

Casting Methods Cheat Sheet

Permanent Mold

Advantages

- Stronger and less porous than sand or die casting
- Good surface finish/texture control
- Long reusable mold life
- Good dimensional accuracy – high precision
- Good for moderate to high volume production
- Relatively quick cycle time
- Can use sand cores, making it semi-permanent mold
- Fine grain structure

Disadvantages

- Higher tooling costs
- Not cost effective for low volume production
- Size limitations
- Parting lines (can be removed by machining/polishing)

Die Casting

Advantages

- High accuracy and complexity
- Design flexibility
- Good surface finish
- Quick production rate
- Good for high volume production

Disadvantages

- Highest tooling costs
- Size limitations
- Only low melting point alloys
- Parting lines

Investment Casting

Advantages

- Achieve complex shapes and details
- High surface finish and accuracy (no flash or parting lines)
- Near net shape – Little to no machining required
- Can be the most expensive casting method
- Limitless in terms of alloy choices

Disadvantages

- Lengthy process
- High manual labor
- High piece price
- Size and handling limitations

Sand Casting

Advantages

- Design flexibility (complexity)
- Low cost tooling

Disadvantages

- Single-use mold
- Poor surface finish and accuracy
- Prone to shrinkage and porosity

Lost Foam Casting

Advantages

- Design freedom
- Near net shape
- Little tool wear

Disadvantages

- Not cost effective for low volume production
- Large initial die cost
- Porosity
- Pattern weakness
- Pattern not reusable (require a pattern for each part)
- Metal tooling required for pattern making
- Few suppliers

