



# Overview and Development Trend in China Foundry Industry



China Foundry Association



# Content

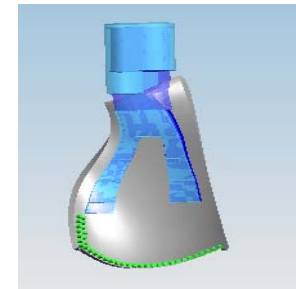
## I. History of Foundry in China



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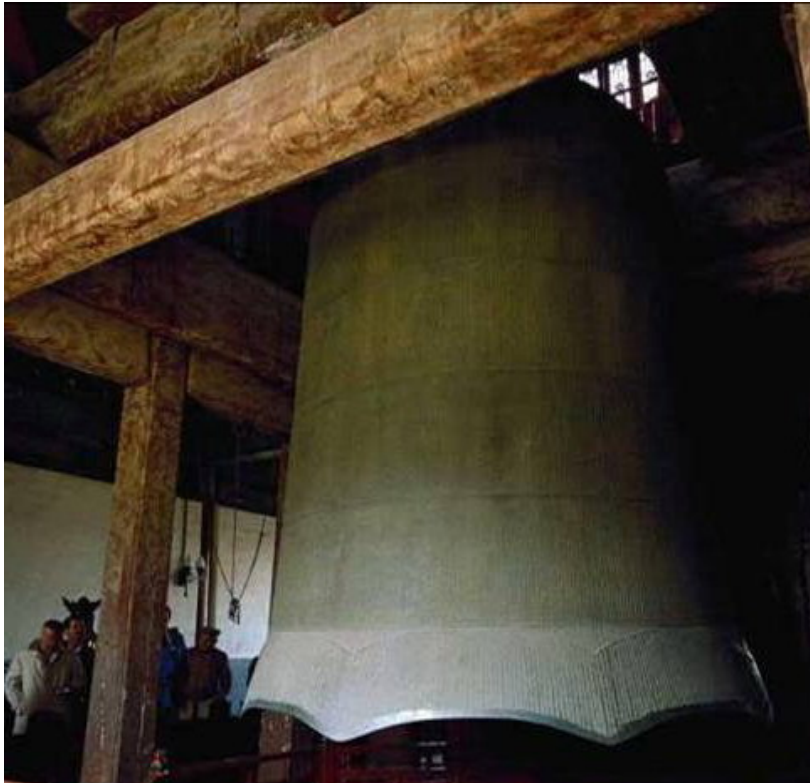
# I. History of Foundry in China

China is one of the world's earliest country to develop casting technology. Casting technology has long history of 6,000 years

The bird-shaped drinking vessel, is being stored in the Museum of Shanxi Province. cast in the the Chou Dynasty (1,000 years ago), made of bronze. height: 39cm; length:31.5 cm and width: 17.5cm



## Chinese foundry industry still lags behind developed countries



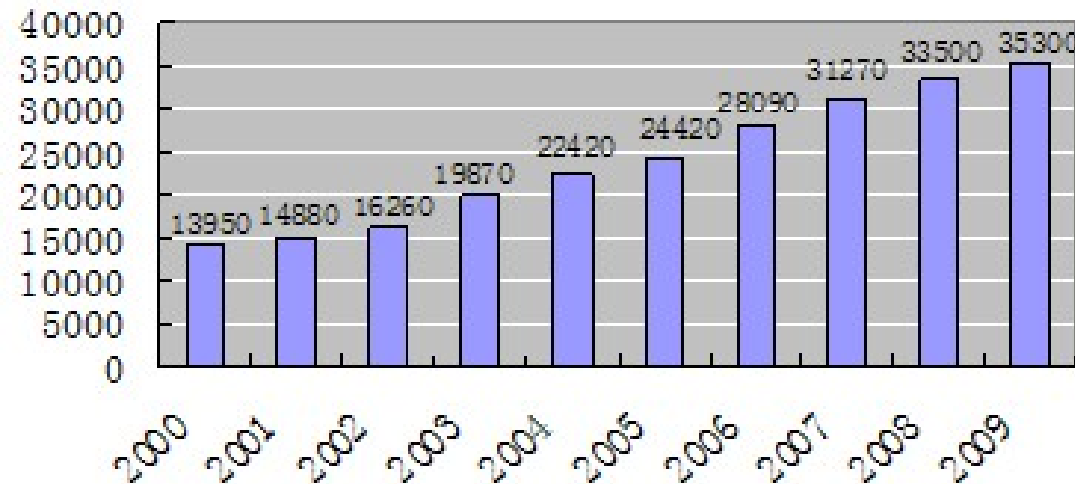
Yongle Bell, cast in the Year of Yongle 18 (Ming Dynasty) is now being stored in Beijing Yongle Temple. Adopted permanent moulding and lost wax moulding process .

Casting in China has over 6,000 years of history. Today, China has a huge foundry industry base but still lags behind developed countries in the overall development. China will work hard to develop low-carbon technologies and endeavor to build an industrial system and consumption pattern with low carbon emission.



## II. Overview of Foundry Industry

Since 1949, China's foundry industry, as the foundation of equipment manufacturing industry, has been rapid development. Especially after reform and opening-up, the industry has been growing even faster. The total output rank the first for nine consecutive years since 2000. In 2009, the output of castings reached 35.3 million tons, accounting for one third of the world's total.



The total output of castings in China from 2000~2009 (1,000t)



## i. Progress Made in China Foundry Industry

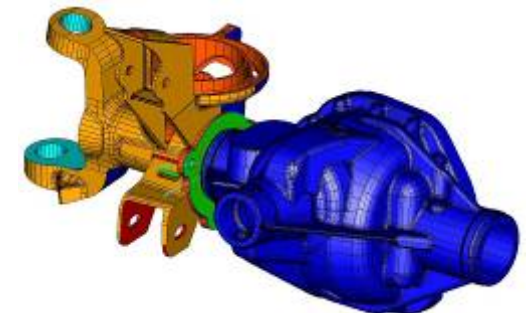
### 1. Further optimized structures for alloy castings; larger proportions of alloys with high specific strength

In recent years, ductile iron castings, austempering ductile iron and vermicular graphite iron are used widely in mechanical products; high-performance Aluminium alloy and Magnesium alloy are also used widely in manufacturing



### 2. Casting technology are highly improved

So far, the largest ductile iron casting weighs 135t and the biggest steel castings weighs 520t. Over 40 plants are capable of producing castings over 30t. China now can produce large castings like water turbines, steam turbines and gas turbines, cylinders for large engines and other complex castings. Many of the domestic casting companies have reached international level, both in terms of scale and technology.

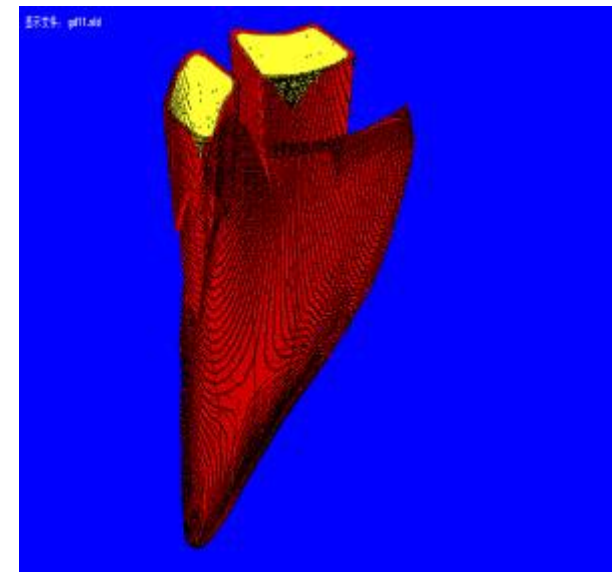
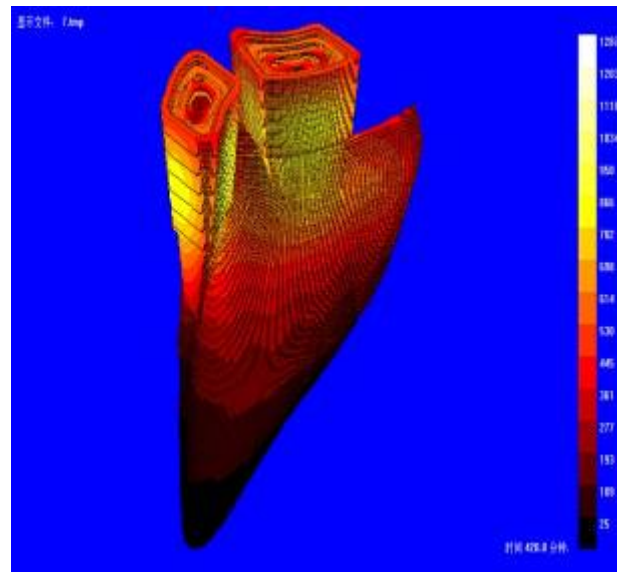


# Application of computer simulation technology

## 3. Extensive application of computer simulation technology

The CAE software jointly developed by Tsinghua University and Huzhong University of Science and Technology and imported simulation software are put into wide use to improve casting quality and reduce waste.

The Chinese CAE software has been widely applied in enterprises, and the market share is over 90%. For example, China National Erzhong Group adopts China-made commercial software and achieve a success in a casting of the Sanxia turbine blade.



## Mechanization and automation

### **4. More foundry plants achieve mechanization and automation and are more aware of environment protection**

Guangxi Yuchai Group uses robots to make and set cores, perform pouring and cleaning treatment



## ii. Export analysis of China Foundry industry

- ❖ Like other countries, China consumed the most of its own castings. The export only accounts for 8% of the total output.
- ❖ Castings that can not be made at home are imported, such as those 20,000-30,000t hydraulic turbine castings and engine cylinders with specific requirements. There is a huge gap between imported castings prices and exported castings prices. Exported prices are usually between USD \$500-1,200 per ton while imported prices are between USD \$ 1,500-5,000 per ton .

### iii. Existing Problems

- ❖ China's casting plants have a low average annual output (about 1,100t per plant). Investment in environment protection accounts for 5% of the total investment in equipments.
- ❖ China has a large foundry industry, but is still not a great power in this field. Analysis shows that there are great differences among the existing 30,000 casting companies in term of scale, technology, management level and casting qualities. Foundry industry in China is still of high energy consumption and heavy pollution.



### III. Foundry Development Trend in China

Since 2007, CFA has conducted systematic research and analysis and reached the following conclusions:

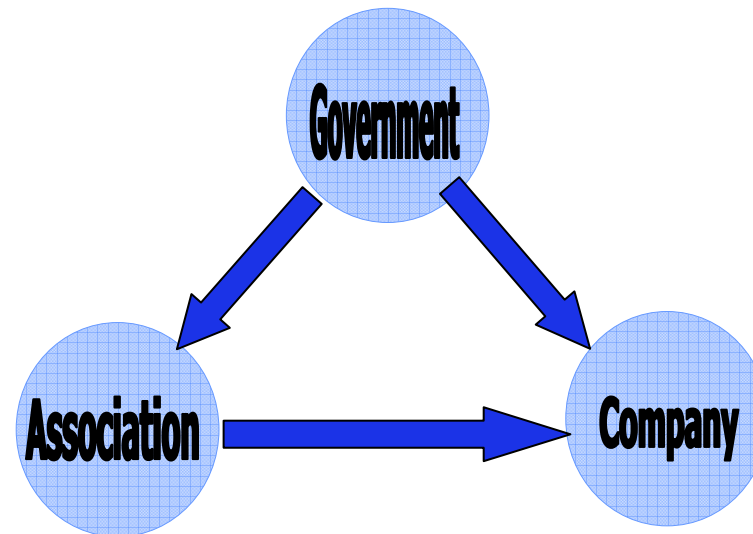
#### **i. Development trend of China foundry industry :**

1. Accelerate the transformation of the pattern of economic development;
2. Adjust product and industry structure;
3. Enhance talents development and independent innovation capacity ;
4. Improve casting quality;
5. Improve level of mechanization and automatization;
6. Energy conservation and emissions reductions

# Healthy and sustainable development

## ii. Ways to promote healthy and sustainable development

- ❖ China's foundry industry is losing its edge in resources and cheap labor force. It is important for foundrymen to think about how to realize healthy and sustainable development.
- ❖ Market-based way and policy-guiding way
- ❖ Interaction and cooperation between government, industry association and companies are the key to industry restructuring and transformation of growth mode.



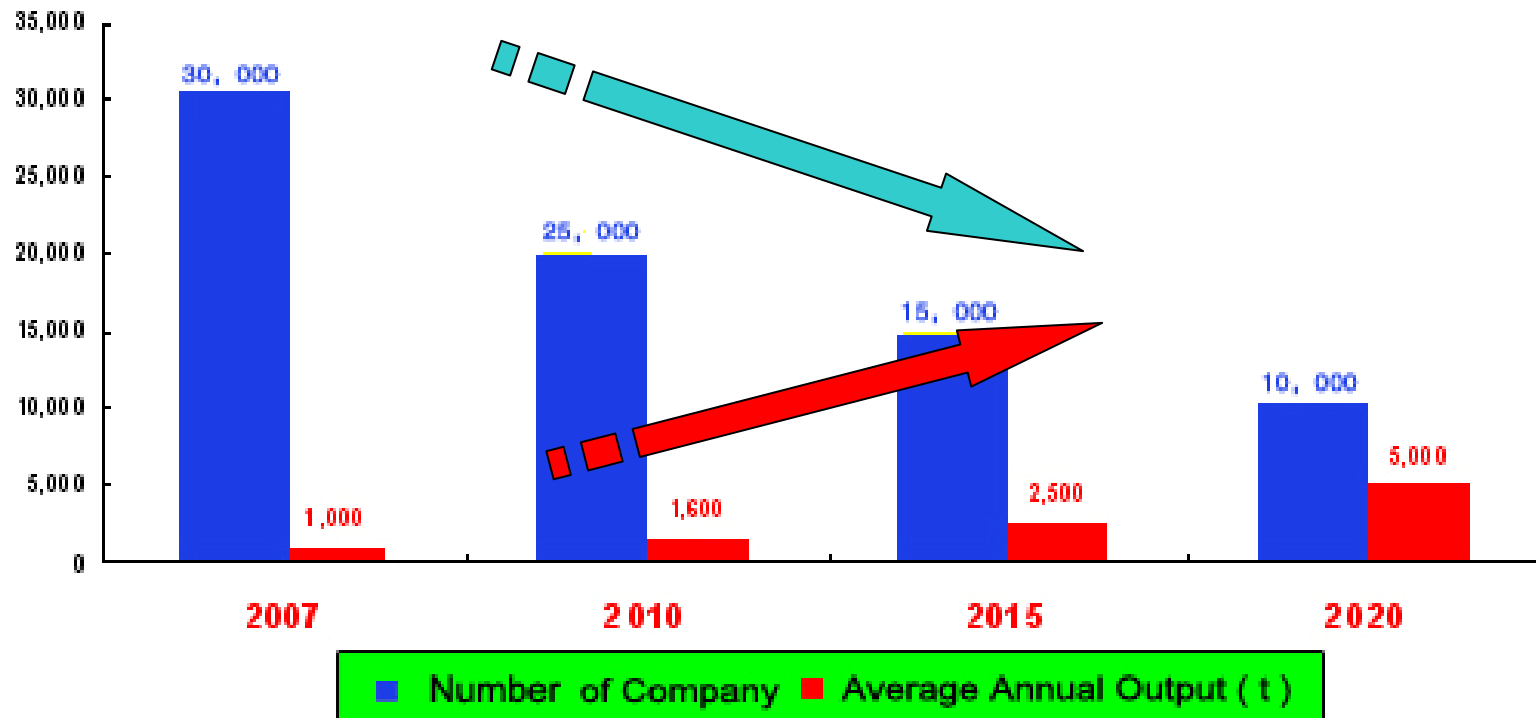
## Foundry Industry Access System and Industry Clusters

- The implementation of *Foundry Industry Access System* and the development of *Industry Clusters* are of strategic importance to ensure healthy and sustainable growth of China foundry industry.
- In recent years, the State Development and Reform Commission (SDRC) and Ministry of Industry and Information Technology (MII) paid great attention to the foundry industry and pushed its restructuring, due to the role of the bridge between the government and companies played by CFA. The government asked CFA to conduct research projects such as the *Long-term Development of Foundry Industry, Access System Research, Energy Saving and Emission Reduction Research*. CFA has formulated some favorable policies and is working on new policies.



## Number of casting companies

Objective of the access system : to limit the number of casting companies to no more than 10,000 by the year of 2020.





## Training bases

China Foundry Association is setting up nationwide training bases. Up to June of 2010, 16 training bases have been established. More than 10,000 technicians and skilled workers can be trained annually.



## Cooperation between China and the world

In order to make the foundry industry stronger and achieve sustainable development, it is very important to coordinate the government, the industry association and the companies. At the same time, it is of strategic importance to implement *Foundry Industry Access System* and develop industry clusters.

CFA has been and will continue playing a crucial role in promoting the development of China foundry industry, communications and cooperation between China and the world.





*Thank you!*



China Foundry Association

