



SFSA CASTEEL REPORTER

Steel Founders' Society of America

a publication serving
SFSA steel casting industry Members

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January — 2019

Casteel Commentary

Steel foundries will face challenges in the marketplace, in staffing and in responding to global economic conditions. For the commentary, I review my thoughts from last January on 2018 and share my thoughts for 2019. Hope you enjoy and disagree. It makes the ongoing discussion more fun and useful.

High Alloy Inclusion Class

Registration for the High Alloy Inclusion class is now open! The class will be taught by Tom Stevens in Guadalajara, Mexico on Tuesday and Wednesday, February 26-27, 2019 with tours of Fimex and POK on Thursday, February 28. The class will cover practical experience, past SFSA research, formation of high alloy inclusions, control from melting through pouring & gating, and problem solving.

Early bird registration by January 25 is \$425 (register here: <https://sfsa.site-ym.com/events/register.aspx?id=1183425>). Registration after January 25 is \$475. The class size will be limited to 30 students. We request that only 2 persons from each member foundry location register by January 15. After that, all the remaining seats will be available on a first come, first served basis. If you would want to attend this class in the US on Fall 2019, contact Diana David ddavid@sfsa.org.

72nd National Technical & Operating Conference

With the commitment of industry to both provide papers and participate, the 2018 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 session focused on silica sand and a session on Smart Manufacturing for steel foundries along with a range of papers covering everything from melting to foundry engineering to molding to finishing to management to quality to technical & featured research. The "Learn from the Legends" workshop offered tricks of the trade from honorary members who shared their experience on topics including quenching, foundry management, casting failure analysis, high strength steel, modulus, and monel. Recordings of these presentations are now available on the wiki (<https://wiki.sfsa.org>). Planning is already in the process for this year's conference. If you would like to recommend a topic and presenter for the 2019 T&O, please contact David Poweleit poweleit@sfsa.org.

2018 T&O Conference Best Papers

SFSA would like to congratulate the best paper winners from the 2018 T&O Conference. The recipients are:

- Rod Duncan Best First Time Paper: Mario Terrazas, Acerlan Matrix Metals, for his paper on "Deoxidation Process Change to Prevent Under-Riser Cracking Caused by Aluminum Nitrides on Heavy Sections"
- Robert G. Shepherd Runner-up Best Paper: Daniel Wile, Southern Cast Products, for his paper on "High-Yield Yield Improvement"
- Robert G. Shepherd Best Paper: Wade Marquardt, Highland Foundry, for his paper on "Continuing the Conversation - Naturally Pressurized Fill System"

The T&O Committee is honored to showcase these papers by making them available for download here: <https://www.sfsa.org/to>. We appreciate the support provided to the steel casting industry through papers such as these. To receive the full conference proceedings and hear the authors firsthand

present their material, please make plans to attend the 2019 National T&O Conference tentatively on December 11th – 14th.

GIFA 2019

The world's largest foundry show, GIFA, will be held in Dusseldorf, Germany on June 25-29, 2019. SFSA is arranging for foundry tours in France the week before (week of 6/17) and will be attending GIFA. Unfortunately, we were unable to secure a block of rooms near Dusseldorf due to the demand for the show. We have booked at the Crowne Plaza (details below) tentatively from 6/23 to 29, and would recommend you setup a reservation here or nearby to participate as a group and to best take advantage of transportation logistics (tour bus will use this location and it is easy to take public transportation to GIFA and the airport). We are working on setting up the logistics and costs for the tours. As space will be limited, please RSVP with Corrine O'Connell coconnell@sfsa.org now to confirm your attendance.

Hotel information:

Crowne Plaza Dusseldorf – Neuss

Rheinallee 1, Neuss | 41460 | Germany | 49-2131-7700

You can book online (<https://www.ihg.com/crowneplaza/hotels/gb/en/neuss/zoqns/hoteldetail>) or contact Melanie Schlopers at +49 (0)2131 77 1801 or melanie.schlopers@gchhotelgroup.com

NextGenMfg Group

Manufacturing, specifically the foundry industry, is facing a challenge of not being able to find the next generation of artisan founders. In 2019, SFSA is forming a group to work on next generation manufacturing technology. The industry will greatly benefit from this technology but is unlikely to see a commercial investment given the size of the industry and uniqueness (hot metal, large and complex shapes, job shop production, etc.). Therefore, with the board's backing, we will make our own investment to take advantage of the latest manufacturing technology – IoT, A.I., Machine Learning, Industry 4.0, Smart Manufacturing. This will become our Steel Foundry 4.0! We envision a manufacturing cell with the technology to inspect, finish and weld a casting. It will not use robots that need to be programmed and use expensive fixtures, which have kept this technology reserved for only high-volume applications that can provide the ROI. Instead, we will utilize high resolution cameras, low cost sensors, and a machine learning process to optimize the manufacturing without programming each novelty of producing a single casting. If you would like to nominate an individual to participate in this group, please contact David Poweleit poweleit@sfsa.org.

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 sponsor the scholarships this year, we received personal contributions from Jim Cooke, John Harmeyer, Doug Imrie, Tyrus Tenold, and anonymous donors.

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. SFSA awarded seven \$1,000 Schumo Scholarships to:

- Brock Grabiak – Duraloy Technologies
- Tyler Jankowski – Stainless Foundry & Engineering
- Amber Nolf - Regal Cast
- Benjamin Previte – Andritz, Inc.
- Riley Simpson - Metaltek-Wisconsin Investcast
- David Sternaman - Metaltek-Wisconsin Centrifugal
- Tanner Wallenkamp - Metaltek-Wisconsin Centrifugal

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 T&O Conference. SFSA awarded a \$1,000 Peaslee Scholarship to:

- Jacob Melvin – Harrison Steel

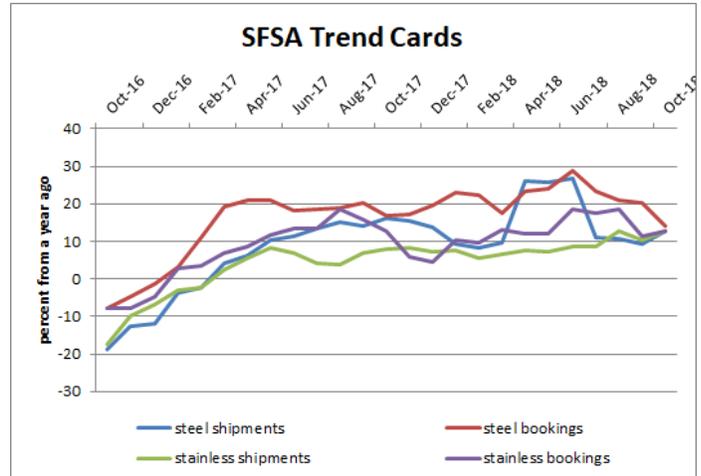
If you currently have or plan to have an intern work at your foundry in 2019, be sure to have them complete a scholarship registration form which the Society will distribute via email and on the SFSA website later this month.

Market News

The demand for steel cast products remained strong in October. Shipments and orders for both steel and stainless castings were 10% above last year which was up from the year before. Many plants are operating at their capability limited by their ability to have an adequate workforce to meet the demand and fully utilize their facility.

Backlogs have risen significantly 9.5 weeks for steel castings and over 10 weeks for stainless castings.

Capital goods orders have stabilized and steel mill production is still well above last year. The steel mill demand is undoubtedly partially due to tariffs displacing demand that was being supplied from other suppliers. The U.S. imports about 30% of its steel so tariffs have a large effect on their market. Iron and steel casting shipments from the Census shows a small decline since mid-2018.



Steel casting demand looks strong for most of 2019 based on our updated forecast which you can get here: <https://www.sfsa.org/news/2019/2019%20SFSA%20Market%20Forecast.pdf>.

Safety Awards

During the 2018 T&O Conference in Chicago last month, SFSA recognized eleven member companies for demonstrating an exemplary safety record for 2017. 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 member achieved a “Perfect Safety Record” with a DART rate of 0:

- Midwest Metal Products – this is Midwest Metal Products sixth time receiving a safety award.

The following ten members achieved an “Outstanding Safety Record” with a DART rate less than 2.2, which is the 2017 industry average for all manufacturing:

- Castmetal FWF de Mexico
- Eagle Alloy – this is Eagle’s sixth time receiving this award and second consecutive year
- Magotteaux – Pulaski, TN, this is the third time the Pulaski facility has earned this award
- ME Global – Duluth, MN, this is the second time the Duluth facility has earned this award and second consecutive year
- ME Global – Tempe, AZ, this is the sixth time the Tempe facility has earned this award and the fifth consecutive year
- MetalTek International – Carondelet Division, Carondelet has earned this award four times and the second consecutive year
- MetalTek International – Sandusky Division
- MetalTek International – Wisconsin Centrifugal Division – Wisconsin Centrifugal has earned this award every year for the last 11 years.
- Southern Alloy Corporation, this is Southern Alloy’s fourth time receiving this award
- Southwest Steel Casting Company – this is Southwest’s seventh time receiving this award.

SFSA Master Artisan Recognized at the 2018 T&O Conference

SFSA in creating an artisan program to develop the essential skills to train our next generation workforce has encouraged members to nominate their highly skilled workers for Master's recognition. There are two classifications of Masters. At the highest level is a Master Founder, who is an individual that is distinguished as a generalist with a range of personal foundry and leadership skills and contributes in an extraordinary way to the success of the organization. The other is Master Artisan, who has highly developed skills in one area of steel foundry production, such as melting, molding, and finishing. Recognizing these masters raises the value and status of these individuals and creates good publicity for the company in the industry. Furthermore, these Masters will be able to guide the training and qualifications for future artisans.



Nominations are reviewed by the SFSA Guild, which consists of individuals that have achieved Master Founder and are responsible for reviewing future master's nominations and providing oversight for the continued development of the artisan program.

At the 2018 T&O Conference last month, the Society recognized its newest Master – Tom Guthrie, Maggotteaux-Pulaski, as a Master Artisan in Melting.

Tom joined Magotteaux in 1973. He began his career as a Production Helper and progressed through many positions. In 1992, Tom was promoted to General Production Foreman and Production Manager for the Disamatic line. From 1992, Tom was responsible for all the melting and made major contributions including the creation of ladle and furnace lining procedures, as well as melting and deoxidation procedures, and application of a number of best practices as well as upgrades - increasing molds per hour by 25%. In 2017, Tom was promoted to Senior Technical Advisor. Tom's extensive foundry knowledge, his ability to connect with employees, combined with his mentoring and teaching skills, have contributed tremendous value to the organization both locally and in support of plants in Canada, South Africa and Brazil. Tom is now developing the younger supervisors in Tennessee by transferring his knowledge in a matter-of-fact, low key, hands-on fashion which is very effective. Tom's personal character, work ethic, humility and integrity make him a deeply respected co-worker and a role model at Magotteaux.

Cast In Steel

The new *Cast In Steel* competition (<https://www.sfsa.org/castinsteel>), which was created to challenge students to creatively use the steel casting process to design and make a high performance tool, was showcased at the T&O last month and has received a positive response from the academia community. To date, 19 student teams have registered from 16 different universities. The competition and awards presentation is tentatively planned for late April in conjunction with the AFS Cast Expo.

There are still a few teams that are looking for a foundry partner. This is an excellent opportunity to connect with young engineers and the next generation workforce. If you are interested in supporting a student team, or have any questions regarding the contest, please contact Raymond Monroe, monroe@sfsa.org.

New SFSA Staff

SFSA staff continues to grow as it expands its steel casting research portfolio and the services provided to members. SFSA hired Vance Bronson as a Project Engineer in October. Vance has a Masters in Mechanical Engineering from University of Illinois and is responsible for the Digital Innovative Design for Reliable Casting Performance (DID) with support for other R&D programs. Vance's email address is vbronson@sfsa.org, and his direct telephone is (815) 526-8260.



Casteel Commentary

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.**

Too pessimistic but correct on the upside. After growth in 2017, 2018 grew in shipments and orders over 10% for the year.

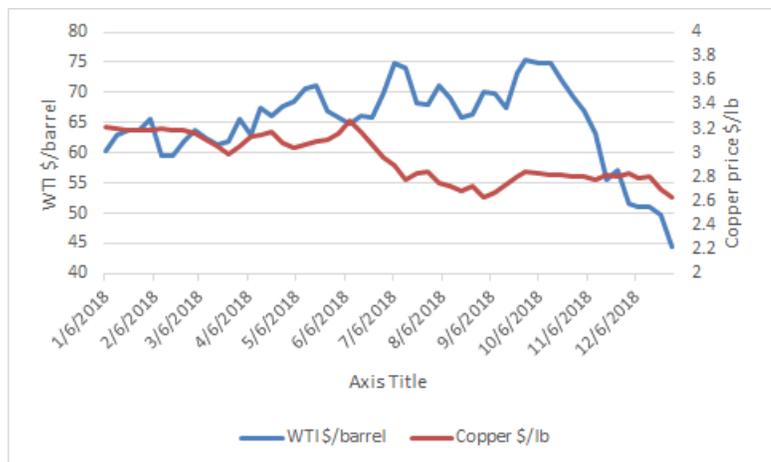
- 2. Equity markets will not continue to increase and are at risk to a significant correction. In the past decade, steel foundries have often been countercyclical and may still have solid markets with a sharp equity downturn.**

Snuck in under the wire late in the year. So far, the drop in equities has not caused significant drop in markets but I am concerned about 2019.



- 3. Oil and copper prices will remain stable with normal volatility supporting most markets for steel castings.**

Wrong, prices remained relatively stable for oil for much of the year before dropping dramatically late in the year, now well under \$50 a barrel which should dampen casting demand. Copper prices drifted down all year but remain high enough to spark some continued investment.



- 4. Fed Funds rate is likely to remain below 2%.**

Wrong, exceeded 2% in October and reached 2.27% in December

- 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.**

Corporate tax reductions did occur and did support increased production but they were not the big story in the 6% increase in manufacturing in 2018.

Bigger than the corporate tax reduction was both the tariffs, 232 and 301 on steel and other products. Also big was the replacement of the NAFTA agreement with the new USMCA agreement. Both of these factors are part of an effort on the part of the Trump administration to address the serious imbalances in trade, mainly concerned with China. The combination of lower taxes and advanced buying to avoid the effect of tariffs provided strong support for demand for steel castings.

This led to another unexpected effect. With exceptionally low unemployment and shifting cultural and demographic trends, staffing the plant has become the biggest hurdle to increasing production. The emphasis on border control and immigration limit the pool of workers coming new to the U.S. and interested in traditional manufacturing jobs. While much ink has been spilt on the plight of low skilled men with the reduction in manufacturing, in the current environment these "lost" jobs are not being filled by these men. The lack of willing workers for ordinary manufacturing work is a serious and likely systemic problem for our industry. This issue is not limited to the U.S. but will be global I suspect.

So, what will next year hold for us?

My Ideas for 2019 for the North American Steel Foundry Industry:

- 1. China will slow down this year and prove to be a drag on manufacturing. While they compete, they also consume copper and oil supporting the commodity prices.**
- 2. Tariffs, especially the 301 tariffs directed at China will improve demand for us at least for the first part of 2019. This support should slide down as our customers are hit by their overseas competitors that are not bearing the cost of tariffs.**
- 3. Equity markets will drop further but may have a small impact on our demand. It is possible that the drop in commodity prices and squeezes on profits for our customers will cause a more severe fall in demand in the second half of 2019.**
- 4. Staffing will become even more challenging due to the low unemployment rate, reduced immigration, retirements and rising wages. Automation will be a critical response.**
- 5. Interest rates will stay around the 2% mark.**
- 6. Oil prices and copper prices will bounce around but stay in a limited trading range.**
- 7. Trump will still be president at the end of 2019.**

Raymond

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

SFSA Trend Cards (%-12 mos. Ago)	12 Mo Avg	3 Mo Avg	October	September	August
Carbon & Low Alloy					
Shipments	14.7	12.7	20.0	8.1	10.0
Bookings	22.3	19.6	30.3	15.5	13.0
Backlog (wks)	9.0	9.5	9.5	8.0	11.0
High Alloy					
Shipments	9.2	12.7	15.0	7.0	16.1
Bookings	13.1	12.7	15.0	11.0	12.0
Backlog (wks)	9.2	10.1	10.0	9.9	10.5
Department of Commerce Census Data					
Iron & Steel Foundries (million \$)					
Shipments	1,363.5	1,363.0	1,373	1,336	1,380
New Orders	1,382.9	1,421.0	1,378	1,413	1,472
Inventories	2,009.1	2,060.7	2,087	2,066	2,029
Nondefense Capital Goods (billion \$)					
Shipments	76.2	77.9	77.2	79.2	77.4
New Orders	77.5	78.3	75.3	78.5	81.1
Inventories	178.3	179.5	180.4	180.1	177.9
Nondefense Capital Goods less Aircraft (billion \$)					
Shipments	67.7	68.6	68.7	68.5	68.7
New Orders	68.1	69.5	69.3	69.3	69.7
Inventories	124.1	125.3	125.7	125.8	124.5
Inventory/Orders	1.8	1.8	1.81	1.81	1.79
Inventory/Shipments	0.0	1.8	1.83	1.84	1.81
Orders/Shipments	0.0	1.0	1.01	1.01	1.01
American Iron and Steel Institute					
Raw Steel Shipments (million net tons)	7.9	8.1	8.2	7.8	8.4

*Note on SFSA Business Report: Due to government shutdown, Department of Commerce updates are unavailable at this time.