



SFSA CASTEEL REPORTER

Steel Founders' Society of America

a publication serving
SFSA steel casting industry Members

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Casteel Commentary

This month's Casteel Commentary is some random ramblings about trade and the 232 case. I testified on this case and that is [here](#). The final DOC 232 report for the president can be found [here](#).

SFSA Seeking Project Engineer

SFSA needs to add a project engineer to our staff to support our Digital Innovative Design (DID) Program. This position is an ideal opportunity for a new graduate to work with SFSA members and academia on advancing steel technologies. The ultimate goal would be for this person to continue their career in the steel casting industry at the conclusion of the program. We would appreciate your recommendations for a high caliber candidate to fill [this position](#). Please note that we will not consider current member employees as candidates.

NDT/DID Meetings

Our first subject-focused meeting will be on Non-Destructive Testing (NDT). NDT is essential for delivering the product we manufacture to our customers' delivery requirement criteria. Current NDT processes are qualitative or workmanship standards. Under SFSA's Digital Innovative Design for Reliable Casting Performance (DID) program, we will be developing quantitative NDT and a correlation to performance. The NDT subject-focused meeting on Tuesday afternoon, April 17th, will feature presentations on typical NDT processes for steel castings along with past research aimed at improving the reliability of these techniques along with correlating levels to performance. Building off this background, we will kick-off the DID program for steel casting design, manufacturability and reliability on Wednesday and Thursday, April 18-19. The DID kick-off meeting will cover an overview of the program along with the research elements supporting it. There will be plenty of time for discussion as we would appreciate input and steering from all attendees. Both meetings will take place in Chicago near O'Hare. Final details for the meeting will be sent to all registered attendees. There is no cost for the meeting - travel, hotel, meals, etc. are the attendees' responsibility.

To RSVP, please use the event link <http://sfsa.site-ym.com/events/register.aspx?id=1081695>. Please confirm if you will attend one or both meetings. As well as if you will participate in Dutch treat dinners on Tuesday & Wednesday. Contact [Corrine O'Connell](#) if you have any registration issues.

On the topic of research, the annual Research Review will be held in Chicago on Tuesday, July 10th through Thursday, July 12th. Please mark your calendars (additional information will be sent when available).

Safety/HR Meeting

Please plan to attend the SFSA EHS & HR Meeting on May 8-9, 2018 at Eagle Alloy in Muskegon, MI. This meeting is a great opportunity to learn from your peers on many topics including how to improve EHS training and practices, communication, and the latest HR topics. In addition, a roundtable discussion is the perfect forum to share practices and get answers to your safety and human resource questions. There is no registration cost for the meeting - travel, hotel, meals, etc. are the attendees' responsibility. Please visit the SFSA website for additional meeting details and registration.

<https://www.sfsa.org/meetings/mgmtmtg.php?e=308>

Spring Leadership Meeting

Please plan to attend the SFSA Spring Leadership Meeting scheduled for Wednesday, May 16th in Milwaukee, WI at the Intercontinental Hotel. This year, SFSA has arranged a tour and dinner at [MSOE's Grohmann Museum](#) Tuesday evening. The Spring Leadership Meeting kicks off the next day with a tour of MetalTek – Wisconsin Centrifugal followed by an industry roundtable and business sessions. This year's topics will include: Forces Transforming Manufacturing, Economic update and market analysis, Foundry supply and transportation Issues, and Recruiting Interns and students.

The SFSA Executive Committee and Board of Directors will meet on Tuesday, May 15th and the Marketing Committee will meet in the morning on Thursday, May 17th. We invite everyone to stay after the program to participate in the marketing committee meeting. Please visit the SFSA website for additional meeting details and registration. <https://www.sfsa.org/meetings/spring18.php>

Future Leaders Meeting

As members look to recover from the deep business downturn for steel foundries over the past few years, it will be critical to rebuild and plan for the long-term by hiring new, bright individuals who are capable of advancing the industry, their company and their own careers. To assist with the career development of aspiring employees to ensure we have the next generation of supervisors, foundry managers, technical directors, etc., SFSA started the Future Leaders Group a decade ago – the first such activity for foundry societies in North America. We continue this service with our first group meeting of 2018 on May 17-18 in Milwaukee, WI. Please consider making an investment in your future by considering some of the new personnel at your foundry for participation in this event. If you have constraints for attending this meeting, but would be interested in having key personnel developed for a successful future, we can add them to our group email list. To be added to the mail list or for more information on the meeting, please contact [Dave Poweleit](#).

Specifications Committee

We need your help in understanding what standards, specifications and codes affect your business. To make certain we best take advantage of our DID program, and to investigate a request from the SFSA Board to support foundry members, please complete this short [survey](#). [Here is a list of specifications](#) included in the recent update to Handbook Supplement 2.

The Specification Committee will meet on Tuesday, May 22 in San Diego in conjunction with the ASTM A01 meeting. Please contact [Dave](#) for more information or to participate in this activity. The committee met in November to review ballot and task group discussion:

- The addition of a note to the first (A781) general requirement standard to better describe test material.
- Adding the allowance in the general requirements (A781) for the foundry to obtain test coupons from castings in place of the product standards.
- Update to general requirements (A781) for test coupons of Figure 4 from A1067 to limit its use solely to castings with cross sections less than 2-1/2" and for stainless and nickel-base alloys.
- The use of "production welding" v. "repair welding". This will be on the first A01.18 ballot of 2018.

The committee will support A01.13TG effort on A370 duplex hardness conversion tables. EPRI is looking to add a modified (residual restrictions) C12A to A217. They will not add it to A1091 (new cast C91 standard) as it is not in ASME. The initial A262 ILS for wrought material has not yet started. A survey has been completed and UAB completed an initial assessment for a Gage R&R on NewAge Shear Pin. A presentation on DID was provided at the A01.18 meeting. At the 2017 T&O, Jeanne Wagner from Stainless Foundry presented on SFSA survey results that had 35 responses.

Steel Foundry Tours

The February Mexico steel foundry tours was an outstanding success with 40 participants. We appreciate the support from our gracious hosts: Fundidora Morelia, POK and Fimex. There is still time to participate in the tour of steel foundries in Spain on June 25-29. The event is co-sponsored by AIST's foundry and specialty alloy producers. Registration is limited and will officially close at the end of the month. For more information contact [Diana David](#). Finally, looking ahead to next year, the

world foundry show, GIFA, will be held in Dusseldorf, Germany on June 25-29, 2019. SFSA is setting up arrangements for a group visit to GIFA along with foundry tours before the fair.

T&O 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! 45 member foundries participated in the conference by sending 116 people to attend. Thanks to UAB, attendees greatly enjoyed the hands-on activity at the workshop. Discussion on gating and pouring was continued at the conference with a session focused on this topic. We plan to both have a subject-focused meeting on pouring & gating but also correlation of model to actual part, and feature additional papers on at this year's conference. The T&O Committee is preparing plans for the 72nd T&O Conference on December 5-8, 2018 at the Loews Hotel Chicago. Recommendations for a topic and presenter for the 2018 T&O can be submitted to [Dave Poweleit](#).

3D Printing and Casting

In response to a feedback column published in [ASM International's Advanced Materials & Processes November/December 2017](#) issue, Raymond Monroe submitted the following feedback:

I am disappointed that the author's response in the Nov/Dec 2017 feedback department did not accurately identify the radically different product maturities and capabilities of castings and 3D-printed metal parts. As more mature technology, castings have legacy design practices that include casting factors that can be reduced or eliminated with modeling and quality control. The design properties and mature modeling techniques allow casting designers confidence in the performance of cast parts prior to production.

In contrast, 3D-printed metal parts lack standard design properties and each component must be qualified for service. There are no standards and no inspection techniques that can qualify a critical part apart from component testing. Casting producers are quite familiar with 3D technology and were the earliest adopters, developing tooling, patterns, and molds with 3D techniques from the beginning. We use 3D printing to move directly from modeling to production. Castings and all components including 3D-printed parts have performance-limiting features that must be understood and controlled to get reliable service.

The design freedom of 3D-printed parts will enable more creative and complex castings. Further, inspection and post processing requirements of 3D-printed parts will accelerate the use of high-performance castings. For example, using hot isostatic pressing (HIP) techniques to ensure performance of 3D-printed parts will develop the infrastructure to HIP cast components and achieve many of the same benefits.

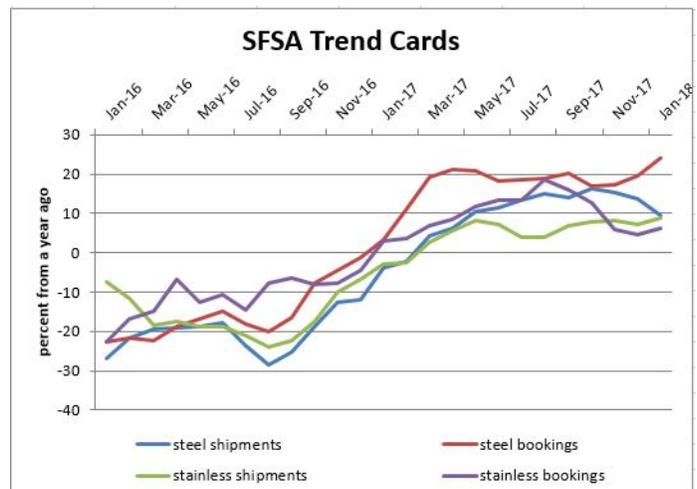
Both castings and 3D-printed parts allow designers to create unique geometries and properties in three dimensions to improve performance. We both need to enhance our process modeling and process control to improve reliability and performance. We both benefit from developing post-processing techniques like HIP.

Most disappointing was the failure to acknowledge the main point from Keough, that taking molten metal and making it into a powder that must be reprocessed into a part will always be less energy efficient than forming the part directly as a casting.

Market News

Steel and stainless steel casting shipments remained positive in January 2018. Steel bookings like steel shipments remained strong compared to the prior year. Stainless bookings in particular were not as strong. It was also concerning that bookings were below shipments hinting a decline in this market.

The metal miner index slowdown in stainless demand in mid-year 2017 and a drop in December but shows a sharp recovery in early 2018 which matches the feedback we get from



members.

Backlog for both steel and stainless castings remains fairly steady at around 9 weeks slightly down from the peak. Steel mill shipments are up sharply in the weekly numbers and in the MetalMiner index. Steel future prices are up sharply as well.

Non-defense capital goods orders are up and above the shipments, which are also up showing sustained growth. The higher prices for oil and copper suggest sustained improvements for the steel casting industry.

All indications for steel and stainless steel casting production are up suggesting a strong first half at least for 2018.

President Trump Signs Proclamation for Section 232 Tariffs

On March 8th, President Trump signed proclamations imposing a 25% tariff on imports of steel products and 10% tariff on imports of aluminum products. Canada and Mexico were excluded from the tariffs pending NAFTA renegotiations. The tariffs are scheduled to go into effect on March 23rd.

The products covered by the increased tariffs:

"Aluminum articles" are defined in the Harmonized Tariff Schedule (HTS) as: unwrought aluminum (HTS 7601); aluminum bars, rods and profiles (HTS 7604); aluminum wire (HTS 7605); aluminum plate, sheet, strip and foil (flat rolled products) (HTS 7606 and 7607); aluminum tubes and pipes, and tube and pipe fitting (HTS 7608 and 7609); and aluminum castings and forgings (HTS 7616.99.51.60 and 616.99.51.70), including any subsequent revisions to these HTS classifications.

"Steel articles" are defined in the HTS six-digit level as: 7206.10 through 7216.50; 7216.99 through 7301.10; 7302.10; 7302.40 through 7302.90; and 7304.10 through 7306.90, including any subsequent revisions to these HTS classifications.

Casteel Commentary

Trade is an intractable issue.

Current senior leaders in policy making positions globally believe that there is no need for any restrictions or rules that limit trade. Free trade is an absolute good. Restrictions are not warranted no matter how different regions or countries operate in the global marketplace. Predatory or corrupt practices that would not be allowed within a country are not disqualifying when used in global trade.

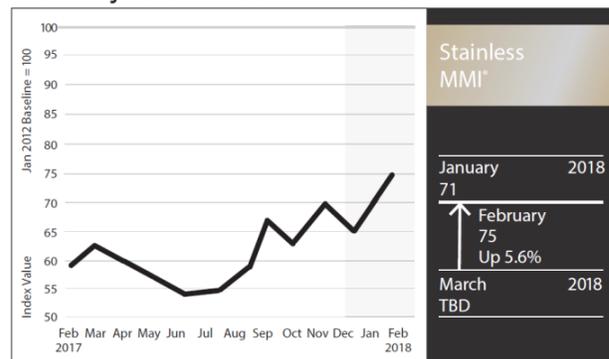
If a country want to export steel for example below the cost of production as a strategy to establish their industry as dominant in certain markets is beneficial to the market of the importing country. The importing country's economy gains the benefit of cheap steel and if the exporter tries in the future to use their market position to charge excessive prices, then "someone" will build capacity and supply steel at the market price driven by the most competitive process for production.

Historically, this idea of unrestricted "free" trade is absurd. In fact, while this idea of free trade is dominant in the policy making world in the West, it is still necessary for policy makers to agree that we need a rules based trading system. Policy makers must support fair trade as a way of advancing this notion of free trade.

Fair trade is largely left undefined. We have different notions of what is fair in different regions and countries. But, the concept of fair trade is not really intended to be a moral concept about fairness but a condition where reciprocity is the meaning of fairness. If I allow your goods to be imported at a 1% tariff and you charge a 15% tariff on my exports to your country that is not fair because it does not show reciprocity. This makes fair trade definable but still challenging.

Free trade is an absolute good if it is fair so the most efficient highest value producer gains his rightful place in the market. But if the business

Monthly Stainless MMI® Gains 4 Points



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structure in another region gives their exporter subsidies or penalizes our exports to their region, then the lack of reciprocity makes for an economically inefficient outcome.

The notion that unfair (non-reciprocal) trade is good is an example of the same fallacy identified in the broken window parable: https://en.wikipedia.org/wiki/Fr%C3%A9d%C3%A9ric_Bastiat. Yes, if a mercantilist country subsidizes their steel industry and sells below the full cost of production, we may benefit from cheap steel just like the glass seller benefits from the broken window. But like the broken window, the overall effect of this mercantilist approach is negative.

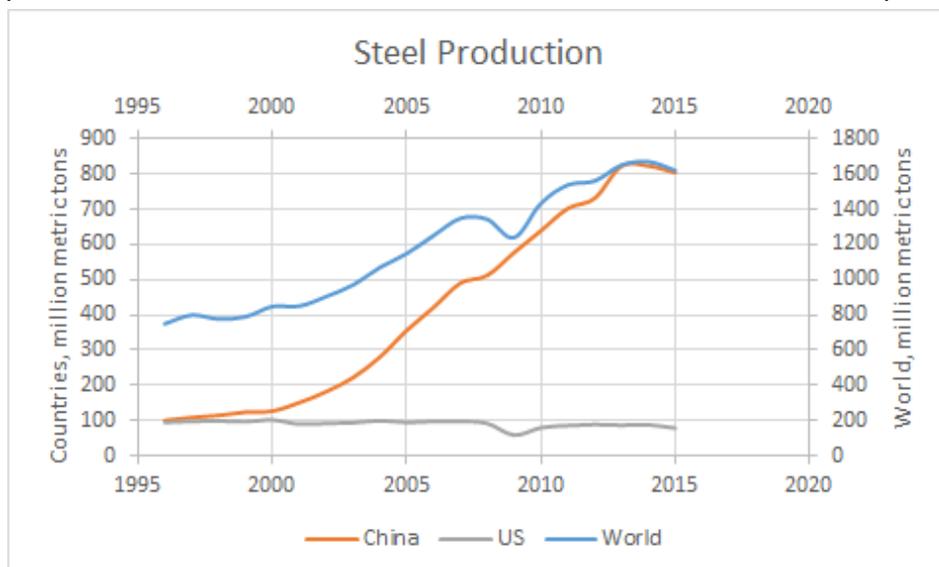
The challenge of fair trade though is significant. We have normally only considered tariffs of import and export restrictions. What about state owned utilities providing power below cost? What about the cost of complying with air pollution requirements? What about bankruptcy systems that do not end up in liquidation of inefficient plants?

Externalities is the economic term used to describe factors that will not be addressed with market forces. For example, air pollution mitigation costs might be avoided by allowing our plant to pollute. So ordinarily, the government will develop regulations, laws and structures to address these externalities. In fact at one level all government actions are backed by force and are themselves externalities.

So real free trade would adjust at the border all the policy costs and benefits of the trading partners so that the price competition was based on the value and economic efficiency of the producer. It would need to be adjusted for taxes, environmental regulations, etc. This makes fair trade intractable and free trade unmanageable.

It is clear now that the ongoing costs of the current idealization of free trade is politically unsustainable. No significant voices have been raised to deal with the tough questions of trade. The US 232 action is the result of this political environment.

China has no economic advantage in steel making. They do not have cheap power, ores, or advanced technologies; these are all imported. The labor for a steel product made in the US is less than one hour per ton. The labor cost of a ton of steel is less than the cost to transport it from China to



the US. In less than twenty years, China went from producing like the US 25% of the world's steel to producing 50% of the world's steel eight times the steel production of the US. This growth of capacity was not the result of market forces but of policies in China creating the investment in this excess capacity. For the last twenty years, steel producing countries have been in constant discussion regarding this addition of excess capacity.

If we do not do something to deal with this issue, we will lose the capability to make steel needed for our economy and defense. If we do nothing and lose the capacity, we cannot simply turn the machine back on, we would need years to recreate what now exists. It is not clear to me how this trade issue will be resolved but I am concerned that the policy makers commitment to free trade without an equal concern for fair (complete reciprocity) trade will prove unworkable and politically unsupportable.

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

SFSA Trend Cards (%-12 mos. Ago)	12 Mo Avg	3 Mo Avg	January	December	November
Carbon & Low Alloy					
Shipments	11.2	9.3	8.6	4.2	15.0
Bookings	19.9	23.0	21.0	28.0	20.0
Backlog (wks)	8.7	8.7	8.0	8.0	10.0
High Alloy					
Shipments	6.2	7.5	5.0	6.5	11.0
Bookings	11.3	10.5	18.6	2.8	10.0
Backlog (wks)	8.6	8.5	8.5	9.0	8.0
Department of Commerce Census Data					
Iron & Steel Foundries (million \$)					
Shipments	1,301.8	1,327.3	1,329	1,331	1,322
New Orders	1,333.8	1,318.3	1,288	1,293	1,374
Inventories	1,981.3	2,030.0	2,043	2,028	2,019
Nondefense Capital Goods (billion \$)					
Shipments	72.2	74.4	74.3	74.4	74.5
New Orders	73.2	74.6	73.7	74.9	75.1
Inventories	178.8	181.2	182.1	181.1	180.4
Nondefense Capital Goods less Aircraft (billion \$)					
Shipments	64.6	66.9	67.1	67.1	66.6
New Orders	65.0	67.0	66.7	66.9	67.3
Inventories	123.4	125.3	125.8	125.5	124.7
Inventory/Orders	1.9	1.9	1.89	1.88	1.85
Inventory/Shipments	0.0	1.9	1.88	1.87	1.87
Orders/Shipments	0.0	1.0	0.99	1.00	1.01
American Iron and Steel Institute					
Raw Steel Shipments (million net tons)	7.6	7.5	7.6	7.3	7.4