Status and Outlook of China Foundry Industry

China Foundry Association

Sept. 2012
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I. Briefings on status of foundry industry

1. Casting Output

In the past 12 years the average casting output annual increase rate is 11%.

the total output have reached 41.5 million tons in 2011, exceeding 40% of the total output of the whole world.
Output of casting since 2000

Annue output (10Kt)

Year

1 2 3 4 5 6 7 8 9 10 11 12

Output: 1395 1489 1626 1987 2242 2442 2809 3127 3350 3530 3960 4150
share of casting material (2011)

- GCI, 48.0%
- SGI, 25.0%
- MCI, 1.0%
- steel, 13.0%
- Cu alloy, 2.0%
- Al alloy, 10.0%
- others, 1.0%
share of customer industries in 2011

- automobile, 25%
- internal combustion engine, 14%
- construction machinery, 10%
- heavy and mining machinery, 12%
- casting pipe and fittings, 11%
- machine tool, 8%
- power generation, railway, 6.5%
- ship, 1%
- textile, 1%
- others, 7%
2. Status of Foundries

- There are about 30 thousands of foundries, largely located in East, North-East and North of China.

Most of foundries are in small or middle size, the average production per plant is only 1383t.

- There are about 2 million employees in foundry field, the average one person output is 20 ton.
Distribution of foundries in China

Large foundry Provinces
- Jiangsu: 3.52 million tons
- Shandong: 3.47 million tons
- Hebei: 3.40 million tons
- Zhejiang: 3.20 million tons
- Shanxi: 3.20 million tons
- Liaoning: 2.74 million tons
- Henan: 2.08 million tons
- Hubei: 1.33 million tons
- Anhui: 1.12 million tons
- ......
in today's China, more than 40 foundries are able to produce castings of more than 30 tons, among which the largest single piece of ductile iron casting weighs 145t and the largest steel casting weighs 520t.
The pouring site of the 520t casting
# Leading Foundries in China

<table>
<thead>
<tr>
<th>Company Name</th>
<th>Main Products</th>
<th>Province</th>
</tr>
</thead>
<tbody>
<tr>
<td>Xinxing Ductile Iron Pipe Co., Ltd</td>
<td>Cast Pipe</td>
<td>Hebei</td>
</tr>
<tr>
<td>China First Heavy Industries</td>
<td>Cast Steel</td>
<td>Heilongjiang</td>
</tr>
<tr>
<td>Sinosteel Xintai Machinery &amp; Mill Roll Co., Ltd</td>
<td>Mill Roll</td>
<td>Hebei</td>
</tr>
<tr>
<td>Anshan Heavy Machinery Co., Ltd</td>
<td>Cast Steel</td>
<td>Liaoning</td>
</tr>
<tr>
<td>Faw Foundry Co., Ltd</td>
<td>Auto Casting</td>
<td>Jilin</td>
</tr>
<tr>
<td>Weichai Power Foundry &amp; Forging Co., Ltd</td>
<td>Auto Casting</td>
<td>Shandong</td>
</tr>
<tr>
<td>Anhui Yingliu Group</td>
<td>Cast Steel</td>
<td>Anhui</td>
</tr>
<tr>
<td>Kocel Group</td>
<td>Cast Steel</td>
<td>Ningxia</td>
</tr>
<tr>
<td>Jixin Wind Power Technology Co., Ltd</td>
<td>Wind Power Casting</td>
<td>Jiangsu</td>
</tr>
<tr>
<td>Dalian Huarui Cast Steel Co., Ltd</td>
<td>Cast Steel</td>
<td>Liaoning</td>
</tr>
</tbody>
</table>
3. Import & Export

Being similar with other countries, the castings produced in China are mainly for domestic needs. The export accounts for approximately 5% of the total output of castings. This data only includes separate castings export without those castings assembled into complete machines.

- Import of Castings accounts for less than 1% of the total output. Only few castings like high temperature resistant blade of the aircraft motors, a few parts of the nuclear power station need to be imported from abroad.
<table>
<thead>
<tr>
<th>year</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total output</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>2,809</td>
<td>3,127</td>
<td>3,350</td>
<td>3,530</td>
<td>3,960</td>
<td>4,150</td>
</tr>
<tr>
<td><strong>Export volume</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>260</td>
<td>277</td>
<td>223.3</td>
<td>163.0</td>
<td>202</td>
<td>205.6</td>
</tr>
<tr>
<td><strong>Import volume</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>1.7</td>
<td>3.0</td>
<td>3.2</td>
<td>2.2</td>
<td>3.4</td>
<td>3.2</td>
</tr>
</tbody>
</table>
## Export and Import of Foundry Equipment in 2011

<table>
<thead>
<tr>
<th>Number</th>
<th>Name</th>
<th>Export Quantity</th>
<th>Import Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>External furnace refining equipment</td>
<td>128</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Die casting machine</td>
<td>441</td>
<td>165</td>
</tr>
<tr>
<td>3</td>
<td>Square billet continuous casting equipment</td>
<td>73</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>Slab continuous casting equipment</td>
<td>14</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Steel continuous casting equipment</td>
<td>119</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>Other foundry equipment</td>
<td>1956</td>
<td>437</td>
</tr>
<tr>
<td>7</td>
<td>Other pouring ladle, ingot case and spare parts of casting machine</td>
<td>89212</td>
<td>1775</td>
</tr>
</tbody>
</table>
### Number of Molding Machine Purchased in 2011

<table>
<thead>
<tr>
<th>Type of Molding Machine</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flask molding machine</td>
<td>62</td>
</tr>
<tr>
<td>Flaskless molding machine</td>
<td>201</td>
</tr>
<tr>
<td>Self-hardening sand molding machine</td>
<td>307</td>
</tr>
<tr>
<td>Resin coated sand molding machine</td>
<td>38</td>
</tr>
<tr>
<td>Lost foam molding machine</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>658</strong></td>
</tr>
</tbody>
</table>

**Number of newly purchased electric furnaces topping over 500.**
• Workshop of a diesel engine foundry:
• widely use of the robots for core-making, core setting and pouring as well as cleaning.
4. Problems facing China foundry industry

• 1) decline in domestic and international market
• 2) lack of professional technicians and short of labor force.
• 3) Continual increase of foundry materials's price.
• 4) Pressure of environmental protection.
II. Medium-term targets of China foundry industry

China foundry association have finished the medium-term development project. During 2011~2015 China foundry industry should develop according to the following five strategies.

a) Development Strategy

<table>
<thead>
<tr>
<th>High Quality Castings Strategy</th>
<th>China will produce more High quality castings instead of only increase the total output.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Foundry Strategy</td>
<td>The idea to Reduce, recycle and reuse will be strengthen. In order to construct environment friendly and people enjoyable foundries.</td>
</tr>
</tbody>
</table>
1. Carry out foundry access system and self-discipline;
2. Construct more industry clusters and Casting industry park
3. To realize structural optimization of foundry industry and products;

**Structural Optimization Strategy**

**Innovation Strategy**

Improve the technological innovation system with enterprises as main body to enhance the production, university and research institute combine to enhance standardization, to promote the technology innovation of foundry industry

**Human Resources Strategy**

To strengthen foundry education and training system, building social education and training network
b. development targets

Target 1: Maintain a more steady growth

(1) The output of castings is expected to have 6% increase in the next five years. To maintain a more steady growth, and at the same time basically realize the transformation to quality & profit orientated pattern.
By the end of 2015, the output should have reached 50 million tons with sales income amounting to 750 billion Yuan (119 billion USD).
Enlarge the capacity of per plant (2500t/unit by end of 2015)

Average annual output per foundry (t)
Raise Labor Productivity (29 t/person)
Target 2: Structural adjustment of alloy castings

1. Proportion of ductile iron castings should exceed 30%.
2. Proportion of non-ferrous castings should be around 20%.
Target 3:
Share of high quality complex castings should be around 1/3
Target 4: 20% reduction both on energy consumption and waste emission

<table>
<thead>
<tr>
<th>Date</th>
<th>2006〜2010</th>
<th>2011〜2015</th>
<th>2015 estimated calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Power Consumption</strong>（1t SCE/t of castings）</td>
<td>0.6</td>
<td>0.48</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Emission</strong>（1t CO2/t of castings）</td>
<td>2.3</td>
<td>1.84</td>
<td>20%</td>
</tr>
</tbody>
</table>
• China foundry are developing, China Foundry Association as the only national level foundry association, are the core organization of China foundry industry.
• With over 100 staff, we are working actively to promote communication and cooperation within China and all over the world.
• one of CFA contribution is international exhibition (Metal China);
2013

THE 9TH CHINA INTERNATIONAL NON-FERROUS AND SPECIAL FOUNDRY EXHIBITION

THE 6TH CHINA CASTPART EXHIBITION

CHINA FOUNDRY EQUIPMENT EXHIBITION

CHINA FOUNDRY MATERIAL EXHIBITION

Sponsor: China Foundry Association
Time: April 9-11, 2013
Venue: Suzhou International Exhibition Center
we are building The Global Procurement Service Platform

• More than 40% castings are produced in China and the quality of Chinese casting are improving; you can found almost everything you want in China now.

• There are more than 30 thousand foundries in China, to find a good partner is not easy;
• Foundries which regist are guaranteed by CFA
• Each individual user can build their private business partnerships through a cloud service, and build enterprise value through Social Network;
• You can quickly find secure and reliable suppliers & all kinds of high quality products;

More easy, More successful.
Conclusion

- in the passed 12 years, China foundry industry developed very fast, and from now on we should develop in a more stable and sustainable way. The prosperity of China foundry will bring the whole world benefits.
Welcome to China to share with us the excellent opportunities and cast a win-win future.
Thank you!

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