



SFSA CASTEEL REPORTER

Steel Founders' Society of America

a publication serving
SFSA steel casting industry Members

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August — 2014

Casteel Commentary

This month's Casteel Commentary argues that we need to make steel casting design and use accessible to the next generation of designers and purchasers. This suggests that we will need to take some responsibility for the performance of the part and deliver a finished component to eliminate the challenges that our current customers face when using castings. We will likely need to machine and finish the casting to deliver a compliant component that is cast. We will also need the NDE and design tools to develop and deliver reliable performance that we can guarantee.

Spring Management Meeting

The SFSA Spring Management Meeting in Tulsa included a number of presentations that are available to you on our website at <http://www.sfsa.org/folio/downloads>

Western Division Meeting and Heavy Section Product Group

The SFSA Western Division Meeting and Heavy Section Product Group meeting is August 21-22 at Bradken Tacoma. The Heavy Section Group will be discussing specialty sands for large castings. The Western Division meeting has a number of interesting topics. Details for the meeting are here, <http://www.sfsa.org/meetings/western14.php>

SFSA Annual Meeting

The SFSA Annual Meeting is not to be missed. We are meeting in Montreal September 6-9, 2014. Meeting topics will include: US EPA ENERGY STAR in steel foundries, design liability management, DoD Impact on Manufacturing, steel capacity study, the SFSA market forecast, and steel drivers. Registration and additional information can be found on SFSA's website <http://www.sfsa.org/meetings/annmtg14/>

Technical & Operating Conference

The 68th SFSA Technical & Operating Conference will be held December 11-13 at the Drake Hotel in Chicago, with a Workshop session on the afternoon of Wednesday December 10. A preliminary program is attached to this newsletter and available online at <http://www.sfsa.org/sfsa/toconf>. More information will be sent to SFSA members as it becomes available.

Future Leaders Group

The Future Leaders meeting is scheduled for October 7-8 in Milwaukee, WI and will include tours of Mercury Marine and Maynard Steel Casting. The meeting will include a roundtable for networking and technology advancement, along with a mini-seminar for continued learning. The group will also discuss on-going support for activities such as the steel casting wiki.

Southern Division Meeting

The Southern Division meeting will be October 15-16 at MetalTek – Carondelet near St. Louis. The focus of the meeting will be discussions on protecting liquid metal during the induction melting process

(SPAL/EGAL technology). Terry LaSorda from Air Liquide will provide a presentation along with three foundries who have noted benefits from adopting the process.

Market News

Markets have continued to show slow and small improvements for most of 2014. SFSA Trend cards have yet to show any improvement in shipments but bookings for steel and stainless steel castings are improving. The slow shipments are evident not only in the trend cards but the continued reduction of the backlog.

Improvements in steel mill products can be seen both in the monthly and weekly data. The weekly data from AISI is posted each week on the website and in the past few weeks, production is back to the levels in early 2012. Steel casting demand normally follows the same trend as steel production with some delay. Steel mill production has stabilized and is trending up. This would suggest the steel castings should see some modest growth in demand for the balance of 2014.

Steel Mill shipments reported by the DOC Census also shows the trend for improved sales of steel mill products. The shipments of iron and steel castings reported by Census are up slightly from the low in mid 2013. This index also tends to lead the trend in steel casting shipments.

Capital Goods orders and shipments continue to increase since late 2012. Even though the prime rate has not increased to winding down of QE indicates a strengthening market.

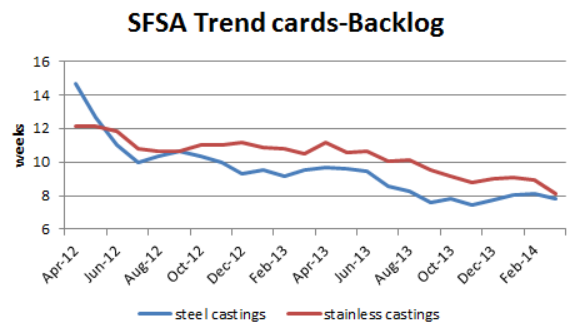
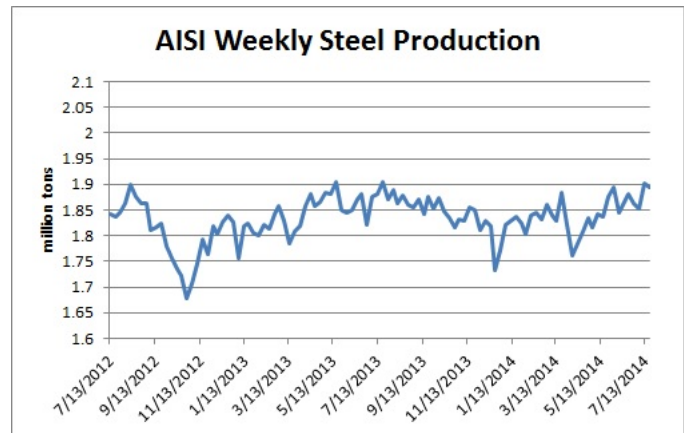
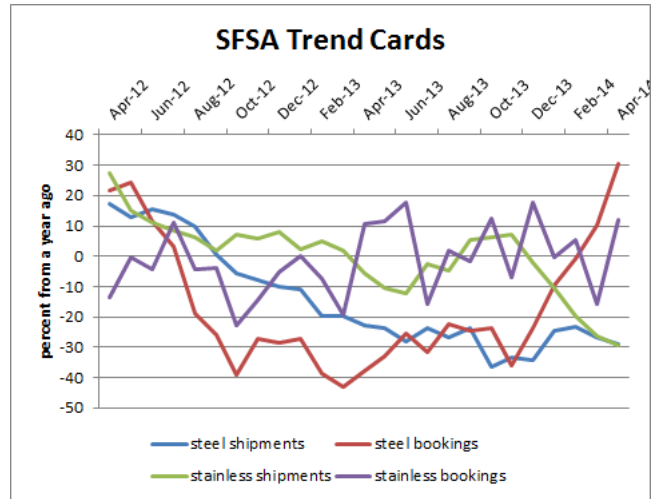
All of these indicators suggest that steel casting demand should improve for the balance of 2014 and continue to show ongoing modest growth in 2015.

Casteel Commentary

New markets, new customers, new employees, new challenges; all require that we develop new approaches. Our industry has existed by taking casting designs that are legacies of old business or innovations from new designers. Our current approaches to casting design and market development are not well suited to our new and changing environment. We expect new customers and a new generation of designers to adopt and learn antiquated methods of design and specifying steel castings.

When a new customer designs a casting, he assumes that the steel has uniform properties. He expects that he will get the minimum properties of the specified material anywhere in the casting. He expects that the quality of the casting to allow him to depend on sound and inclusion free material everywhere.

When he finds out that it is customary on important castings to use NDE like RT (radiographic testing) or MT (magnetic particle testing) to verify casting quality, it is disconcerting. His expectation is that he can order the highest standards of soundness and inspection as a given.



In our efforts to “educate” this new potential customer, we assure him that while the casting may have a range of properties in the casting with some below the material standard requirements and the casting will have significant indications in RT and MT, the casting will meet his required service performance. We try to convince the new customer that he can accept normal “commercial” practices for RT and MT requirements and the casting will perform. The fact that the specification material properties are only required in the test bars and not in the casting will be okay. And we will provide not guarantee, he has to take the liability of designing a casting in our traditional system with no determinate engineering rationale to provide assurance of performance.

We are working with a number of member companies to try to develop castings for the building construction industry. As we try to design and qualify parts, it becomes painfully obvious that we need new approaches to design that provide commercially cost effective casting designs while also providing assurance that the design and casting quality will give the requires safe and reliable service. At SFSA we are trying to develop an approach using modeling and performance based NDE to allow engineers to design reliable castings that are elegant in performance and suited to foundry production. Our hope is that this approach will allow designers to create unique and creative castings that will expand our marketplace. To do this completely though we will need to shift some of our business practices.

We need to figure out a way to participate or otherwise engage in the design process to take some responsibility and even liability for performance. We need to develop the capacity to machine or otherwise finish the castings so we deliver not a raw casting but a finished component with predictable assembly and performance at our customer’s and the user’s site. We need to become capable of meeting our customer’s expectations by finishing the casting and supplying a quality component ready to assemble and use.

The next generation of designers and purchasers will become increasingly reluctant to take the quality and performance risk of using a casting. We need to find a way to provide a casting that meets their expectations with the guarantee of reliable performance.

We are not there yet and we are not yet capable of this transition but we must find a way to do this or our customers will find alternative products to meet their needs.

**STEEL FOUNDERS' SOCIETY OF AMERICA
BUSINESS REPORT**

SFSA Trend Cards (%-12 mos. Ago)	12 Mo Avg	3 Mo Avg	April	March	February
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Carbon & Low Alloy

Shipments	-28.4	-29.1	-23.7	-39.4	-24.3
Bookings	-8.6	30.5	60.7	36.5	-5.7
Backlog (wks)	7.9	7.3	7.5	7.5	6.9

High Alloy

Shipments	-9.2	-29.3	-26.0	-26.8	-35.2
Bookings	2.0	12.0	55.9	-21.7	1.8
Backlog (wks)	8.9	7.5	7.4	6.6	8.3

**Department of Commerce
Census Data**

Iron & Steel Foundries (million \$)

Shipments	1,680.0	1,711.0	1,709	1,722	1,702
New Orders	1,699.8	1,733.0	1,707	1,765	1,727
Inventories	2,240.7	2,248.0	2,239	2,251	2,254

Nondefense Capital Goods (billion \$)

Shipments	75.0	76.1	76.5	77.0	74.8
New Orders	81.7	80.2	82.6	83.0	75.1
Inventories	174.8	178.4	179.2	178.1	178.0

**Nondefense Capital Goods
less Aircraft (billion \$)**

Shipments	66.6	67.9	68.2	68.4	66.9
New Orders	68.5	69.5	70.2	71.0	67.4
Inventories	120.0	120.5	120.9	120.4	120.3
Inventory/Orders		1.7	1.72	1.70	1.79
Inventory/Shipments		1.8	1.77	1.76	1.80
Orders/Shipments		1.0	1.03	1.04	1.01

American Iron and Steel Institute

Raw Steel Shipments (million net tons)	8.1	8.3	8.2	8.3	8.3
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Steel Founders' Society of America

National T&O Conference – December 11-13 2014
Grand Ballroom, Drake Hotel, Chicago, IL

Session 1 Thursday Morning – December 11 8:30 AM

- 1.1 Affordable Care Act: An Update
Marc A. Schmucker, Bradken - Atchison
- 1.2 Case Study on Detection, Investigation, and Abatement of Copper in Waste Water
Tonya Burgess, Sivyer Steel Corporation
- 1.3 Design Agent Teaming for Casting Conversions from Weldments
Matthew C. Draper, General Dynamics Electric Boat
- 1.4 Hitting Par on the Course with HR
Amie Perez, Bradken - Atchison
- 1.5 Revitalizing SFSA Marketing
Teresa Decker, Spokane Industries
- 1.6 SFSA Wiki Project
Callen Richards, MetalTek International - Sandusky
- 1.7 Transbay Node Update
John Cory, Bradken - Atchison
- 1.8 Utilizing Information Thru Collaboration
Brent K. Leger, Zac Hanks, Bradken - Amite

Industry Luncheon – French Room

Session 2 Thursday Afternoon – December 11 2:00 PM

- 2.1 Sample Casting Routing Control
Jeanne Wagner, Stainless Foundry & Engineering
- 2.2 Innovative Heat Treatments to Improve the Ductility of High Strength Steels
David C. Van Aken, Terrell Webb, Missouri University of Science & Technology
- 2.3 Welding of High Strength Steels
John DuPont, Robert Hamlin, Erin Barrick, and Brett Leister, Lehigh University
- 2.4 Improved Heat Treatment Schedules for High Alloy Castings
John DuPont, Dan Bechetti, Lehigh University
- Schumo Foundation Intern Papers - TBD

Discussion Session

Industry Reception

- SFSA Member or staff
- ◻ Researcher or industry consultant

Preliminary Program –Subject to Change

Session 3**Friday Morning – December 12****8:30 AM**

- 3.1 Argon/SPAL/Porous Plug
Barry Craig, MetalTek International - Carondelet
- 3.2 EGAL Process (updated SPAL)
Bryan Tiger, American Foundry Group
Terry LaSorda, Air Liquide
- 3.3 3M Cubitron - Survey
David Poweleit, SFSA
- 3.4 Pouring Cups
Jenni Duncan, Bradken - Chehalis
- 3.5 Quench Tank Qualification and How it's Done
Michael Pershing, John Carpenter, Caterpillar
- 3.6 Energy Savings and Sustainability in the Foundry
Anoop Balakrishnan and Kyle Long, Harrison Steel Castings Company
- 3.7 ERP
Shawn Cefalu, MetalTek International - Wisconsin Centrifugal Division
- 3.8 Implementing an ERP... and Actually Making it Work.
Jessica Okhuysen, Corporaçion POK
- 3.9 ME Elecmetal Melting: Optimizing Expansion
Paul Henriksen, Travis Needham, ME Elecmetal - Minneapolis
- 3.10 New Facilities
Dave Fazakerly, Eagle Alloy
- 3.11 Sample and Benefits of Floating Cover Lids
Albert Miller, Jr., Joe Hutto, Bradken - Amite

Industry Luncheon – French Room**Session 4****Friday Afternoon – December 12****1:30 PM**

- 4.1 New EAF Transformer Selection, Installation, and Tuning
Benjamin Wells and Robert Finley, ME Elecmetal - Tempe, AZ
- 4.2 Digital Radiography Equipment Selection and Use at Caterpillar
Pat Hayes, Douglas Guyer, Caterpillar
- 4.3 Digital Radiography at Spokane Industries
Billy Newman, Spokane Industries
- 4.4 3D Printer Tooling and Solidification Analysis
Mike May, May Foundry & Machine Company
- 4.5 Rapid Patternmaking
Frank Peters, Matt Frank, Iowa State University
- 4.6 Sand Printing - Additive Manufacturing of Cores and/or Molds
Jerry Thiel, University of Northern Iowa
- 4.7 Practical Application of 3D scanning in the Foundry
Glenn McQuarter, Bay Cast
- 4.8 Moon Rocks in Reclaimer
Danny Kermicle, Magotteaux Pulaski
- 4.9 Use of PMI/XRF Gun on Reclaimed Sand
Shawn Cefalu, MetalTek International - Wisconsin Centrifugal Division
- 4.10 Progress in Determining Riser Sleeve Properties for Steel Castings
Thomas J. Williams and Christoph Beckermann, University of Iowa

Discussion Session

Preliminary Program –Subject to Change

- SFSA Member or staff
- Researcher or industry consultant

- 5.1 API Spec. Revision
Jeanne Wagner, Stainless Foundry & Engineering
- 5.2 ASTM Update
Elaine Thomas, Bradken - Tacoma
- 5.3 Pour Time and Water Modeling Revisited
Charles Monroe, John Griffin, Robin Foley, University of Alabama - Birmingham
Raymond Monroe, SFSA
- 5.4 Portable Hardness Tester Gage R&R
John Griffin, University of Alabama - Birmingham
- 5.5 Conversion Factors for Sub-size Charpy Specimens
John Griffin, University of Alabama - Birmingham
- 5.6 Simulation Software Comparison Study
Glenn McQuarter, Bay Cast
- 5.7 Data Mapper Use
Keith Pearl, Sivyer Steel Corporation
- 5.8 Data Analytics for Foundries with R
Shawn Martin, Harrison Steel Castings Company
- 5.9 Porosity and Cleanliness Limitations on High Strength Steels
David C. Van Aken, Terrell Webb, Missouri University of Science & Technology
Robin Foley, University of Alabama - Birmingham
- 5.10 Under-riser segregation
Raymond Monroe, SFSA

Adjourn

T & O Workshop - 2014

STEEL FOUNDERS' SOCIETY OF AMERICA



National T&O Workshop Program

2:00 PM to 6:00 PM
Wednesday, December 10

- **Process Improvement and Six Sigma**
Amie Perez, Bradken
- **Physical Metallurgy**
John DuPont, Lehigh University
- **Heat Treatment Principles**
Raymond Monroe, SFSA
- **Flux Core vs. Solid Core Welding Wire**
TBD

Preliminary Program –Subject to Change