



# SFSA CASTEEL REPORTER

Steel Founders' Society of America

a publication serving  
SFSA steel casting industry members

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## March — 2020

### Casteel Commentary

In this month's Casteel Commentary, the issue of a disruptive technology change with the transition to electric vehicles is considered. Will this hurt or benefit steel casting producers?

### Cast in Steel

SFSA is inviting you to attend the Cast in Steel Bowie Knife Competition on April 20, 2020 in Cleveland, OH, a day before the Metalcasting Congress. There are 40+ student teams expected to participate in this year's competition. Each team's Bowie Knife will be tested for durability and sharpness. The performance testing starts at 10AM and Award Ceremony will be at 3PM. Both events will be held at DoubleTree by Hilton Hotel Cleveland Downtown-Lakeside.

To RSVP, click [here](#). If you have any questions about the competition or the event, please contact [Diana David](#).

### Foundry Intern Scholarships

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 Steel Founders' Society Foundation 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. If you currently have or plan to have an intern work at your foundry in 2020, be sure to have them complete [this registration form](#) by July 6.

### T&O Best Papers

Congratulations to the best paper winners from the 2019 T&O Conference!

- Founders' Choice Award: Jim Erskine, Progress Rail, for his paper on "Closed Coupled Pouring using Zero Harm Ladle"
- Rod Duncan Best First Time Paper: Doug Willsey, Black Cat, for his paper on "Contact Pouring with Existing Infrastructure"
- Robert G. Shepherd Runner-up Best Paper: Jean-François Carton, Safe Metal, for his paper on "Comparison of Conventional and 3D Printed Cores from a Mechanical Point of View"
- Robert G. Shepherd Best Paper: Amoldeep Jaggi, Magotteaux, for his paper on "Rapid Pattern Making Machines at Magotteaux ... The Continuation"

The T&O Committee is honored to showcase the best paper, which is available for [download](#). We appreciate the support provided to the steel casting industry through papers such as this. To receive the full conference proceedings and hear the authors firsthand present their material, please make plans to attend the 2020 National T&O Conference in Chicago on December 9th – 12th.

### SFSA EHS/HR Meeting

Please plan to attend the SFSA EHS & HR Group Meeting on April 7-8, 2020 at MetalTek - Wisconsin Centrifugal in Waukesha, WI. This meeting is a great opportunity to learn from your peers on many topics including how to improve EHS training and practices, compliance, and the latest HR topics. The round-table discussions are the perfect forum to share practices and get answers to your EHS and HR questions. There is no registration cost for the meeting - travel, hotel, meals, etc. are the attendees' responsibility. Additional meeting details and registration are available here: <https://sfsa.site-ym.com/event/ehs-hr-April2020>.

**Hotel Accommodations:**

Holiday Inn - Pewaukee

Group Room Rate: \$114/night (includes breakfast)

Rate cutoff is March 23, 2020

**Finishing & Inspection Meeting**

The Finishing & Inspection subject-focused meeting, leveraging and applying Iowa State University (ISU) research, will be on April 15-16th in Ames, IA. Attendees will have the opportunity to learn fundamentals and the latest industry research from world-class professors. Learning opportunities on Thursday morning through early afternoon on 4/16 will include: arc-air roundtable discussion and grinding automation, MPI best practices and digital surface inspection, effect of indication on fatigue, and Additive Manufacturing. On the afternoon of April 15th, there will be an opportunity to tour the ISU manufacturing labs and the Center for Non-Destructive Examination. There is no cost for the meeting - travel, hotel, meals, etc. are the attendees' responsibility. Final details for the meeting will be sent to all registered attendees. Contact [David Poweleit](#) for more information.

**Spring Leadership Meeting**

SFSA invites members to attend the SFSA Spring Leadership Meeting on May 19-20 at the Delta Hotel by Marriott in Muskegon, MI. The Spring Leadership meeting will start on Tuesday after the SFSA Board meeting and include lunch and an industry roundtable. The marketing committee will meet in the afternoon and everyone is welcome to attend. On Wednesday, the group will tour as many as three foundries including Eagle Alloy. Breakfast, lunch, and transportation will be provided. An email with the meeting details and registration will be sent out next week.

**NextGenMfg and Future Leaders**

The Next Generation Manufacturing (NGM) and Future Leaders meetings will be held together and in conjunction with the Spring Leadership Meeting in Muskegon, MI on May 20-22. NGM is quintessential to the future of manufacturing steel castings. SFSA has joined SwRI's ROS-I Program, and their consortium members are eager to work on the deployment of ROS technology in a steel foundry. We have three NGM focus categories: Smart Automation (job shop steel foundry manufacturing), Smart Data (machine learning and IoT), and Augmented Reality (work instructions, training, and video for AI/IoT). The NGM meeting will feature presentations by UAB on AI and SwRI on robotic blending. The Future Leaders meeting will focus on data and learning how to use a Design of Experiment. Additional information will be shared when available. Contact [David Poweleit](#).

**Steel Performance Initiative (SPI)**

SFSA is in the process of establishing long-term continuity for research to support the steel industry through our Steel Performance Initiative (SPI). This will foster the development of new steel alloys, hybrid casting solutions, model driven design + manufacturing + performance, and the continued development of manufacturing technology.

**Research Review**

This year's Research Review will be the week of July 20<sup>th</sup> in Chicago. The agenda will not be structured by university but instead by topic. We will also be extending invitations to design/end-user partners to participate in the design day as we'd like their input to ensure we meet our goal of design for reliable steel casting performance. Additional information will be shared when available. Contact [David Poweleit](#).

**Fall Leadership Meeting**

Please save the date and plan to attend the 2020 SFSA Fall Leadership Meeting, which will be held on September 19-22 at the beautiful [Omni Grove Park Inn](#) in Asheville, NC.

**Market Commentary**

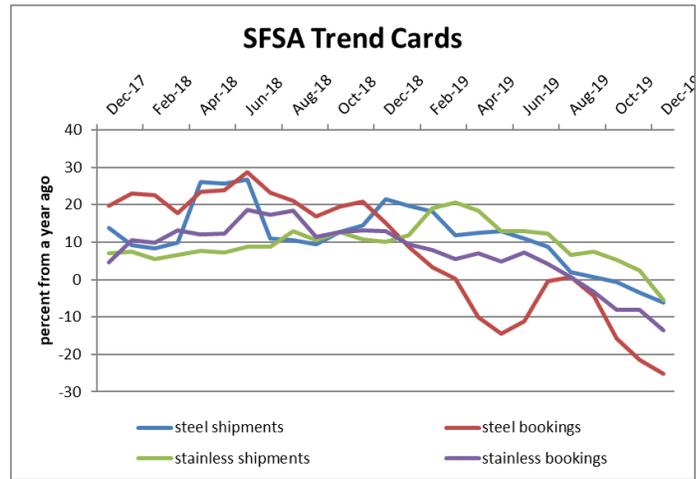
As most plants have seen, the end of 2019 had a drop in booking and shipments in all steel castings. Booking were off more than shipments, and both were negative, market shrinking compared to last year. December showed a small decline in backlog confirming a softening market.

Our current weekly charts show a bottom forming with stability at a lower level of production.

The softening is apparent in the other reports on iron and steel casting shipments from the Department of Commerce and seen in the steel mill product shipments.

Capital goods orders are flat. Oil and copper prices are at the lower end of their current range but appear also to be forming a bottom.

Markets appear to be stabilizing but with the recent sharp drops in equities, the balance of the year is uncertain.



**Casteel Commentary**

Is the development and production of electric vehicles a threat or opportunity for steel casting producers?

Unlike other segments of the casting industry, steel casting producers have little direct exposure to the automotive industry. There are almost no parts or components that are steel castings that go into auto and trucks. We have a small exposure to some item in Class 8 heavy trucks.

Electric vehicles, EVs, will continue to become a bigger part of the market and if battery technology becomes more capable and affordable, could displace as a disruptive technology the current automotive producers. The valuation of TESLA in the equity markets is a bet that this disruption will occur.

What will that mean for steel casting producers?

I think it is good news for us. Why?

Building one wind turbine requires 900 tons of steel. Solar power and transmission infrastructure require major construction efforts to produce the infrastructure requires. To ensure supply when the sun doesn't shine, or wind blow currently requires Peaker generation plants. All these infrastructure requirements and production equipment are large capital investments using the capital equipment that are our major markets. (If You Want 'Renewable Energy,' Get Ready to Dig, Mark Mills, WSJ, August 6, 2019)

The materials needed for moving to a renewable electric economy will require significant mining development and activity. Silver and indium mining for solar panels must increase 250 to 1,200%. Rare earth production must go up 300 to 1,000% by 2050 to meet the current Green goals.

Essential Metal	Incremental 2035 Requirement (Bernstein Research Estimate)	2018 Production Base
Copper	20.4 million tpa	21.0 million tpa
Aluminum	17.3 million tpa	60.0 million tpa
Graphite	2.2 million tpa	930,000 tpa
Nickel (battery grade)	1.8 million tpa	1.5 million tpa
Cobalt	679,000 tpa	104,000 tpa
Lithium	353,000 tpa	84,000 tpa

A single EV battery weighs 1,000 pounds and requires digging up, moving and processing more than 250 tons of dirt. An estimate of the additional requirement for basic materials for EV to meet the projected 2035 requirement is shown in the table. The numbers of required additional production are staggering. <https://www.nakedcapitalism.com/2019/07/mining-and-electric-vehicles-lithium-nickel-cobalt.html>

So as an industry, we need to position ourselves if we want to participate in mining and construction equipment as well as in natural gas Peaker turbine and wind energy structures. While the casting industry as a whole may suffer dramatically from the shift, we should be able to prosper if we can develop the castings key to implement the technology.

*Raymond*

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

<b>SFSA Trend Cards</b> (%-12 mos. Ago)	12 Mo Avg	3 Mo Avg	January	December	November
<b>Carbon &amp; Low Alloy</b>					
Shipments	3.2	-8.1	0.5	-8.2	-16.5
Bookings	-13.0	-25.7	-29.0	-20.0	-28.0
Backlog (wks)	9.9	9.5	10.0	8.5	10.0
<b>High Alloy</b>					
Shipments	6.5	-10.1	-8.0	-10.9	-11.5
Bookings	-2.1	-11.3	-8.5	-18.5	-7.0
Backlog (wks)	10.0	10.0	10.0	9.0	11.0
<b>Department of Commerce Census Data</b>					
<b>Iron &amp; Steel Foundries (million \$)</b>					
Shipments	1,482.4	1,430.7	1,460	1,382	1,450
New Orders	1,464.5	1,415.0	1,445	1,371	1,429
Inventories	2,144.8	2,155.0	2,137	2,153	2,175
<b>Nondefense Capital Goods (billion \$)</b>					
Shipments	75.5	74.1	73.2	74.6	74.3
New Orders	72.2	68.6	72.5	64.5	68.9
Inventories	191.6	198.0	198.3	198.8	196.9
<b>Nondefense Capital Goods less Aircraft (billion \$)</b>					
Shipments	69.4	69.0	69.4	68.7	69.0
New Orders	69.1	69.1	69.4	68.7	69.2
Inventories	129.5	129.6	129.3	129.9	129.6
Inventory/Orders	1.9	1.9	1.86	1.89	1.87
Inventory/Shipments	0.0	1.9	1.86	1.89	1.88
Orders/Shipments	0.0	1.0	1.00	1.00	1.00
<b>American Iron and Steel Institute</b>					
Raw Steel Shipments (million net tons)	8.1	8.1	8.5	8.0	7.7