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Overview

Manufacturers report that competition from offshore manufacturers continues to decrease. While offshore competition is decreasing, it does not always translate into U.S. sales. Parts currently sourced from China are slowly coming back to the U.S. but more often to Mexico. Few major new parts for the U.S. are being sourced from China. That is, if it is a high volume part sourced from China it will probably stay there as long as it is in production.

One foundry did report a disturbing part loss to China. They produce large sophisticated aluminum castings used in difficult applications. The part was lost to China. Until now, China was not particularly known for complex, hard-to-make castings. These are labor intensive parts so U.S. foundries are vulnerable as Chinese foundries improve their quality levels.

The U.S. Bureau of Economic Analysis reported that in June year-to-date that Finished Metal Shapes exports in 2015 were \$11.672 billion versus \$12.012 billion in 2014. Imports of Finished Metal Shapes imports in the same period were \$10.461 billion in 2015 and \$10.268 billion in 2014. According to the Bureau, the U.S. exported more finished metal shapes in the first 6 months of 2015 than were imported.

There are no direct statistics kept for specific types of castings.

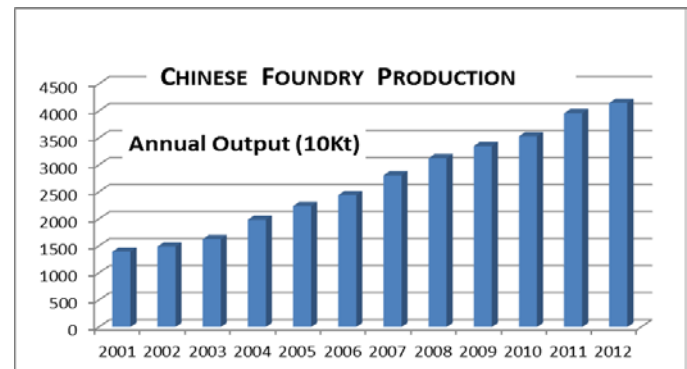
Overall, the U.S. imports more iron castings than it exports with significant trade differentials with Mexico and Canada.

CHINA

China is watching the yuan carefully and controlling it to maintain their own economy. Growth in China is still positive but the rate of growth has slowed. Look for China to hold the yuan steady until they are comfortable that letting it slide will have a controlled impact on the economy.

China is the elephant in the room. China is now the largest producer of all types of castings of any country in the world. Producing in excess of 44.5 million metric tons 2013 it is nearly five times the second place U.S. production and about 40% of the world production. With over 30,000 foundries in China in 2008, the average production per foundry is 883 tons per year compared to 5,943 tons per foundry of the 2,017 foundries in the U.S. in the same period While the

implication that the typical foundry in China is very small and labor intensive, some of the most modern and labor efficient foundries have been built in China in the recent years. The average tons per foundry have been dropping.



Iron casting imports from China rose to \$105.7 million in 2012 from \$80.6 million in the same period of 2009. During the same time period, exports of castings to China dropped by \$7.5 million to \$26.8 million.

The Chinese Foundry Association reports casting sales in China increase 4.7% in 2013 from the prior year with a total value of 550 billion Rmb (\$89.5 billion US). They also reported that aluminum and ductile are the fastest growing segments. Automotive is the growth segment. Wind energy casting production dropped sharply.

Exports of castings dropped 10.1% in 2013 from the prior year to \$2.87 billion US. Exports were 1.779 million mt of the total production of 44.5 million mt or 4.0% of the castings produced in China are exported.

The price of imported castings to China was reported to have increased by \$7,483 per ton, indicating the imports are very high value. A win for U.S. foundries was the agreement by the Chinese military to purchase 12,000 tons of iron castings from Cast-Fab, Cincinnati, Ohio. U.S. foundries can export, if they try.

We believe the value of castings imported is understated. The Chinese have been aggressively adding value by machining and complete assembly. When the casting is

included in an assembly, the value transfers from the casting to the product category of the assembly (i.e., pump, valve, etc.).

Foundries, on average, are small in China. The average annual production is only 883 tons per facility. In the United States, average is 6,380 tons per plant. Germany leads all nations at 8,618 tons per plant. There are a number of large foundries but they are more than offset by small foundries. The foundries employ 2 million people with average output of 20 tons per person. The low rate of productivity helps offset China's low labor rate advantage.

Chinese foundry technology has improved dramatically. In addition to some of the most modern foundries they are rapidly developing skills. Chinese foundries can now produce iron castings to 145 mt and steel castings to 520mt, much larger than any U.S. foundry.

The castings produced in China are primarily for domestic requirements. Export castings are about 4% of total casting production. China does import about 1% of its castings, mostly very complex alloys.

Chinese Casting Exports and Imports (10Kt)						
	2006	2007	2008	2009	2010	2011
Total Output	2,809.0	3,127.0	3,350.0	3,530.0	3,960.0	4,150.0
Domestic Use	2,549.0	2,850.0	3,126.7	3,367.0	3,758.0	3,944.4
Export Volume	260.0	277.0	223.3	163.0	202.0	205.6
Import Volume	1.7	3.0	3.2	2.2	3.4	3.2

China predicts that by the end of 2015, output will reach 50 million tons and \$119 billion US dollars.

Foundry capital investment in China in 2011 was very strong with 62 flask type molding machines, 201 flaskless molding machines, 307 no-bake mixers and over 500 electric melt furnaces.

Casting quality is a major issue but savvy buyers have discovered that problems can be avoided by having an employee in China pre-inspect the castings. Several foundries and importers have reported that imports have slowed and prices increased from China. We have been contacted by OEMs seeking to in-source castings from both China and India.

The development of state-of-the-art foundries was necessary to provide consistent, high quality castings. Castings from a highly automated Chinese foundry are 15% more expensive than a hand foundry but are necessary for applications requiring repeatability and quality.

Casting production for import to the United States is moving out of China. Unfortunately, it is not coming to the US in any real volume. Most of it is going to Mexico with a portion going to India. Deliveries can be a problem. One foundry told us of a customer dual sourcing their iron castings after shipments scheduled to arrive in April finally landed in November.

Past Trend, Present Value and Future Projection of Exchange Rates

The slowdown in the rate of growth of the Chinese economy from the 10-11% range to a predicted 7.4% in 2015 has caused the Chinese government to adjust the exchange rate of the yuan. In November 2014, the yuan was 6.12 to the U.S. dollar. In August 2015 a government policy change caused the yuan to increase by about 3.2% to 6.35 in October 2015. This has the effect of causing exports to be less expensive and imports to China more expensive. For U.S. casting buyers of Chinese castings, this is a price reduction of about 3%.

Labor rates have increased in the coastal manufacturing areas as labor has been more fully employed. Transportation rates will moderate with the decline in the price of oil. Since China imports scrap, raw material costs are higher while energy costs are comparable. Our forecast is that the trend of importing from China will moderate and work will continue to shift slowly back to the U.S.

On September 25, 2009 the rate was 6.82 CNY per US dollar. On October 1, 2015, the rate was 6.35 CNY per US dollar, a change of about 7%. This change combined with increasing cost in China has helped make US metal casters more competitive.

Foundries have been reporting recent price increases from Chinese foundries bringing the landed price to within 10% of U.S. prices. When the spread is down to that level, convincing customers to buy American becomes relatively easy. If the yuan continues to move, look for the trend to increase.

China is now the second largest economy in the world, surpassing Japan in 2010 and second only to the U.S. We look for it to be the largest economy in the world within the next 20 years. They have the resources and people to make it happen.

OTHER ASIAN (JAPAN, KOREA, THAILAND AND TAIWAN)

Imports from this area are moderating due to Japanese auto makers rebalancing their supply chain after the devastation caused by the tsunami. Exports from Japan are increasing due to the weak yen. Japanese light vehicle manufacturers are continuing to shift casting production from Japan to the U.S. The weak yen may shift some of this production back to Japan.

INDIA

India saw major drops in casting production due to its heavy export orientation. However, internal growth of the automotive industry has driven some recent upturns in production levels. When the economies in North America and Europe return, India may not be in as good a position to supply castings as they were previously. The country suffers from infrastructure issues related to raw materials and energy supplies.

India is the new China....sort of. It is now the second fastest growing economy in the world. The growth is due to internal demand coupled with international companies shifting production from China to India. Production costs in India from the U.S. viewpoint are now lower than China although transportation is slightly higher but the net result is that landed cost is lower.

India has about 4,600 foundries that are mainly clustered in 19 areas. They produce about 9 million metric tons per year with 500,000 direct employees.

India reported total exports in 2011 at \$1.1 billion U.S. About 34% of those were low value gray iron sanitary castings.

India has seen major increases in internal demand competing for capacity that have moderated in the last year. The country has an automobile building mandate designed to produce vehicles not only for India but also for export. The India Foundrymen Association estimates that India needs to double its casting capacity in the next five years to meet projected demand. The Indian foundries are hampered by cumbersome regulations and very high energy costs. Also, with lower availability of raw materials than other major countries, there are extra costs incurred in acquiring raw materials. India has proven to be a limited threat to U.S. foundries. Discontinuities in raw materials supply and energy availability negatively impacts the reliability of Indian foundries. Several Indian foundries are seeking foundries in the U.S. to insure casting availability.

In total weight, India is now tied with the United States as the second largest producer of castings. However, we don't see any merit in adding total tonnage as a measure of size. Their tonnage is dominated by gray iron, the lowest cost metal. In

dollar value, they have a long way to go to catch up to the U.S.

BRAZIL

Brazilian exports are down significantly due not only to the economy but also due to the gain of the real against the dollar. Look for them to stay down until the exchange ratio changes.

Brazil has dropped significantly as an exporter of castings to the U.S. This is primarily due to the gain in the real against the dollar. With a strong supply of iron ore, Brazil is well positioned to export to the U.S.

Brazil once posed a threat to the U.S. casting industry but no longer does. ABIFA, the Brazilian Foundry Industry Association that the cost of producing in Brazil is 23% higher than in the United States.

MEXICO

Mexico is now the fastest growing economy in the world. They are benefiting from work being shifted from China and finally destined for the United States.

Mexico is the third largest supplier of castings to the U.S. after China and Canada. Exports to the U.S. have grown at the expense of China. Mexican casting prices are now near parity with Chinese prices. Shorter lead times and closer proximity work strongly in Mexico's favor. Mexico, however, does not have the casting industry that China so their ability to ramp up production is more limited.

The biggest portions of these are engine blocks and automotive castings from larger foundries in Mexico. Smaller foundries do export to the U.S. but operating a foundry in Mexico is not easy. Graft is rampant. Unions are mandated by the government for all companies as well as mandated heavy social costs. Casting volumes from Mexico look to continue to increase as costs in China and India increase. We are starting to see a backlash against smaller Mexican suppliers due to quality and reliability issues.

Castings exported from the U.S. to Mexico typically have value added in machining and assembly before frequently coming back to the U.S.

We believe that the economic impact on a smaller country such as Mexico will cause labor rates and costs to rise rapidly. Don't look for this to be a long term trend.

CANADA

The U.S. imports about 9.8% of the imported castings from Canada. The major driver to importing from Canada are pricing parity with the U.S. and proximity.

With the Canadian dollar now at parity with the U.S. dollar and operating costs comparable, Canada has ceased to have any real advantage over U.S. foundries. Competition from Canadian foundries is comparable to competition from other U.S. foundries.

EUROPE

About 350,000 tons of castings are imported from Europe each year. Many of these castings are for European transplant auto manufacturers. The exchange rate of the euro versus the dollar has been relatively stable. However, European aluminum casting suppliers have committed to major plant investments in the U.S. that will be coming on-line in the next year. Europe experienced many of the difficulties facing U.S. foundries a long time ago – high labor costs, high labor burdens and high tax rates. They responded by improving productivity effectively minimizing the impact of labor and trending to larger, more efficient foundries with superior quality. Europe is the go-to place for very high quality castings. The smarter U.S. foundries compete very effectively with European foundries and will continue to shift work to the U.S.

The European economy is struggling. Look for European foundries to become more competitive.

SUMMARY

More productive foundries are telling us they can compete on casting price with any country in the world (landed cost and value). However, they also tell us that when they are required to provide a machined casting, they have a difficult time. At 10 man-hours per ton and a fully burdened labor cost of \$30 per hour, a five pound casting has \$.75 of labor – that's a little under 20 seconds work. Productivity is typically lower in other countries (except Germany). Machining, even operating multiple machines, usually adds a lot more than 20 seconds making it more difficult to be competitive with low labor cost countries when value is added to the casting.

We're bullish on the American metal casting industry, provided they continue getting smarter. That means improving productivity, reducing scrap, improving quality and continuing the value added trend. Over 100 metal casters closed during the recession, including some significant producers. For those who have survived 2009-2010, the future is looking much better. The pie is growing again and there are fewer left to share in it.

The dollar has started to gain some strength against the euro. This does not bode well for exports to Europe. We like to see it weak.

Manufacturing companies are managing inventories better than ever. This will put greater pressure on metal casters to respond more quickly with shorter lead times. The smart metal casters will learn to operate "lean" and seek to provide more value added services. There is a real benefit for metal casters in better managed inventory – when a customer reduces production, the metal caster will be impacted only by the drop in production not accompanying inventory adjustments.

Look for OEM's to rethink their manufacturing as sales rebuild. It is much easier to manage a downturn in sales – and respond to an upturn – if manufacturing is out sourced. Metal casters who add value through machining and assembly are in a better position to benefit.

Watch though. Historically, when OEM's have been faced with significant supply problems they have responded by securing captive sources – either through acquisitions or green field foundries.