



Introduction to Mechanical Engineering, Lecture 8

Design Thinking and Manufacturing



What things do you consider when designing a part?

Some properties to consider when designing a part



Shape of the part	Temperature specs
Forces affecting the part	Post processing
Shape	Mating and jointing
Material	Scale of manufacturing
Surface finish	Manufacturing cost



What manufacturing methods do you know?

Main types of manufacturing

Seif's classification



Additive	Subtractive
Formative	Casting/Molding

Main types of manufacturing



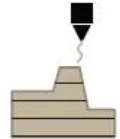
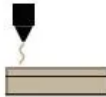
Formative



Subtractive



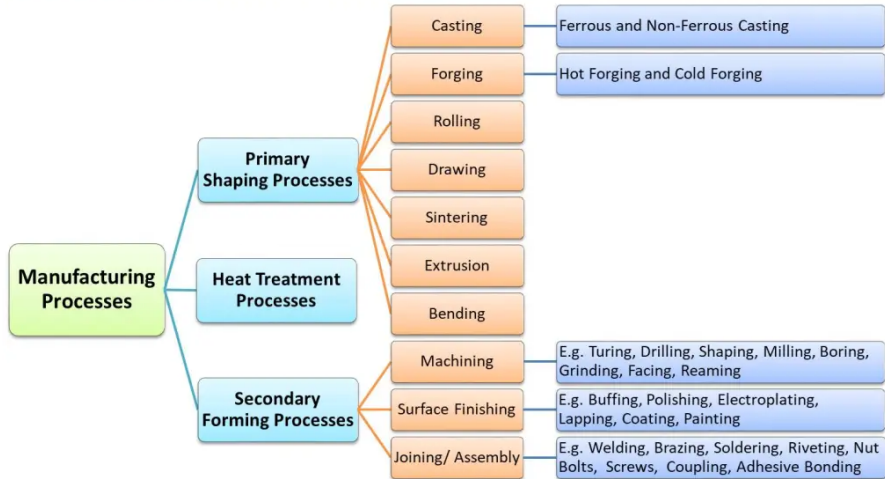
Additive





Now, what machines fall under these manufacturing types?

Manufacturing Processes types





Videos for self education

1. How Things Are Made | An Animated Introduction to Manufacturing Processes
2. UNBELIEVABLY FAST! High-Speed CNC Machining
3. CNC turning thread with high speed
4. High-speed CNC milling!
5. CNC Water Jet Cutting Machine
6. SLA 3D printers
7. SLS 3D Printer
8. Keyway Cutting on Shaper Machine (Долбёж)
9. RPM 3500 with Steel. Fast but Waste Tools
10. 5D Milling machine
11. Z-MaT F855 High speed Vertical Machining Center
12. Metal bird. CNC machining. 5-axis machining.
13. Electrical Discharge Machining
14. EDM Machine at home
15. Result of EDM Machining

The diagram on the screen is titled "MANUFACTURING PROCESSES TYPES". It is organized into three main categories, each with a list of specific processes and examples:

- Primary Shaping Processes:**
 - Casting: Examples include Sand Casting, Investment Casting.
 - Forging: Examples include Open Die Forging and Hot Forging.
 - Rolling
 - Extrusion
 - Drawing
 - Blow molding
- Metal Treatment Processes:**
 - Annealing
 - Heat Treating
 - Surface Treatment
 - Welding
 - Joining
 - Assembly
- Secondary Forming Processes:**
 - Stamping
 - Die Casting
 - Injection Molding
 - Extrusion
 - Blow Molding
 - Thermoplastic Forming
 - Thermosetting Forming
 - Composites Forming
 - Adhesive Bonding
 - Welding
 - Joining
 - Assembly

Invited Lecturer Seif (ENG)

Video, Part 2



Deserve "A" grade!

– Oleg Bulichev

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📍 @Lupasic

🏢 Room 105 (Underground robotics lab)