3300
www.victauliccastings.com

Victaulic Custom Castings is your global partner for the highest quality green sand and no-bake ductile iron castings, at a competitive price. Turn-key options at all manufacturing locations.

Wabash Castings Inc.*

Booth 325

3837 Mill St.
Wabash, IN 46992
260-563-25566
www.wabashcastings.com

Wabash Castings, Inc. is a leader in technically complex aluminum castings. We ensure the highest product quality, on-time delivery, and competitive pricing for all of our customers. Our history, performance and personnel are second to none. We have built an excellent reputation within the aluminum foundry industry, and continue to deliver, and produce the highest quality aluminum castings. We are known for large complex cored aluminum castings. We have the ability to produce castings ranging from 2 to 50 lbs. We can cast, machine and assemble all under one roof. Depending on your needs, we are a full service supplier and are confident that WCI can meet the demands of our customers for any casting design. We specialize in manufacturing aluminum castings in green sand, and we will meet all of your aluminum requirements.

Ward Corporation*

Booth 436

642 Growth Ave.
Fort Wayne, IN 46808
260-426-8700
www.wardcorp.com

Ward Corporation is a family owned green sand and permanent mold aluminum foundry. We have the capacity to handle high production, low production, and prototyping. Ward Corporation is comprised of four divisions: Ward Pattern & Engineering, Ward Aluminum Casting, Ward Heat Treating and Ward Production Machine. Ward Corporation is a IAF 16949:2016 certified company.

Watry Industries*

Booth 345

3312 Lakeshore Dr.
Sheboygan, WI 53081
920-457-4886
www.watry.com

Waupaca Foundry Inc.*

Booth 431

1955 Brunner Dr.
Waupaca, WI 54981
715-258-6611
www.waupacafoundry.com

Waupaca Foundry, a Hitachi Metals Group company, has a reputation as solid as the castings we create. With headquarters and three foundries in Waupaca, Wis., as well as operations in Marinette, Wis., Tell City, Ind., Etowah, Tenn., and Lawrenceville, Pa. Machining and assembly operations are located in Effingham, Ill., and Waupaca, Wis. Combined, seven foundries and two machining/assembly operations employ more than 4,500 people. Waupaca produces gray and ductile iron casting components for global markets including the automotive, commercial vehicle, agriculture, construction, and other sectors. Components up to 350 pounds (160 kg) are produced on vertical or horizontal molding equipment by a workforce that puts generations of iron casting expertise to work for our customers. Count on Waupaca for industry-leading quality management, technology, and manufacturing automation. Together, this provides long-term value to our customers with VA/VE cost savings and the most consistent, high-quality iron casting components.

Webster Industries***Booth 322**

325 Hall St.
Tiffin, OH 44883
800-243-9327
www.websterchain.com

The Webster Foundry has been in operation since 1914. We specialize in the production of custom malleable iron castings in quantities from a few pieces to high volume production runs. We cast in sizes from two ounces to 50 pounds in the following metals: white iron, high alloy white iron, ferritic malleable iron, and pearlitic malleable iron (most classes). Our casting operations include: pattern making; induction channel melting; shell, oil sand and no-bake core making; Squeezer, Roto-Lift and Hunter automatic mold making; controlled atmosphere annealing; and insured pattern storage. We also have in-house heat-treat and machining facilities for more advanced machining requirements. Webster Industries quality system is certified to the ISO9001:2015 standard. The workforce of the Webster foundry is comprised of highly skilled, well-trained, and experienced employees, supported by our in-house engineering and design department.

Wisconsin Aluminum Foundry***Booth 422**

838 S. 16th St.

Manitowoc, WI 54220
920-682-8286
www.wafco.com

Established in 1909, Wisconsin Aluminum Foundry has consistently provided the finest quality aluminum and copper-based alloy castings for a wide variety of industries. We specialize in permanent mold, green sand molding, dry sand and low pressure molding processes and can take your casting design from prototype samples to production tooling in a time frame to meet your needs. Wisconsin Aluminum Foundry takes pride in our quality, engineering, manufacturing and service that keeps us well ahead of our competition. Continuous technological advances throughout the foundry such as robotic finishing equipment, and precision CAD prototyping prove Wisconsin Aluminum Foundry's commitment to excellence. It's that type of commitment that has earned WAF the prestigious Wisconsin Manufacturer of the Year award 3 times!

2019 FOUNDRY LEADERSHIP SUMMIT



TRAVERSE CITY, MI SEPTEMBER 22-24, 2019

GRAND TRAVERSE RESORT AND SPA

Join us for North America's premier event for leaders from foundries and supplier companies at the Grand Traverse Resort and Spa in Traverse City, Michigan. The Foundry Leadership Summit features high-level speakers, industry roundtables, and presentations about issues important to metalcasting leaders, including industry innovation, public policies and economic forecasts. The 2018 Foundry Leadership Conference saw attendance increase for the third consecutive year and attracted attendees from seven countries. We look forward to seeing you in September!

REGISTER TODAY AT
WWW.AFSINC.ORG/2019FLS

ABRIDGED LIST OF SPEAKERS



THORNTON WHITE
Executive Director, American
Metalcasting Consortium



DAVID T. CARLSON
Senior VP for Manufacturing
& Automotive, Marsh USA



AMY MCCULLOCH
Account Executive,
Lighthouse Insurance Group



JOE LEONARD
President, HS HR Group



STEVE GOREHAM
Executive Director, Climate
Science Coalition of America



TOM CHRISTE
President, ATEK Metal
Technologies, LLC



SARA TIMM
Marketing Communications
Manager, Waupaca



SARA JOYCE
VP, Quality & Technical
Support, Badger Mining



PETER REICH
2019-2020 President,
American Foundry Society



STEPHANIE SALMON
AFS Washington
Representative, AFS



APRIL 27-30, 2019

ATLANTA, GEORGIA

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connecting SUPPLIERS | METALCASTERS | CASTING BUYERS

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PRODUCT SHOWCASE

Laempe Reich

At the core of great foundries. Laempe's CoreCenter is a coreshooter, sand mixer, and gas generator – all under a single controller. Use vertical and horizontal tooling, or combination up to 6 parts with no machine changes, or use your existing tooling with a simple conversion. Laempe Reich is unique that we have a research, complete testing, and core production facility.



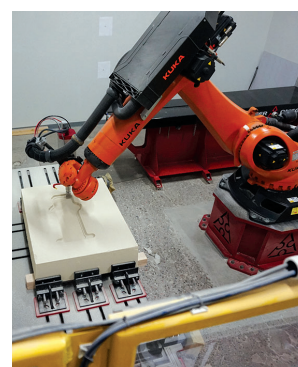
Laempe Reich

205-655-2121
www.LaempeReich.com
Booth 1236



Tinker Omega Sinto

The RSM Sand Milling Robot System. Sand milling is now proven to provide pattern-less castings at a significantly lower price than printed sand molds. The RSM system combines established software with a proprietary interface to make mold machining a simple, easy to learn process. With features like Simple-Link file transfers, auto tool changing and laser tool inspection, the RSM provides the average foundry with a cost-effective way to enter the pattern-less casting market. Contact us for more information or see us at CastExpo and GIFA.



Tinker Omega Sinto

937-322-2272
www.tinkeromega.com
Booth 627



Vulcan Engineering Co.

Vulcan Engineering manufactures foundry specific equipment. Vulcan's equipment lines include Fox® grinding & cutting machines, Action® robots & manipulators, Donovan™ mold handling rollovers, Vantage™ patterns & tooling, Lost Foam molding and casting equipment including Trufoam® casting lines, Trufo® mold handling systems, Robotic Casting Cleaning, Robotic material handling cells, and more. Vulcan's Equipment has been designed by engineers with multiple years of foundry industry experience, providing practical solutions that stand up to the harsh foundry environments.



Vulcan Engineering Co.

205-663-0732
www.vulcangroup.com
Booth 1037

Inductotherm Corp.

Inductotherm's iSense™ Melt Shop Equipment Data Visualization System represents the future of advanced diagnostics. It is a combination of network topology, communications protocols, database and sensors connected through a graphical user interface. iSense™ technology is currently the only way to get access to nearly every detail of all your equipment in one place accessible from anywhere, anytime.



Inductotherm Corp.

800-257-9527
www.inductotherm.com
Booth 1537



Covia

TechniSand TruCoat® resin-coated sand is a new core and mold casting system that dramatically lowers odor, in-plant smoke and other emissions while delivering superior performance. Our advanced resin-coated technology allows you to lower hazardous air pollutants (HAPs) by more than 41%; reduce free formaldehyde by 35%; and decrease free phenol levels 62% without sacrificing product quality. This innovative foundry solution, supported with outstanding customer service, offers greater productivity, uniform curing and fewer casting defects that result in better quality castings.

**Covia**

800-255-7263
CoviaCorp.com
Booth 1825

Verder Scientific

The ELEMENTRAC ONH-p determines Oxygen, Nitrogen and Hydrogen in inorganic samples by inert gas fusion in an impulse furnace with temperatures in excess of 3000 °C. The ONH-p guarantees precise and fast sample analysis and covers a wide range of applications. This analyzer can be supplied with up to two infrared cells with different path lengths, accommodating both high and low level oxygen analyses.

**Verder Scientific**

866-473-8724
www.eltra.com
Booth 2119

**Inductotherm Corp.**

Inductotherm's VIP® Dual-Trak® units have been proven to use the lowest kWh per ton melted ensuring you melt more metal faster, with less energy and kVA of demand. VIP® Dual-Trak® units "track" the power – regardless of changing furnace conditions – to provide full power from start to finish for the fastest melting times. Equipped with the latest EZ digital controls, the VIP® unit represents the most advanced and reliable system available.

**Inductotherm Corp.**

800-257-9527
www.inductotherm.com
Booth 1537

**REFCOTEC**

REFCOTEC, a second-generation family-owned company has been a proud supplier to the North American metal casting industry for over 30 years. In our Ohio and Texas facilities, we manufacture the highest quality foundry products available on the market including, refractory coatings, sand additives, resin systems, pastes, partings, and many more. We specialize in custom product formulation, outstanding technical service, and short lead-times. We have products for every metal alloy and all molding methods. Bring us your casting challenges!

**REFCOTEC**

330-683-2200
www.refcotec.com
Booth 1437

**Gradmatic Equipment**

Gradmatic Equipment provides an engineered control to meet OSHA's PEL when lining coreless furnaces with silica refractory. Uninterrupted forking produces a denser lining, longer lining life, fewer annual linings and cost savings. Two workers line a furnace regardless of its side. Gradmatic can build a system for furnaces sizes 1 to 85 tons. The system can line a furnace using any particulate material, not just silica. For more information contact:

**Gradmatic Equipment**

705-762-0945
www.gradmatic.com
Booth 1017

**The Future of Castings**

ASK Chemicals is one of the world's largest providers of comprehensive solutions and tailored consulting services in the castings industry. Beyond delivering exceptionally engineered products we also offer world-class research & development and unparalleled technical support. Present in 25 countries, ASK Chemicals helps you keep pace with global developments and trends in the casting industry.

**ASK Chemicals LLC**

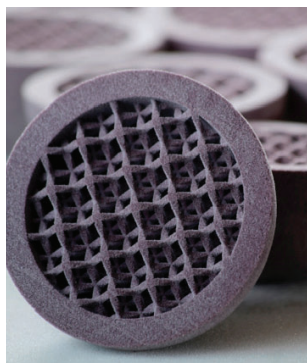
800-848-7485
www.ask-chemicals.com
Booth 2037

ASKCHEMICALS
We advance your casting



ExOne

ExOne® 3D printing systems and services simplify the production of complex and accurate sand cores and molds for castings – particularly for prototypes, spares and replacement parts – with significant time-savings over traditional processes. Ideal for your most challenging applications, the ExOne process can reduce costs, lower the risk of trial and error and create opportunities for design innovation.

**ExOne**

877-773-9663
www.exone.com
Booth 1906

**Gradient Lens Corporation**

Users of Hawkeye® V2 Video Borescopes now have the ability to add notations to the still images, and video footage, they capture. Using the V2's Annotation Feature, inspection images can now document not only the date of an inspection, but the inspector's notes as well. Hawkeye V2 Video Borescopes are available in diameters of 4 and 6 mm, offer 4-way articulation, and are made in the USA. Prices start at \$8995. Optional Close-Focus, and 90° Prism, adaptors are available.

**Gradient Lens Corp.**

800-536-0790
www.gradientlens.com/V2
Booth 808

**Sinto America**

Sinto's CNDR Drum Blast features significantly less parts maintenance than conventional Tumble Blast machines with faster overall cycle time. Other features include zero pinch design that eliminates jams, hydraulic bucket loader and no leak drum design. The CNDR is low maintenance, has low operating costs and minimizes downtime. Contact us for information on more of our Surface Treatment equipment.

**Sinto America**

517-371-2460
www.sintoamerica.com
Booth 1209

**Agile Casting Solutions**

Agile Casting Solutions, a division of Humtown Products, is dedicated entirely to 3D sand printing. We've secured a building large enough to house 10 printers to keep up with the growing demand of the industry. From prototyping to long-term production, Humtown Products' Agile Casting Solutions will help you take the next step toward innovation. Eliminate the need for tooling, enjoy unlimited design freedom, and get the most accurate molds and cores possible.

**Humtown Products**

330-482-5555
www.humtown.com
Booth 1726

**Laempe Reich CoreRoom**

We sell em. We use em. When we started The CoreRoom, a core supply company, we chose the same machine we want you to buy. Laempe. And for the same reasons. Quality cores, at high efficiency, at a reasonable price.

**Laempe Reich**

205-655-2121
www.TheCoreRoom.com
Booth 1236

**Vulcan Engineering Co.**

Vulcan Engineering provides a one source solution for project design, build and installation. Vulcan's "Total Responsibility" approach provides seamless integration of all aspects of a project, including keeping all involved parties apprised of the project's goals and status. Vulcan's multi-disciplined personnel, with years of foundry related experience, provide the correct mix of expertise to execute projects efficiently and on schedule. Vulcan has extensive experience with "Greenfield" and "Brownfield" projects and can take on all aspects of large-scale foundry projects.

**Vulcan Engineering Co.**

205-663-0732
www.vulcangroup.com
Booth 1037

Humtown Products

Humtown Products, a 3rd generation family owned company, has been serving the foundry industry for over 50 years. A manufacturer of cold box, air-set and 3D printed sand cores and molds, Humtown has the capability of producing extremely high-quality cores in a wide variety of sizes, weights and configurations. For washes - several are kept in stock, we can special order a wash or use a company supplied wash. To meet tooling and rigging needs, Humtown Products offers an on-site Pattern Shop along with the UNItube Blow Tube System, the adjustable and uniquely flexible blow tube.

**Humtown Products**

330-482-5555

www.humtown.com

Booth 1726**Tinker Omega Sinto**

Tinker Omega Sinto's gas-fired thermal reclamation plants are available from 0.25-12TPH for reclamation of all sand systems. The equipment features a patented dead bed and bubble cap design. The PX plants provide the LOWEST MAINTENANCE COST systems available. The reclaiming process is so gentle, we offer a 3-Year Warranty on the Air/Gas Burner Assemblies and Thermal Linings. As sand prices increase it is becoming more important to reuse every grain of sand possible. Contact us for more information.

**Tinker Omega Sinto**

937-322-2272

www.tinkeromega.com

Booth 627**ExOne**

The ExOne® S-Max™ is the leading 3D printer for fast, cost-effective and reliable production of sand cores and molds, without the limitations of traditional processes. Build size is practically limitless; complex molds and cores can be printed in sections (1800x1000x-700mm job box) and assembled to achieve very large castings with detailed features. The S-Max can be used from batch production to single prototypes, spares or replacement parts.

**ExOne**

877-773-9663

www.exone.com

Booth 1906**Covia**

Covia has a rich history, building upon the legacies of two leading organizations: Fairmount Santrol and Unimin. As the foundry industry's only vertically integrated supplier, Covia offers high-purity sand, resin-coated sand, and high-performance resin technologies. We leverage our expanding product lines combined with decades of foundry expertise to develop innovative foundry products and technologies that enable our customers to enhance operational efficiency and decrease their environmental footprint.

**Covia**

800-255-7263

CoviaCorp.com

Booth 1825**Verder Scientific**

The carbon/sulfur analyzer ELEMENTRAC CS-i was developed for the accurate and safe analysis of carbon and sulfur in inorganic samples. The analyzer is equipped with a powerful induction furnace for sample combustion. Up to four highly sensitive infrared cells allow the analyzer to determine high and low carbon/sulfur concentrations in one measurement run. The measuring range of each cell is adaptable to the user's specific requirements.

**Verder Scientific**

866-473-8724

www.eltra.com

Booth 2119**Sinto America**

The Barinder Grinder's innovative robotic part handling and unique grinding wheels reliably automate the removal of gates, burrs, and parting line fins on aluminum, brass, gray and ductile iron castings. The Barinder is easy to learn, program and operate, and enhances your production by repeatability and fast product changeovers.

**Sinto America**

517-371-2460

www.sintoamerica.com

Booth 1209

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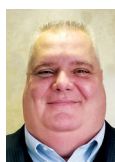


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Rolla, MO*

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*Engineering Manager
Element Materials Technology
Wixom, MI*

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*Global Technical Team Manager
Caterpillar Mapleton Foundry
Mapleton, IL*

The **AFS SERVICE CITATION** . . . for his important work in advancing the technical understanding of iron casting and his support of advanced research, as well as his extensive service to the Cast Iron Division and his regional AFS chapter.



PETER SATRE

*Manager Corporate Engineering
Allied Mineral Products, Inc.
Columbus, OH*

The **AFS SERVICE CITATION** . . . for his steady leadership of AFS technical programs, outstanding service to the Melting Methods & Materials Division, and service to the industry as a rich source of technical information.



BRIAN V. SMITH

*Casting Consultant
Saginaw, MI*

The **AFS SERVICE CITATION** . . . for his relentless focus on attracting youth to the metalcasting industry through Foundry in a Box and other outreach activities, as well his longtime service to AFS regional chapters.



AFS MILLIONAIRES SAFETY AWARD

AFS congratulates the following **AFS Corporate Members** for achieving a million or more safe-hours worked without incurring a lost time injury or illness during the calendar year 2018:

Oil City Iron Works, Inc. (Corsicana, TX): 3 million safe-hours

Charlotte Pipe and Foundry Company (Charlotte, NC): 1 million safe-hours

Denison Industries (Denison, TX): 1 million safe-hours

LeSueur Inc. (LeSueur, MN): 1 million safe-hours

Neenah Foundry Company (Neenah, WI): 1 million safe-hours

2019 CASTING OF THE YEAR

AFS MARKETING DIVISION & METAL CASTING
DESIGN & PURCHASING CASTING COMPETITION



Swing Frame Conversion

Neenah Foundry
Neenah, WI

NEWCOMER: Bogie Crossmember Aluminum Casting - **Consolidated Metco, Vancouver, WA**

SMALL FOUNDRY: RF Cavity center section - **Roman Manufacturing and Quality Non-Ferrous Foundry, Grand Rapids, MI**

BEST CONVERSION: Halo - **TPI Arcade, Inc., Arcade NY**

BEST INNOVATION: Interplanetary Lander Body Structure - **Tooling & Equipment International, Livonia, MI**

OUTSTANDING ACHIEVEMENT:

Steering Wheel Armature - **Aristo Cast, Inc., Almont, MI**

Opener Frame - **Lethbridge Iron Works, Lethbridge, AB & CA**

T1XX Side Door Mirror Reinforcement Bracket - **Magna Cosma Casting Michigan, Battlecreek, MI**

Front Bracket Extension - **Monarch Industries Limited, Winnipeg, MB & CA**

Pump Housing - **O'Fallon Casting, O'Fallon, MO**

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UPDATE YOUR SDSs TODAY!

AVAILABLE NOW FROM AFS

AFS is releasing new and updated Safety Data Sheets (SDSs).

A list of currently available SDSs can be found online in the **AFS Bookstore** at www.afsinc.org/store. In addition, the SDSs will be available for order at the **HUB** during **CastExpo**. The SDSs will also be 10% off till the end of April 2019. **AFS staff** will be available in person at the **HUB** to answer any questions you may have.

If you have questions about the SDSs, please contact Juliette Garesché at (847) 824-0181 or jgaresche@afsinc.org.



APRIL 27-30, 2019

ATLANTA, GEORGIA

CASTEXPO

& METALCASTING CONGRESS

connecting SUPPLIERS | METALCASTERS | CASTING BUYERS

AFS
INFORMATION

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(As of March 6, 2019)

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 AAM - Castings - Brewton
 AAM - Castings - Browntown
 AAM - Castings - Columbiana
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 AAM - Castings - Kingsford
 AAM - Castings - Menomonee Falls
 AAM - Castings - New Castle
 AAM - Castings - Oconomowoc
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 AAM - Castings - Wauwatosa
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Blast Cleaning Technologies
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 Bradken - Oconomowoc
 Bradken - Amite
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 BRP US Inc. - Sturtevant
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 Covia - Troy Grove
 Covia - Tuscaloosa
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 CPP - Minneapolis Operation
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 Curto-Ligonier Foundries Co.
 Custom Castings Limited
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 EBAA Iron Inc. - Cordele
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 GE Cntr. for Additive Tech Advancement
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 Hiler Industries
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 HS Group HR Inc.
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 Humtown Products
 Hunter Foundry Machinery Corp.
 Hygieneering Inc.

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 I Sq R Power-Cable Co.
 ID Castings LLC
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 IMERYS - Cincinnati
 IMERYS - Niagara Falls
 IMERYS - Roswell
 IMERYS - Waterloo
 Impact NDT LLC
 Indquip Co. LLC
 Induction Iron Inc.
Inductotherm Corp. - Pico Rivera
Inductotherm Corp. - Rancocas
Inductotherm Group Canda Ltd.
 Industrial Ceramic Products Inc.
 Industrial Metals Recycling
 Industrias John Deere SA de CV - Santa Catarina
 Industrias John Deere SA de CV - Torreon
 International Thermal Systems
 Interstate Castings
 Iron Age Designs
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J

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 Jef-Scot Metal Industries Inc. - Centerville
 Jenkins Electric Co. - Charlotte
 John Deere Co. - Ankeny
 John Deere Co. - Coffeyville
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K

Kansas Castings Inc.
 Kanthal Heating Systems
 Kelly Foundry & Machine Co.
 Kenton Iron Products LLC
 Keramida Inc.
 Key 3 Casting Co.
 Keystone Casting LLC
 Kimura Foundry America Inc.
 King Tester Corp.
 Kirsh Foundry Inc.
 Kloster Foundry Products
 Knoebel & Associates
 Kodiak Group
 Kohler Co.
 Kolene Corp.
 Kurtz Bros Inc.
 Kurtz North America
 Kuttner LLC

L**L**

A Aluminum Casting Corp.
Laempe Reich Corp.
 Lakeshore Sand Co.
 Larpén Metallurgical Service
 Latrobe Foundry Machine & Supply Co.
 Lebanon Tool Co. Inc.
 LeClaire Manufacturing Co.
 LECO Corporation
 Lee Brass Co.
 Lemfco Inc.
 LeSueur Incorporated
 Lethbridge Iron Works Co. Ltd.
 Liberty Casting Co. LLC
 Liberty Pattern Company
 Liberty Technology Co. LLC
 Ligon Industries LLC
 Lindberg/MPH
 Littlestown Foundry Inc.
 Lodge Mfg. Co.
 Lodi Iron Works Inc.
 Louis Meskan Foundry Inc.
 Lou-Rich Inc.
 Lung Kee Metal Ltd.

M

MacKenzie Castings LLC
 Magaldi Technologies LLC - Atlanta
 Magaldi Technologies LLC - Salerno
Magma Foundry Technologies Inc. - Schaumburg
 Magneco/Metrel Inc. - Addison
 Manley Bros of Indiana Inc. - Troy Grove
 Marcellus Metalcasters Inc. - Marcellus
 Martin Engineering - Neponset
 McConway & Torley LLC - Pittsburgh
 McHenry Brass Inc. - McHenry
 McWane Inc. - Anniston
 McWane Inc. - Birmingham
 McWane Inc. - Coshocton
 McWane Inc. - Elmira
 McWane Inc. - Oakland
 McWane Inc. - Oskaloosa
 McWane Inc. - Phillipsburg
 McWane Inc. - Provo
 McWane Inc. - Ste Croix

McWane Inc. - Tyler
 Meloon Foundries LLC
 Mercer Forge Corporation
 Meritor Inc. - Fletcher
 Meritor Inc. - Franklin
 Meritor Inc. - Troy
 Metal Technologies Inc.
 Metal Technologies Ravenna Ductile Iron Plant
 Metal Technologies Three Rivers Gray Iron Plant
 MetalTek International - Chattanooga
 MetalTek International - Pevely
 MetalTek International - Watertown
 MetalTek International - Waukesha
 MIA Manufacturing Inc.
 Michigan Pneumatic Tool Inc.
 Michigan Wheel Marine
 Mid City Foundry Co. - Grafton
 Mid City Foundry Co. - Milwaukee
 Midland Manufacturing Co.
 Midvale Industries Inc. - Montgomery
 Midvale Industries Inc. - Saint Louis
 Midvale Industries Inc. - Tulsa
 Midwest Manufacturing & Logistics
 Miller and Company
 Minerals Technologies
 Modern Equipment Co. LLC
 Monett Metals Inc.
 Morgan AM&T
 Morgan Molten Metal Systems
 Morris Bean & Co.
 Mossner
 MPM Infosoft Pvt. Ltd.
 Mueller Canada
 Mueller Co. - Albertville
 Mueller Co. - Chattanooga
 Mueller Co. - Decatur
 Multi-Cast LLC
 Multi-Vac

N**Na-**

val Foundry & Propeller Center
 Neenah Foundry Co.
 Neptune Technology Group Inc.
 New London Engineering
 Newport News Shipbuilding
 Non-Ferrous Cast Alloys Inc.
 Nordmet SA
 North Star Products
 North Vernon Industry Corp.
 Northern Foundry LLC
 Northern Iron & Machine
 Northfield Manufacturing Inc.
 NovaCast Solutions USA Inc.
 NovaCast Systems AB - Goteborg
 NovaCast Systems AB - Ronneby
 Novis Works

O

O'Fallon Casting
 O'Hare Foundry Corp
 Oil City Iron Works Inc.
 Olson Aluminum Castings
 Osco Industries Inc. - Jackson
 Osco Industries Inc. - Portsmouth
 Oshkosh Corporation
 Otto Junker

P

P&W Foundry Inc.
 Pacific Alloy Casting Co. Inc.
 Palmer Engineered Products
 Palmer Foundry Inc.
 Palmer Maus North America Corp.
 Palmer Mfg. & Supply Inc.
 Pangborn Corp. - Birmingham
 Pangborn Corp. - Fairburn
 Peerless Metal Powders & Abrasive
 Perfect Patterns Inc.
 Perkins Engine Co. Ltd.
 Perma-Cast Co.
 Peter E Macler Assoc PLLC
 Pier Foundry & Pattern Shop
 Pillar Induction
 Plymouth Foundry Inc.
 Poitras Foundry Ltd.
 Polyrix Inc.
 Porter Warner Industries Inc. - Arlington
 Porter Warner Industries Inc. - Birmingham
 Porter Warner Industries Inc. - Chattanooga
 Porter Warner Industries Inc. - Compton
 Porter Warner Industries Inc. - Houston
 Porter Warner Industries Inc. - Oakland
 Porter Warner Industries Inc. - Phoenix
 Porter Warner Industries Inc. - Richburg
 Porter Warner Industries Inc. - Tulsa
 Powercast Mfg Inc.
 Precision Enterprises Inc/Duro Cast Inc
 Precision Rail and Mfg Inc.
 Premier Aluminum LLC
 Premier Thermal Solutions
 PRL Industries Inc.
 Product Development & Analysis LLC
 Production Pattern & Foundry Co.
 ProfitGuard LLC
 Progress Rail, a Caterpillar Company
 Prototype Casting Inc.

Q

Quad City Safety
 Quality Castings Co.
 Quality Electric Steel Castings

R

Rassini Frenos SA de CV - Plymouth
 Rassini Frenos SA de CV - San Martin Texmelucan
 REFCOTEC Inc. - Orrville
 Regal Cast Inc. - Lebanon
 Reliability Concepts
 Renaissance Manufacturing Group - Waukesha LLC
 Resource Recovery Corp.
 Rheocast Co.
 Rice Industries Inc.
 Richmond Industries Inc.
 Rimrock Corp.
 Rio Tinto Alcan - Independence
 Rio Tinto Alcan - Jonquiere
 Rio Tinto Iron & Titanium Inc. - Montreal
 Rio Tinto Iron & Titanium Inc. - Sorel-Tracy
 Rio Tinto Iron & Titanium Inc. - South Jordan
 RJ Lee Group Inc.
Roberts Sinto de Mexico
 Robocasting Enterprises LLC

Rochester Metal Products Corp. - Muncie
 Rochester Metal Products Corp. - Rochester
 Rock Island Arsenal Joint Mfg. & Tech Cntr. (RIA-JMTC)
 Rockford Foundries Inc.
 Rocky Mount Engine Plant
 Rolls Royce Marine North America
 Roloff Manufacturing Corp
 Roman Manufacturing/Quality Brass
 Ross Aluminum Castings LLC
 RRTC Inc.

S

Sandmold Systems Inc.
 Sandusky International Inc.
 Schaefer Furnaces Inc.
 Schust Engineering
 Scott Sales Co.
 Seabee Cast Steel Foundry
 Selee Corporation
 Seneca Foundry Inc.
 Setco Automotive
 Shandong Jingang New
 Materials Co. Ltd. - Houston
 Shandong Jingang New
 Materials Co. Ltd. - Zouping
 Sherpa Industries LLC
 Shipston Aluminum Technologies Inc.
 Sigma Electric Manufacturing Corp.
 Simpson Technologies Corp.
 SinterCast Inc. - Naperville
 SinterCast Ltd. - Sunninghill Berkshire
 Sintex Minerals & Services Inc.

Sinto America

Sipi Metals Corp.
 Skat-Trak Inc.
 Sloan Valve Co. - Augusta
 Sloan Valve Co. - Franklin Park
 Smith & Richardson Mfg. Inc.
 Smith Foundry Co.
 Snam Alloys Pvt. Ltd.
 Solar Turbines Inc.
 Solex Thermal Science Inc.
 solidThinking Inc.
 Sotrem-Maltech
 Southeastern Fdry. Products & Fdry. Coatings Inc.
 Southland Metals Inc. - Maumelle
 Southland Metals Inc. - Mishawaka
 Southland Metals Inc. - Pryor
 Southland Metals Inc. - Roswell
 Southland Metals Inc. - Tomball
 Southwest Steel Casting Co.
 SP Foundry
 Specialty Castings LLC
 Spectro Analytical Instruments
 Spring City Electrical Mfg. Co.
 Spuncast Inc.
 St. Louis Precision Casting Co.
 St. Marys Foundry Inc.
 St. Paul Foundry
 Stahl Specialty Co. - Kingsville
 Stahl Specialty Co. - Warrensburg
 Standard Alloys & Manufacturing
 Star Pipe Products
 Strato Inc.
 StrikoWestofen
Summit Foundry Systems

Superior Aluminum Alloys
 Superior Aluminum Castings Inc.
 Superior Graphite Co.
 Supreme Cores Alabama
 Supreme Cores of The Carolinas Inc.
 Swerea SWECAST
 Synchro ERP Ltd. - Austin
 Synchro ERP Ltd. - London
 SYSCON Sensors

T

THMfg Co.
 Tampa Brass & Aluminum Corp.
 Taylor Foundry Co.
 TB Wood's Inc.
 TDJ Group Inc.
 TechniSand Inc.
 Tennetek Inc.
 Textron Defense Systems
 Textron Inc.
 The AWC Company - Courtice
 The AWC Company - Romeo
 The Federal Metal Co.
 The Hill & Griffith Co. - Cincinnati
 The Hill & Griffith Co. - Indianapolis
 The Raymond Corporation
 The Wasmer Company LLC
 THORS eLearning Solutions
Tinker Omega Mfg LLC
 Tonkawa Foundry Inc.
 Tooling & Equipment International
 Torrance Casting Inc.
 Toscelik Granul Sanayi AS
 Townley Foundry & Machine
 TPI Arcade Inc. - Arcade
 TPI Arcade Inc. - Harmony
 TRC Companies Inc. - Ann Arbor
 TRC Companies Inc. - Brookfield
 TRC Companies Inc. - Grand Ledge
 TRC Companies Inc. - Grand Rapids
 TRC Companies Inc. - Greenville
 TRC Companies Inc. - Nashville
 TRC Environmental Corp. - Cleveland
 TRC Environmental Corp. - Madison
 Tromley Industrial Holdings Inc.
 Tyco Fire & Building Products
 Tyler Pipe Co.

U

US

Foundry & Mfg. Co. - Atlanta
 US Foundry & Mfg. Co. - Medley
 US Pipe & Foundry Co. - Bessemer
 US Pipe & Foundry Co. - Council Bluffs
 US Pipe & Foundry Co. - Hoover
 US Pipe & Foundry Co. - Lisle
 US Pipe & Foundry Co. - Lynchburg
 US Pipe & Foundry Co. - Union City
 Ultraseal America Inc.
 United Brass Works Inc. - Erie
 United Brass Works Inc. - Randleman
 United Western Supply Co. - Portland
 United Western Supply Co. - Seattle
 Universal Electric Foundry Inc.
 Urick Ductile Solutions
 Urschel Laboratories Inc.
 US Aluminum Castings

V

Van

Hydraulics Inc.
 Verder Scientific Inc.
 Verichek Technical Services Inc.
 Vermont Castings
 Versevo Inc.
 Victaulic Co. of America - Alburtis
 Victaulic Co. of America - Easton
 Victaulic Co. of America - Leland
 Victaulic Co. of Canada
 Victaulic De Mexico S de RL de CV
 Victaulic Technical Center
 Viking Pump
 Viking Technologies
 Virginia Industries Inc.
 Viridis3D LLC
 VJ Technologies Inc.
 Voestalpine Nortrak Inc.
 Voxeljet AG
 Voxeljet America Inc.
 Voxeljet China Co. Ltd.
 Vulcan Engineering Co. Inc. - Birmingham
 Vulcan Engineering Co. Inc. - Helena

W

Wabash Castings
 Ward Corporation
 Ward Heat Treating
 Ward Manufacturing LLC
 Washburn Iron Works Inc.
 Washington Mills
 Waterous Company
 Watry Industries LLC
 Waupaca Foundry Inc. - Etowah
 Waupaca Foundry Inc. - Marinette
 Waupaca Foundry Inc. - Tell City
 Waupaca Foundry Inc. - Tioga
 Waupaca Foundry Inc. - Waupaca
 Wear-Tek
 Weatherly Casting & Machine Co.
 Weaver Materiel Service Inc.
 Webster Industries Inc.
 Weil McLain
 Weir Pump and Valve Solutions, Inc.
 Wellman Dynamics
 West Salisbury Fdry & Machine Co.
 Western Foundries Inc.
 Wexford Sand Co.
 WGB Industries Inc.
 WGS Global Services LLC - Flint
 WGS Global Services LLC - Tell City
 Wheelabrator Group - Burlington
 Wheelabrator Group - Lagrange
 Wheelabrator Group - Waukesha
 Whibco Inc.
 William Goetz and Associates
 Wirco Inc. - Avilla
 Wirco Inc. - Champaign
 Wisconsin Aluminum Foundry Co.
 Wisconsin Oven Corporation
 Woodland/Alloy Casting Inc.

Y

Ya-

maha Marine Precision Propellers Inc.
 YXLON

AFS INSTITUTE UPCOMING COURSES

Copper Metallurgy 201

June 5-6 | Birmingham, AL

Knowledge of physical metallurgy of copper alloys is necessary for foundry metallurgists to effectively operate. This knowledge includes melt treatment, effects of alloy additions on physical and mechanical properties, solidification and heat treatment.

List Price: \$1,350 | Member Price: \$1,150

Casting Design

June 12-13 | Schaumburg, IL

This course addresses principles of effective metal-casting design by delving into the major factors that affect final part design.

List Price: \$1,350 | Member Price: \$1,150

Steel Melting 201

June 19-20 | Schaumburg, IL

Steel Melting 201 will cover the operations of steel melting furnaces including electric arc and induction; the process steps of charging and start up, melt down, chemistry slag control, alloying, tapping, and post melt processing methods.

List Price: \$1,350 | Member Price: \$1,150

Casting Defect Analysis

June 19-20 | King of Prussia, Pennsylvania

The intention of this course is for participants to become proficient in applying a 10-step procedure that will enable them to analyze and reduce metal-casting defects.

List Price: \$1,350 | Member Price: \$1,150

Improving the Effectiveness of Visual Inspection

June 26-27 | Schaumburg, IL

This course provides you with the information needed to understand the factors of influence on the human task of visual inspection, permitting true quality engineering of this critical operation.

List Price: \$1,250 | Member Price: \$1,050

Introduction to Metalcasting

July 17-18 | Schaumburg, IL

This course introduces the process of metalcasting. It provides a broad picture of what happens in a casting production facility, while illustrating the technology, variables and complexity involved in producing a casting.

List Price: \$1,250 | Member Price: \$1,050

Foundry Process Improvement

August 6-8 | Schaumburg, IL

This 2 ½ day course provides foundry personnel with disciplined problem solving techniques by emphasizing tools to better understand process data and performance with unique examples and case studies drawn from foundry settings.

List Price: \$1,750 | Member Price: \$1,550

Iron 101

August 15 | Schaumburg, IL

This is an introductory course covering the major cast iron families.

List Price: \$1,000 | Member Price: \$800

Gating & Riser Design 201

August 21-22 | Schaumburg, IL

This course is a continuation of Gating & Riser Design 101 with an emphasis on application of sands, chill, sleeves, and other thermal control properties, fluid flow principles and filtration, and your facilities process parameter ranges.

List Price: \$1,350 | Member Price: \$1,150

Casting Cost Estimating

September 18-19 | Schaumburg, IL

Cost estimating is a critical factor in ensuring a manufacturing company continues to acquire customers and be profitable.

List Price: \$1,350 | Member Price: \$1,150

Casting Defect Analysis

October 8-9 | Boston, MA

Participants will become proficient in applying a 10-step procedure that will enable them to analyze and reduce metalcasting defects by correctly identifying defects, root causes, and determining corrective action.

List Price: \$1,350 | Member Price: \$1,150

Iron Melting 201

October 8-9 | Chattanooga, TN

This course provides detailed coverage of iron melting and related processes. Topics include charge materials selection; understanding of cost, value, and risk; information covering electric and cupola melting procedures; refractory lining; and more.

List Price: \$1,350 | Member Price: \$1,150

AFS UPCOMING CONFERENCES

2019 Government Affairs Fly-In

June 11-12 | Washington, D.C.

Your voice counts. Every U.S. foundry and supplier is encouraged to send at least one employee to participate in this important Fly-In. With 100 new lawmakers and hundreds of new congressional staff, it's time to stand together as an industry. We will hear from policy experts, then band together for meetings with our lawmakers, calling for commonsense policies including infrastructure investment, workforce readiness programs, and more.

Future Directions in Steel Castings

July 10 | Schaumburg, Illinois

Could there be a better time to devote one day focused on the future of steel castings? The American Foundry Society has assembled an all-star cast of senior steel foundry executives and steel-casting academic leaders from around the country. Their insightful presentations, combined with your own participation in the discussions, will make for an informative day you won't want to miss. Future Directions in Steel Castings will cover new innovations, ground-breaking research now underway, and an economic forecast for steel castings. Lunch and refreshments are included.

Hit a Homerun Managing An All-Star Team

July 23 | Milwaukee, WI

Back by popular demand, the HR Division presents this year's roundtable, themed "From drafting your All-Star to their final season and everything in between." Come join other metalcasting professionals and talk about topics that impact your organization: assessing talent, facilitating interviewing, effective training and tracking systems, safety, performance reviews, handling office gossip, and terminations. These are just some of the topics that will be discussed at the roundtable at Miller Park in Milwaukee. The one-day interactive roundtable includes lunch and an evening networking event at the park with great seats to the Milwaukee Brewers vs. Cincinnati Reds game.

Chapter Officers Conference

August 12-13 | Schaumburg, IL

Delegates from all 42 regional groups are invited to AFS headquarters for networking, an exchange of ideas and best practices, and a review of AFS resources available to them. This event initiates new chapter leaders and reinvigorates seasoned chapter leaders, allowing for open discussion about communications, event topics, student engagement, and fundraising.

2019 Casting Copper Alloys Workshop

September 18-19 | Schaumburg, IL

This workshop will focus on many aspects of copper-based alloy castings, walking participants through everything from melting to molding, with a review of basic foundry practices and new advancements in the industry.

2019 Foundry Leadership Summit

September 22-24 | Traverse City, MI

Join us for North America's premier event for leaders from

foundries and supplier companies at the Grand Traverse Resort and Spa in Traverse City, Michigan. The Foundry Leadership Summit features high-level speakers, industry roundtables, and presentations about issues important to metalcasting leaders, including industry innovation, public policies and economic forecasts.

2019 Safety 101 Seminar

October 6-7 | Louisville, KY

This seminar will provide new employees with current safety and health information and concepts they need to know regarding safety, health and OSHA in the metalcasting industry. This seminar will help supervisors, engineers and safety professionals apply these principles in their operations. Integrating safety and health into production and engineering is a basic part of operation excellence. Attendees will gain a working understanding of key safety and health concepts, regulations and practical skills that they need to make their metalcasting operation run safely and effectively.

31st Environmental, Health, & Safety Conference

October 8-10 | Louisville, KY

Every year, industry members gather to hear from some of the most accomplished professionals in the field, network, discuss the issues of the day, present the results of EHS research papers, mingle with vendors showing off the newest technology, and acknowledge those companies and individuals who have achieved significant safety goals.

2019 Young Professionals Program

October 14-17 | Schaumburg, IL

The Young Professionals Program aims to enhance the competitiveness of the foundry industry toward a new era through the promotion of global exchange and the formation of networks and contacts within North America, Japan and Germany. Fifty attendees will take part in a week long event taking them from Schaumburg, IL, to Wisconsin to Chicago, hearing industry speakers, participating in foundry tours, building networking connections and hearing perspectives of young professionals in metalcasting.

2019 International Ferrous Melting Conference

October 30 - November 1 | Nashville, TN

Participants at this conference will be able to listen to and network with the leading minds in ferrous melting practice and research. The conference features presentations from industry experts on metallurgy, charge materials, induction melting, cupola melting, energy use measurement, bidding for energy contracts in deregulated states, channel furnaces, and automatic pouring.

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& METALCASTING CONGRESS
connecting SUPPLIERS | METALCASTERS | CASTING BUYERS

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Inductotherm: The Brand You Trust



Reliable Equipment, Manufactured Locally

Our “Global yet Local” business plan ensures that Inductotherm equipment is designed to our USA standards and built locally to provide the best local support.



Energy Efficient, Guaranteed Results

Our systems are customized to your application to ensure you get the most out of each kilowatt hour. They are proven to melt more metal faster and with less power.



Technologically Advanced, Digital Solutions

We offer the most advanced controls and diagnostic tools you need to access nearly every detail of your induction melting equipment in one place.



Unparalleled Service & Technical Support

Excellent customer service is our ongoing goal. Available 24/7/365, we set the world standard for “Global yet Local” service and support.



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As your OEM, we are best equipped to keep your equipment in top condition whether it be for an upgrade, repair, rebuild or preventive maintenance.

*Visit us at booth #1537 to learn more
about our products and services.*



Complete System Integration

Visit booth #1537 to see our cutting edge solutions and extensive range of induction melting, heating, holding and pouring equipment and technology that is available on the market today. Only Inductotherm has the unique advantage of being the only induction furnace supplier that truly offers a completely integrated product line to cover all your melt shop needs. The Inductotherm name has been a brand you’ve come to rely on for over 65 years. We promise to continue to deliver unmatched service, support and value to our customers by ensuring we deliver the most advanced solutions in the industry.

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