



# SFSA CASTEEL REPORTER

Steel Founders' Society of America

a monthly publication  
serving SFSA steel casting industry Members

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## August — 2013

### Casteel Commentary

This month's Casteel Reporter welcomes Rick Boyd as our new Vice President of Technology. It also asks for your help and insight on the best way for us as senior technical and management staff to pass along the hard lessons we have learned about making the best steel castings in History.

### Annual Meeting

SFSA's annual meeting is September 7-10, 2013 in Half Moon Bay, CA. Meeting topics include: Healthcare Reform: Affordable Care Act, Peeking Behind the Curtain: Steel Foundry Statistics and Observations, Product Liability Risk & Minimization, Management as Stewardship: A Path to Improved Performance, and the steel casting market forecast. Additional information and registration is available at <http://www.sfsa.org/meetings/annmtg13>

### The Good, the Bad, and The Ugly

It's back... SFSA's "The Good, the Bad, and The Ugly" Seminar. If you missed this opportunity a year ago, it is now coming to the Midwest. The seminar is a one-day event with straight talk on steel castings to enable the education of our customers, which is critical to maintaining a good business relationship. The seminar will cover challenges we face with communicating with the customer, capabilities of steel castings compared to forgings/weldments/hog-outs, nuances of casting steel, casting defects, welding castings, quality, and specifications. This seminar is free and open to all SFSA members. These facts about steel castings will be presented by Raymond Monroe and David Poweleit. So, whether you have a new design engineer, quality manager, salesperson, or anyone else new to the steel casting industry, they should attend this one of a kind event so they are equipped to better educate your customers. The seminar will be held in Milwaukee on October 1st (prior to the North Central Division meeting) - more details forthcoming. Please register with David Poweleit at [poweleit@sfsa.org](mailto:poweleit@sfsa.org).

### SFSA Schumo Scholarships

Two scholarships of \$2,000 each will be awarded to interns who have been employed by member companies during the current calendar year. Member companies are asked to bring notice of this opportunity to any interns that they employ during the current calendar year. The scholarships will be competitive; each applicant is required to submit a paper and Powerpoint presentation on a particular project they have completed during their employment. Scholarship winners will present their papers at the SFSA National T&O Conference in Chicago this December. More information is available here: <http://www.sfsa.org/foundation/Intern2013.pdf>

### North Central Meeting and Future Leaders

This year we are holding the North Central Division meeting back-to-back with a Future Leaders Group meeting, which will give Future Leaders an opportunity to participate in the divisional meeting. The North Central Division meeting will be on Wednesday, October 2nd and will include a tour of Badger Alloys in the morning and member presentations in the afternoon. The Future Leaders Group meeting will be on Thursday, October 3rd and Friday, October 4th. The meeting will include a couple of tours of local foundries along with presentations from industry "graybeards". Future Leaders will also benefit from the discussions at the round table session and partake in Raymond Monroe's mini-seminar on

high alloy metallurgy. Finally, there is a tentative plan to tour Bucyrus (Caterpillar Global Mining). Please register by contacting David Poweleit at [poweleit@sfsa.org](mailto:poweleit@sfsa.org).

### **Western Division Meeting**

There is still time to plan to attend the Western Division meeting that will be held August 22 in Portland, OR. The agenda includes presentations on hydrogen baking, water quench cleanliness, sand control, B&L Odyssey ERP System, demand controller, rebuild of a heat treat oven, burn-in/burn-on, and an SFSA update from Rick Boyd. Please register with Rick at [boyd@sfsa.org](mailto:boyd@sfsa.org).

### **Marketing Committee**

The next SFSA marketing Committee meeting is at the Four Points Sheraton on August 14th to prepare the 2014 forecast. Committee members will meet for dinner on the 13th. Contact R. Monroe if you are planning to attend.

### **Rod Duncan, Larry Krueger**

Sad News. Two of the true leaders and significant contributors to the steel foundry industry and our Society have passed away.

Rod Duncan was a supporter of the industry, an innovator, a careful technical expert and an enthusiastic steel foundryman. He passed away last month and we all will miss his leadership and friendship.

Larry Krueger was a recognized leader in SFSA and AFS. He spent his career at Pelton Steel. He received all the top awards from AFS and SFSA. He was a sharp, perceptive leader with clear ideas of where he thought the industry and the Society should go. He displayed the highest integrity. He will be remembered as a founder of our industry.

### **SFSA Research Progress**

#### **Data Mapping Software**

Final stages of the software for mapping of castings are being done. This software has the potential of being a significant tool to not only the foundry industry but to any industry that needs to collect location and type sensitive data across a range of parts or assemblies. The design of the software maximizes quick response and versatility while maintaining a simple learning format. The software not only collects the data for later retrieval but is also capable of combination of data from multiple parts to identify trends. Integration of the software with foundry computer systems is also being looked at from the perspective of commercializing the technique.

#### **Distortion of Steel Castings**

Experimental work was conducted on the displacement of a steel cylinder in a mold with a core during cooling. Displacement was measured in the casting as well as of the mold. This data was compared with predicted computer simulations. A factor of expansion of the mold due to initial heating after pouring is significant.

#### **Melting Efficiency**

Work is continuing to complete the spreadsheet for evaluating changes to a foundry's energy footprint in ladle and furnace practices.

#### **Reliable Base Casting Design**

The reliability of cast products is being addressed with testing of surface induced linear indications. Work to date indicates that a linear indication such as a crack can be modeled for casting design purposes using accepted parameters for drilled holes. The research is developing information to equate an indication length to a factor of safety. A significant consideration of the material is its elongation.

#### **Riser Sleeves**

This project is to determine riser sleeve simulation properties and parameters. The most common suppliers and types have been determined and test material was obtained. Castings were poured at University of Northern Iowa Metal Casting Center using WCB steel. The generated data is being used

to adjust the simulation parameters. A specific question was asked of what sizes are best suited for insulating and what sizes should use exothermic. This information should be forthcoming soon.

Welding – High Strength Steels

This work is in its earliest stages of developing welding procedures for high strength steels of the order of 200ksi yield strength and elongation >10%.

Digital Radiography of Heavy Sections

The problems of radiographing heavy section castings using digital screens is being addressed. The high sensitivity of the screens is picking up scattered radiation from reflected sources other than just the beam from the source passing through the castings. This added exposure is masking any indications in the castings. A technique change for placement of the source relative to the casting appears to be the solution.

**Market News**

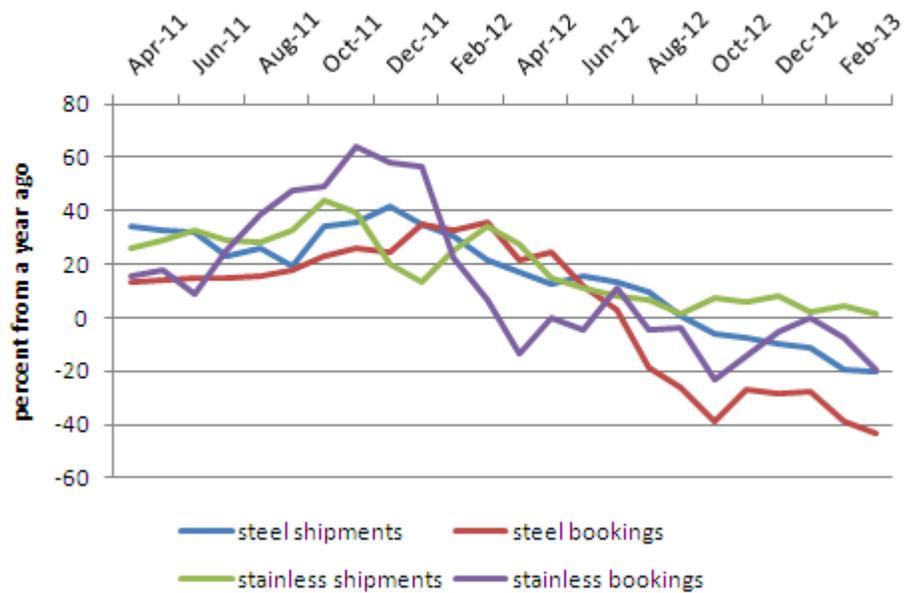
After a sharp recovery and extended period of strong orders following the financial meltdown in 2008, steel casting shipments including high alloy products have declined. Business conditions began to soften in the middle of the year in 2012.

Steel casting shipments across the industry are down from the prior year by 20%. High alloy steel castings are stable and have not yet seen the sharp decline seen by steel casting producers. The decline is not affecting all markets uniformly with mining taking some of the hardest declines. This can be seen in the reduction of backlogs.

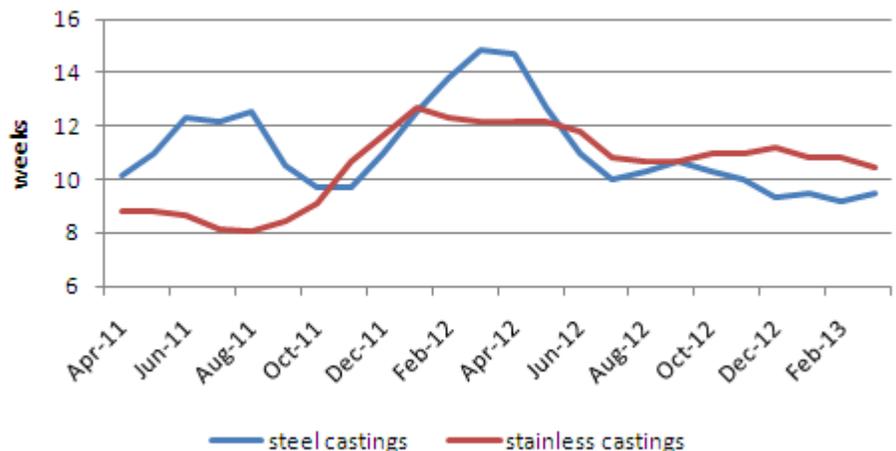
Orders for capital goods that normally contain castings and are correlated on an annual basis with steel casting demand continues to see modest growth from the low points in late 2012 but remain at levels below those seen in 2011.

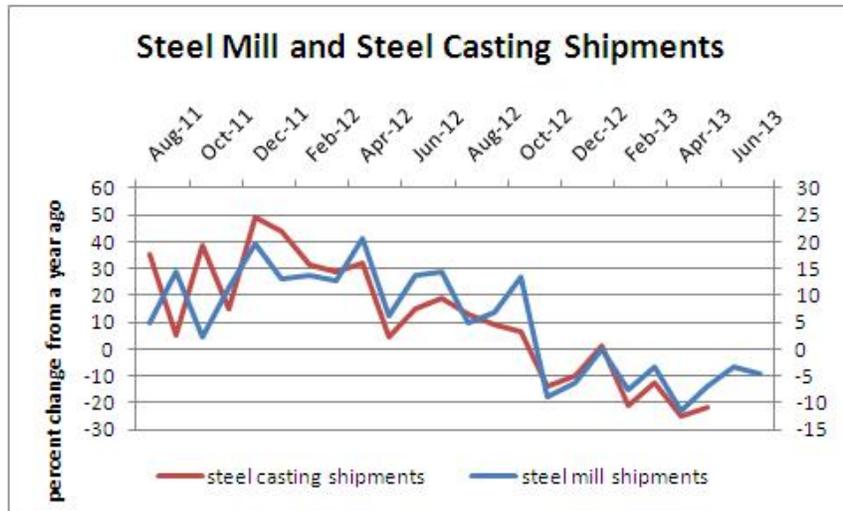
Steel mill shipments and steel casting shipments are typically closely correlated with steel mill shipments at times coincidental and other times leading. For the past two years, steel mill shipments and steel casting shipments are following the same declining trend. Steel mill products have half the volatility of steel casting shipments.

**SFSA Trend Cards**

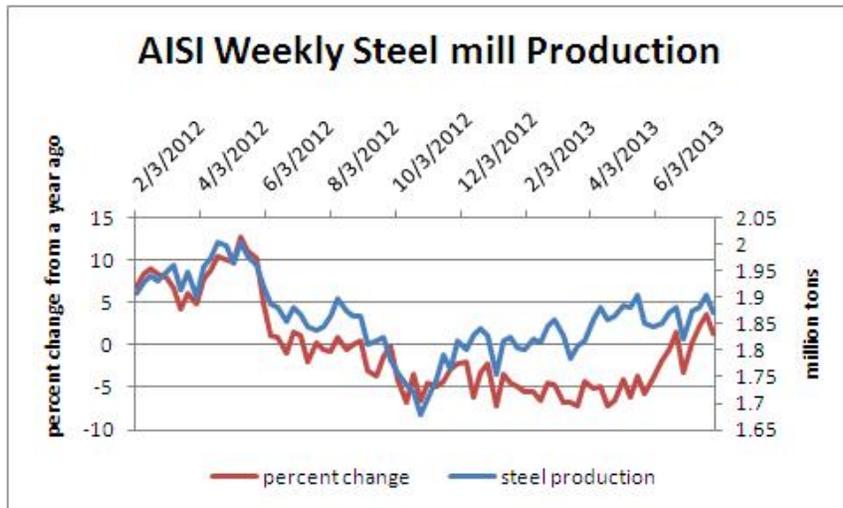


**SFSA Trend cards**





Steel mill production is reported on a weekly basis so this makes it possible to know the current market trends in mill products. This data is noisy and cannot be taken as an absolute indicator but is clearly increasing for the past month.



The same trend of decline is seen when plotting the production of steel mill products on a weekly basis compared to the SFSA reported changes in steel casting production. The weekly numbers do show a modest uptick for the past month suggesting improving market conditions for steel products. This suggests stable or modest improvements in steel casting production.

**Casteel Commentary**

SFSA has always had the advantage of a smart, dedicated, connected, and strategic leadership. Our industry has attracted and developed leaders in technology, business, and manufacturing. Our product is difficult and demanding to make. As we look to the future, our stewardship of these characteristics will be seen in our ability to pass on a strong, healthy, and growing industry. To do this, we all recognize the challenge of growing the next generation of steel foundry leaders.

SFSA faced a challenging and critical staffing task to help support our future. Malcolm Blair retired after decades of providing technical support and leadership to our Society and to our customers. He was capable, knowledgeable and experienced. Out of his store of personal understanding and interest, he was able to serve our industry and serve it well. With Malcolm's retirement, would SFSA be able to continue to offer experienced and capable support to the wide range of needs of our members?

We agonized over the effort of finding a new technical leader for our staff. The demographic hole between old and young, the lack of experienced and qualified people, the demands of not only technical leadership but also personal capabilities made the search requirements narrow and the field

of candidates small. Since we also were not trying to steal a capable person from our members, it seemed like a task destined to disappoint us.

Fortunately, near the end of our search one of our senior technical experts in our industry volunteered to take up the task. Rick Boyd, recently of Nova Precision was considering how he could best advance our industry for the capstone of his career and found his circumstances such that he was free to join SFSA as our senior technical staff member.

Rick has over 40 years of steel casting experience. He was involved both as an operations and technical staff at Pennsylvania Steel. For the past 15 years, he has been the owner and operator of an investment casting plant. He is proficient in foundry operations, melting, high alloy metallurgy, etc. With Malcolm's continuing support, SFSA is ideally positioned to continue to support and serve the members and the steel foundry industry.

This is critical since we have a fundamental task before us. Our business climate resulted in few people that are now mid-career with operational or technical expertise. Most of our senior staff is 55 plus and many of our next generation/future leaders are less than 30.

We at SFSA have been trying to help bridge this demographic gap. At many meetings, especially the Future Leaders meetings, we have been offering training to pass along our legacy understanding of how the industry works. With the direction of the SFSA Board, we are developing an apprenticeship program. Rick has been vocal and passionate about his interest in this issue.

It seems that we as a Society may need to re-examine our program for the members to do a more adequate job of providing the support to develop the next generation. For example we need to change from an apprenticeship program to an artisan program to train the master craftsman for our industry.

Our meetings including tours and networking opportunities are helping develop the operational expertise needed. We need to continue the interaction and development in this area. For technical people, we need to figure out an efficient method to pass on our tribal knowledge. Do we need to sponsor short courses on troubleshooting? Do we need to have one day symposia on specific technical areas like embrittlement in heat treatment or formation of sigma phase? Do we need a retreat for technical staff from industry segments with time to discuss a wide range of technical related topics like melting?

Please join me in welcoming Rick to our staff. Please make sure to exploit his experience and insights. Please make sure to give us your feedback and your good ideas about how we can train up the next generation with our imbedded experience.

Raymond

Rick Boyd's contact information is:

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or 1 815 455-8240 ext. 202

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

**SFSA Trend Cards**            12 Mo Avg    3 Mo Avg    Mar    Feb    Jan  
(%-12 mos. Ago)

**Carbon & Low Alloy**

Shipments	-19.8	-19.8	-22.0	-25.0	-12.5
Bookings	-43.1	-43.1	-48.8	-39.0	-41.6
Backlog (wks)	9.5	9.5	10.0	9.0	9.5

**High Alloy**

Shipments	1.8	1.8	-4.0	9.3	0.0
Bookings	-19.5	-19.5	-40.0	-13.4	-5.0
Backlog (wks)	10.5	10.5	10.0	11.4	10.0

**Department of Commerce  
Census Data**

**Iron & Steel Foundries (million \$)**

Shipments	1,774.3	1,774.3	1,770	1,784	1,769
New Orders	1,751.7	1,751.7	1,719	1,756	1,780
Inventories	2,097.0	2,097.0	2,090	2,096	2,105

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

Shipments	71.2	71.2	72.3	70.7	70.6
New Orders	74.2	74.2	70.7	78.6	73.4
Inventories	175.1	175.1	175.6	175.3	174.5

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

Shipments	65.0	65.0	65.6	65.3	64.1
New Orders	65.6	65.6	64.9	64.4	67.6
Inventories	120.6	120.6	120.4	120.5	120.9

Inventory/Orders		1.8	1.85	1.87	1.79
Inventory/Shipments		1.9	1.84	1.85	1.89
Orders/Shipments		1.0	0.99	0.99	1.05

**American Iron and Steel Institute**

Raw Steel Shipments (million net tons)	7.9	7.9	7.9	7.4	8.2
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