

## CAST YOUR FUTURE WITH CASTING

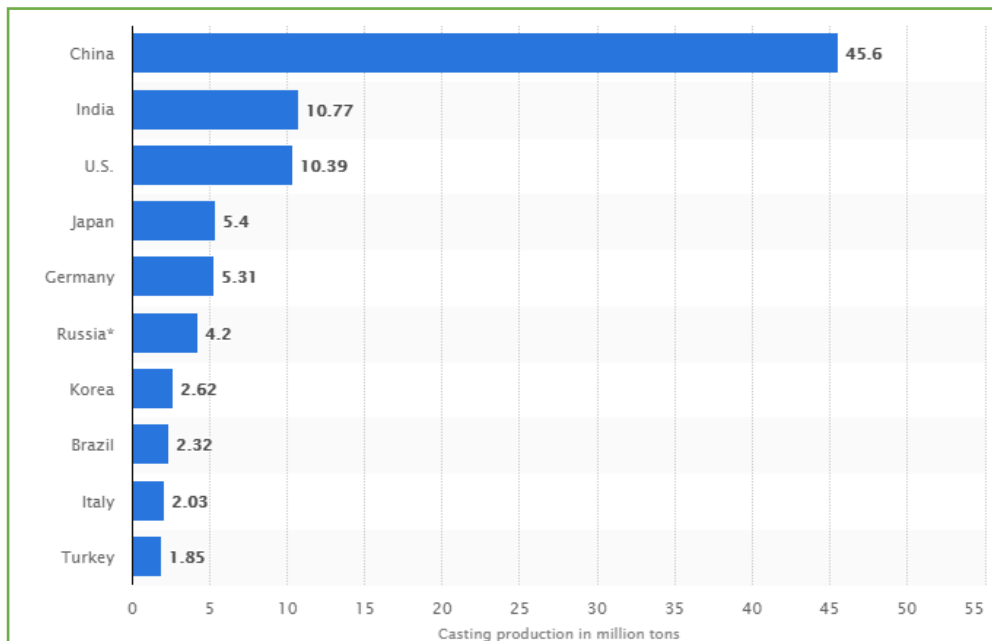
by Biswajit Ghosh (NCP-1976)

### What is Foundry

Foundry is a technology of castings metal in different shape by melting them in a furnace and pouring them in a mould which may be made of sand or metallic. After metal is solidified the metal is taken out from mould known as castings.

### Global requirement of castings

Global castings production has increased by 14% between 2016 and 2017.



Source: The Statistics Portal

China is no 1 since 2006 while India is moved to no 2.

India total castings production 10.77 million tons from 4600 foundries.

### Foundry classification

#### 1. GREEN SAND PROCESS

Basically, caters automobile industries products are engine block for 4-wheeler car and tractor.

Process Silica sand mixed with Bentonite and coal dust to produce mould in high pressure moulding machine.

Metal temperature 1350°C

Production Rate Approx. 150 castings per hour.

Approx... 20% of the total casting production.

Above foundries are fully automated and having robotic operation.

This type of foundry required highly skilled people from operators to head of departments.

In maintenance /utility/project engineers are diploma holder in mechanical/electrical/ electronics.

In process and developments mostly, mechanical diploma holder along with post diploma in foundry technology from NIFT Ranchi.

## **2. RESIN BONDED PROCESS**

The process catered mostly steel foundries.

Process Silica sand mixed with phenol base resin and suitable catalyst to produce mould.

Equipment's used for this process are known as Continuous Mixer and sand Reclamation Plant.

Pouring Metal temperature 1650°C

Product used in Railway, Pump and valve, Wind mill, Cnc machines, cement plant, earth mover etc

Some of the foundries are semi-automatic and some of fully automated but not the level of high pressure moulding.

Production rates 20 castings/hour

Mostly diploma holder in mechanical and electrical are seen in shop floor.

Pouring metal in an automated moulding line



## Process Sodium Silicate

Apart from the above some foundries are still operational with old conventional sodium silicate process but due to strict environmental rules they are phasing out.

Process sodium silicate mixed with silica sand in a conventional batch mixer.

Pouring Metal temperature 1650°C

Product used in Pump and valve, Railway castings General Engineering

## Melting

Most of the y foundries are in India used medium frequency induction furnace for melting metals. Operating frequency of medium frequency induction furnace is 1200Hz. typical example a 450-kw medium frequency furnace can melt approx. 1000kg of steel per hour.

## Laboratory

- (i) Physical
- (ii) Metallurgy

In above area metallurgical and physical properties of the casting are checked.

**Please note:** Equipment involved Spectrometer/ tensile testing machine/ ultrasonic testing/ X-ray etc

## Fettling/Inspection

Here raw casting is processed by manual grinders or automatic manipulator for finishing and some time by Heat treatment process. After that inspection/ material analysis report casting is despatched.

Fettling operation for BIG CASTING



## Fettling operation with manipulator in automobile casting



### **Opportunities for young engineers in the foundry Industries**

As foundry industry is expanding day by day with high technology and automation scope of job opportunities are brighter especially mechanical/electrical/ electronic/ foundry technology field. Apart from that if any mechanical diploma holder wants to study in specific foundry industry, Diploma course in foundry technology from NIFT is also a good option. The Indian Institute of Foundrymen is the only association for foundry eternity. They do conduct different courses and seminar on foundry. Their head office is in Kolkata.

As Foundry technology is too vast to grab by personnel in one life, I am trying to summarise the same through few specific briefs.

### **About Author:**

- ❖ Biswajit Ghosh, Director – Technical in India for UK based Foundry Machine Manufacturer; has completed Diploma in Electrical Engineering from North Calcutta Polytechnic [Don Bosco]. He has been serving in casting industry in India & abroad since 1980; having experience of nearly four decades. In this tenure, he is not only serving his duty in India & International market, but also played major role in different collaboration and in continuation of knowledge sharing in various platform.