



# SFSA CASTEEL REPORTER

Steel Founders' Society of America

a monthly publication

serving SFSA steel casting industry Members

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## August — 2005

### Casteel Commentary Highlights:

China plays an important role not only as a competitor but also as a consumer. The purchases of China have helped fuel demand for commodities and capital equipment investment. China steel foundries appear to be on an unsustainable path if the selling price reported by the China Foundry journal is accurate. This month's Commentary reports some of these numbers and does an analysis to demonstrate this reality.

### SFSA Annual Meeting

Our Annual Meeting is coming up on September 10-13 at the Hyatt Regency Lake Tahoe. We have an informative mustn't miss program on the future of our industry. Not only the program but also the opportunity to network and informally discuss the industry is important. Especially as all of us face staffing and production challenges the opportunity to build relationships or business arrangements with others is important. We need all members to attend! Details on the program are available here:

<http://www.sfsa.org/sfsa/annmtg>

As a late breaking possibility, one of the real champions of manufacturing in Congress, Don Manzullo, has been invited and is checking his calendar for availability. Hopefully the Congressman will attend and we can get the latest scoop on manufacturing policy in D.C.



### Schumo Foundation

SFSA with the leadership of Scott Holman and with the generosity of Bob Schumo created the SFSA Foundation to ensure the future of the industry. The Foundation was renamed when Bob passed away in recognition of his vital contribution. The Foundation has about \$120,000 invested from the generosity of several member companies and individuals. We have offered SFSA internships for the past three years and have two sponsored this year. Member companies sponsor interns and pay their salary and guide them in their projects. Interns receive a \$5,000 scholarship after presenting a paper on their project at the T&O Conference. We need to increase the investment available to increase this vital program. I will be sending all members a request for a voluntary contribution to the Schumo Foundation equal to 10% of your annual SFSA dues. IF all participate this will raise over \$40,000 in additional funds. It is hoped that several members will contribute even more so that we can grow the Foundation and sponsor up to 5 interns in the near future.

### Persons Available

A1210 has significant foundry experience in metallurgy, quality control and foundry and process engineering. Involved in ASQC, ASM and AIST.

### Trade Events

The Department of Commerce routinely organizes trade events and a list of upcoming opportunities is at this website:

<http://www.buyusa.gov/uppermidwest/events.html>

A list of upcoming events is attached.

## **Performance Benchmarking**

We have sent out invitations to members to participate at no fee in an industrial benchmarking study. All participants will receive a custom report comparing them to other steel foundries. The survey must be submitted by September 9th. Survey forms and other details are posted here: <http://www.sfsa.org/surveys>

## **SFSA Safety Awards**

SFSA would like to recognize member companies that have better than typical safety records. SFSA members that have maintained a safety record during 2004 equal to or less than 7.0, the national average for all manufacturing will be recognized with a certificate. An application and letter describing the recognition are posted here: <http://www.sfsa.org/safety>

## **Innovation**

Our research program at ISU has been trying to reduce costs and improve quality by managing the finishing operations. Some of their recent results are telling. About 80% of all grinding is done in nonreproducible areas, not at contacts and parting lines. Two important facts could aid members in controlling and reducing their costs here.

One, visual inspection to mark up the casting is not reproducible. Different inspectors have different standards; the same inspector has a different standard on a different day, over grinding costs money but is hidden, under grinding results in returns and rework. The bias in the system is to over grind. Cross training, operator inspections, clear visual standards are all efforts to overcome lack of inspection reproducibility. ISU has made cheap plastic standards for members to use in the cleaning room.

Two, grinding is inefficient. Muscle power is unable to apply enough pressure to efficiently grind. The need to look while grinding while applying maximum pressure leads to back injuries and eye injuries. The lack of adequate pressure leads to clogging the wheel, wasted abrasive, and long cycle times. Jigging, power assists, pre-machining, etc. all offer opportunities to reduce costs, reduce injuries, and improve throughput.

## **Question of the Month**

Last month, the question was the ratio of maintenance hours to production hours. We had only four respondents so I need more members to email me their results. So far, the maintenance hours are reported from 6 to 14% of operating hours. One plant targets their maintenance costs as a percent of gross sales in the range of 10 to 15%. If too little is done the plant is inadequately maintained, too much and no value is added.

This month's question: What percent of your production costs is rework and scrap?

## **High Alloy Research Review**

A review of current SFSA High Alloy research will be held on August 25 at the Spring Hill Suites Chicago O'Hare. Presentations will be given on Heat Treatment Procedure Qualification, the A890 5A Data Set for Inclusion in A923, Corrosion Testing, and Transformation Diagrams. Contact SFSA if you are interested in attending any divisional or research review meeting.

## **Western Division**

On August 18, the Western Division will meet in Spokane, Washington. The program will include presentations on Heat Treatment, Sand Fillers, Castings for the Building Industry, Visual Inspection, and a panel discussion on Flow Coating. All SFSA members are welcome to attend any divisional meetings. Plant tours will be held on August 19.

## **Southern and Eastern Division**

The Southern and Eastern Divisions are holding a joint meeting in Cleveland, Ohio on August 16, including a tour of Foseco's manufacturing facility, presentations on Visual Inspection Variability and Heat Treatment Optimization, Southwest Steel's Safety Program, Developments and Uses of Porous Plugs, and an update on SFSA research.

## **Ohio Technology Showcase**

The Showcase is a three-day event, combining technical sessions, plenary addresses by business, political and government leaders, special forums on selected topics, BestPractices training and tours of Showcase plants. Hear from industry leaders, technology experts, government agency staff and suppliers about the latest in managing energy in your facility and technology developments that can improve productivity and reduce energy in your operations. The Showcase will provide specialized breakout sessions in the following industry sectors: Aluminum and Forging, Polymers and Plastics, Glass, Metal Casting, and Steel. More information is available online at <http://www.ohioshowcase.org>

## **Market News**

Trend cards from SFSA show continued increases exceeding 20% for May in addition to about 20% last year in May and about 10% in May 2003. This is a much lower growth rate than recent months but that rate was clearly a rebound as market demand began to resume normal economic activity. The continued shortages and high prices in a number of commodities continues to stimulate demand for capital equipment. A study, available at <http://www.sfsa.org/sfsa/news/2005/MoriciSteelPrices.pdf> (62kB), from the steel industry shows how small the effect of increases in steel prices has had on the cost of our customers. The market may see some softening as the year ends and the lead times may come down but production rates should remain high. The increase in raw material costs, energy prices and a need to restore financial stability will continue to call for appropriate pricing. The continued shortage of supply and long lead times in many markets shows the limit on steel casting capacity. Orders for steel, capital goods and inventory levels have stabilized at high levels for the past few months.

## **Specification Note**

SFSA participates in ASTM to represent members in the formulation of useable specifications. With global competition, making the specifications reflect the high standards of North American commercial practices helps us compete against newly industrialized regions that cannot meet these standards. One item currently being balloted forbids the use of plugging, peening or impregnation to cover up a rejectable casting condition. This allows the use of peening to clean the surface or to prepare the weld cavity, but forbids peening or plugging to stop a leak in a valve casting. This prohibition is only at the point of certification of the casting by the foundry. ASTM requirements on castings apply at the point of certification in the foundry and do not restrict the user.

## Casteel Commentary

While I have been guilty of predicting too soon the collapse of the Chinese steel foundry industry, it is unquestionable that their current structure is unsustainable. I have taken from their journal, China Foundry, a summary of their costs of materials and their selling price for castings. A summary of their report is in the table and the full report is attached.

Table: Prices for Castings and Scrap from Published Sources

Product	Date	Price \$/ton
Steel Castings US from MA331A(03)-1	Oct 2004	1742
Steel Castings US from USITC Publication 3371	2003	2358
Hot rolled steel sheet (Purchasing Magazine)	Jul 2004	646
Hot rolled steel sheet (Purchasing Magazine)	Jun 2005	495
Reinforcing Bar (Purchasing Magazine)	Jul 2004	468
Steel scrap #1 Heavy melt Chicago (Purchasing Magazine)	Jul 2004	235
Steel scrap Liaoning (China Foundry)	Dec 2004	284
Steel scrap Beijing (China Foundry)	Dec 2004	296-326
Steel scrap Beijing (China Foundry)	Mar 2005	320-356
Steel scrap Hangzhou (China Foundry)	Dec 2004	314
Steel scrap Laiwu (China Foundry)	Jan 2005	258
Steel scrap Wenzhou (China Foundry)	Jan 2005	314
Steel scrap Xi'an (China Foundry)	Jan 2005	278
Manganese Castings Liaoning (China Foundry)	Dec 2004	749-1087
Manganese Castings Tangshan (China Foundry)	Dec 2004	628-1932
Carbon Steel Liaoning (China Foundry)	Dec 2004	700-785
Carbon Steel Tangshan (China Foundry)	Dec 2004	555-580
Carbon Steel Wenzhou (China Foundry)	Jan 2005	785-845
Carbon Steel Xi'an (China Foundry)	Jan 2005	712-785
Alloy steel castings Liaoning (China Foundry)	Dec 2004	1027-1328
Alloy steel castings Xi'an (China Foundry)	Jan 2005	797-870
Stainless Castings 18-8 Xi'an (China Foundry)	Jan 2005	2778-3019
Heat resistant 25-20 Xi'an (China Foundry)	Jan 2005	5072-5435

The steel casting number for the US in MA331A(03)-1 is a low estimate of typical value because it reports on 2003 and that was at the lowest end of the market and high tonnage products have high yields and low labor requirements and are more modestly priced dominate this report. The ITC report 3371, available at <http://www.sfsa.org/sfsa/news/2005/pub3771.pdf> (3,110kB), has a low but more realistic price of \$2358. Minimill products such as hot rolled sheet and reinforcing bar a clearly a lower bound for steel production. In minimills their costs are due to scrap, consumables, maintenance and energy. Labor is fifth or sixth in then cost structure. Without molding or finishing, minimills are selling steel at \$450 to 650 depending on the product and cost of scrap. Steel foundries everywhere are far less efficient at melting and their yield is typically 50% instead of over 90%. Labor is often half the cost of casting production.

If a foundry produces steel as hot metal at minimill costs of \$500 a ton with 50% yield and takes credit for \$200 a ton scrap, the metal cost alone is \$1000 for two tons minus a ton credit for yield, \$200, or \$800 per ton in shipped steel. The ITC report 3371 raw material plus energy costs are \$670 per short ton or \$737 a Metric ton. At 60 man-hours a ton with a fully loaded cost of \$20 per hour there is \$1200 per ton in labor. The ITC report 3371 gives a direct labor cost of \$549 per short ton or \$605 for labor. At a sand to metal ratio of 3, one ton of castings requires 6 tons of sand with \$25 a ton for the sand and \$50 a ton for freight the sand is \$450 and the binder would be about \$25 or \$475 for molds. Mold material costs were included by the ITC report in the raw materials. This pro forma calculation would give a cost of \$2475 for producing a ton of steel castings. The ITC report gives a cost without labor for casting production of \$1464 a short ton or \$1610 for a metric ton. If labor was free it would still cost \$1275 for a ton based on the pro forma estimate or \$1610 based on the ITC study of actual costs in 2003.

In China, scrap is as expensive as it is in the US. Energy is bought at world prices. Producing the steel in China should mirror the cost for steel in the US and that \$750-800 exceeds the selling price of many grades as shown in the table. This analysis shows that it is not possible to compete on price with China but that it is not low cost labor but non-market subsidies that create their advantage. It also demonstrates that China steel casting production is unsustainable at the current costs and reported prices.

China has the goal of producing \$1,000 GDP per capita. In the US a typical steel foundry is capable of producing two tons per employee per month. If China on average is half of our productivity because of the need to employ citizens and because of low labor costs, they would make one ton per person or 12 tons a year. The increase in GDP because of casting can be estimated by subtracting the cost of materials and energy from the selling price. Materials and energy required, from ITC report, have costs that are \$737/ton. At a selling price of \$500 to \$850, the per capita increase in GDP is -\$2844 to +\$1356. If their productivity is poorer as it may well be the picture is even bleaker. This also does not take into account the need for workers to produce more than \$1,000 GDP to account for non-working retirees and children. As has been reported, China is not investing in our industry as it had and this is likely due to the poor contribution to the GDP. As they industrialize they will need their installed capacity to meet their own domestic requirements. Our major challenges are likely to be financing the recapitalization of our industry and staffing.

Raymond

# STEEL FOUNDERS' SOCIETY OF AMERICA

## MEETINGS CALENDAR

### 2005

August

16 Southern and Eastern Divisions Meeting, Cleveland, OH  
18/19 Western Division Meeting, Spokane, WA  
25 High Alloy Research Review, Rosemont, IL

September

10/14 SFSA Annual Meeting, Incline Village, NV

November

2/5 National Technical & Operating Conference, Chicago, IL

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

**SFSA Trend Cards** 3 Mo Avg                      May                      Apr  
(%-12 mos. Ago)

**Carbon & Low Alloy**

Shipments	27.6	32.8	-4.0
Bookings	31.9	40.3	14.0

**High Alloy**

Shipments	46.1	8.3	26.0
Bookings	25.0	-23.0	89.0

**Department of Commerce  
Census Data**

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

Shipments	1,701	1,709	1,732
New Orders	1,772	1,822	1,838
Inventories	2,139	2,155	2,148

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

Shipments	68.3	68.8	69.1
New Orders	72.4	80.6	70.5
Inventories	113.3	113.6	112.9

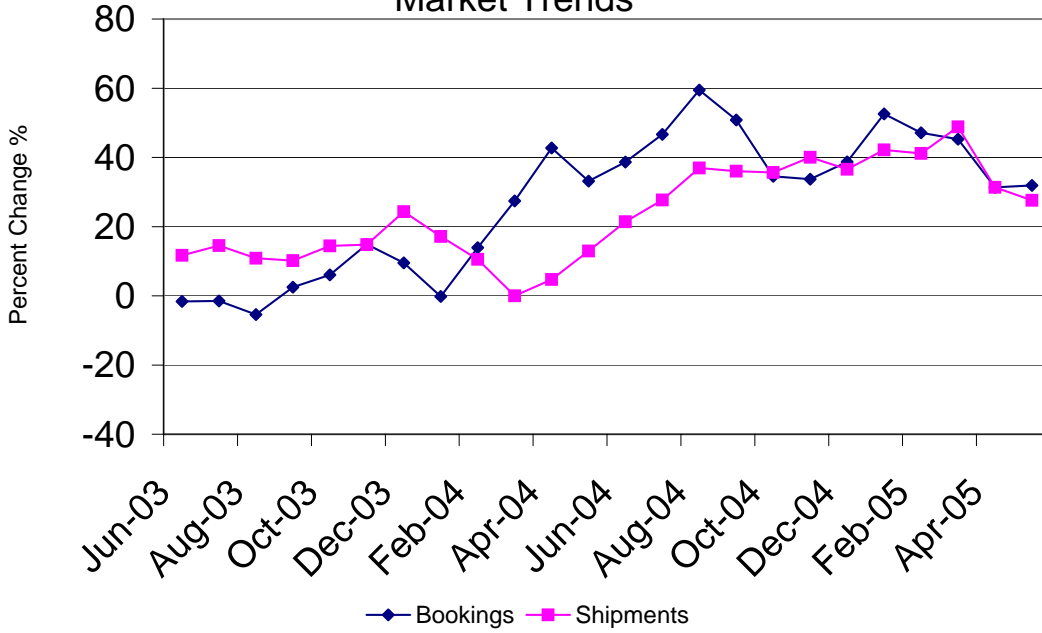
**Nondefense Capital Goods  
less Aircraft (billion \$)**

Shipments	65.2	65.9	65.6
New Orders	65.3	65.1	66.8
Inventories	96.2	96.5	96.1
Inventory/Orders	1.47	1.48	1.44
Inventory/Shipments	1.47	1.46	1.47
Orders/Shipments	1.00	0.99	1.02

**American Iron and Steel Institute**

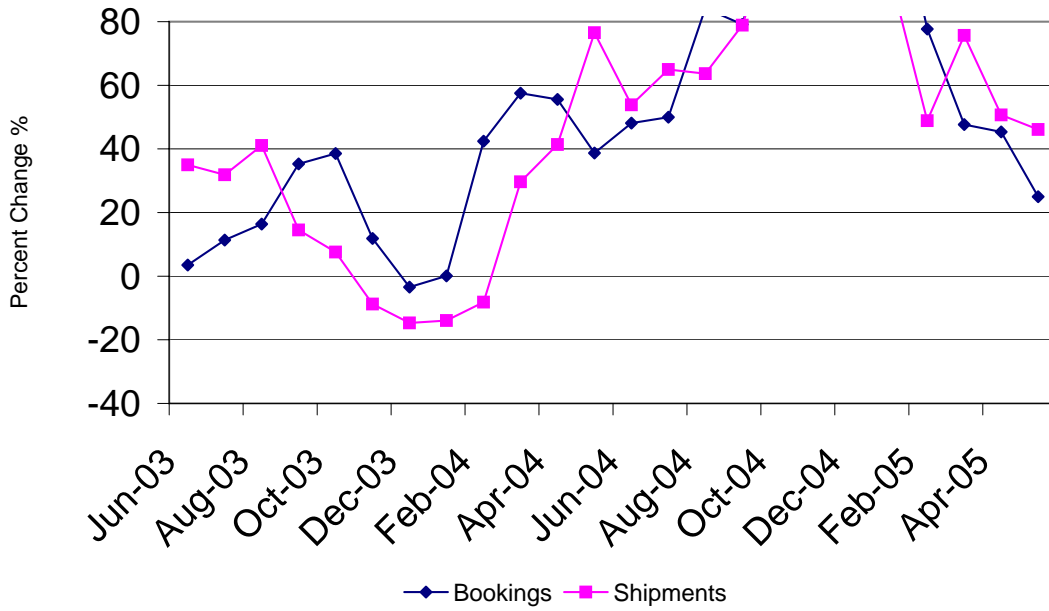
Raw Steel Shipments (million net tons)	8.7	8.4	8.5
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### Carbon & Low Alloy Casting Market Trends



SFSA Postcards

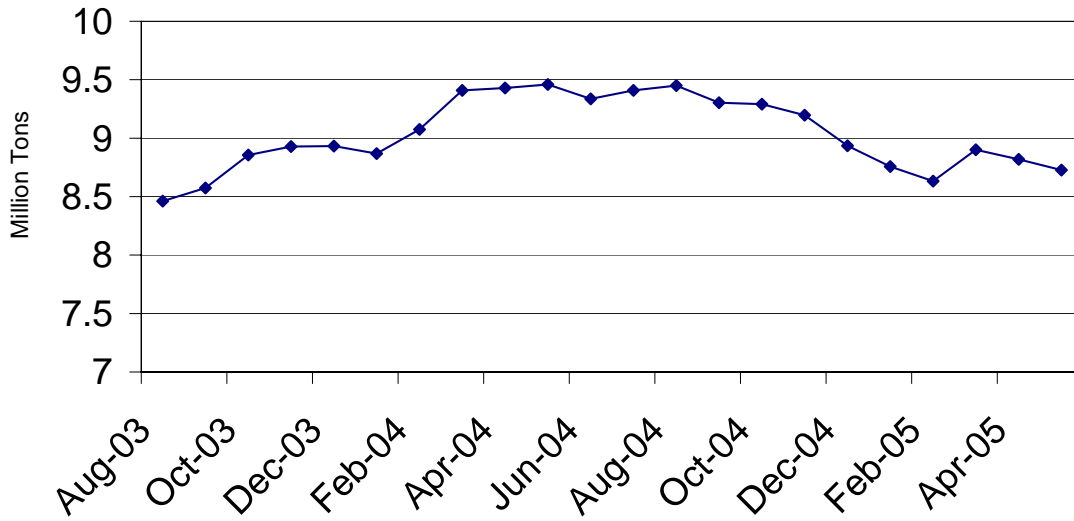
### High Alloy Casting Market Trends



SFSA Postcards

## Raw Steel Shipments

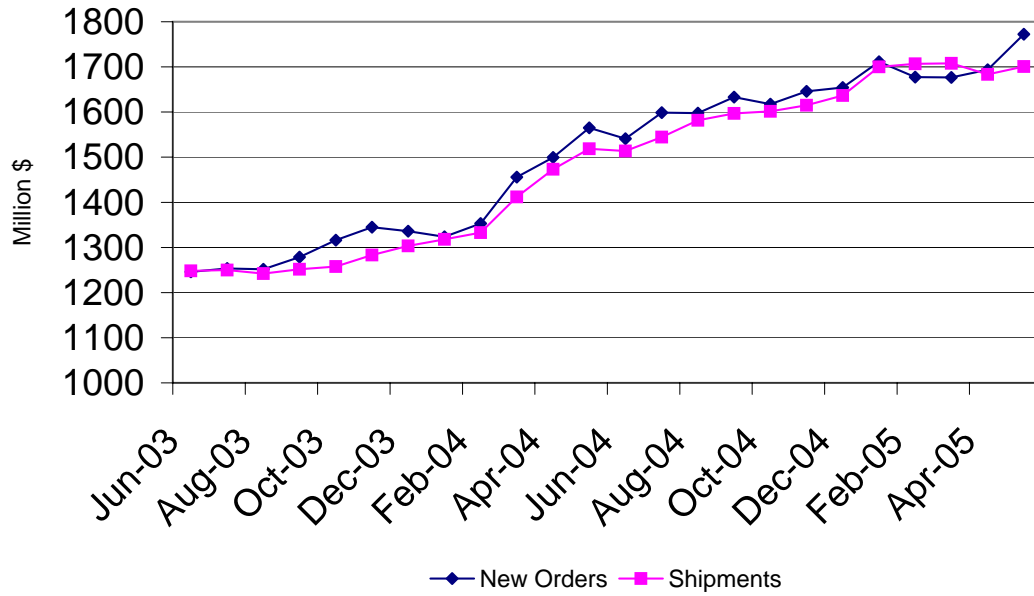
3 month average



AISI Data

## Iron and Steel Castings

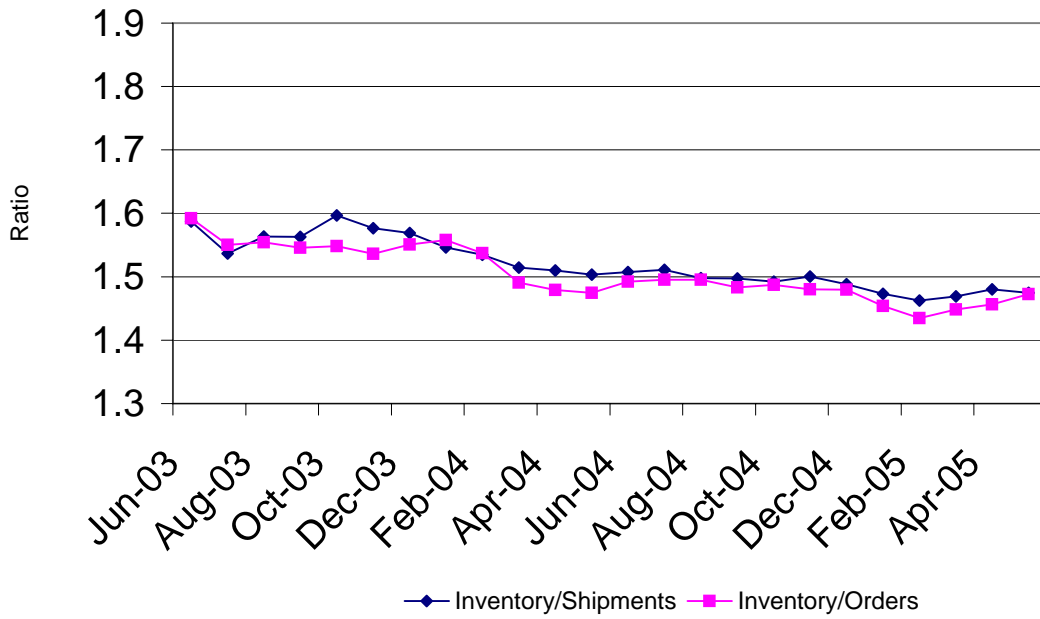
3 month average



SFSA

## Nondefense Capital Goods less Aircraft

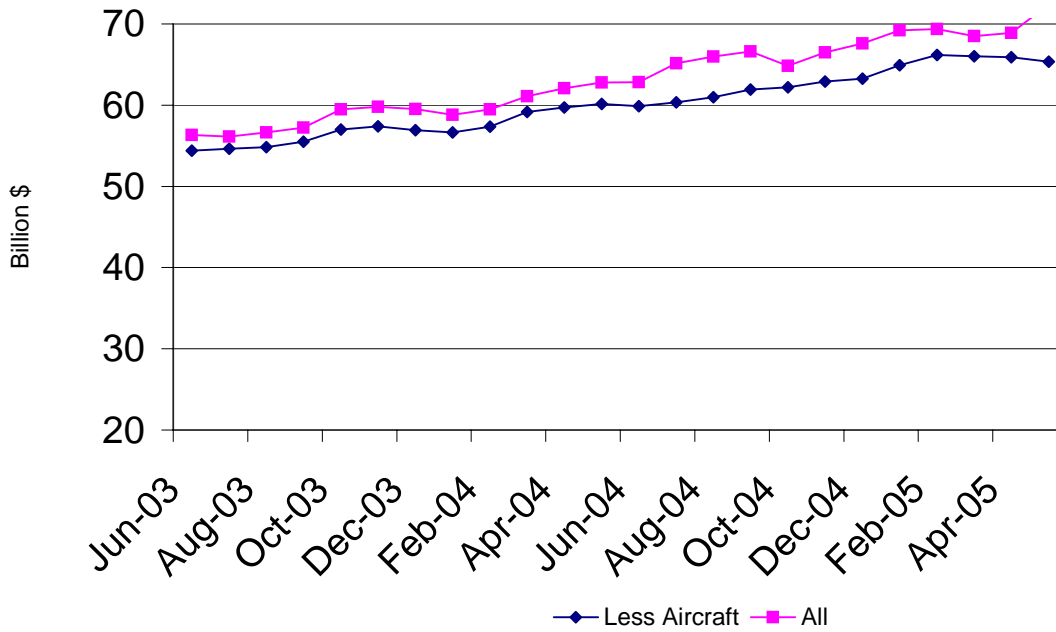
3 month average



Department of Commerce

## Nondefense Capital Goods New Orders

3 month average



Department of Commerce

**Subject: Upcoming Illinois Trade Events**

*Below is a list of upcoming int'l trade events, many of which our office is organizing or co-sponsoring. We hope that you will be able to join us for at least one of them! You can also access this list as well info on other upcoming int'l events & missions at <http://www.buyusa.gov/uppermidwest/events.html>*

*Best Regards,*

*Debra H. Rogers  
International Trade Specialist  
U.S. Export Assistance Center – Chicago  
US Dept of Commerce  
T: 312-353-6988*

**July 29-31, 2005: Africa Business Opportunities Conference - Chicago**

Events include an exporting workshop on Friday, panels discussions on doing business in Africa on Saturday, and a dinner and fashion show on Sunday. Sponsored by African Connections, Chicago Sister Cities, & Northwestern University African Studies Program. Our office will be presenting at the exporting workshop at 12:30 on Friday along with our colleagues from the Export-Import Bank, the Illinois Trade Office, and the SBA. All events at Northwestern University Law School, 357 E. Chicago Ave., Chicago. For information & registration, contact African Connections at 312-674-4985 or [info@africanconnections.biz](mailto:info@africanconnections.biz) or Northwestern University African Studies program at 847-491-7323 or [african-studies@northwestern.edu](mailto:african-studies@northwestern.edu).

**August 1, 2005: EU Regulations Briefing on WEEE and RoHS - WebEx**

Do you export electronic or electrical goods/components to the European Union? Do you know what WEEE and RoHS stand for, or how these EU regulations will affect the import of their products into the EU? The Waste of Electronic and Electrical Equipment (WEEE) directive goes into effect in August 2005, and the Reduction of Hazardous Substances (RoHS) directive goes into effect in July 2006. These EU regulations place the burden on manufacturers to reduce the environmental impact of both production processes and the disposal of the actual products throughout the 25 EU Member States. To learn more, please join us on Monday, August 1 at 12:00 noon for a U.S. Commercial Service Europe Team-sponsored WebEx (internet & teleconference) briefing that will demystify these new directives and provide guidance compliance. This briefing is free of cost, but please RSVP to Shanna Obluck or Catherine Pligavko at [Shanna.Obluck@mail.doc.gov](mailto:Shanna.Obluck@mail.doc.gov) or 312-353-3749. Call in/ log in details will be sent out on Friday, July 29.

**August 24, 2005: NAFTA, Chile, Singapore & Australia FTAs: Certification & Rules Of Origin – Crystal Lake**

Seminar sponsored by McHenry County College, the McHenry International Networking Group, and the U.S. Department of Commerce, Rockford Export Assistance Center. Presentation by Louisa Elder, Trade Specialist, Abbott. 9:00 a.m. – 2:30 p.m., McHenry County College Conference Center, Building B, 8900 U.S. Highway 14, Crystal Lake, IL. Fee: \$40. Advance registration requested by Aug. 20. For information and registration, call Dawn Wagner at 815/479-7737 or e-mail [dwagner@mchenry.edu](mailto:dwagner@mchenry.edu).

**September 8, 2005: Minority Enterprise Development (MED) Week, Global Trade Workshop - Chicago**

The workshop will focus on how to take advantage of government financing programs and free trade services. Exporting questions will be answered by a panel of government experts from the U.S. Department of Commerce; Small Business Administration; Export - Import Bank; Illinois Department of Commerce, & Economic Opportunity, International Trade Office & the International Entrepreneurship Network/ITC. Venue: Hyatt Regency, Chicago. Register at [www.chicagomedweek.com] or (312) 353-0182 for this and other MED Week events September 7-9. For questions specifically regarding this workshop, contact Constance Green at [constance.green@mail.doc.gov](mailto:constance.green@mail.doc.gov) or 312-353-4798.

**September 8-15, 2005: Print '05 – Chicago**

Held every four years, PRINT@05 is the largest international trade event for the prepress, printing, publishing, converting, mailing and fulfillment industry in the world in 2005. Since this is a certified International Buyer Program (IBP) show, U.S. Commercial Service overseas offices are recruiting foreign buyer delegations from all over the world to attend this show. Chicago USEAC staff can help you meet members of those delegations and will be available for export counseling in the show's International Business Center. Contact: Debra Rogers at 312-353-6988 or [debra.rogers@mail.doc.gov](mailto:debra.rogers@mail.doc.gov)

**Sept. 9 - Nov 4, 2005: Illinois Certificate in International Business - Chicago**

The State of Illinois Certificate in International Business trains executives through entrepreneurs in the theory and practice of international business. The 5-day program is taught by leading experts and practitioners and covers topics such as international marketing, finance, and supply chain management while also preparing candidates to take the NASBITE Certified Global Business Professional (CGBP) national exam. It will be offered alternating Fridays from September 9 to November 4 at the James R. Thompson Center in Chicago, IL. For more information, go to [www.bradley.edu/turnercenter/cib](http://www.bradley.edu/turnercenter/cib) or contact the International Trade Center at Bradley University at (309) 677-3075.

**September 22, 2005 The CEO Guide to Innovation and New Product Development**

2nd in the Manufacturing Seminar Series aimed at CEOs and upper management of manufacturing companies facing offshore competition and seeking to accelerate innovation. CEO Speaker Bob Deprez, CEO and Owner of Martinez Group International; Keynote Speaker: Michael Collins, hosted by McHenry County College, 8900 US Highway 14, Crystal Lake, IL. 8 AM to Noon. Cost: \$65.00. Register on line at [www.cmcusa.org/events/ceoseriefcm](http://www.cmcusa.org/events/ceoseriefcm).

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# Prices of Castings, Foundry Raw and Auxiliary Materials in Some Regions of China

(Time range: Nov. 2004-Mar. 2005)

## Prices of foundry materials for investment casting in Shenyang region in 2003-2004

Name	Price (RMB yuan /t)	Range of price rise (%)
Urea	1 350-1 900	40.74
Zircon flour	6 700-9 700	44.78
Gangue flour (sand)	360-440	22.72
Fuel oil	3 500-4 300	22.86
Ferrochromium	9 800-13 100	33.67
Stainless steel scrap	8 900-13 900	56.18
Coal	220-295	34.09
Nickel plate	110 000-165 000	50
Aluminum ingot	15 100-17 300	14.57
Ferromolybdenum	64 000-305 000	376.56

\*The information is provided by Shoushan SUN, Shenyang Sidanli Co. Ltd.

## Prices of foundry materials and castings of Beipiao city, Liaoning in the end of Dec. 2004

Name	Price (RMB yuan /t)	Name	Price (RMB yuan /t)
<i>1. Foundry materials</i>		<i>2. Castings</i>	
Mechanical iron	2 100-2 200	High-manganese castings for	
Scrap steel	2 300-2 400	Cement and building material	6 200-7 000
High-carbon Ferromanganese (75%)	9 000-9 200	Mine and metallurgy	8 000-9 000
Ferromolybdenum (60%)	325 000-330 000	Carbon steel castings	5 800-6 500
Water glass	600	Medium-carbon alloy steel castings	8 500-9 000
Pig iron	2 300-2 500	High-carbon medium-chromium	
Scrap manganese steel	3 300-3 400	steel castings	10 000-11 000
Ferrosilicon	7 000-7 200	Grey iron castings	4 000-5 000
High-carbon ferrochromium	8 000-8 200	Ductile iron castings (pipe)	7 000-8 000
α-starch	5 000		

\* The information is provided by Zhongbao LI, Multielement Alloy Foundry Co. Ltd

## Prices of foundry materials and castings of Hangzhou region in early Dec. 2004 (including tax)

Name	Price (RMB yuan /t)	Name	Price (RMB yuan /t)
<i>1. Foundry materials</i>		Mould sand	1 480
Ferrosilicon 75#	6 800	Red sand	230
RE magnesium alloy	8 500	Metallurgical coke	1 750
Pig iron for ductile iron	2 850	<i>2. Castings</i>	
Common pig iron	2 750	Ordinary castings HT200	4 500
Ferromanganese (silicon-manganese)	7 500	Ordinary castings HT250	5 000-5 500
Bentonite	230	Ductile iron castings	5 800-6 200
Scrap steel	2 600		

\* The information is provided by Zhengqiang LU, Jiande Qiangsheng Foundry Co.Ltd

### Foundry materials prices of part regions of China in early Dec. 2004

Name	Production Place	Price (RMB yuan /t)	Name	Production Place	Price (RMB yuan /t)
Q10 pig iron	Hebei	2 750	Coal dust	Baotou	1 200
Common pig iron	Shanxi	2 600	Bentonite	Liaoning	890
Special grade scrap steel	Beijing	2 700	Water-base coating	Beijing	4 800
Common scrap steel	Beijing	2 450	Alcohol-base coating	Beijing	5 200
Recarburizer	Hebei	3 300	Metal mold coating	Beijing	4 800
Ferrous sulfide	Changzhou	9 600	Furan resin	Beijing	11 000
Deslagging agent	Beijing	1 160	Binder	Beijing	3 900
Ferrosilicon	Qinghai	8 500	Stripping agent	Guangdong	29 000
Ferromanganese	Tianjin	7 300	Filter screen	Guangdong	0.1 yuan/cm <sup>2</sup>
Nickel plate	Jinchuan	160 000	Patching pasty	Beijing	8 600
Ferromolybdenum	Beijing	260 000	Plastic material for cupola	Beijing	11 500
Tin ingot	Beijing	96 000	Spray-patching materials for cupola	Beijing	3 900
Copper wire	Beijing	55 000	Rammed materials for cupola	Beijing	3 900
Ferro phosphor	Beijing	6 800	Pouring materials for ladle	Beijing	3 700
Sr-series inoculants	Jilin	19 000	Coke powder	Beijing	1 200
Ba-series inoculants	Xi'an	11 000	Clay-bonded sand	Beijing	0.55 yuan/block
Si-series inoculants	Qinghai	89 000	Wood	Beijing	600
Ferrosilicon magnesium alloy	Beijing	96 000	Clay	Beijing	120
Coke	Shanxi	1 750	Amorphous graphite	Henan	380
Limestone	Beijing	150	Crystalline graphite	Henan	1 400
Scrubbed sand	Hebei	460			

\*The information is supplied by Xuefang GENG, Lishile (Beijing) Hydraulic Co. Ltd

### Castings prices of Tangshan region, Hebei in early Dec. 2004 (including tax)

Name	Price (RMB yuan /t)	Remarks
<b>1. Carbon steel and alloy steel</b>		
ZG35, ZG45 (Carbon steel)	4 600-4 800	Ordinary castings
ZGMn13	5 200-5 800	Teeth plate, liner and impact board
ZGMn17-19 (super-high manganese steel)	14 000-16 000	Large scale crusher (more than 120kg)
ZG40Cr	5 600-6 200	Large hammer etc.
ZG42Cr2MnSiMoRE	6 600-7 200	Liner for large ball mill and cement mill
ZGCr13 (high-chromium liner)	9 000-11 000	
<b>2. Grey iron and high-chromium alloy casting iron</b>		
HT 200-400	3 800-4 200	Ordinary castings
KmTBCr26	12 000-14 000	Impurity pump and impeller for washed coal
Ductile iron	4 800-5 200	Liner for cyclone separator etc.

\*The information is supplied by An LI, Yongkang Chengan Machine Works

**Prices of foundry materials and castings of Yongkang, Zhejiang in Dec. 2004 (not including tax)**

Name	Price (RMB yuan /t)	Name	Price (RMB yuan /t)
<i>1. Foundry materials</i>		6# silica flour	130
Sundry brass	17 500	Thermal insulation sand	290
Scrap aluminum	14 000	<i>2. Castings</i>	
Non-standard pig iron	2 150	Brass castings	20 000-23 000
14# pig iron	2 200	Aluminum castings	19 000-22 000
18# pig iron	2 350	Non-standard iron castings	3 200-3 500
10-12# pig iron for QT	2 500	HT150 grey iron castings	3 300-3 700
75# ferrosilicon	4 900	HT200 grey iron castings	3 600-4 000
65# ferromanganese	4 500	QT400 ductile iron castings	4 500-5 000
Crystalline silicon	7 900	QT500 ductile iron castings	4 800-5 300
Kaolin	285	QT600 ductile iron castings	5 000-5 500
Red coal dust (Datong)	650		

\*The information is provided by An LI, Yongkang Chengan Machine Works

**Prices of castings and foundry materials of Wenzhou region, Zhejiang in early Dec. 2004**

Name	Price (RMB yuan /t)	Name	Price (RMB yuan /t)
<i>1. Castings</i>		Rim charge for press forming	2 500
Ductile cast iron (including tax)	6 000	Premium grade coke (lower S)	1 450
Ductile cast iron (small castings, including tax)	6 500-7 500	(produced by Shanxi)	
Ordinary castings	4 000-5 000	5-8# alloy nodulizer	8 500
<i>2. Foundry materials</i>		(produced by Baotou, including tax)	
14 # pig iron for QT	2 500	Ferrosilicon (70%)	5 300
(lower P, S, not including tax)		Red coal dust	600
Common pig iron	2 300	Kaolin	370
Cast iron scrap	2 200-2 300	Molding sand	150
		(produced by Fujian)	

\*The information is supplied by Jinxiang WANG, Wenzhou louqiang dongfeng Foundry Works

**Foundry materials prices of Laiwu region, Shandong in the middle of Jan. 2005**

Name	Price (RMB yuan /t)	Name	Price (RMB yuan /t)
Common pig iron	2 323	Fireclay	190
High-purity pig iron	2 688	Common clay	67
Coke	1 128	Premium quality bentonite	660
Block coal	547	Common bentonite	240
Scrap steel	2 137	Coal dust	654
Scrap copper	28 205	Resin	10 086
Ferromanganese	6 496	Hardener	3 743.6
Nodulizer	6 421-8 200	Coating	2 735
Inoculation	6 667-8 120	Stripping agent	13 850
Raw sand	99	Resin-coated sand	256
Washed-out sand	160		

### Castings prices of Laiwu region, Shandong in the middle of Jan. 2005

Name	Price (RMB yuan /t)	Name	Price (RMB yuan /t)
<i>Grey cast iron:</i>		<i>Ductile cast iron:</i>	
Rough castings	4 000-6 000	Rough castings	4 800-9 000
Finished castings	5 000-10 000	Finished castings	6 000-13 000

\*The information is provided by Jie ZHANG, Shandong Laiwu Huijin Co. Ltd.

### Prices of castings and foundry raw materials of Wenzhou region, Zhejiang in the middle of Jan. 2005 (not including tax)

Name	Price (RMB yuan /t)	Name	Price (RMB yuan /t)
<b>1. Castings</b>		Brass	20 000
Iron castings	4 300-4 500	Kaolin	300
Ductile iron castings	5 500	Water-base coating for steel castings	2 500
Carbon steel castings	6 500-7 000	<b>3. Raw materials for investment casting:</b>	
Carbon steel castings produced by investment casting	8 000-9 000	58°-70° wax	5 900
Iron castings produced by EPC	8 500-9 000	(produced by Dalian Petrochemical Co.)	
Exhaust tube castings	10 000	Stearic acid	6 300
<b>2. Foundry raw materials:</b>		(produced by Lanxi, Zhejiang)	
Common pig iron	2 300	Crystalline aluminum chloride	2 500
Pig iron for ductile cast iron	2 500	(produced by Whenzhou)	
Coke	1 400	Ammonium chloride (produced by Hangzhou)	950
Scrap steel	2 600	Artificial silica sand:	
Ferrosilicon (70%)	5 300	(produced by Liushi Silica Ltd. Co., Fuzhou):	
Ferromanganese (60%)	5 800	5# and 6# dry silica sand	300 (Bag-pack)
		9# silica sand	380 (Bag-pack)

\*The information is provided by Jingfei CHEN, Whenzhou Foundry Centre

### Castings prices of Xi'an region, Shanxi in Jan. 2005

No.	Name	Price (RMB yuan /t)	Remarks
1	Carbon steel castings	5 900-6 500	Sand casting, ordinary requirement
2	Alloy steel castings	6 600-7 200	Sand casting, not containing Mo
3	ZG30Cr26Ni5	18 000-19 000	Sand casting, ordinary requirement
4	ZG1Cr18Ni9Ti	23 000-25 000	Sand casting, ordinary requirement
5	ZG35Cr25Ni20	42 000-45 000	Sand casting, ordinary requirement
6	ZG35Cr24Ni7Si2N	21 000-24 000	Sand casting, ordinary requirement
7	ZG35Cr18Mn12Si2N	19 000-21 000	Sand casting, ordinary requirement
8	High-manganese steels	6 300-7 000	Sand casting, ordinary requirement
9	ZGMn13Cr2	6 600-7 300	Sand casting, ordinary requirement
10	Grey iron castings	4 200-4 800	Sand casting, ordinary requirement
11	Ductile iron castings	5 300-6 000	Sand casting, ordinary requirement
12	KmTBCr26	11 000-12 000	Sand casting, ordinary requirement

The prices of carbon steel castings, stainless and heat resistant steels tend to be stable. The prices of low alloy not containing Mo remain relatively stable, but the prices of iron castings are rising a bit. The prices of alloy steel containing Mo and high-manganese steels tend towards rise with raising of the prices of ferromanganese and ferromolybdenum.

**Prices of main foundry materials of Xi'an region, Shanxi in early Jan. 2005**

No.	Name	Price (RMB yuan /t)	Remarks
1	Scrap steel	2 300	Medium-size
2	Foundry pig iron	2 100	Mean price
3	Turnings	1 800	
4	High-carbon manganese steel	7 800	Price by Mn65 P<0.2%
5	High-carbon manganese steel	7 400	Price by Mn65 P≥0.2%
6	Low-carbon manganese iron	14 500	Price by Mn78
7	High-carbon ferrochromium	6 500	Price by Cr50
8	Low-carbon ferrochromium	10 500	Price by Cr50
9	Ferromolybdenum	350 000	Price by Mo55
10	RE ferrosilicon	9 200	
11	RE silicon magnesium alloy	11 000	Mean price
12	Ferrosilicon	5 700	Price by Si75
13	Silica sand	240	
14	Bentonite	360	
15	Water glass	840	
16	Carbon dioxide	26	Each bottle
17	Pig iron for ductile iron	2 400	Mean price
18	Metallurgical pig iron	2 300	Mean price
19	Coke	950	
20	Nickel plate	155 000	

General trend of price is: the prices of auxiliary materials are relatively stable, but the price of iron, steel and ferro-alloy are in a state of considerable fluctuation. After adjusted last time, the prices of scrap steel remain stable, but the prices of ferrochromium and ferrosilicon drop down a bit. The prices of ferromanganese, especially low ferromanganese has gone up. The prices of ferromolybdenum are always at the high levels; the prices of pig iron appear to be lower first than those of scrap steel. Therefore, the factories producing high-manganese steel should develop the new wear-resisting metal, such as low-manganese wear-resisting steel and medium-chromium wear-resisting steel.

\*The information is provided by Baizhan LEI, Shanxi Xindong Foundry Co. Ltd

**Prices of foundry materials of Qinghai region in Jan. 2005**

Name	Price (RMB yuan /t)	Name	Price (RMB yuan /t)
<b>1. Metal materials</b>		Red sand	250
Low-carbon ferrochromium	10 256	Water glass	1 717
High-carbon ferrochromium	6 926	<b>3. Coatings</b>	
Ferrosilicon	5 727	CMC	7 000
Medium-carbon Ferromanganese	14 102	Sodium carbonate	1 600
Ferromolybdenum	310 000	Iron oxide powder	5 000
Z18 pig iron	2 850	Silica flour	650
RE ferrosilicon	11 112	Bauxite	1 111
Ferro-phosphor	3 076	Bentonite	800
<b>2. Molding materials</b>		Zircon Powder	7 600
Clay	384	<b>4. Other material</b>	
Silica sand	61.32	Deslagging agent	7 600

\*The information is provided by Fakui ZHAO, Qinghai Datongqiao Foundry Co.

**Prices of foundry materials and castings of Xiuzhou, Anhui in the middle of Feb. 2005**

Name	Price (RMB yuan /t) (Including tax)
<b>1. Foundry materials:</b>	
Q12 pig iron	2 740
Ferrosilicon (75%)	5 600
RE magnesium alloy	8 300
Coke	1 300
Kaolin	180
Coal dust	460
Scrap steel	2 400
<b>2. Castings:</b>	
HT250	3 900-4 200
QT450	5 000-5 500

\*The information is provided Jianguo CAI, Xiuzhou Caisi Foundry Co.

**Prices of foundry raw materials in Jinhua region, Zhejiang in the middle of March 2005**

Name	Price (RMB yuan /t) (Including tax)
18# pig iron	2 850
Q12 pig iron	3 100
RE magnesium alloy	8 200
Coke	1 500
Clay	270
Coal dust	480
Scrap steel	2 800
60# ferromanganese	5 500
72# ferrosilicon	5 800
5# silica sand	140
Thermal insulation sand	280

\*The information is provided by An LI, Yongkang Chengan Machine Works

**Foundry materials prices of part regions of China in the middle of March 2005**

Name	Price (RMB yuan /t)	Regions	Name	Price (RMB yuan /t)	Regions
Q10 pig iron	3 250	Hebei	Coke	1 000	Shanghai
Ordinary pig iron	3 100	Hebei	Limestone	170	Beijing
Special grade scrap steel	2 950	Beijing	Scrubbed sand	560	Hebei
Ordinary scrap steel	2 650	Beijing	Bentonite	1 200	Baotou
Recarburizer	3 500	Hebei	Water-base coating	4 500	Beijing
Ferrous sulphide	11 000	Jiangsu	Alcohol-base coating	5 500	Beijing
Deslagging agent	1 200	Beijing	Metal mould coating	4 500	Beijing
Ferrosilicon	7 300	Qinghai	Furan resin	12 000	Beijing
Ferromanganese	8 100	Tianjin	Binder	4 800	Beijing
Nickel plate	170 000	Jinchuan	Stripping agent	31 000	Guangdong
Ferromolybdenum	275 000	Beijing	Filter screen	(0.2 yuan/cm <sup>2</sup> )	Guangdong
Tin ingot	10 000	Beijing	Patching pasty for core	8 800	Beijing
Copper	66 000	Beijing	Spray-patching for copula	12 000	Beijing
Ferrophospher	7 000	Beijing	Rammed material for cupola	4 200	Beijing
Sr-series inoculants	17 000	Xi'an	Clay	150	Beijing
Ba-series inoculants	12 000	Qinghai	Amorphous graphite	860	He'nan
Si-series inoculants	75 000	Beijing	Crystalline graphite	2 150	He'nan
RE silicon-magnesium	9 200	Beijing			

\* The formation is provided by Xuefang GENG, Lileshi (Beijing) Hydraulic Co. Ltd

**Ferrovanadium prices of main regions  
in the end of Nov. 2004 (including tax)**

Specifications	Price (RMB yuan /t)	Regions
Fev50	158 000	Jinzhou
	157 000	Linghai
	158 000	Panzhuhua
	153 000	Qinghe
	162 000	Nanjing
	156 000	Jiangyin

\*The information is extracted from Chinese Hot Treatment Net

**Medium-carbon ferromanganese prices of main  
regions in the end of Nov. 2004 (including Tax)**

Specifications	Price (yuan /t)	Regions
FeMn78C2.0	12 200	Shanghai
	11 800	Xi'an
	12 000	Jinzhou
	11 800	Deyang
FeMn78C1.5	12 600	Shanghai
	12 300	Xi'an
	12 400	Jinzhou
	12 200	Deyang

**Medium-carbon ferrochromium prices of main  
regions in early Dec. 2004 (including tax)**

Specifications	Price (RMB yuan /t)	Regions
FeCr69C2.0	11 800	Wuhan
FeCr55C200	9 500 (50 basic price)	Shanghai
FeCr55C200	9 200 (50 basic price)	Shenyang
FeCr55C100	9 200 (50 basic price)	Jilin
FeCr55C200	11 600 (60 basic price)	Huangshi
FeCr55C200	11 500 (60 basic price)	Anyang

\*The information is carried in Chinese Foundry Materials and Equipment Net

**Ferromolybdenum prices of main regions  
in Feb. 2005 (including tax)**

Specifications	Price (RMB yuan /t)	Regions
FeMo60	355 000	Qinghe
	360 000	Jiangyin
	365 000	Chaoyang
	364 000	Jinzhou
	365 000	Ranchuan
	368 000	Huludao

\*The information is supplied by Chinese Foundry Materials and Equipment Net

**High- and low-carbon ferrochromium prices  
of main regions in Dec. 2004 (including tax)**

Specifications	Price (RMB yuan /t)	Regions
FeCr55C1000	6 500 (50 basic price)	Liaoyang
		Lanzhou
		Shenyang
		Chongqing
FeCr67C9.5	6 600 (50 basic price)	Nanjing
	6 550 (50 basic price)	Jiangyin
FeCr55C25	12 200 (60 basic price)	Xinhua
	12 000 (60 basic price)	Jinan
	11 700 (50 basic price)	Jilin
	10 000 (50 basic price)	Shenyang
	11 400 (50 basic price)	Yongdeng
	9 900 (50 basic price)	Jiande

**Ferrosilicon prices of main regions in Feb. 2005  
(including tax)**

Specifications	Price (RMB yuan /t)	Regions
FeSi75	5 200	Shizuishan
	5 200	Xi'an
	5 300	Rongjing
	5 300	Xichang
	5 800	Shanghai
	5 600	Wuxi
	5 200	Baotou
	5 300	Zunyi
	5 200	Lanzhou
	5 200	Anyang
FeSi72	5 000	Shizuishan
	5 000	Lanzhou
	5 000	Xi'an
	5 100	Rongjing
	5 100	Xichang
	5 400	Wuxi
	5 600	Shanghai
	5 000	Anyang
	5 200	Zunyi
	5 000	Baotou

\*The information is supplied by Chinese Foundry Materials and Equipment Net

**Ferrotungsten prices of main regions  
in Jan. 2005 (including tax)**

Specifications	Price (RMB yuan /t)	Regions
FeW80 (70 basic price)	72 000	Lengshuijiang
	73 000	Jinzhou
	71 000	Shanghai
	71 000	Ganzhou
	72 000	Changshu
	70 000	Lanzhou
FeW70 (70 basic price)	73 000	Wuhan
	72 000	Jiangyin
	72 000	Tianjin
	71 000	Xingtai
	71 000	Anshan
	72 000	jinan
	72 000	Chengdu

\*The information is extracted from Chinese Hot Treatment Net

**Ferromolybdenum prices in some regions  
in the middle of March 2005**

Specifications	Price (RMB yuan /t)	Regions
FeMo60	390 000-400 000	Qinghe
	410 000-420 000	Jiangying
	410 000	Chaoyang
	410 000-415 000	Jinzhou
	415 000	Luanzhou
	410 000	Huludao

\*The information is supplied by Chinese Foundry Materials and Equipment Net

**Ferrotitanium prices of main regions  
in early Jan. 2005 (including tax)**

Specifications	Price (RMB yuan /t)	Regions
FeTi30-A	11 500	Linhai
	11 800	Handan
	12 000	Tianjin
	11 300	Yizheng
	11 500	Taiyuan
	11 700	Jinzhou
	12 000	Anyang
	11 500	Changge
	13 000	Shijiazhuang

\*The information is carried in Chinese Foundry Materials and Equipment Net

**Medium-carbon ferromanganese prices of  
main regions in early Jan. 2005 (including tax)**

Specifications	Price (RMB yuan /t)	Regions
FeMn78C2.0	12 300	Shanghai
	12 100	Xi'an
	12 300	Jinzhou
	12 100	Deyang
FeMn78C1.5	12 700	Shanghai
	12 600	Xi'an
	12 700	Jinzhou
	12 600	Deyang

\*The information is extracted from Chinese Hot Treatment Net

**Prices of some alloy materials in Liuzhou, Guangxi in early March 2005 (including tax)**

Name	Specifications	Price (RMB yuan /t)
High-carbon ferromanganese	FeMn65C7.0	6 850
Medium-carbon ferromanganese	FeMn75C1.5	12 000
Ferrosilicon	FeSi75Al1.5-A	6 850
High-carbon ferrochromium	FeCr55C1000	8 600
Medium-carbon ferrochromium	FeCr55C2.0	13 500
Low-carbon ferrochromium	FeCr55C25	15 000
Trace-carbon ferrochromium	FeCr55C15	16 500
RE ferrosilicon	FeSiRE24	10 500
RE magnesium ferrosilicon	FeSiMg8RE5	8 600
RE magnesium ferrosilicon	FeSiMg8RE7	8 900
RE magnesium ferrosilicon	FeSiMg10RE7	9 000

\* The information is provided by Hongxin Che, Liuzhou yufeng Cement Alloy Wear-resistant Materials Works