Blasting Technology Increases Efficacy in Foundry and Allied Industries

Prepared by: Mr. P.A.Patel
Email: info@pshotblast.com
Website: www.pshotblast.com

Created by: Mr. P.A.Patel (National Counsel Member - IIF)
Introduction

- There are about 5,500 foundries in India out of which around 85% can be classified as a small and medium enterprise producing 10 million tones castings, holding No. 3 position after China & US in Global Market. The industry employees 5 Lac people and indirectly 1.5 Lac people.


- Most of the foundries are located at Belgaum, Coimbatore, Batala, Jalandhar, Kolhapur, Rajkot, Ahmedabad, Mumbai, Pune, Gurgaon, Faridabad, Agra, Ambala, Chandigarh, Hawarah, Shimoga, Raipur and many other places.
 Sector wise Major Consumption of Castings:

1. Auto Industry – 32%
2. Agriculture Machinery – 07%
3. Earth Moving Equipments – 02%
4. Pump & Compressors – 05%
5. Valves – 04%
6. Diesel Engine – 03%
7. Sanitary – 02%
8. Electrical Equipments – 03%
9. Machine Tool – 02%
10. Pipes & Fittings – 08%
11. Railway – 06%
12. Defence – 04%
13. Power Generations – 05%
14. Industrial Machinery – 07%
15. Others – 10%
Product Mix of Caste Metal Items

1. Grey Iron – 67%
2. Steel – 12%
3. SG Iron – 10%
4. Aluminum & Nonferrous – 10%
5. Malleable – 01%
Gujarat - New Auto Hub

- There are many foundry clusters coming up in Gujarat for manufacturing of automobile components. The reason being large auto projects coming near Sanand, Ahmedabad. Some of the projects are Tata Motors, Ford India, General Motors, Maruti Suzuki, Atul Auto, Bajaj Auto, Asian Motors and the list is growing. Gujarat Government has put a target of production of 2-3 Lacs cars / year by 2017-18 through above units which will mean increasing production of existing foundries, setting up new foundries, technology upgradation, cluster development, training and education of the workers. The Industry employs 500,000 people and indirectly 150,000 people. India’s share in the global market is approximately 10% of appx. 91.67 million metric tons. The majority of the foundry are placed under Micro, Small & Medium Enterprise (MSME).

- The Indian Automobile industry is 7th largest in the world with an annual production over 2.6 million unit. By 2050 the country is expecting to top the world in car volume appx. 611 million vehicles on the nation’s road. This will bring corresponding growth in foundry sector.
Export Trend

The future of metal casting industry in India is very promising. It is feeding castings to Automobile, Railways, Auto Components, Power Sectors, Earth Moving Equipments, Tractors, Compressors, Pumps, Pipe Fittings, Textile, Cement, Agro Machinery, Machine Tools, Sanitary Castings, Defense and Exports. India has emerged as one of the world’s largest manufacturers of small cars. The Indian automobile industry is seventh largest in the world with annual production of over 2.6 million units in 2009 and this volume will be growing. There are number of Automobile companies like Hyundai Motors, Nissan, Toyota, Volkswagen, Maruti Suzuki, Tata Motors, Mahindra, General Motors, Ford, Fiat, Skoda, Ashok Leyland, Force Motor and may others.

Many foundries are setting up fully finished auto component units with excellent facilities like high pressure molding line, Modern core shop, melting facility, shot blasting & surface finishing facility. The Top 10 importers of cast products are USA, Germany, France, Canada, UK, Japan, Russia, Italy, Belgium, Australia. Also 10 niche markets are China, Mexico, S. Korea, Thailand, Austria, Brazil, Poland, Saudi Arabia, Czech Republic and Singapore. Besides there are many other lucrative countries for India.

There are many foundry clusters are coming up, For example coimbatore cluster is famous for pump-sets castings, the Kohlapur and the Belgaum clusters for automotive castings and the Rajkot clusters for diesel engine castings.
Typical Blasted Components

- With higher velocity larger size abrasive can be used for finishing larger castings. By decreasing the motor rotation of the turbine wheel (RLM Wheel) delicate work pieces can be finished without damage and change in size of abrasive.

Tractor Components – Unblasted & Blasted in Hanger Type Machine
Shot Blasting improves Surface Finishing

All types of sanitary castings are cleaned in shot blasting machine. All the sand is removed during operating Cycle. The cleaning time is appx. 6-10 minutes. Previously manual chipping, air hammering and wire brushing were used to remove cores and sand.
Sanitary Casting

Manhole Covers Under Blasting

Sanitary Castings Under blasting process

Sanitary Castings
Sanitary Casting

Sanitary Casting shot blasted in hook type Shot blasting machine

Parts are hung on hangers or special fixtures And are carried into abrasive streams for Blast cleaning
Shot Blasting improves Surface Finishing

Auto Parts are suspended on Hanger or Special Fixtures and are carried into blasting machine. Previously it took several hours to fetal individual castings which is done now in few minutes. Only one operator is required for loading and unloading the hanger. Breakages are eliminated. Uniform Cleaning of all surfaces achieved.
Shot Blasting improves Surface Finishing

The primary benefits are:

1. Increased life of wheel components
2. Reduced maintenance on the blast equipment and dust collector.
3. Reduced ventilation air requirement for separators.
4. Reduced metallic content in reclaimed sand.
In Steel Casting Components made with CO2 process, sand adheres very strongly and requires more abrasive throw to clean and remove sand efficiently from shot blasting machine. We meet this requirement.
Shot Blasting improves Surface Finishing

Cylinder Head being loaded on special fixtures for blasting

After Shot Blasting final finish
No shots & Sand Remain Inside Cylinder Head
Aluminum Casting Deburring

Aluminum Alloy Wheel Shot blasting in a Continues conveyor type machine

Shot blasting provides uniform homogeneous mate surface In addition to deflashing it is an inspection tool.
Aluminum Casting Deburring

Monorail, Parts are suspended on trees hung on hanger or special fixtures and are Carried in to abrasive stream

Small Aluminum Casting Cylinder Blocks For 2 Wheelers are hanged on special fixtures And carried into abrasive stream
Aluminum Casting Deburring & Finishing

Die casted Components manufactured from Aluminum, zinc and magnesium alloys required to be shot blasted for removing bur and giving esthetic value with aim to obtain even, shiny finish on all size. Many user prefers stainless steel shots as a consumption is one sixth of steel shots. carbon steel shot gives dull grey finish. While stainless steel imparts matt silver finish pleasing to eyes. Many auto units like Honda, Bajaj, Endurance, Rockman are using special grade shots to achieve the desire surface finish.

Aluminum Components like cylinder head, water pump body, exhaust muffler, armature cover etc. are shot blasted provide uniform homogeneous mate surface.
Aluminum Surface Finished Components

2 Wheel Door Hanger Shot Blasting Machine
Aluminum Surface Finished Components

Continues Monorail Aluminum Surface Preparation Machine
Aluminum Surface Finished Components

2 wheeler’s Alloy Wheels
Aluminum Surface Finished Components

Continues Monorail Aluminum Surface Preparation Machine
Aluminum Surface Finished Components

2 wheeler’s Components
Aluminum Surface Finished Components

Aluminum Insulator Casting
Aluminum Surface Finished Components

Aluminum Insulator Casting
Internal Shot Blasting of Cylinder Liners

- Cylinder Liners Being Loaded in Blasting Machine for Internal Blasting
- Surface Finish Achieved with Aluminum Oxide prior to hard chrome plating
STEEL CASTING FOR RAILWAY

Railway Crossings

Valve Body

Rail Bogie Bolster
Manganese Railway Crossing

Rail Crossing as taken out from the mould
Before shot blasting

Rail Crossing after shot blasting
Railway Coach Wheel

Rail Coach Wheel prior to Blasting

Rail Coach Wheel after Blasting
Heavy Duty Engine Block

7 tone engine block hung on hanger
Carried into abrasive stream
For blasting

blasted engine block being unloaded
Concluding Remarks:

Shot blasting is no more an optional process in a foundry. It provides faster and better cleaning. It saves power, labour, space and also saves on cutting tools and permits better inspection, thus minimizing the rejection of castings. Apart from foundry it is also widely used in many other industries. Proper understanding about the machine, its construction and use enables us to improve its efficiency and utility. Before Selecting the equipment it is necessary, to consider above points, spare parts, availability, sales services offered, and many other points, with humble beginning in 1990-in 22 years we have supplied more than 3000 machines for various applications.

Foundry Industry will have to upgrade produce good quality casting and finishing. No buyer will tolerate delay in delivery, defective casting. Foundry will have to adopt new and efficient fettling and finishing practice with several new auto units coming up demand for automotive castings will increase and local manufacturer will have to increase their capacity to meet delivery in time,
Our goal is Gujarat's growth for India's growth

Thank You!

P. A. Patel (M.D.)
Patel Furnace & Forging Pvt. Ltd. (Shot Blasting Division)
A – 2 / 510 G.I.D.C. Industrial Estate, Makarpura, Vadodara – 10, Gujarat, India
Mobile: +91 98240 38602 | Email: papbrd@yahoo.com
Phone: +91 265 2644864, 2640406, | Fax: +91 265 2643663
Company Email: info@pshotblast.com, sales@pshotblast.com
Website: www.pshotblast.com
YouTube Channel: www.youtube.com/pshotblast