Introduction to Manufacturing
&
Sand Casting

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Presentation outcomes

Learner will be able to

- **Describe the working principle of casting process**
- **Prepare layout of sand mould for give component**

Contents:

- **Introduction to Manufacturing**
- **Basic steps in Casting Process**
- **Layout of Sand Mould with Animation**

Introduction to Manufacturing

Manufacturing can be simply defined as value addition processes by which raw materials of low utility and value due to its inadequate material properties and poor or irregular size, shape and finish are converted into high utility and valued products with definite dimensions, forms and finish imparting some functional ability.

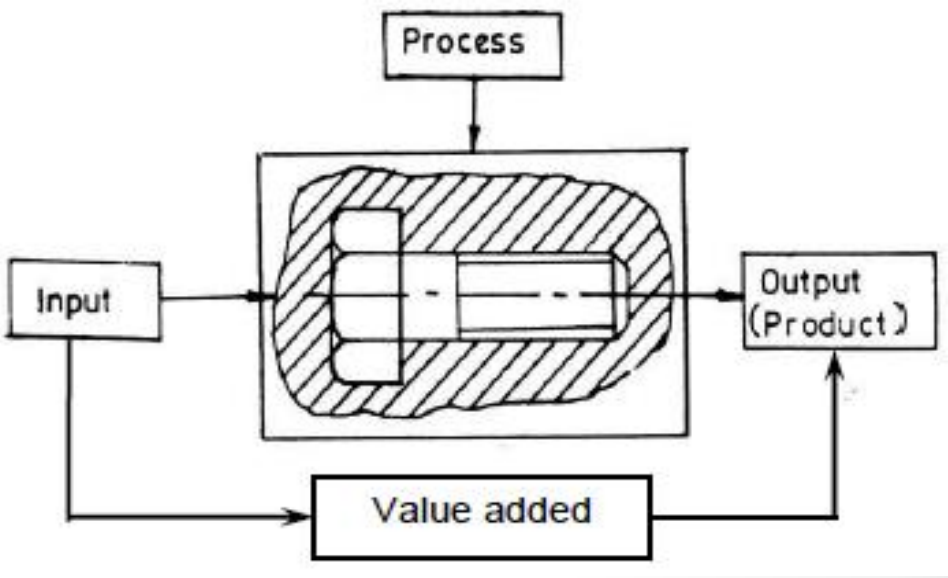

Fig: 01

Manufacturing Processes

This refers to science and technology of manufacturing products effectively, efficiently, economically and environment-friendly through

- Application of any existing manufacturing process and system
- Proper selection of input materials, tools, machines and environments.
- Improvement of the existing materials and processes
- Development of new materials, systems, processes and techniques

Introduction to casting

- Casting is One of the oldest materials shaping methods carried out in the foundry and the product of casting process is called as casting.
- In casting process molten metal is poured into cavity (called as mould) of required shape & size to be made, and allowing it to solidify. When solidified, the desired metal object is taken out from the mold either by breaking the mold or taking the mold apart. The solidified object is called the casting.
- Applications: Typical application of sand casting process are cylinder block, liners, machine tool bed, piston, piston rings, mill rolls, wheels, housing, water supply pipes and bells

Basic steps in Casting Process

- **Material is heated to a specified temperature**
- **Molten material is poured into a mold cavity**
- **Molten material solidifies into the shape of the cavity**
- **Casting or mold is removed**
- **Casting is cleaned, finished, and inspected**

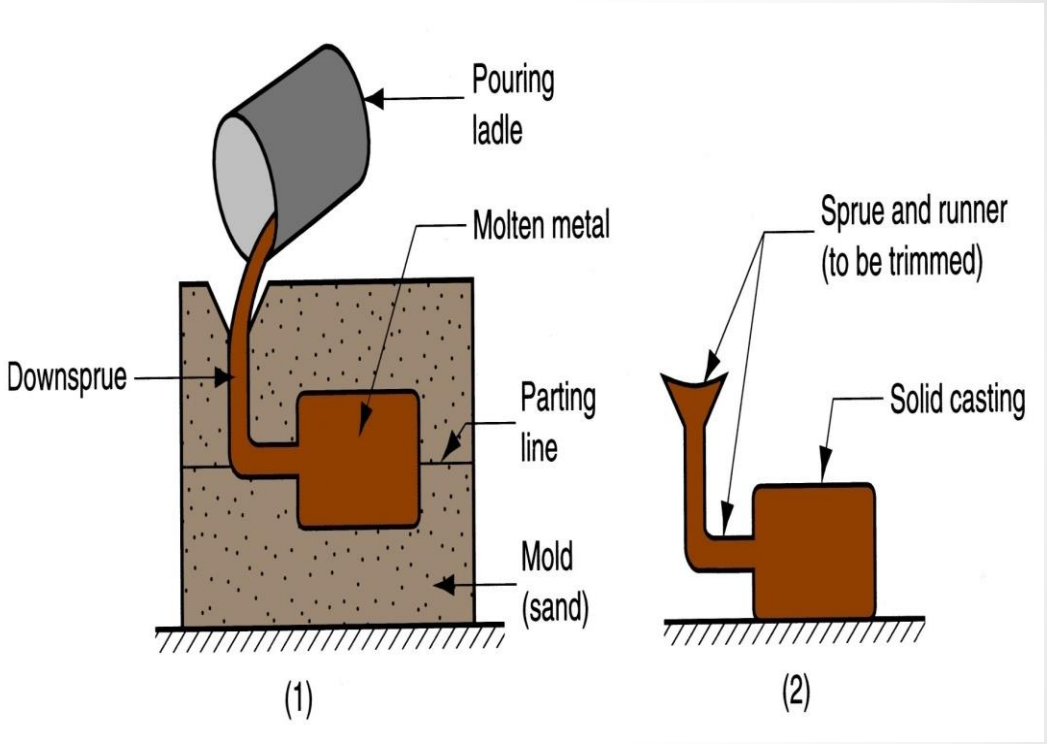

Fig: 02

Layout of Sand mould

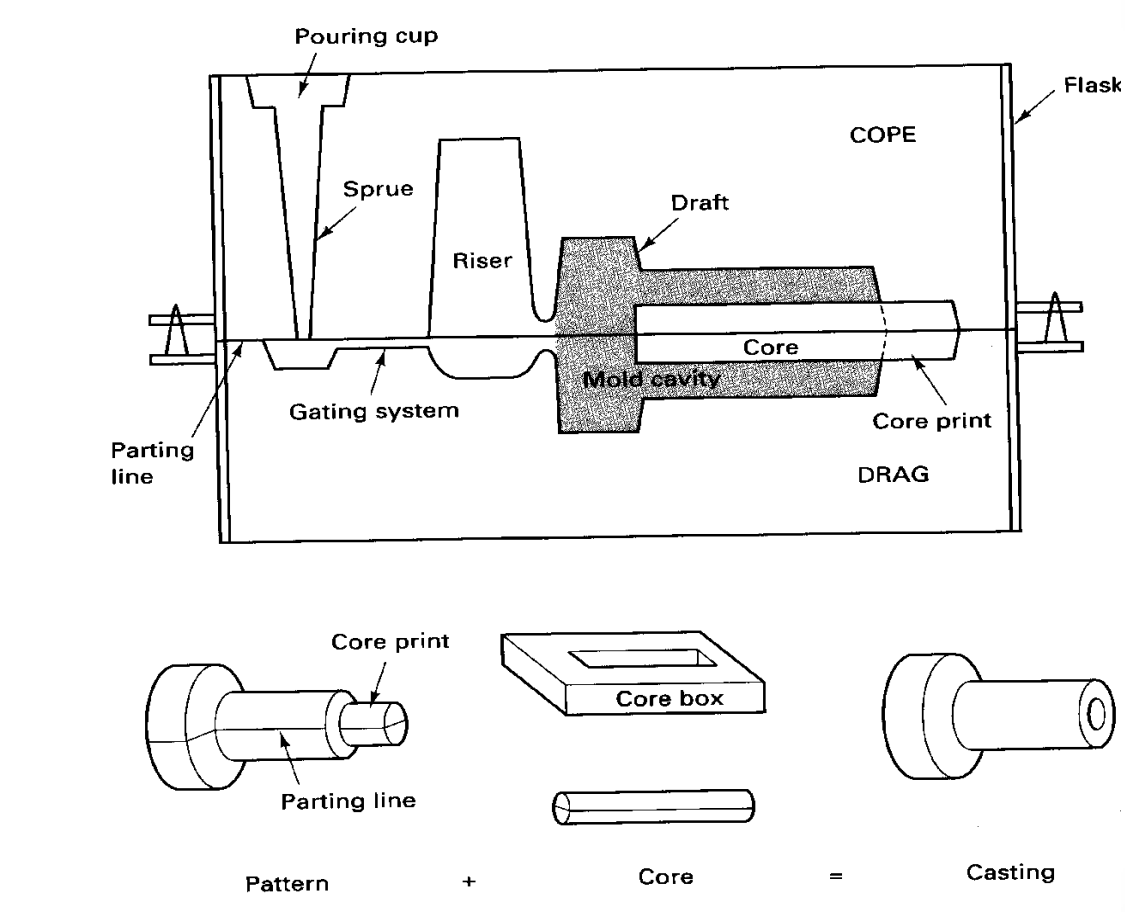

Fig: 03

Animation Videos

Reference. : https://youtu.be/cjebklLgrf8

Summary

- **Define the term Manufacturing with example**
- **Steps involved in casting process**
- **Layout of Sand Mould with Animation**

Any Question

Quiz

1. The ability of the moulding sand to withstand the heat of melt without showing any sign of softening is called as

   i. strength ii. Refractoriness iii. Collapsibility iv. Adhesiveness

2. The pattern which are made in two or more pieces are called as

   i. solid patterns ii. Split pattern

   iii. Loose piece patterns iv. None of the these

3. The lower fluidity of molten metal causes

   i. Misrun ii. Cold shut iii. Slag inclusion iv. Fusion

References

- ‘Manufacturing Technology by P.N. Rao, Tata McGraw Hill, New Delhi
- https://www.nptel.ac.in/courses/112105126/
- https://youtu.be/cjebklLgrf8
- Ghosh A. and Mallik A. K., Manufacturing Science, EWP Pvt. Ltd

Thank You