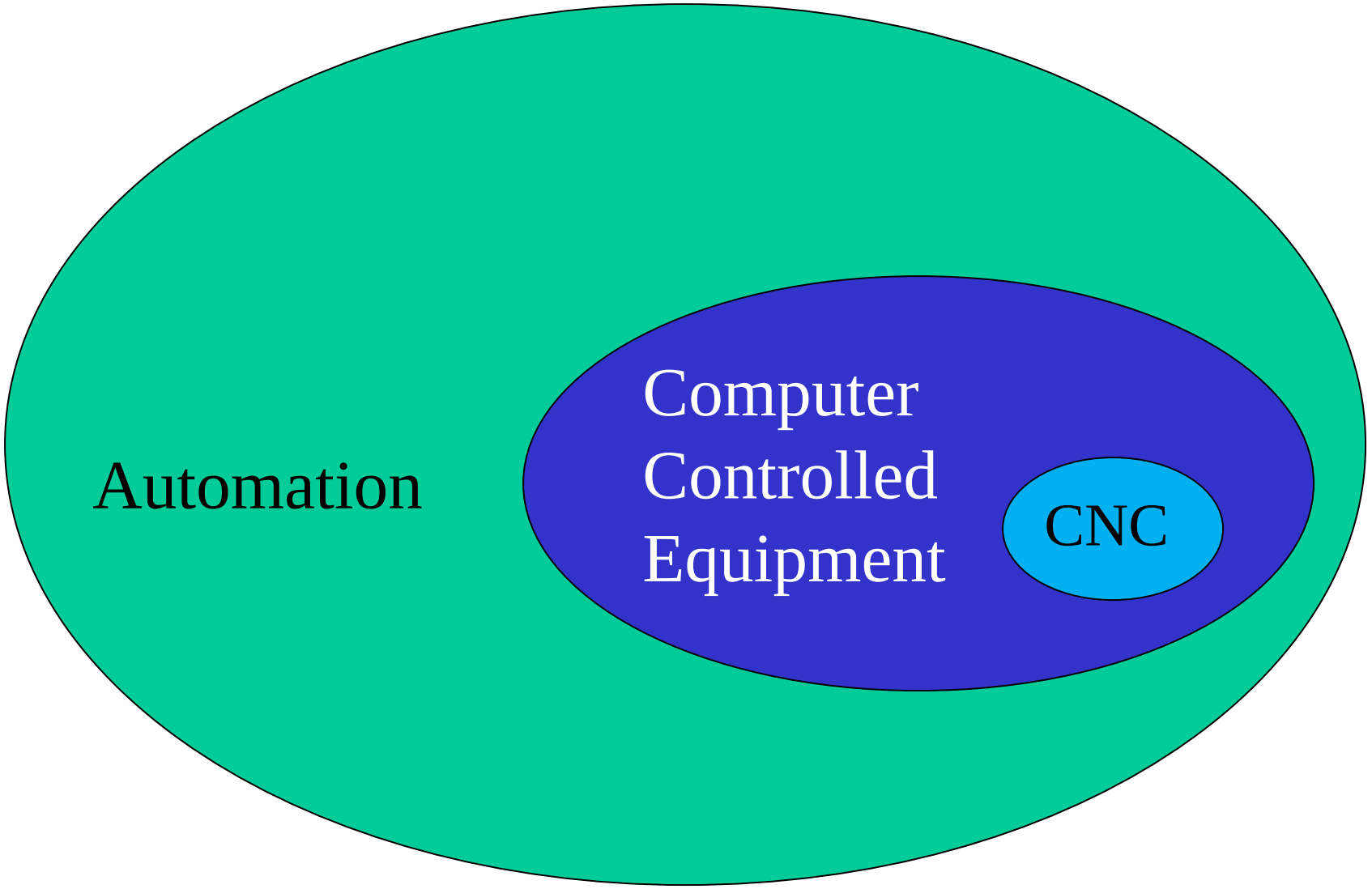
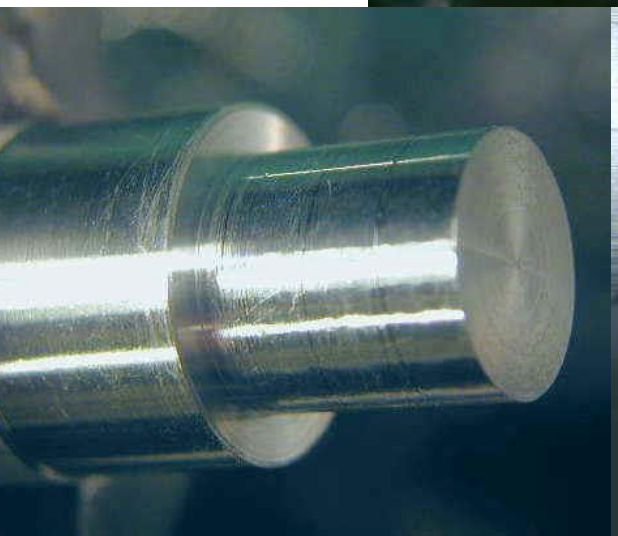
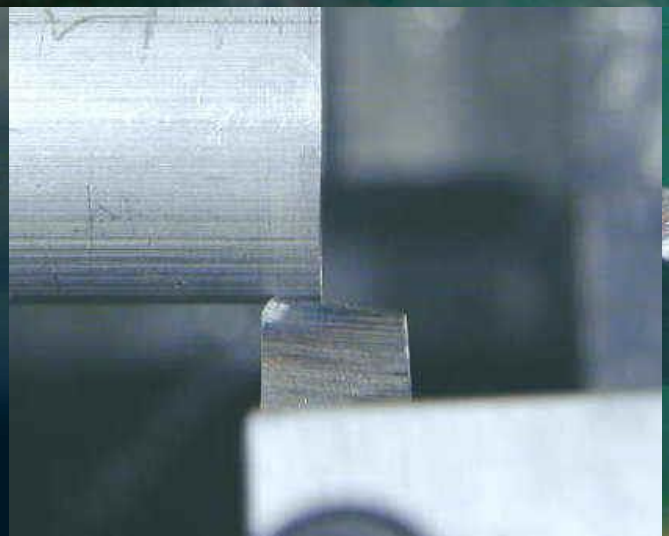
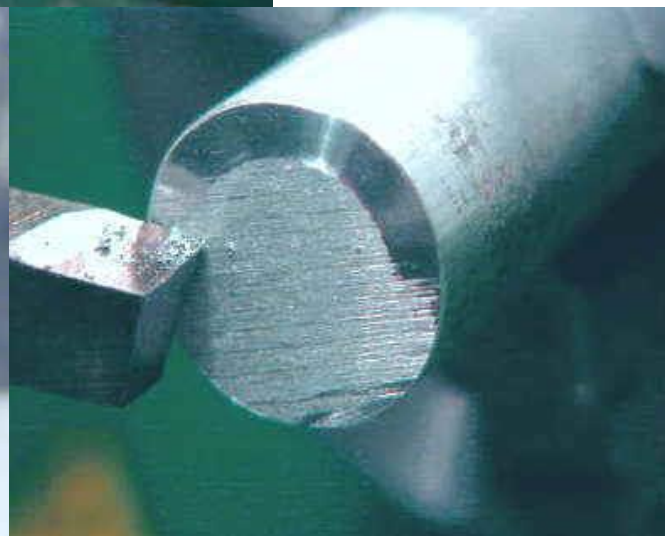

Automation
Computer
Controlled
Equipment
CNC

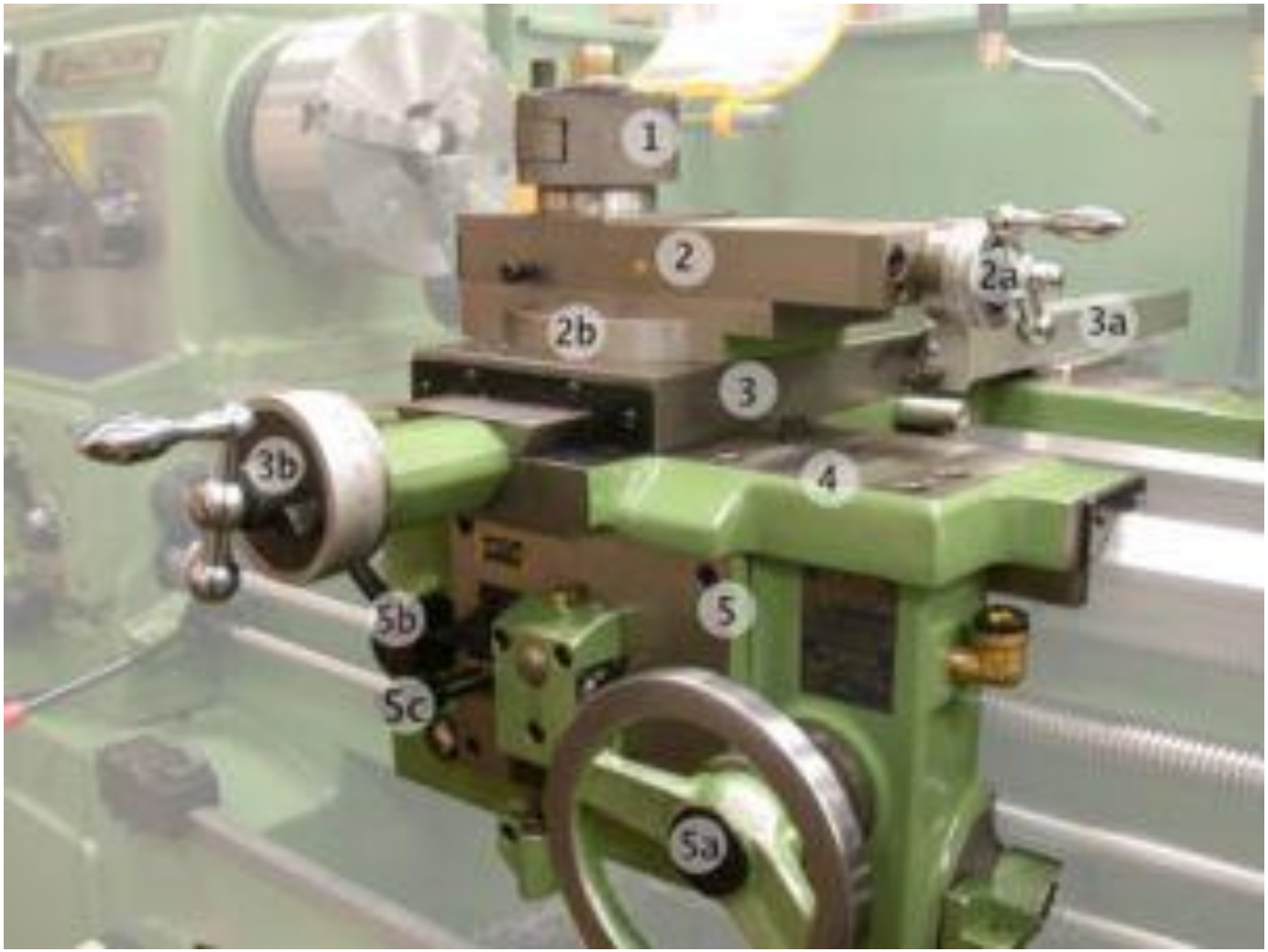
Lathe Operations



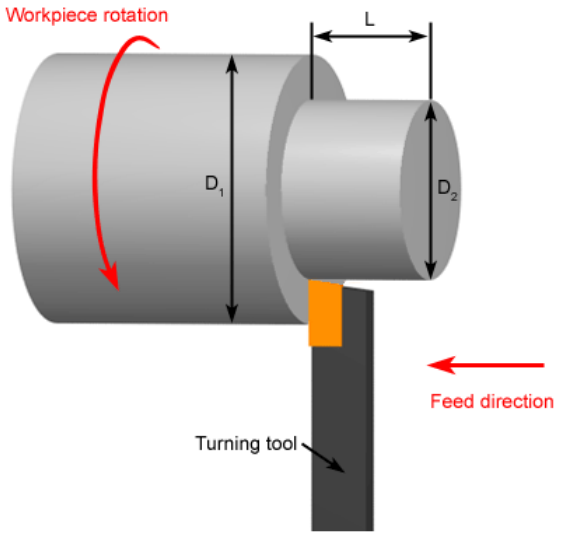




Lathe Operations



Lathe Operations



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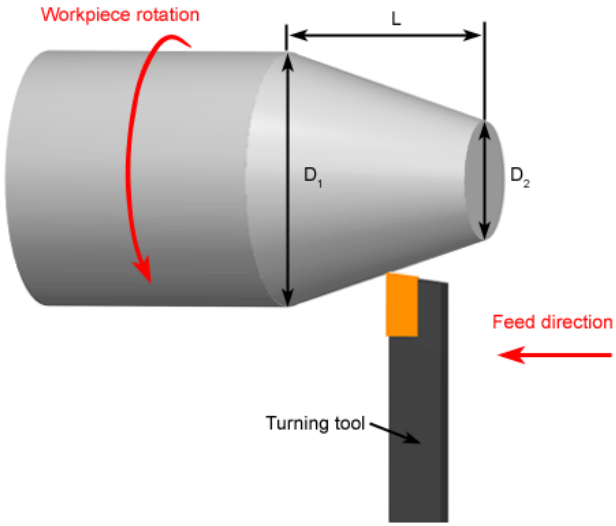

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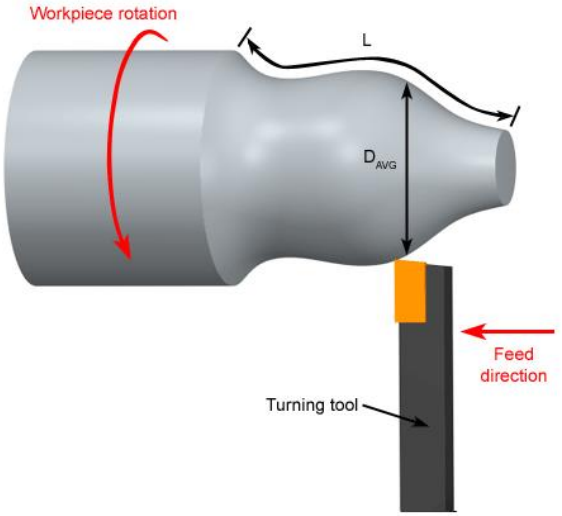

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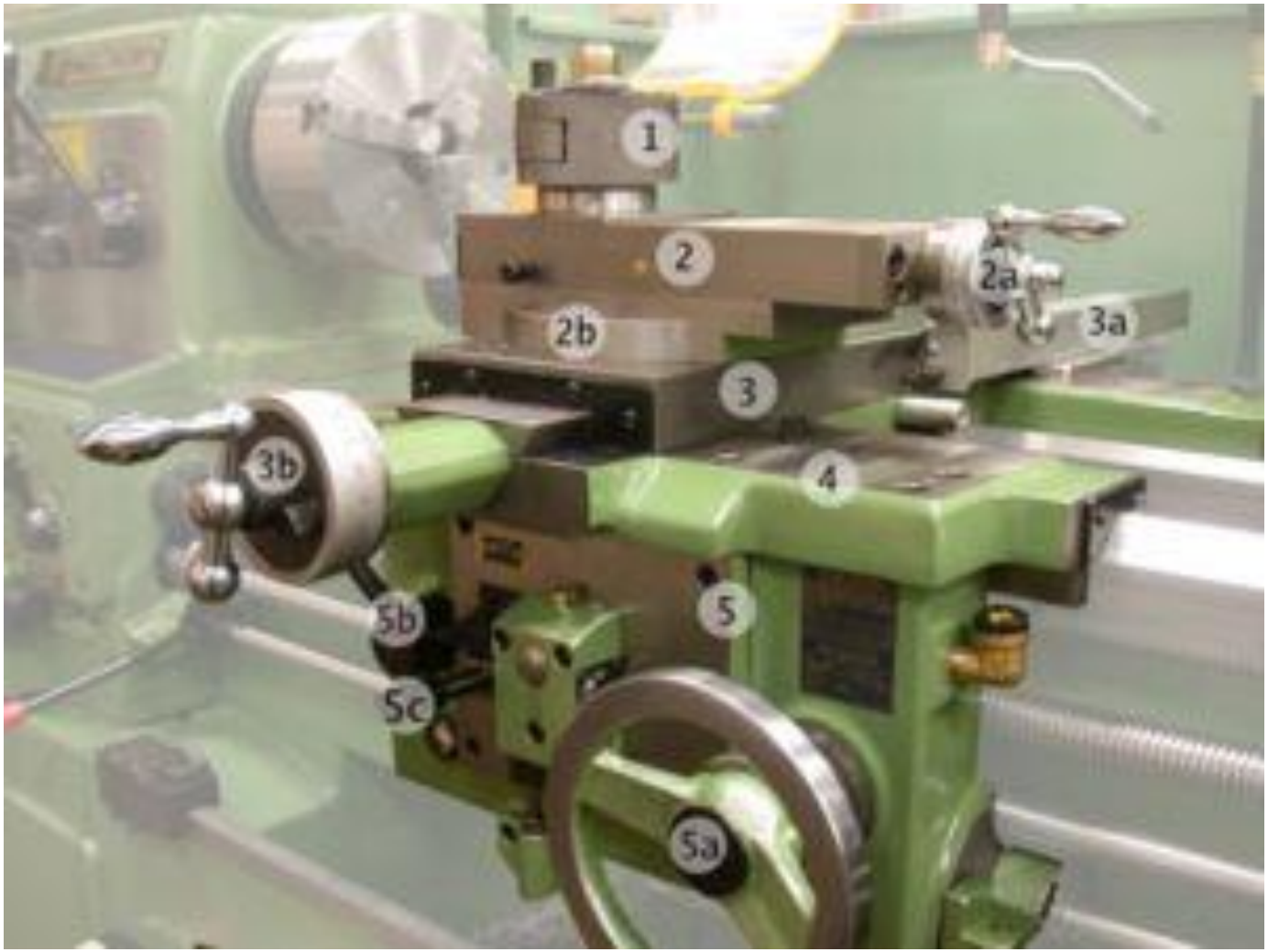
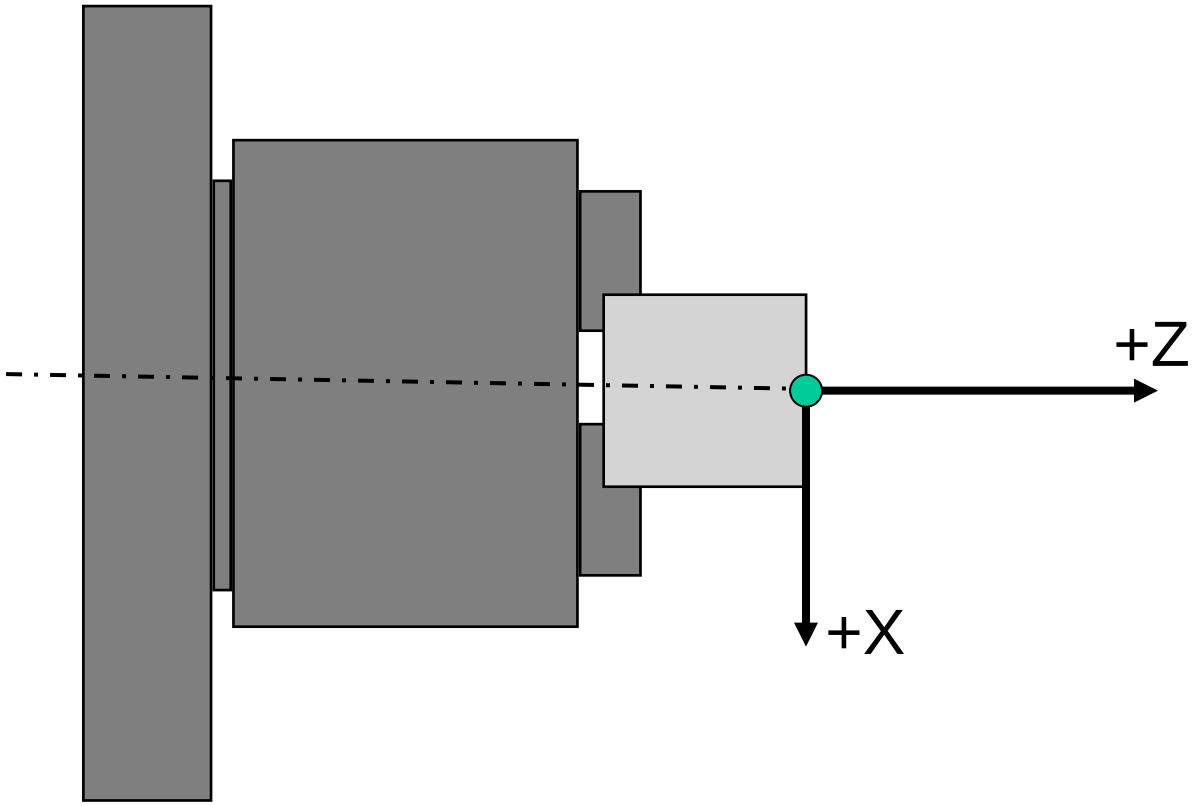
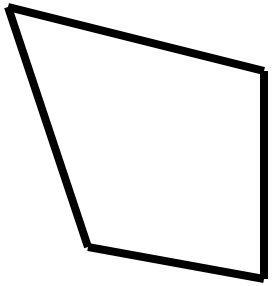
Lathe Operations



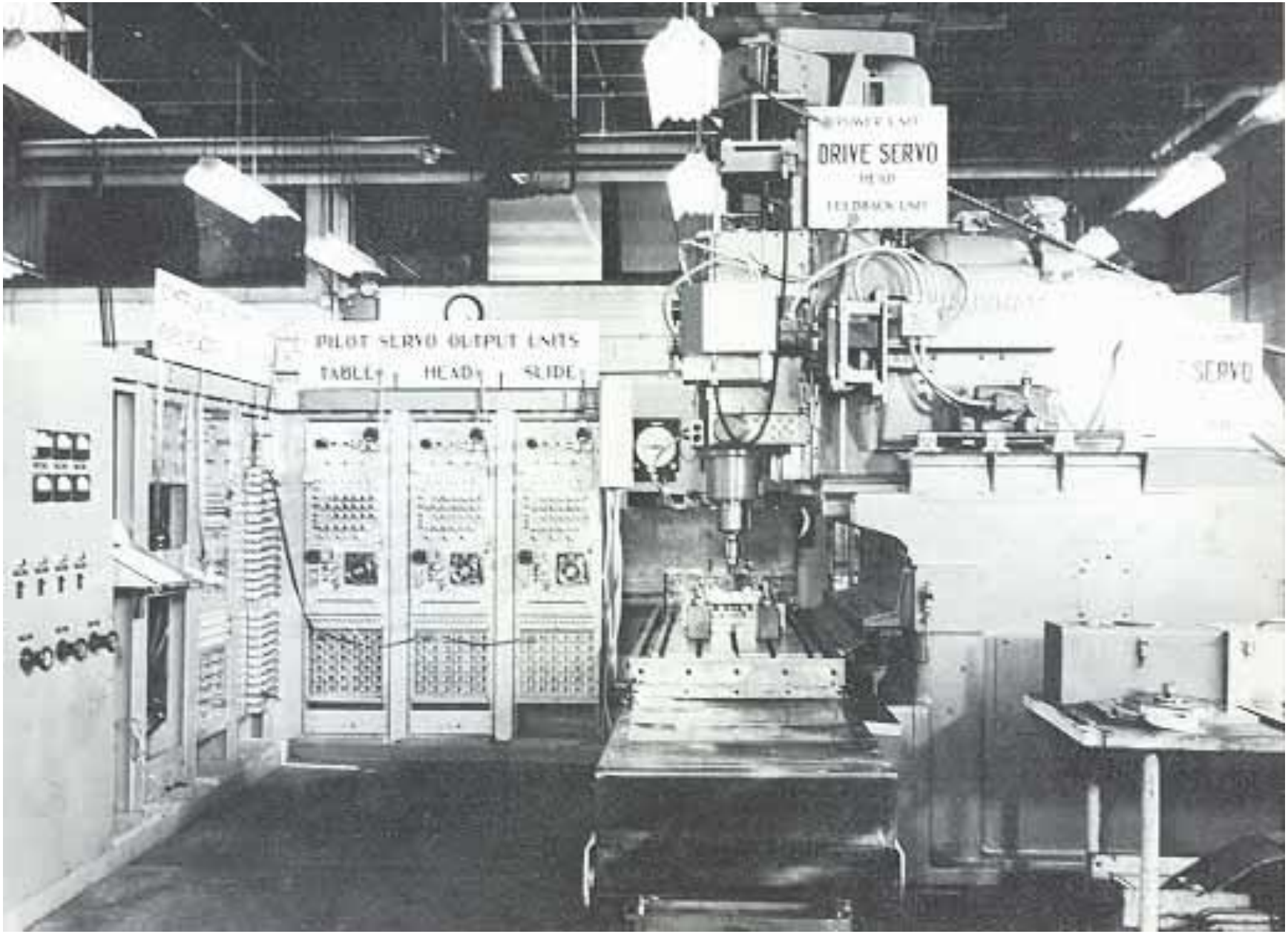
CNC Axes





CNC Lathe

First NC Machine at MIT (1952)



CNC Machines & Programming

CNC stands for “Computer Numerically Controlled”.

In using CNC machines one has to prepare a computer program to manufacture the part.

Preparation of CNC programs and proving them is first step to machine the part.

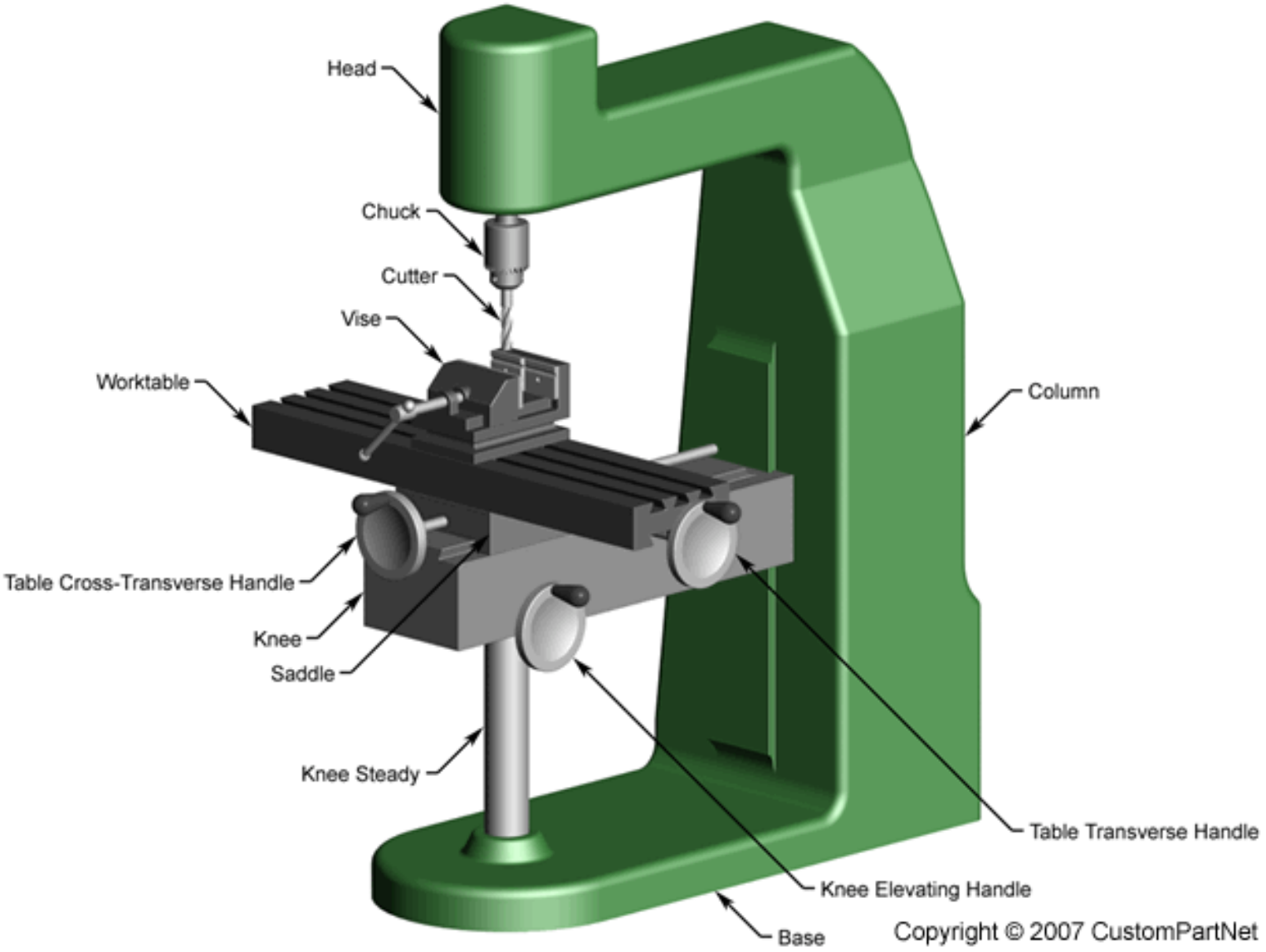
CNC programs are also called part programs.

There are two types of codes are used in CNC programming:

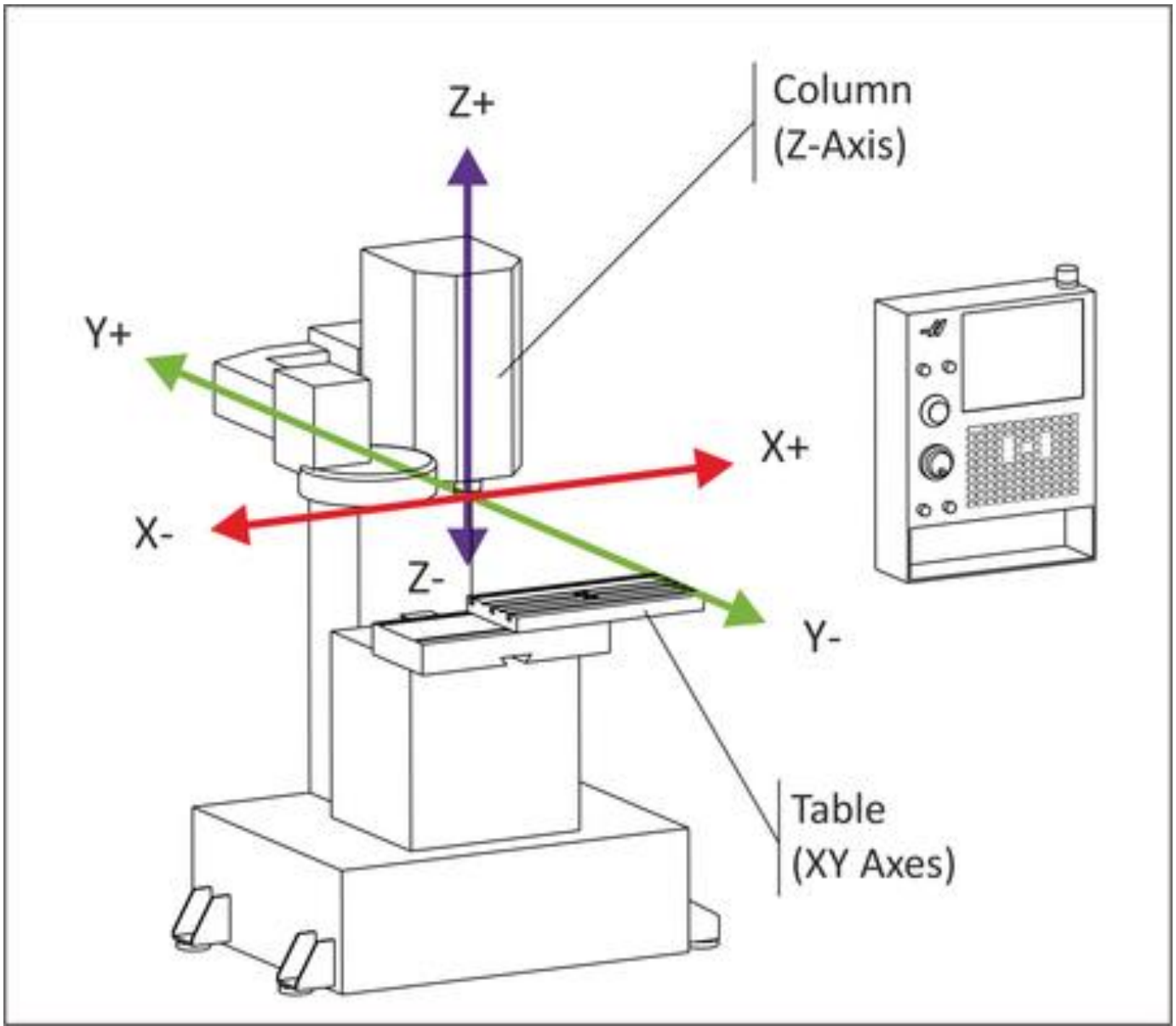
preparatory codes (G Codes)

miscellaneous codes (M codes)

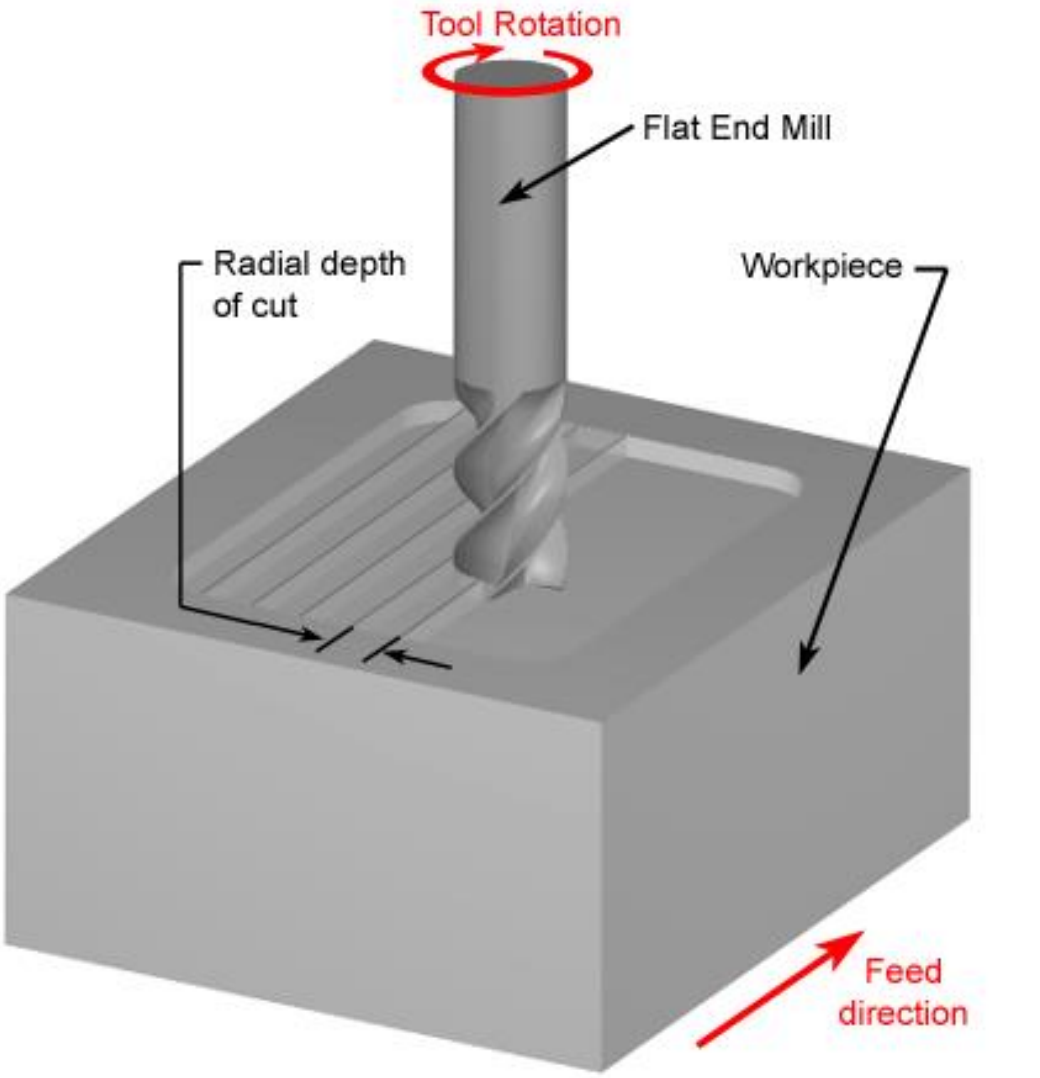
Milling Machine



Milling Machine Axes



Milling Process



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CNC Programming

Motion Statements

G00 Linear Movement (rapid)

G01 Linear Movement (feed)

G02 Circular Movement (cw feed)

G03 Circular Movement (ccw feed)

CNC System

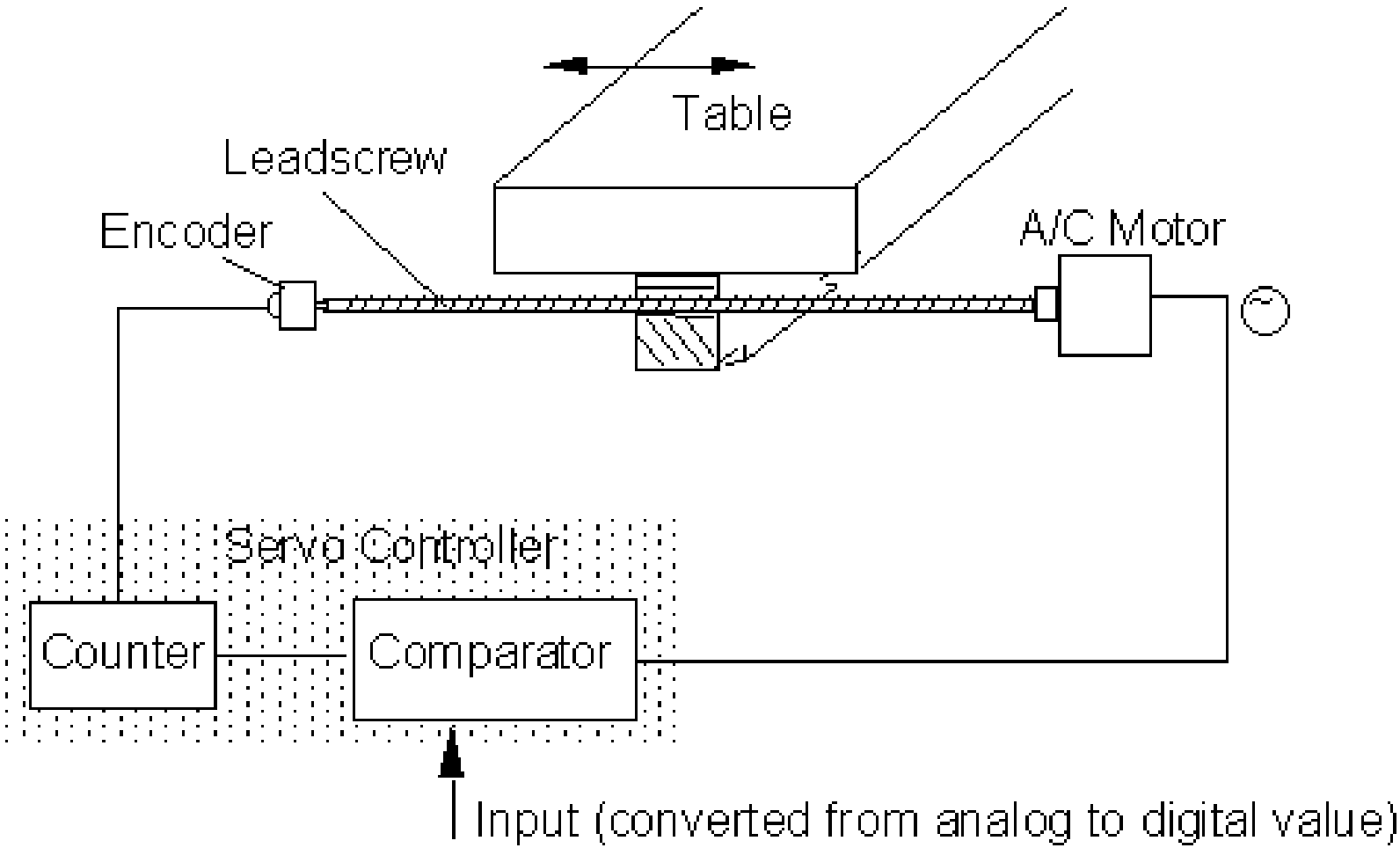
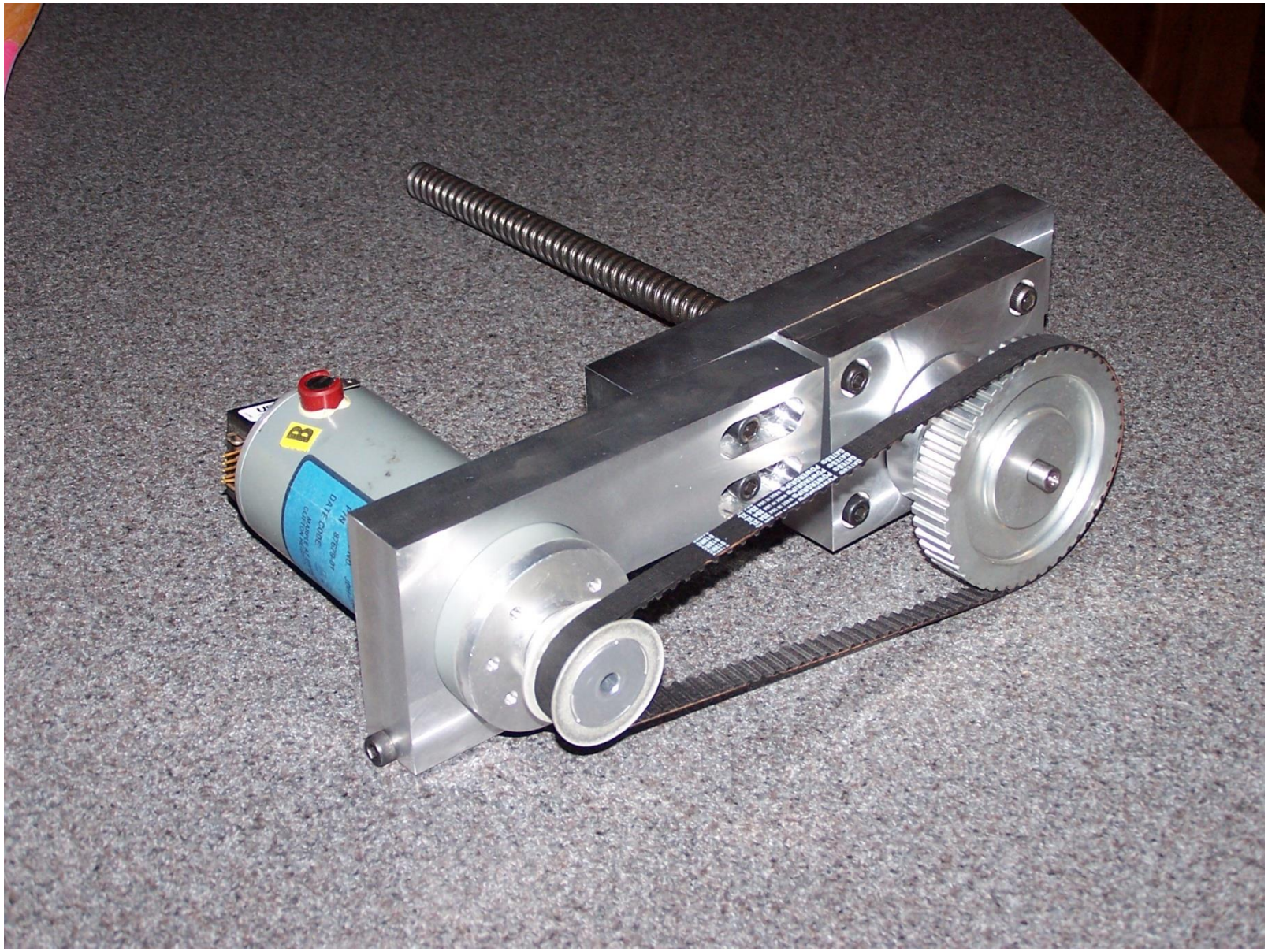
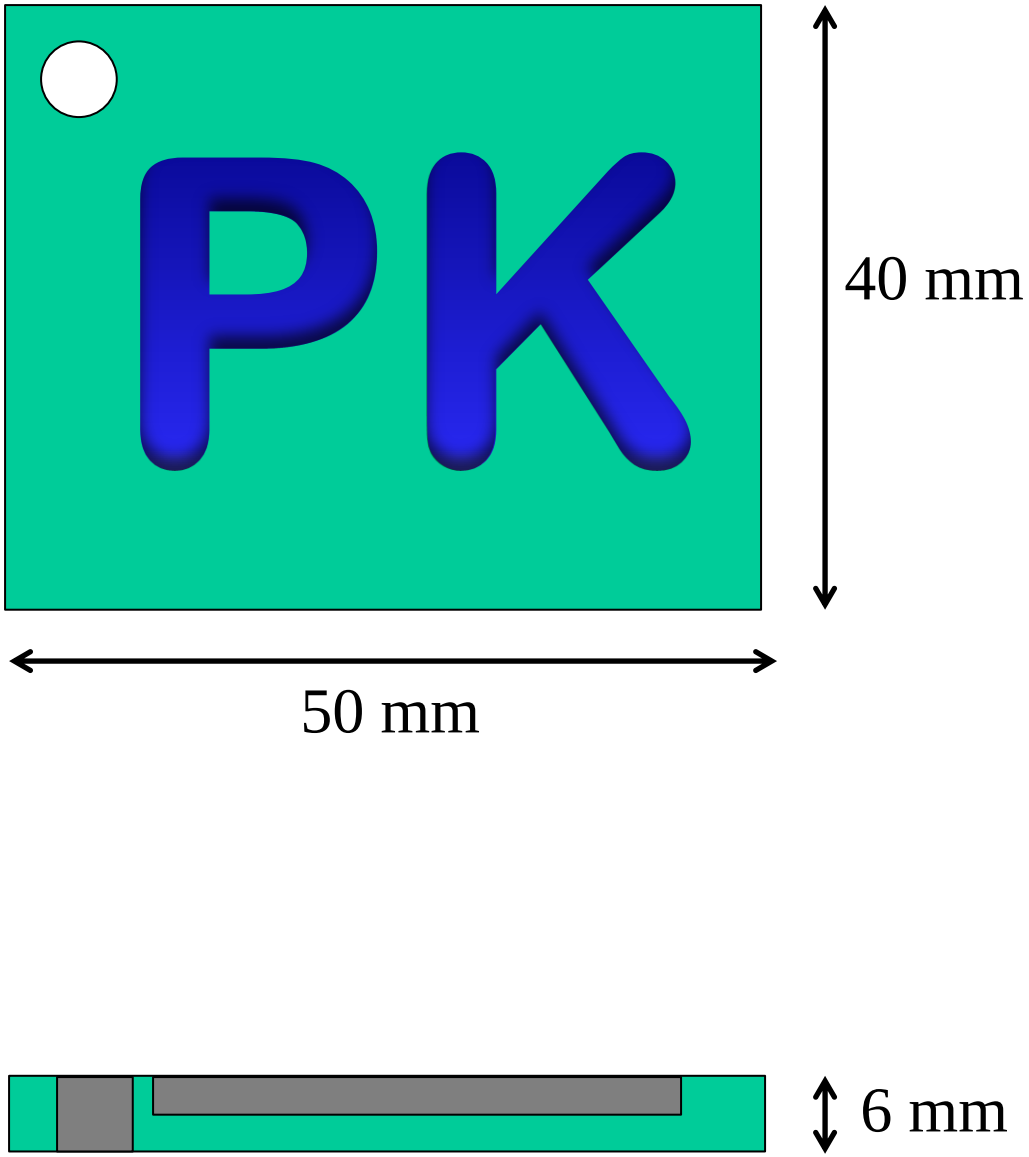


Table
Leadscrew
Encoder
A/C Motor
Servo Controller
Counter
Comparator
Input (converted from analog to digital value)

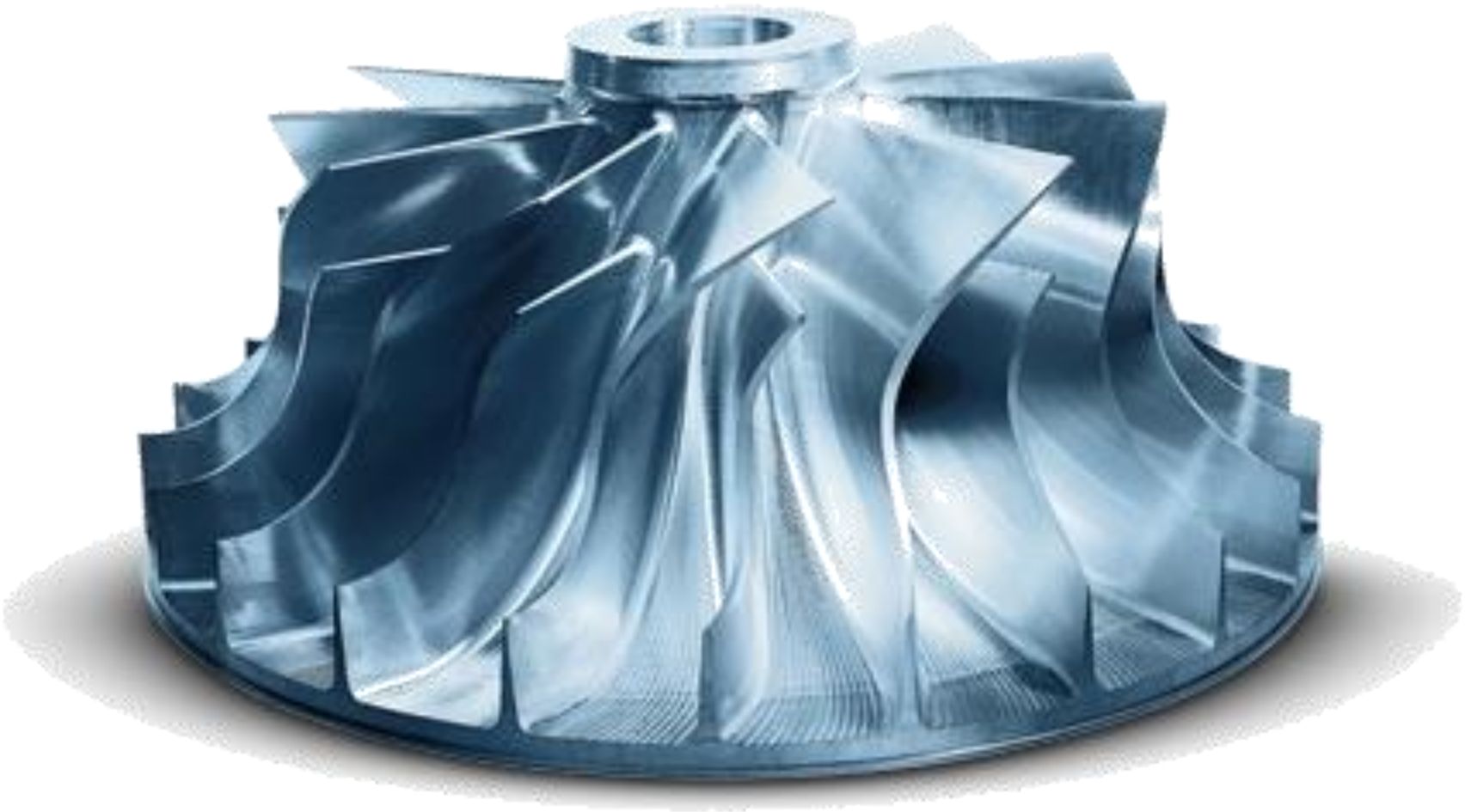
CNC System



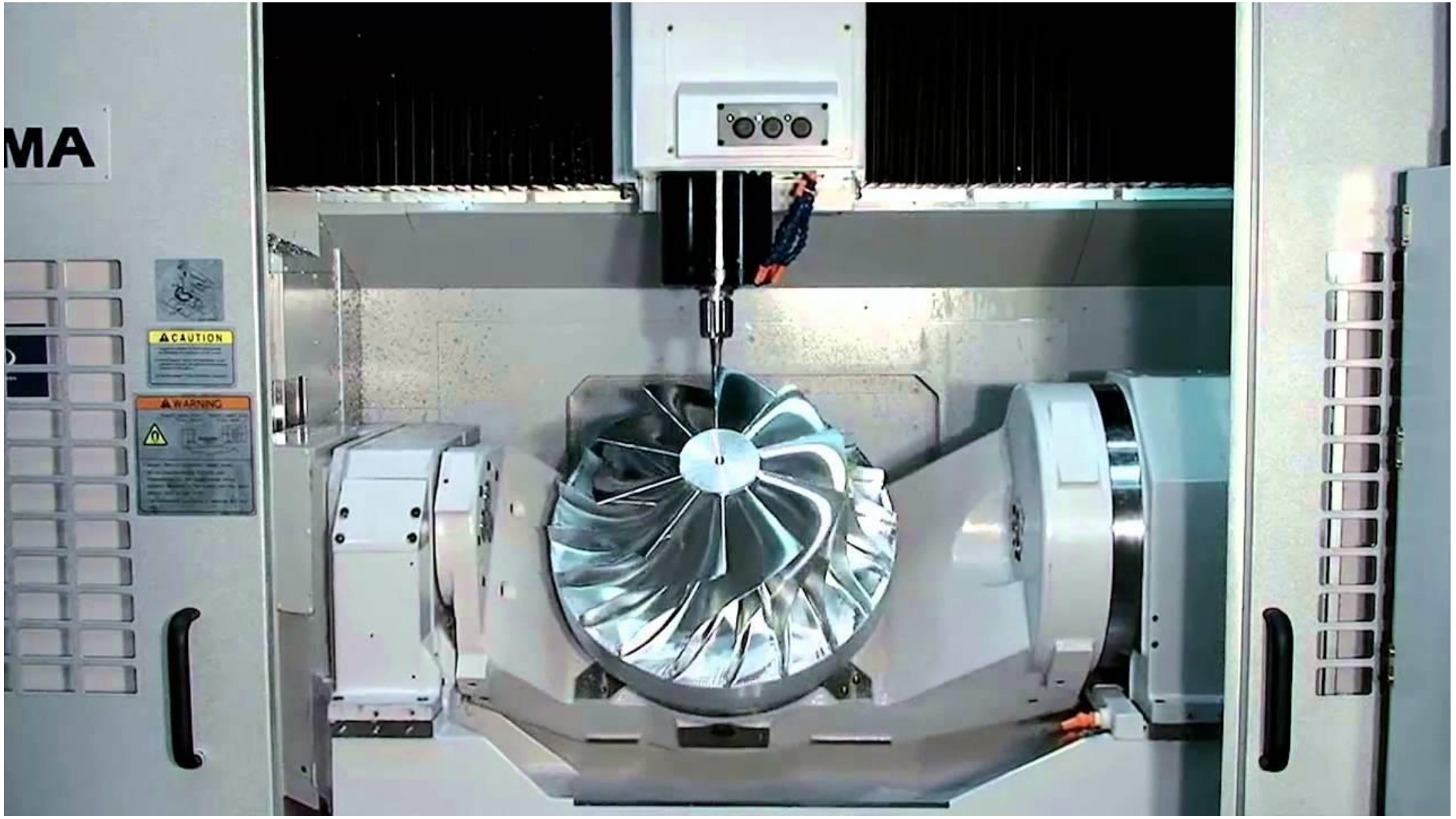

PK
40 mm
50 mm
6 mm

Hip Implant

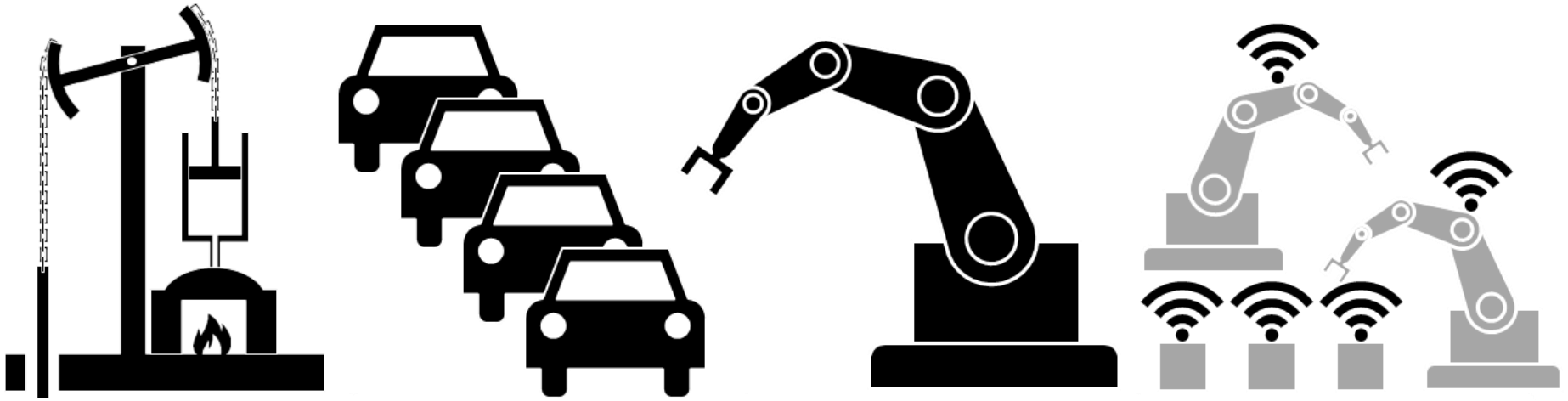
Impeller



Five Axis Machining



Industry 4.0 (Machines)



1st	2nd	3rd	4th
Mechanization, water power, steam power	Mass production, assembly line, electricity	Computer and automation	Cyber Physical Systems

Designing for Cyber-Physical Systems

Sensors

+

Internet

+

Data

+

AI