



# SFSA CASTEEL REPORTER

Steel Founders' Society of America

a monthly publication  
serving SFSA steel casting industry Members

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## *December — 2012*

### **Casteel Commentary**

This month's Casteel Commentary forecasts conditions to expect next year. It includes a report card for last year and I was surprised at how close the forecast was to reality. I would not expect to forecast as well this year but you can decide for yourself how useful this exercise is for planning. I expect a slow stagnant economy but better conditions for steel foundries than for the economy as a whole.

### **Future Leaders**

The next meeting of the group is scheduled for February 21-22 at Bradken in Amite, LA. The meeting will feature a mini-seminar on heat treatment and the microstructure of steel castings. For additional details, contact David Poweleit at [poweleit@sfsa.org](mailto:poweleit@sfsa.org).

### **Investment Casting**

The next Investment Casting Group meeting will be February 12-13 at Conbraco in Conway, SC. The tentative agenda includes: a tour of Conbraco, wax presentation by Von Richards (MS&T), an overview of the sand casting yield survey by Malcolm Blair, an update on the apprenticeship program and investment casting seminars, discussion on additional use of 3M Cubitron and alternatives to zircon flour and zircon stucco, roundtable discussion on Rapid Tooling, new I/C technologies, and show 'n discuss casting quality issues, and foundry statistics through presentations on Vivid software and upper/lower limit analysis. For additional details, contact David Poweleit at [poweleit@sfsa.org](mailto:poweleit@sfsa.org)

### **Safety/HR**

The Safety/HR meeting will be held in Longview, TX on February 19-20, 2013 and will include a tour of Southwest Steel Casting Company.

### **Apprenticeship**

SFSA has developed a prototype apprenticeship program for our members. It was distributed before Christmas for your comments. Please look at this effort and give us your comments. Also if you are interested in using the program, please drop me an email, [monroe@sfsa.org](mailto:monroe@sfsa.org). If you need to look at the program it is located at <http://www.sfsa.org/apprentice>

### **Member Issue**

Issue: Problems on a machined surface

Our customer places a Purchase order for castings to be supplied in the as cast condition. The customer gives us the machined drawing and we are aware of the locations of machined surfaces. The customer specifies NDE requirements (UT and MT) on the casting and we meet those requirements when we ship the casting. However, when the customer machines the castings, some indication such as porosity, an inclusion or crack appears on the machined surface. When we meet the specified NDT requirements on the casting at the time of shipping, is it still our responsibility for the defects that appear on machined surfaces?

As we know the locations of machined surfaces, we generally prefer (but not always possible) to rough machine castings and heat treat them later and carry out NDT on rough machined surfaces. We meet

the specs on rough machined surfaces too. But sometimes during final machining the indications appear. We believe that meeting NDT specs is not a 100% guarantee that something will not appear on machined casting.

Answer:

The appearance of some porosity or crack or inclusion on the final machined surface is a perennial problem for steel casting producers and users. No good solution is available for eliminating this issue in steel casting supply.

The traditional remedy for finding an unacceptable condition on the steel casting in final machining is to collaborate to resolve the problem. If possible, the foundry may be able to remediate the casting with welding and additional heat treatment. Often this is not possible since the welding and heat treatment will result in distortion and the casting will not conform to the final machined dimensional tolerances. It may also be the case that it is more economical and less risky to replace the unacceptable casting with a new casting. The common traditional commercial practice is for the foundry to either repair or replace the casting for the customer at no added cost to the customer and with no additional financial penalty to the foundry.

Some customers have attempted to recover some of their lost machining cost for the scrap casting from the casting producer. In general this has not been an accepted arrangement. If there is a larger volume production that is semi-continuous then sometimes these type arrangements are made but this is a special situation and not a general commercial practice.

There are no inspection techniques that will allow the steel casting producer to ensure that the final machined surface will be clean and acceptable for service. UT on the as cast surface is not capable of the resolution required. On a rough machined surface it may be possible but often the resolution so close to the surface is difficult. No generally accepted UT technique is currently applied to qualify the final machined surface prior to the finish machining. MT is a surface inspection capable of some near surface detection. It has not been shown to successfully qualify final machined surfaces. Remediating MT indications on the cast surface to a more rigorous standard has not been shown to be successful at eliminating problems on the final machined surface.

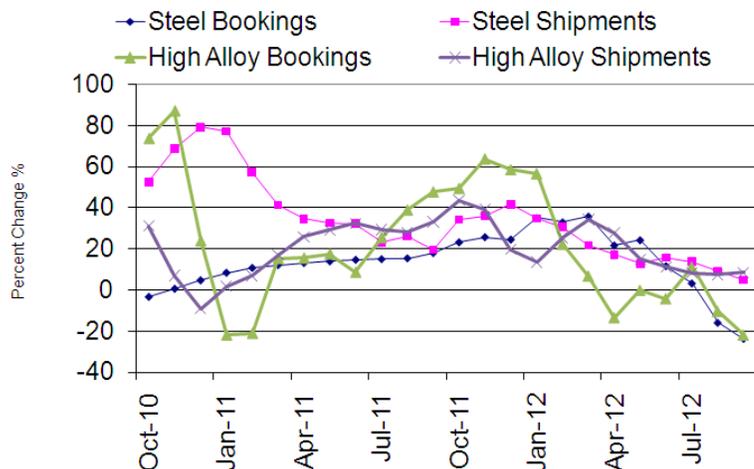
Rough machining the surface at the foundry dramatically reduces the incidence of problems on the final machined surface and is a common trend to reduce scrap and rework at the users plant in final machining. This does not eliminate the problem but does reduce the occurrence dramatically since most of these issues appear in rough machining.

The casting supplier is not responsible for indications unless this is an explicit requirement of the purchase agreement and accepted by the supplier. The common commercial arrangement is to replace the unacceptable casting at no charge and with no penalty.

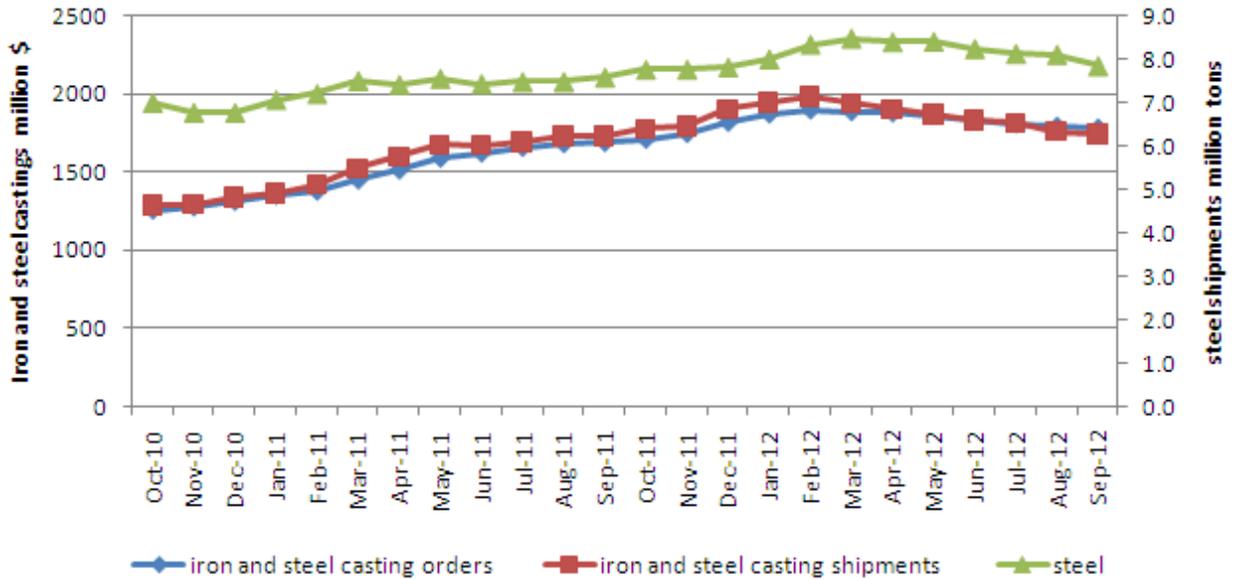
### **Market News**

The SFSA forecast was reviewed at the T&O conference by the Marketing Committee and is available here, <http://www.sfsa.org/sfsa/news>. Please let me know if you have any questions.

The results from the SFSA trend survey are given below. Orders are declining and have fallen to more that a 20% decline from a year ago (2011) in September. This still makes the current order rate exceed the prior year. Shipments are still positive but show a slower growth trend. Bookings are significantly below shipments in rate of change suggesting that the market will continue to soften.

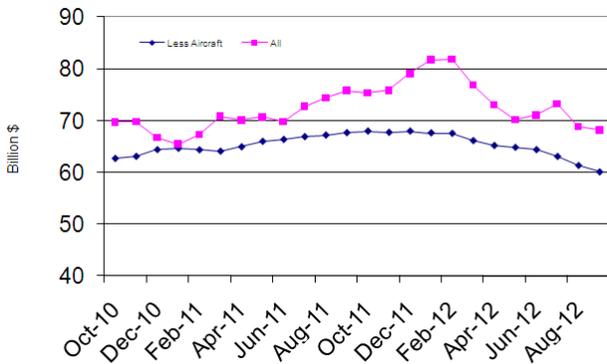


## Iron and steel casting shipments and AISI steel shipments



The softening in demand for iron and steel products is also seen in the report of iron and steel casting shipments for the DoC. This is also seen in the decline of shipments of steel products reported by AISI for September.

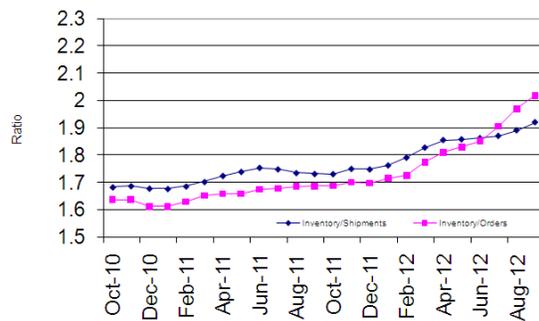
Nondefense Capital Goods New Orders  
3 month average



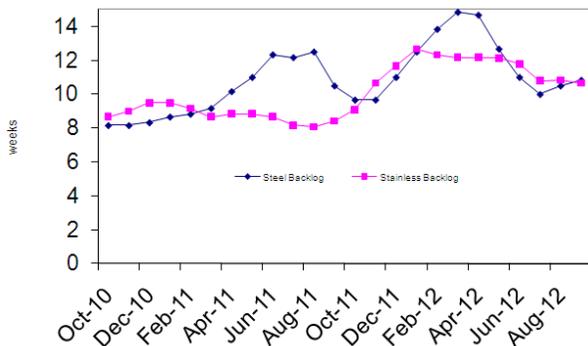
declined more than inventories. One speculation is that part of the year end slowdown is significantly the result of managers trying to reduce inventories to maximize year end performance measures.

This decline in shipments of iron and steel products is mirrored by the decline in orders for capital goods. Non-defense capital goods new orders excluding aircraft is perhaps the most helpful sign of underlying activity for capital equipment and it is declining since the beginning of the year. Orders have declined more than shipments and both have

Nondefense Capital Goods less Aircraft  
3 month average



Casting Backlog



SFSA trends also look at backlog. Backlog peaked in late spring and has fallen into September but remains relatively strong.

So the expectation is that the slowing activity for the final quarter of the year will stabilize but little improvement is expected in the beginning of 2013.

## Casteel Commentary

From Last Year's Forecast:

- 1. Economic activity in North America will slow by the middle of this year and may dip into a recession.**

This seems to have held up well with the downturn being later than suggested but a general slowdown in activity in the final quarter of 2012. Mining fell especially sharply.

- 2. European financial structures will need fundamental reworking. This may not occur and Europe may just find ways to kick the can further down the road. Germany will pay what is required to maintain the euro.**

This also held up well. Europe continues to struggle with its financial structure. They are unable to maintain the current structure of fiscal policy and are unable to find a path forward so far.

- 3. China's growth will slow significantly, with rates falling well below double digits.**

Maybe. China is slowing and the future remains unclear. The potential slowdown in China growth would reduce the demand for commodity products and might adversely effect demand and prices for steel castings.

- 4. Commodity prices, oil and copper, will remain comfortably high enough to spark continued investment but will moderate and not see continued strong price increases.**

Commodity prices have stabilized at lower levels but do remain elevated enough to support continued investment. The current slowdown in economic activity may cause additional price reductions but steel casting demand should not fall drastically.

- 5. Steel casting production will increase this year but will moderate as the economy does resulting in shrinking backlogs but not in lower production.**

The SFSA trends card survey shows that production for 2012 did grow compared to 2011. The recent trends in new orders show a slowing market with production continuing to fall the balance of 2012.

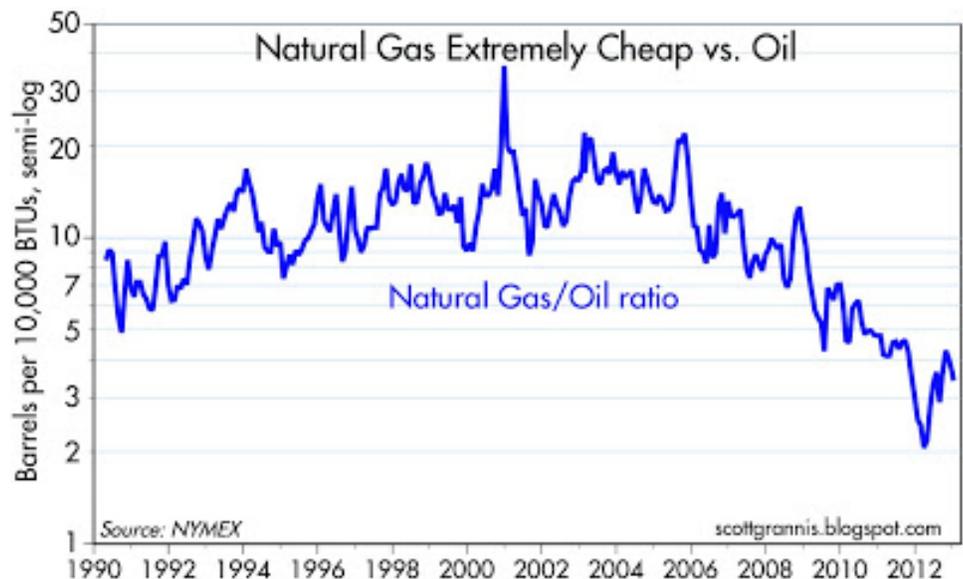
- 6. Construction will finally turn the corner and will notably increase.**

This is wrong. We saw not real increase in construction activity in the year.

- 7. Large customers will continue to find it difficult to purchase all the steel castings they need for production and global acquisition will decline. Existing plants will make targeted investments to increase their capacity and capability.**

Large steel products continued to have a robust backlog and long lead times for most of the year. They are still in demand but the orders are weakening.

So with the election over and the political power balanced, it appears that we want what we always want, more programs from Washington that benefit us and someone else to pay the bills. On the other hand, technology improvements in recovering oil and gas, from tight rock formations through fracking, are likely to revive the economy and continue to drive investment in North America. The optimistic outcome is that this



improvement in our geo-political position combined with our cultural capability to grow will allow us to overcome the market distortions caused by an irrational set of economic policies. We will be able to prosper in spite of the market distorting forces that confront us. I believe however that we are more likely to face Japanese-like stagnation as the political establishment tries to maintain the existing structures and policies. They are not interested or likely to prove capable to manage the change that will occur in our world.

Having asserted that as the direction of the economy as a whole, I believe that our industry is still poised for prosperity as we are compelled to make significant capital investments to meet the capital equipment needed in the world to maintain and extend modern living conditions more broadly. It seems inevitable that we will either remain in a stagnant economy of slow growth and limited opportunity or transition to a rising interest rate and inflation environment. My expectation is that we will see the next year as a stagnant year of slow activity. We in the steel casting industry will see a slow first half with a modest improvement in the second half. It is not clear whether at the end of this year or during the next year we will see rising prices and interest rates. The lack of needed capital investment will inevitably lead to spikes in prices.

In fact, the lack of adequate capacity in the supply chain for needed infrastructure will cause disruptions to lead to price spikes not price drops. Like 2001-2003 or 2009, our industry did see significant drops in demand but not to dramatic drops in casting prices.

So for the coming year:

1. Steel casting demand should be slow for most of the year, not falling below levels for the end of 2012 and holding the promise of some improvement in the second half of the year.
2. The price difference between natural gas and oil will lead to the development and investment in new infrastructure to allow natural gas to fuel fleet vehicles and will continue the trend to purchase and install new small gas generators for electrical production.
3. China and India will continue to slow as a result of continued domestic mal-investment, slowness in demand from North America and Europe, rising domestic costs, and financial constraints. The growth rate will remain above 5 but below 10% for the year.
4. Steel Foundries will slow but continue to plan capital reinvestment in North America. This will not be in new plants but will be in the revitalization and modernization of the existing sites.
5. Commodity prices will stabilize at a threshold level, not requiring continued dramatic investment but still providing strong and steady demand. Oil should remain around \$80-90 per barrel and copper should continue above \$3 a pound.
6. The North American economy will see slow almost no growth with recession conditions for the first half of the year. Barring a dramatic change in political consensus; the liquidation of bad debt, restructuring of financial institutions, rationalizing of housing, and responsible Federal budgeting will not occur. This will lead to the effort to maintain the current structures that are incapable of providing the opportunities for change and growth. Construction spending will improve modestly.
7. Steel casting suppliers will find opportunities to improve their business through supplying machined parts and taking responsibility for part performance. Large critical castings will be needed and companies that can manage to assume responsibility for design, liability, and performance with profitability will grow by expanding the market.

Raymond

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

<b>SFSA Trend Cards</b> (%-12 mos. Ago)	12 Mo Avg	3 Mo Avg	Sep	Aug
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**Carbon & Low Alloy**

Shipments	20.9	4.8	0.4	5.0
Bookings	12.0	-23.8	-33.4	-32.6
Backlog (wks)	11.9	10.8	11.0	11.5

**High Alloy**

Shipments	18.4	8.4	15.0	9.4
Bookings	9.8	-21.9	-67.3	-35.0
Backlog (wks)	11.6	10.7	10.0	12.0

**Department of Commerce  
Census Data**

**Iron & Steel Foundries (million \$)**

Shipments	1,827.7	1,776.0	1,770	1,766
New Orders	1,852.0	1,740.0	1,685	1,692
Inventories	2,115.5	2,150.0	2,149	2,157

**Nondefense Capital Goods (billion \$)**

Shipments	70.2	69.9	70.2	69.2
New Orders	73.8	68.2	70.9	57.8
Inventories	168.8	171.7	172.7	171.9

**Nondefense Capital Goods  
less Aircraft (billion \$)**

Shipments	64.3	63.2	62.9	63.1
New Orders	64.6	60.1	60.0	60.3
Inventories	118.2	121.3	121.5	121.4

Inventory/Orders		2.02	2.02	2.01
Inventory/Shipments		1.92	1.93	1.93
Orders/Shipments		0.95	0.95	0.96

**American Iron and Steel Institute**

Raw Steel Shipments (million net tons)	8.1	7.8	7.2	8.4
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