



# 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>

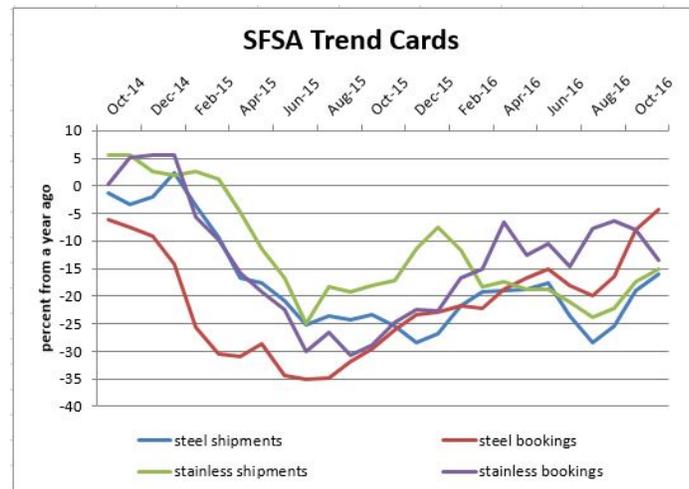
## January — 2017

### Casteel Commentary

This month's Casteel Commentary reviews last year's ideas from January about business in 2016 and proposes new directions for 2017. On the whole, I expect 2017 to turn out better than we have expected in our SFSA forecast. We will see growth as expected but I anticipate we will see double digit improvement from 2016 by the end of 2017.

### Market News

The SFSA market trend cards show continued improvement for November in all categories but all still in negative territory. There is no clear indication of when our industry will see growth relative to the prior year but given the poor level of business in the first quarter of 2016, we should see year over year growth in the first quarter of 2017. Backlogs are stable and low, 6 weeks suggesting that in November the market was still well below typical operating levels. Six weeks backlog appears to be the lowest level that would be commonly reported with lower levels only reported in the depths of the severe drop in business in 2009.



Iron and steel casting orders and shipments reported by the Department of Commerce continued to decline and steel mill shipments remained at a low level in November. Capital Goods New Orders were similar to steel mill products being stable at a low level.

General market conditions have looked like they are improving. Correlated economic factors like steel production, oil and copper prices are higher and stable suggesting that improved market conditions are possible earlier this year.

### Casteel Commentary

My results for 2016 ideas of conditions in the North American steel foundry industry:

- 1. Steel casting demand will improve some by the end of 2016. The first quarter will be brutal as the markets adjust but then underlying economic demand for parts and equipment to keep the system going will require more steel casting production.**

As seen in the market news, the trend by our SFSA trend cards show that we are down each month for the entire 2016. While the first quarter was brutal and we are up from low levels of then, our production based on comparison to a year ago is down for each month. So, this idea was not correct for 2016.

**2. The US dollar will remain strong and that will temper and hamper our competitiveness.**

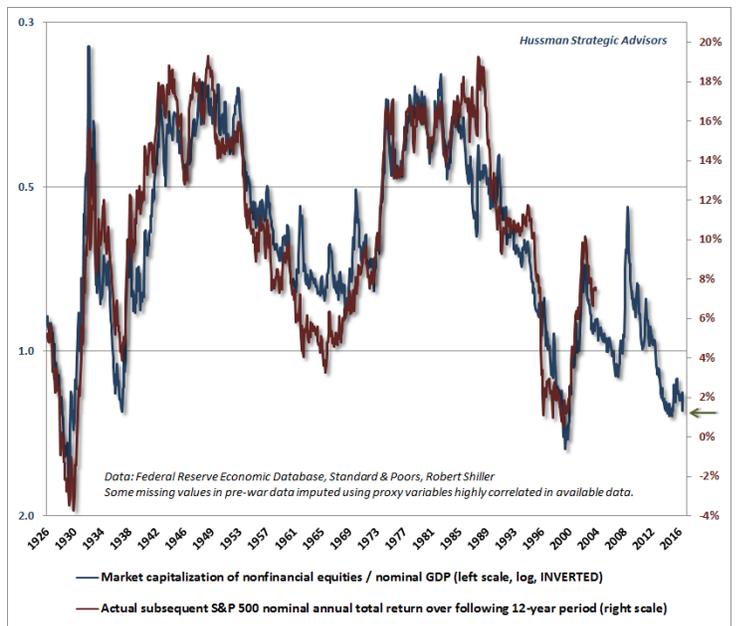
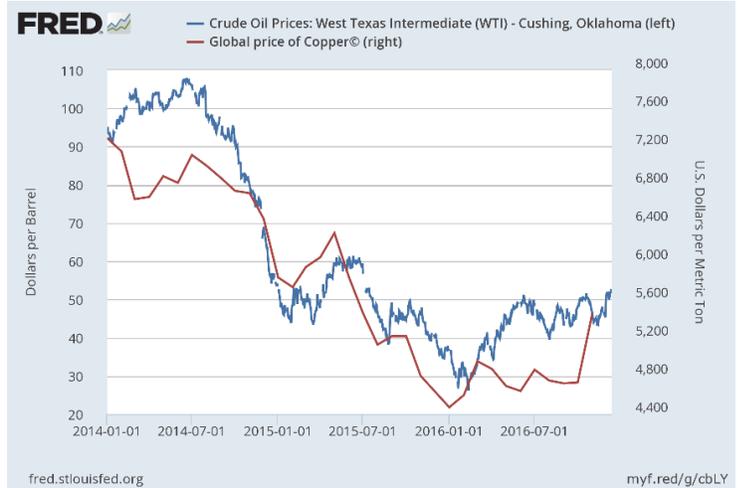
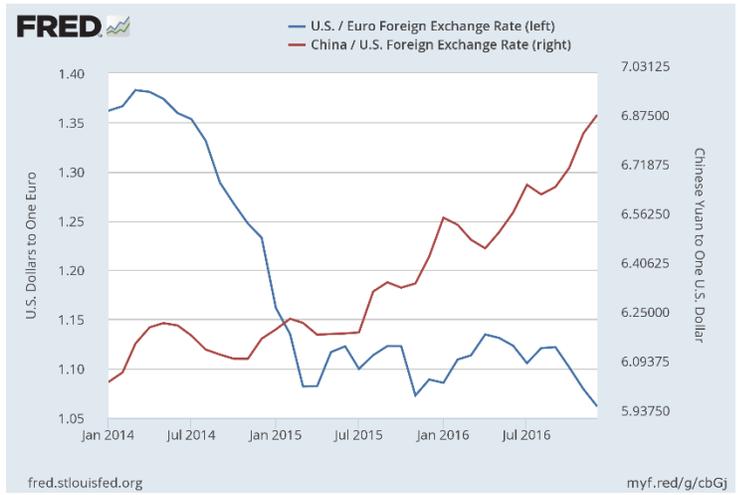
The US dollar remained strong relative to the Chinese yuan for most of the year and has recently begun again to strengthen. The dollar has continuously become stronger against the Euro. This stronger dollar has not been accompanied by rising commodity prices like oil and copper suggesting that this strengthening is only a currency valuation effect.

**3. Oil prices will bottom out around \$30 a barrel in the first half of the year and recover to around \$50 by the end of the year. Copper prices will remain depressed, above \$2 a pound but below \$2.50.**

The price of oil and copper are closely linked to the demand for steel castings. Oil prices were at \$30 a barrel at the beginning of the year but are now around \$50 a barrel. Copper prices did better than anticipated and stayed above \$2 a pound and have risen to around \$2.5 a pound at year's end.

**4. The fall in the stock market will exceed 30% and will likely be around 50% or a DJIA of under 12,000.**

The stock market continued to defy gravity and climb to even higher levels than long term earnings and underlying value would suggest. The low interest rates have been seen by investors as support for higher multiples and stock values but this implies returns on stocks as low as the current interest rates. This expectation was wrong but suggests the possibility of this drop occurring this year.



<http://www.hussmanfunds.com/wmc/wmc161219.htm>

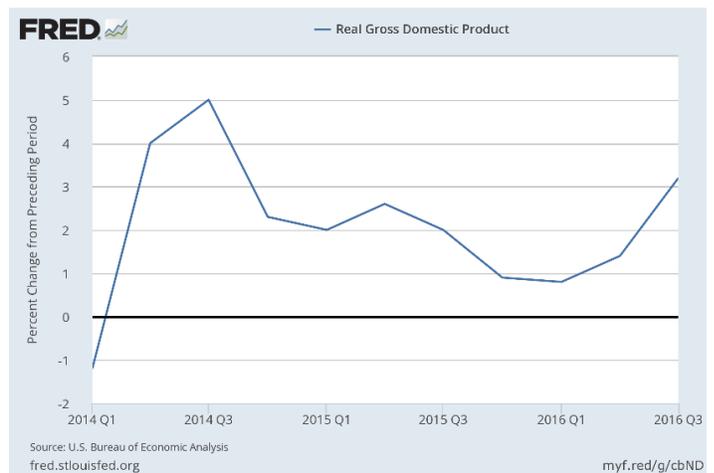
**5. China will be stagnant at best, dampening industrial and commodity demand.**

China claimed to continue to grow but at a much-reduced rate as seen in the graph. An over 6% growth rate in an economy this large is an important part of global demand but the fall from double digit rates and concern over an over built construction sector was in part responsible for the drop in commodity prices. China is still an important but unclear part of the future for 2017.



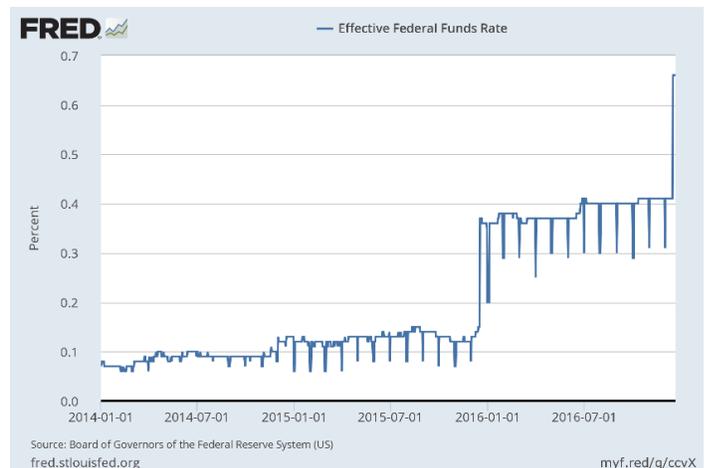
**6. The economy will have at least one quarter of negative growth (a weird way to say a shrinking economy that the financial press uses). It is more likely two so we will have a recession in 2016.**

Growth for the US GDP did have a slow start under 1% for the beginning of the year but has since improved to over 3% in the 3rd quarter. The growth for Q4 and for 2017 is expected to be modest at around 2.5%. There is uncertainty over whether the change in direction with the new administration will release a more aggressive investment approach and a higher growth rate or will the lack of prior investment and slow growth of the labor force limit growth potential in 2017.



**7. Interest rates will remain stable and low while the market adjusts asset prices to more realistic levels and may have a small rise in the last half of the year.**

Interest rates remained stable for the bulk of the year with a Fed Funds rate at 0.4%. Higher growth rates and improved wages make interest rate increases likely for 2017.



**8. Stainless casting demand will not be as poor as steel casting demand but is unlikely next year to see a strong recovery.**

Stainless steel casting demand remained stronger than the demand for steel castings. Improving market conditions and low energy price should support improving demand. Instability in the world will make the US an increasingly attractive place for investment, especially as improvements in technology reduce the benefit of low wages in developing economies.

## 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.
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.
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.
4. The Fed Funds rate will reach 1% by year end.
5. The dollar will continue to be strong making imports a greater challenge and exports more difficult.

### STEEL FOUNDERS' SOCIETY OF AMERICA BUSINESS REPORT

SFSA Trend Cards (%-12 mos. Ago)	12 Mo Avg	3 Mo Avg	November	October	September
<b>Carbon &amp; Low Alloy</b>					
Shipments	-20.4	-12.6	-5.5	-20.0	-12.2
Bookings	-15.8	-4.6	-5.5	1.6	-10.0
Backlog (wks)	6.6	6.5	6.0	7.5	6.0
<b>High Alloy</b>					
Shipments	-16.1	-10.0	0.0	-10.0	-20.0
Bookings	-11.2	-7.7	3.7	-17.5	-9.3
Backlog (wks)	6.5	6.4	6.0	6.8	6.4
<b>Department of Commerce Census Data</b>					
<b>Iron &amp; Steel Foundries (million \$)</b>					
Shipments	1,485.3	1,411.7	1,410	1,401	1,424
New Orders	1,532.5	1,482.7	1,500	1,438	1,510
Inventories	2,062.3	2,020.7	2,026	2,023	2,013
<b>Nondefense Capital Goods (billion \$)</b>					
Shipments	72.2	71.1	70.3	71.2	72.0
New Orders	70.4	71.6	64.7	80.2	69.9
Inventories	171.4	170.0	170.1	169.6	170.2
<b>Nondefense Capital Goods less Aircraft (billion \$)</b>					
Shipments	63.6	62.5	62.5	62.4	62.6
New Orders	63.7	63.1	63.6	63.0	62.7
Inventories	118.6	118.4	118.4	118.2	118.6
Inventory/Orders	1.9	1.9	1.86	1.88	1.89
Inventory/Shipments	0.8	1.9	1.89	1.89	1.89
Orders/Shipments	0.4	1.0	1.02	1.01	1.00
<b>American Iron and Steel Institute</b>					
Raw Steel Shipments (million net tons)	7.1	6.8	6.7	6.8	6.8

## **SFSA Leadership Meetings**

Save the date to attend the SFSA Spring Leadership Meeting on May 17, 2017 in Pittsburgh, PA. This year's meeting will include a tour of McConway & Torley on Wednesday morning and the meeting sessions on Wednesday afternoon. The marketing committee will meet Thursday morning and all are welcome to attend.

The Fall Leadership Meeting will be September 9-12, 2017 in South Lake Tahoe, CA. We look forward to your attendance and participation in this educational and networking meeting and welcome the opportunity to share new developments in the steel casting industry with you.

## **National Technical & Operating Conference**

With the commitment of industry to both provide papers and participate, the 2016 T&O Conference continued the legacy of being the world's premiere steel casting conference even during a depressed business climate. Thanks to the T&O Committee, the program offered a complete range of technical and operating subjects including: silica regulation, casting quality evaluation, equipment for finishing castings, welding practices, reclaiming wash, modeling and hydrogen. The workshop featured topics on: reducing quench cracking, manufacturing analysis software, weld microstructures, and Functional Counter-Gravity methodology.

The manufacturing analysis software to design castings, which was presented by Frank Peters of ISU, is available to members for download at <https://www.sfsa.org/folio/downloads/> (you must first be logged into the [Steel Casting Wiki](#) site to access this link) along with Frank's presentation. This free trial version of the software, ANA, can be used to analyze the impact of part design on the manufacturability of castings. It can be used as an aid to educate customers on why design decisions make a casting good or challenging to make. ISU would appreciate feedback on both the software functionality and the results ANA provides. These can be emailed to Frank at [fpeters@iastate.edu](mailto:fpeters@iastate.edu).

The ASTM A255 hardenability calculator workbook (XLS file), which was presented by Dave Van Aken of MS&T, is likewise available to members to download at <https://www.sfsa.org/folio/downloads/> along with Dave's presentation. Dave's presentation covers his extensive research to develop the workbook, which offers users the ability to readily calculate hardenability based on chemistry, hardness as a function of chemistry and tempering temperature and time, and impact of quench sensitivity.

Planning is already in the process for this year's conference. If you would like to recommend a topic and presenter for the 2017 T&O, please contact David Poweleit at [poweleit@sfsa.org](mailto:poweleit@sfsa.org).

The T&O showcased multiple university research projects supported by SFSA:

- John DuPont (Lehigh University) talked about developing welding procedures and post weld heat treatments to restore mechanical properties of precipitation hardened stainless steels. Strength was almost recovered with the use of an optimized post weld heat treatment. Current work looks at taking advantage of multi-pass welding to recover strength in instances where PWHT cannot be done.
- Charlie Monroe (UAB) discussed the use of quality index as a potential criterion to identify changes in the casting process. Robin Foley (UAB) presented characterization techniques used to understand and optimize properties of a low alloy, high strength steel.
- Christoph Beckermann (UI) presented the initial findings of the air entrainment model that is being developed to predict entrainment during pouring of steel castings. Richard Hardin (UI) presented a summary of the work that they have done on modeling and CT analysis of high strength steel castings.
- Scott Chumbley (ISU) discussed the results of their study on the effect of cooling rate on ferrite content in duplex stainless steels. Sigma formation was found at low cooling rates which may have affected the measurements. More work is needed to understand how much the phases change with cooling rate.
- Sairam Ravi (UNI) talked about the use NIR spectroscopy to determine iron oxide in sand systems. The method was able to detect the different levels of black iron oxide but additional testing in steel foundries should be done.

- Scott Lammers (AFS) presented on strain life fatigue properties of carbon and low alloy steels. Data has been collected for WCB, 4330, and 8630, and is available in Casting Alloy Data Selector (CADS) at <http://www.metalcastingvirtuallibrary.com/cads/cads.aspx>.

### **Safety Awards**

SFSA members set a new record for safety awards with thirteen members that received awards at the T&O conference last month for demonstrating an exemplary safety record for 2015. 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 three members achieved a “Perfect Safety Record” with a DART rate of 0:

- Brafe Engineering Limited
- Southern Cast Products – Jonesboro, AR
- Viking Pumps

The following ten members achieved an “Outstanding Safety Record” with a DART rate less than 2, which is the 2015 industry average for all manufacturing:

- Acerlan S.A. DE C.V.
- Andritz, Inc.
- Aurora Metals Division
- Bradken-Amite
- Eagle Alloy
- Me Global, Inc. – Tempe, AZ
- MetalTek International – Carondelet Division
- MetalTek International – Wisconsin Centrifugal Division
- MetalTek International – Investcast Division
- Monett Metals

### **SFSA Scholarship 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 2016 T&O, SFSA awarded a \$1,000 Schumo Scholarship to Steven Richards of Andritz, Inc.

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.

### **Master Artisans**

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 Foundryperson who is a distinguished individual with expertise in all areas of the 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. Furthermore, these Masters will be able to guide the training and qualifications for future artisans.

The SFSA Board of Directors recently approved the creation of a guild. The SFSA Guild will consist of those individuals that have achieved Master Foundryperson, and will be responsible for reviewing future master nominations and providing oversight for the continued development of the artisan program.

The first member of the SFSA Guild and first to be recognized as Master Foundryman is **Zed Howell**, of Howell Foundry. Two additional Guild members were recognized at the 2016 T&O for achieving Master Foundryman in 2016 – **Glenn McQuarter**, Bay Cast Inc. and **Steve Gear** – Bradken-Tacoma. The new guild's first order of business was to review a nomination from Effort Foundry for **Edmond Yandrisevits**, Vice President of Engineering, as Master Artisan. Edmond began his foundry career at Effort Foundry in 1981, using his construction engineering background to help design and build the foundry's current location in Bath, PA. He has progressed through several positions at Effort Foundry, but found his true love in patterns and casting engineering and has personally rigged more than 15,000 patterns. In his current position as VP of Engineering, he manages the pattern shop, pattern receipt and pattern storage. He has been instrumental in the growth and success of the foundry. To this end, the Guild approved the recognition of Edmond Yandrisevits for Master Artisan in the areas of patternmaking and rigging. The Society plans to recognize him at this year's T&O Conference.

### **New Regulatory Compliance Resources for SFSA Members**

In case you missed the e-mail just after the New Year, SFSA sent out an electronic EHS compliance calendar to all members. The calendar was developed as part of our partnership with Guimond & Associates and includes important reminders, deadlines, and information to assist you in managing your foundry's environmental, health, and safety efforts. This year's calendar includes information on the new silica standard, air sampling, 2017 checklist, R form calculations, and more. If you have questions or need additional assistance, you may call Guimond & Associates (215) 721-4500, included as part of your membership with SFSA.

To download the calendar, visit the [EHS section of the Steel Casting Wiki](#) where you will also find a host of training materials and recorded webinars. SFSA will be busy adding new material to this section throughout the year. If there is something in particular you need to support your EHS program that is not on the website, please send your request to Ryan Moore, [rmoores@sfsa.org](mailto:rmoores@sfsa.org).

### **Steel Casting Educational Course**

After the recent Wear Castings meeting and with the gracious offer of support to the Society by Tom Stevens, SFSA is investigating the opportunity to develop a course for Steel Casting Technology. The tentative plan would be to do quarterly, 1 to 2 day meetings in a location such as Chicago over a year. Attendees would participate in all of the meetings as the material learned would build over the course. Participation would be limited to maintain a small working group. Multiple groups could be done in parallel if the interest is high. The course would cover both technical and operation topics including: basic metallurgy and heat treatment; foundry practice such as patterns, engineering, cores and molding; and melting and pouring. Tom's extensive background in the steel foundry industry and in providing educational services will enable participants to walk away with a strong working knowledge of steel casting technology. There would be a nominal cost for participation. Again, the above plan is tentative and can be modified to meet the interest of members. Suggestions or interest in participating can be emailed to David Poweleit at [poweleit@sfsa.org](mailto:poweleit@sfsa.org).