

Advantages and disadvantages of Casting

8

ADVANTAGES:

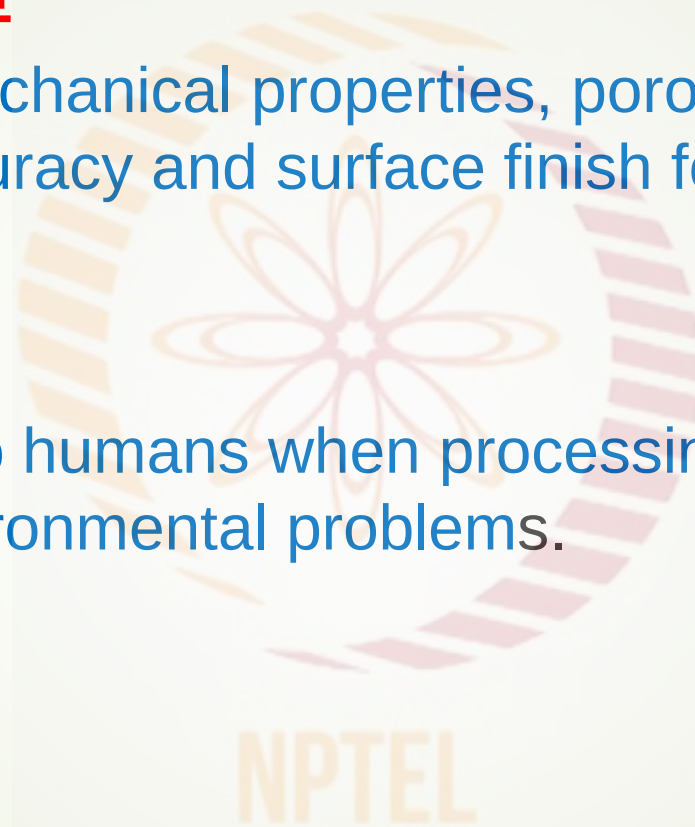
- Casting can be used to create complex part geometries, including both external and internal shapes.
- Some casting processes are capable of producing parts to net shape. Other casting processes are near net shape, for which some additional shape processing is required (usually machining) in order to achieve accurate dimensions and details.
- Casting can be used to produce very large parts. Castings weighing more than 100 tons have been made.
- The casting process can be performed on any metal that can be heated to the liquid state.
- Some casting methods are quite suited to mass production.

Advantages and disadvantages of Casting

9

DISADVANTAGES:

- limitations on mechanical properties, porosity, poor dimensional accuracy and surface finish for some casting processes
- safety hazards to humans when processing hot molten metals, and environmental problems.



Historical Background

10

- Casting is one of the oldest shaping processes, dating back 6000 years.
- Discovery of casting copper occurred accidentally in Mesopotamia
- Shapes much more intricate could be formed by casting than by hammering. More sophisticated tools and weapons could be fabricated. More detailed implements and ornaments could be fashioned. Fine gold jewelry could be made more beautiful and valuable than by previous methods.
- Egypt ruled the Western civilized world during the Bronze Age (nearly 2000 years) largely due to its ability to perform the casting process.
- Construction of cathedrals and churches required the casting of bells that were used in these structures.
- Many of the casting techniques developed for bellfounding were applied to cannon making. The first cast cannon, made of bronze, was made in Ghent, Belgium, in the year 1313—by a religious monk.
- The list of parts includes dental crowns, jewelry, statues, wood-burning stoves, engine blocks and heads for automotive vehicles, machine frames, railway wheels, frying pans, pipes, and pump housings. All varieties of metals can be cast, ferrous and nonferrous.

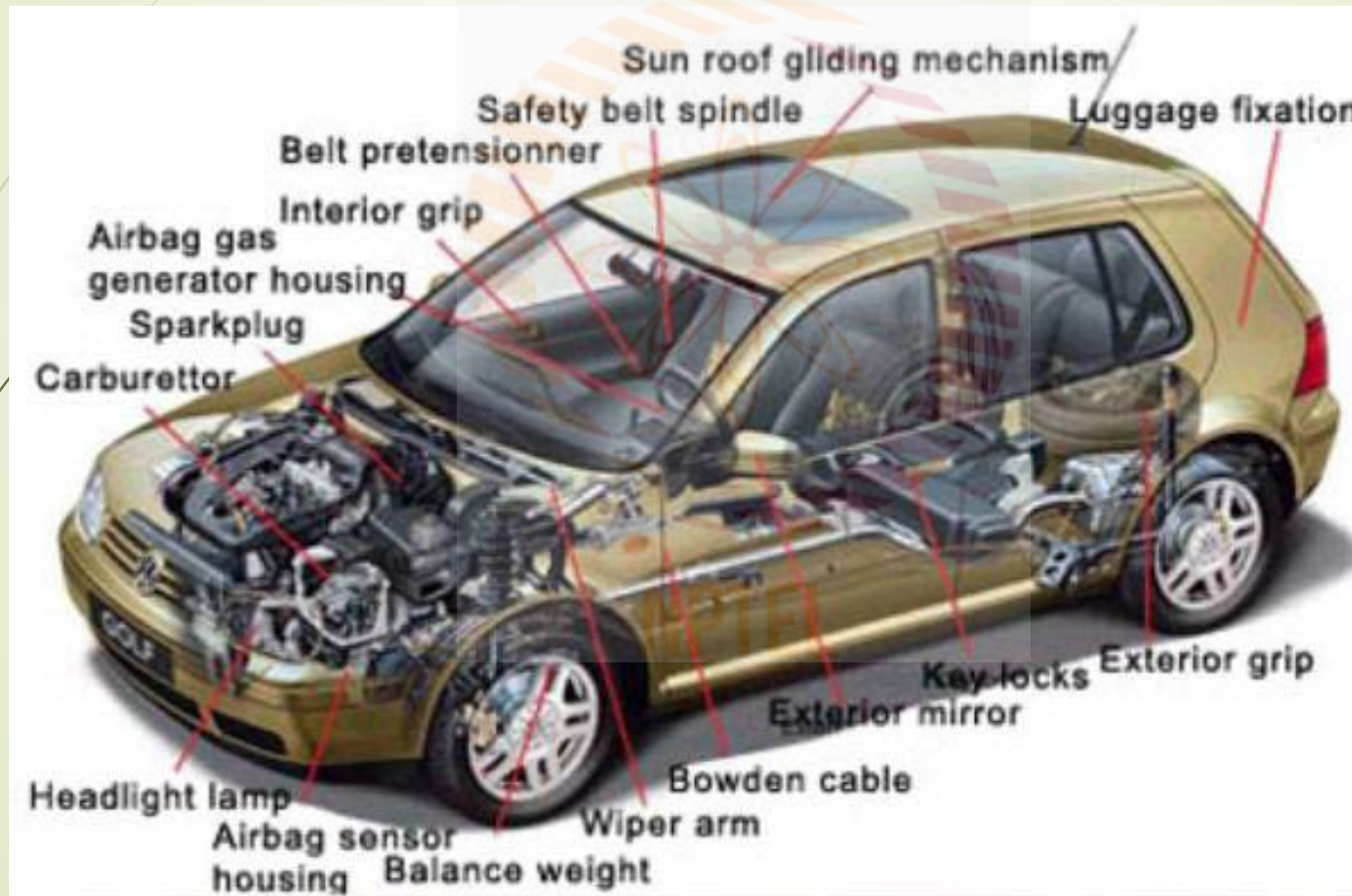
Ashok Pillar was made by Casting Process

11



- Mauryan Emperor Ashoka 268-232 BC
- 7.2 metres high
- 16 inch dia
- Weighs 3000 kg

Application of Aluminum die casting in Automobiles



Foundry Practice

<https://www.youtube.com/watch?v=dqSGTjipFvg>

Following areas need attention for a successful casting operation: **VIDEO on Foundry Practice**

1. Preparation of Moulds and Patterns
2. Melting and Pouring of the liquefied metal
3. Solidification and further cooling to room temperature
4. Casting Defects and Inspection



Casting an iron wheel

14

Video Clip



Casting an engine block, the BMW way

15



<https://www.youtube.com/watch?v=N2hYTdrzuji>



Casting, the Indian way

16



<https://www.youtube.com/watch?v=OM1gJqdqEEE>



Casting, also the Indian way

17



<https://www.youtube.com/watch?v=MK3yIMQnaWM>

<https://www.youtube.com/watch?v=fjgccpQRWDw>

VIDEO CLIP



Casting a propeller, a really big one!

18



<https://www.youtube.com/watch?v=Di6fu7F2BxQ>