SFSA CASTEEL REPORTER

Steel Founders' Society of America

a publication serving
SFSA steel casting industry Members

780 McArdle Drive Unit G, Crystal Lake IL 60014
Tel: 815-455-8240 Fax: 815-455-8241
http://www.sfsa.org

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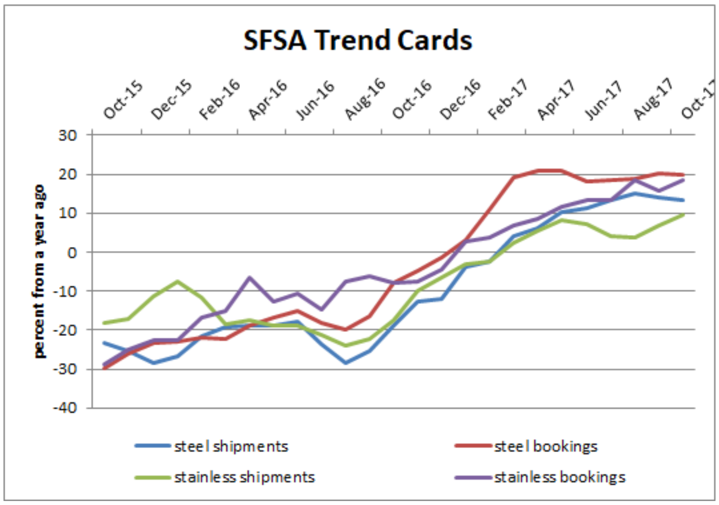
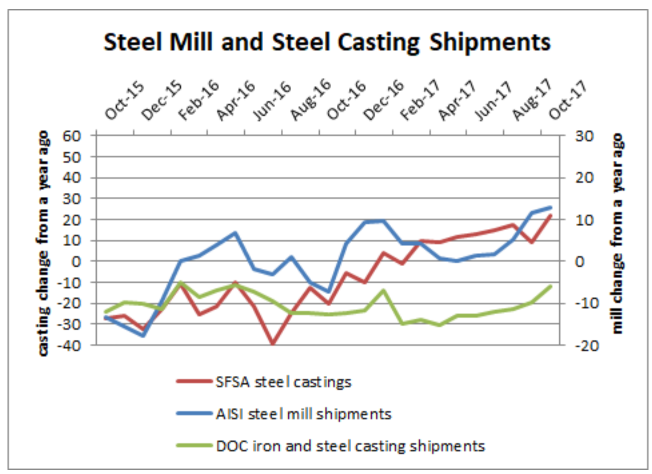
Market News



The SFSA Trend cards continue to show positive developments. If as an industry we were near our capability at the peak of production in late 2012 and our low point in 2016 was only 45% of that number, then a 20% improvement only means recovering to 54% of the 2012 levels of production. If we continue at a bookings rate of 15% for most of 2018, we would be up to 62% of our prior level in 2012. However, with the closure of some plants, we could return to more "normal" business levels. This assumes that we can recruit and train the workforce required to achieve that level of production.

Our shipments for steel castings are up 16% in October and for stainless we are up 8%. Another positive indication is backlog that is now over 9 weeks for both. Bookings are still running higher than shipments as an indication of continued market improvements.

The price of oil and copper continue to suggest stable and improved markets. Weekly steel production seems fluctuating in a trading range but at higher levels with capacity utilization over 70%. While steel casting production appears around twice as volatile as mill production, both can be seen to be improving dramatically since late 2015.



The SFSA Marketing Committee has updated the market forecast for 2018 available here, https://www.sfsa.org/meetings/fall17/. They are projecting positive changes for all segments for 2018 with the average growth around 6%. The strongest improvement is for trucks, construction and oil field; all in excess of 10%.

Casteel Commentary

My Ideas for 2017 for the North American Foundry Industry:

1. **Business for steel foundries will be better than expected with real improvements in demand and production in all markets except railroad.**

Our final forecast given at the 2016 T&O conference was that the total production for steel castings without railroad castings was -1%. With railroad castings it was -13%. Our twelve-month rolling average for carbon steel casting shipments through October was +8% and for stainless was up 3.6%. Our survey does not capture railroad production well and rail was not down as much as feared, -25%.

2. **There will be a significant downturn in the stock market to bring equities back in line with future cash flows and historic expectations for rates of return.**

Wrong!! I still expect this to happen. (https://www.hussmanfunds.com/comment/mmc180101/)

3. **Oil and copper prices will remain mostly stable finishing the year slightly above current prices, oil above $55 a barrel and copper above $2.5 a pound.**

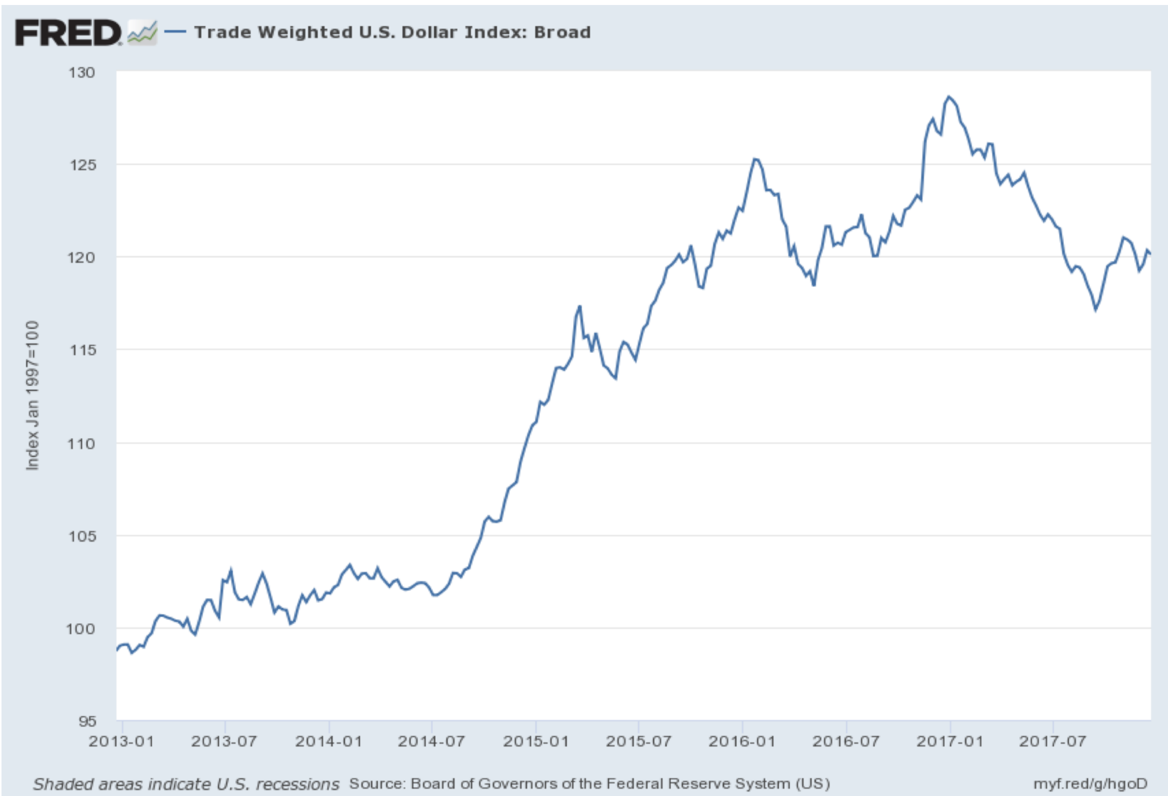
WTI price of oil for 12/26/2017 was $59.55. Copper was $3.2617 a pound on 1/1/2018. These commodities improved prices support the better market demand of 1.

4. **The Fed Funds rate will reach 1% by year end.**

The Fed Funds rate on 1/1/2018 is 1.5 reflecting the strengthening of the economy.

5. **The dollar will continue to be strong making imports a greater challenge and exports more difficult.**

The dollar declined in value for the year but remains high.



My Ideas for 2018 for the North American Steel Foundry Industry:

1. **Business will remain solid for steel foundries in most market segments with better upside than downside potential.**
2. **Equity markets will not continue to increase and are at risk to a significant correction. In the past decade, steel foundries have often been countercyclical and may still have solid markets with a sharp equity downturn.**
3. **Oil and copper prices will remain stable with normal volatility supporting most markets for steel castings.**
4. **Fed Funds rate is likely to remain below 2%.**
5. **The tax rate reductions in the US will improve markets in North America while companies shift production to the US to take advantage of the lower rates.**

2017 National Technical & Operating Conference

With the commitment of industry to both provide papers and participate, the 2017 T&O Conference continued the legacy of being the world's premiere steel casting conference! Thanks to the T&O Committee and all of the authors, the program offered a complete range of technical and operating subjects including: a keynote by Ingo Steller from BDG covering a range of steel casting topics from Europe, pouring & gating, Industry 4.0, robots in the foundry, silica regulation, and SFSA's new program (Digital Innovative Design) on design, manufacturability and reliability of steel castings. Similar to one of the conference sessions, the workshop focused on pouring & gating plus induction furnace preventative maintenance. Planning is already in the process for this year's conference. If you would like to recommend a topic and presenter for the 2018 T&O, please contact David Poweleit at poweleit@sfsa.org.

The T&O showcased some of the on-going university research projects supported by SFSA.

Professor Beckermann (UI) validated the developed air entrainment model with the historical water modeling experiments from the Clean Steel Program. The modeling results were consistent with the experimental findings. Low head height and short pouring time minimize air entrainment during pouring. For bottom pour ladles, a fully open nozzle and the use of a nozzle extension also reduce air entrained. This UI paper was part of the Gating and Pouring Session that discussed the principles, modeling predictions, and experimental data on air entrainment in steel castings.

Professor Van Aken (MS&T) gave a follow-up to his presentation at last year's T&O Workshop on hardenability of steels. MS&T developed a Hardenability workbook to calculate quenched and tempered hardness of low alloy steels using chemistry. This workbook was provided to T&O 2016 attendees. Van Aken re-examined the tempering model and refined the tempering decrement parameter to more closely match recent experimental results. The modified version of this MS&T Hardenability workbook can be downloaded at SFSA member website.

Preliminary results and analysis for other research projects at their earlier stages were also presented. University of Northern Iowa is developing a 3D Laser Scanning method to quantitatively evaluate surface roughness of castings. University of Alabama at Birmingham is examining the use of quality index for process changes to evaluate steel castings.

Safety Awards

SFSA members set a new record for safety awards with fifteen members that received awards at the T&O conference last month for demonstrating an exemplary safety record for 2016. The awards are to recognize members that set the standard in safety practices and contribute to the improvement of the overall safety record for our industry. The following five members achieved a "Perfect Safety Record" with a DART rate of 0:

- Bradken – Amite
- Eagle Precision Cast Parts
- MetalTek International – Carondelet
- Northern Stainless Corporation
- Talladega Castings & Machining

The following ten members achieved an "Outstanding Safety Record" with a DART rate less than 2.2, which is the 2016 industry average for all manufacturing:

- Acerlan S.A. de C.V.
- Brafe Engineering Limited
- Eagle Alloy
- Fimex S.A. de C.V.
- Harrison Steel Castings
- M E Global Inc.
- Magotteaux Ltee
- MetalTek International - Wisconsin Centrifugal
- Monett Metals Inc.
- Southern Cast Products

SFSA Scholarships Awarded

Recruiting students to join our industry and grow into leadership positions remains a critical need in the steel casting industry and a strategic initiative of the Society. The SFSA Schumo Foundation, established in memory of Robert M. Schumo, a former president of SFSA and Pennsylvania Electric Steel in recognition of his generous gift to the Society, aims to attract the next generation workforce by providing scholarships to student interns. To compete for the scholarships, interns are required to work at a member foundry and carry out a specific task or investigation and selected works are presented at the annual T&O conference. At the 2017 T&O, SFSA awarded two $1,000 Schumo Scholarships to Trace Dreschler, M E Global – Duluth and Branson Elliott of Andritz, Inc.

The Kent Peaslee scholarship was established by the SFSA Board in honor of the late Dr. Kent Peaslee, the Chair of Steelmaking Technology and Curators' Teaching Professor of metallurgical engineering at Missouri University of Science and Technology. The scholarship is given to a student who prepares a paper in the area of steel melting or refining and presents it at the SFSA Technical and Operating Conference. SFSA presented Dominic Croce, Southern Cast Products, with a $1,000 Peaslee Scholorship at the 2017 T&O. If you currently have or plan to have an intern work at your foundry in 2017, be sure to have them complete a scholarship registration form which the Society will distribute via email and on the SFSA website later this month.

OSHA's Silica Regulation & SFSA Compliance Materials

Last month, the U.S. Court of Appeals for the District of Columbia Circuit rejected industry challenges to the U.S. Occupational Safety and Health Administration's (OSHA) 2016 rule which significantly lowers the permissible exposure limit for workplace crystalline silica from 100 micrograms per cubic meter (μg/m3) to 50 μg/m3 in the foundry, brick, glass, maritime, and construction industries. The rule had been in the works for years.

Business groups, including the American Foundry Society (AFS) and the National Association of Manufacturers (NAM), and supported by the Steel Founders' Society of America (SFSA), challenged whether substantial evidence supported OSHA's finding that the silica rule is technologically and economically feasible for general industry, including the foundry industry.

The court noted OSHA satisfied its burden to demonstrate technological feasibility for a typical firm in most operations and supported that finding with "substantial" evidence.

SFSA has been busy the past year preparing silica compliance resources for members to assist in complying with the new regulation. The materials include silica abatement guidance documents, written silica exposure control plan, compliance schedule, etc. These resources will be released this month to membership and posted to the steel wiki website exclusively for SFSA members. As a reminder, if you have any questions on the compliance resources or the new silica regulation, SFSA is partnered with Guimond & Associates to provide you EHS compliance assistance and training. Please call the member hotline at: (215) 721-4500.

SFSA Staff News

In order to better support our members and increase availability of our internal resources so that we can better manage our programs and projects, SFSA hired Corrine O'Connell in January. Corrine will be serving as Executive Assistant and will be helping with projects such as updating the Directory of Steel Foundries, organizing meetings, and communicating with SFSA members. Corrine's email address is coconnell@sfsa.org, and her direct telephone and fax number is +1 (815) 479-1833.

STEEL FOUNDERS' SOCIETY OF AMERICA
BUSINESS REPORT

SFSA Trend Cards (%-12 mos. Ago)	12 Mo Avg	3 Mo Avg	November	October	September
Carbon & Low Alloy					
Shipments	9.7	15.4	15.0	22.0	9.3
Bookings	17.0	17.3	20.0	11.0	21.0
Backlog (wks)	8.5	9.8	10.0	10.0	9.5
High Alloy					
Shipments	4.5	8.3	11.0	3.9	10.0
Bookings	9.9	6.0	10.0	1.0	6.9
Backlog (wks)	8.3	9.2	8.0	9.6	10.0
Department of Commerce Census Data					
Iron & Steel Foundries (million $)					
Shipments	1,318.0	1,304.3	1,310	1,318	1,285
New Orders	1,359.6	1,361.0	1,380	1,362	1,341
Inventories	1,981.6	2,029.7	2,046	2,030	2,013
Nondefense Capital Goods (billion $)					
Shipments	71.8	73.8	74.4	73.1	73.9
New Orders	72.2	74.9	75.3	73.5	75.8
Inventories	177.0	180.0	180.5	179.9	179.6
Nondefense Capital Goods less Aircraft (billion $)					
Shipments	64.1	66.2	66.4	66.5	65.6
New Orders	64.6	67.0	67.1	67.2	66.7
Inventories	122.4	124.4	124.6	124.3	124.4
Inventory/Orders	1.9	1.9	1.86	1.85	1.87
Inventory/Shipments	0.0	1.9	1.88	1.87	1.89
Orders/Shipments	0.0	1.0	1.01	1.01	1.02
American Iron and Steel Institute					
Raw Steel Shipments (million net tons)	7.6	7.6	7.4	7.7	7.6