

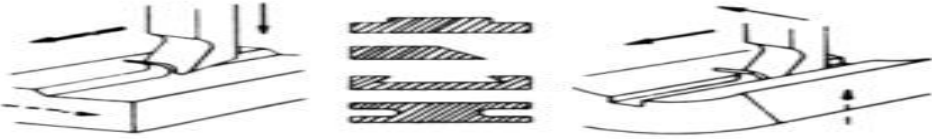
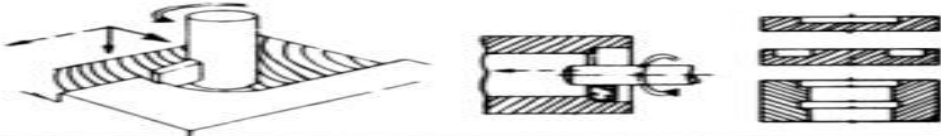
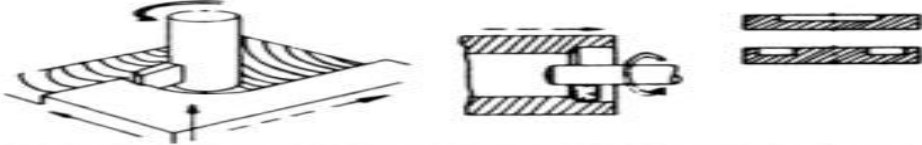
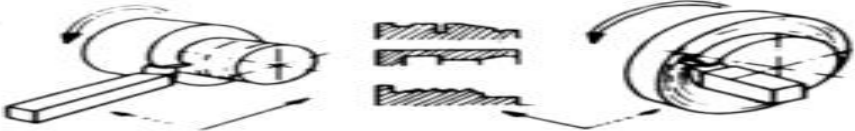


# Types of Machining Process

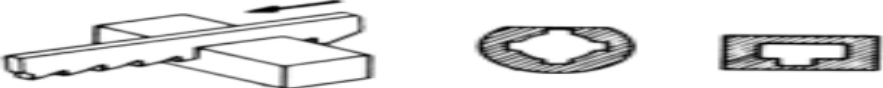







Single Cutting Edge (Point) Processes

Multi-Cutting Edge (Point) Processes

# Single Cutting Edge (Point)

Cutting with single-point tools <sup>b</sup>	Processing machine (machine tool)
	Chisel (hand)
	Planer
	Shaper Slotter
	Horizontal boring machine
	Horizontal boring machine
	Lathe Boring mill

# Multi-Cutting Edge (Point)

Cutting with multipoint tools <sup>b</sup>	Processing machine (machine tool)
	Broaching machine
	(Hand) Saw File
	Band-sawing machine Filing machine
	Lathe Boring mill
	Horizontal boring machine Drill press
	Milling machine Rotary cutoff saw
	Band saw Filing machine
	Milling machines

- A single point cutting tool removes material from a rotating work piece to generate a cylindrical shape
- Performed on a machine tool called a lathe

Types

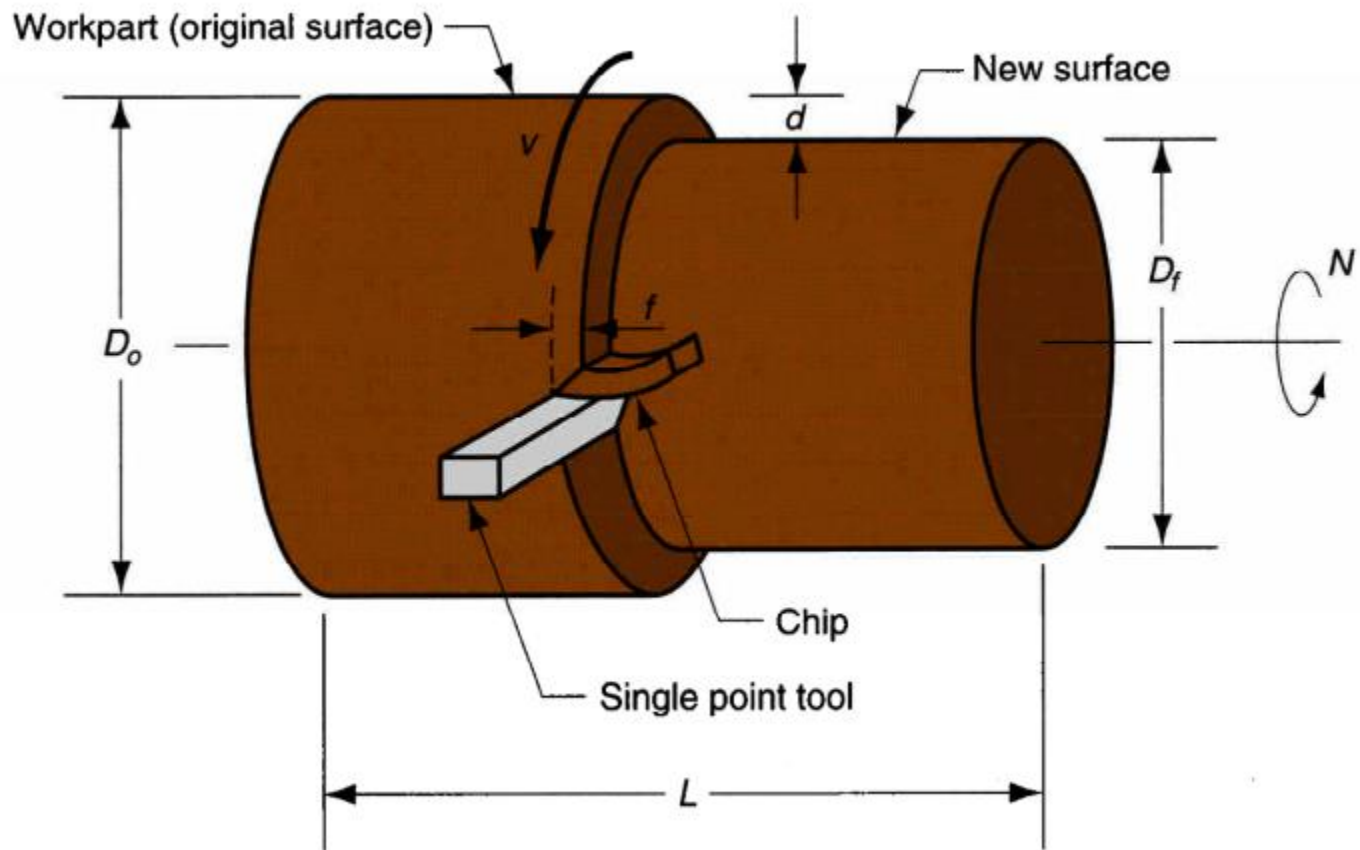
Facing

Contour turning

Chamfering

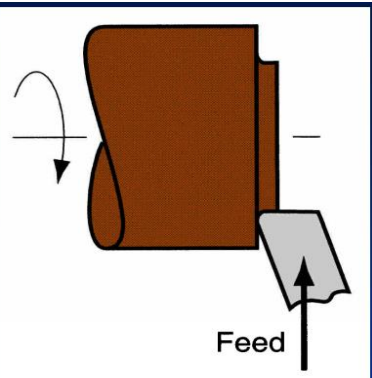
Cutoff

Threading



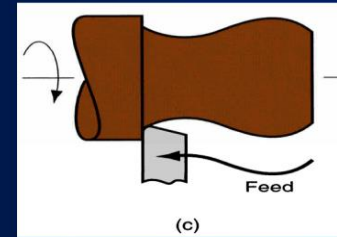
## Facing

Tool is fed radially inward



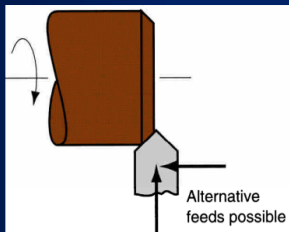
## Contour Turning

Instead of feeding the tool parallel to the axis of rotation, tool follows a contour that is other than straight, thus creating a contoured form



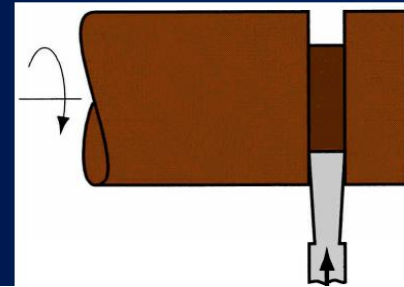
## Chamfering

Cutting edge cuts an angle on the corner of the cylinder, forming a "chamfer"



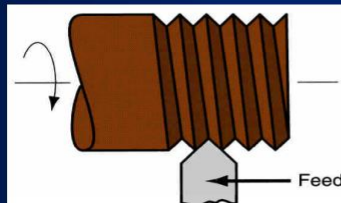
## Cutoff

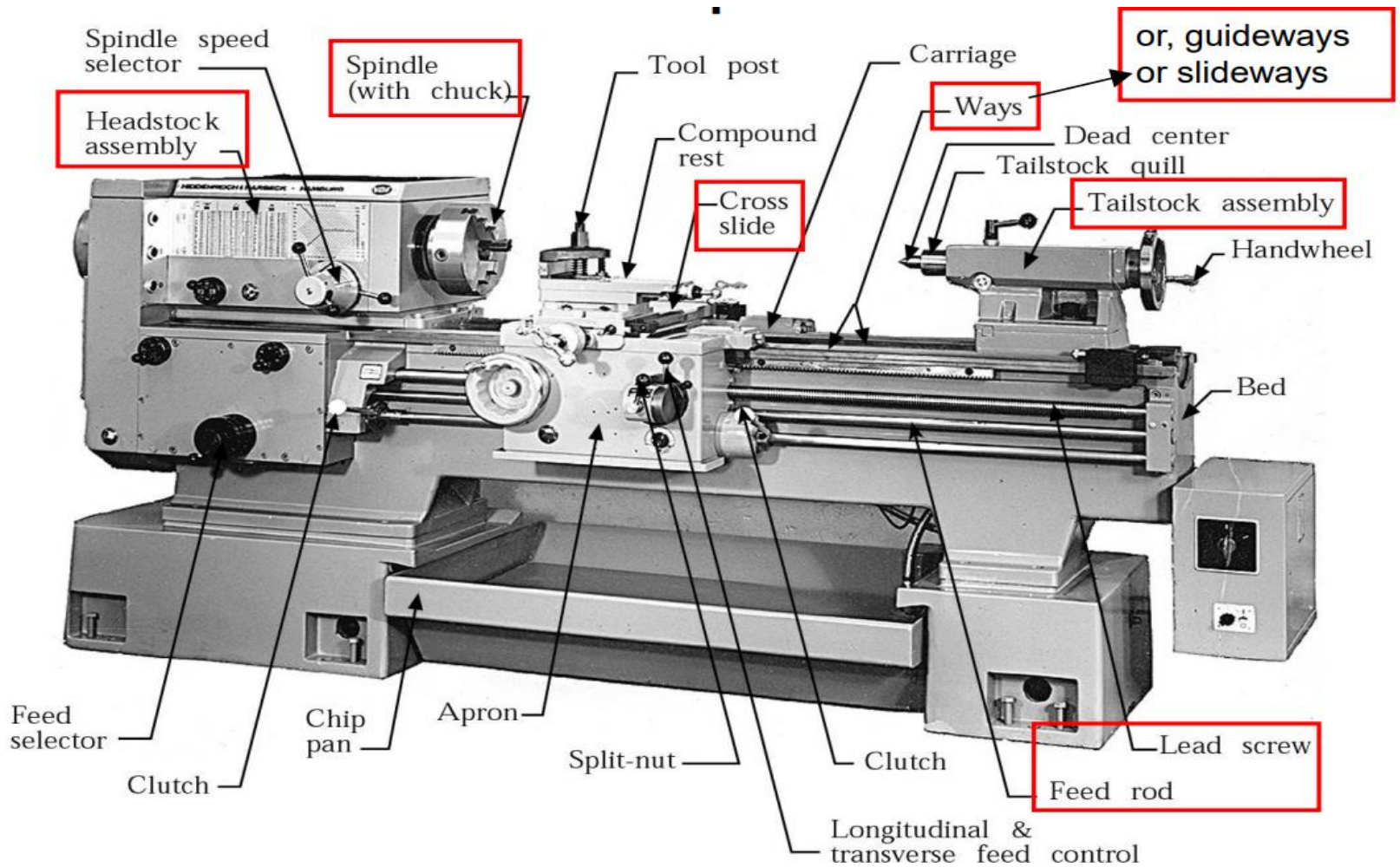
Tool is fed radially into rotating work at some location cut off end of part



## Threading

Pointed form tool is fed linearly across surface of rotating workpart parallel to axis of rotation at a large feed rate, thus creating threads





# Boring

Difference between boring and turning:

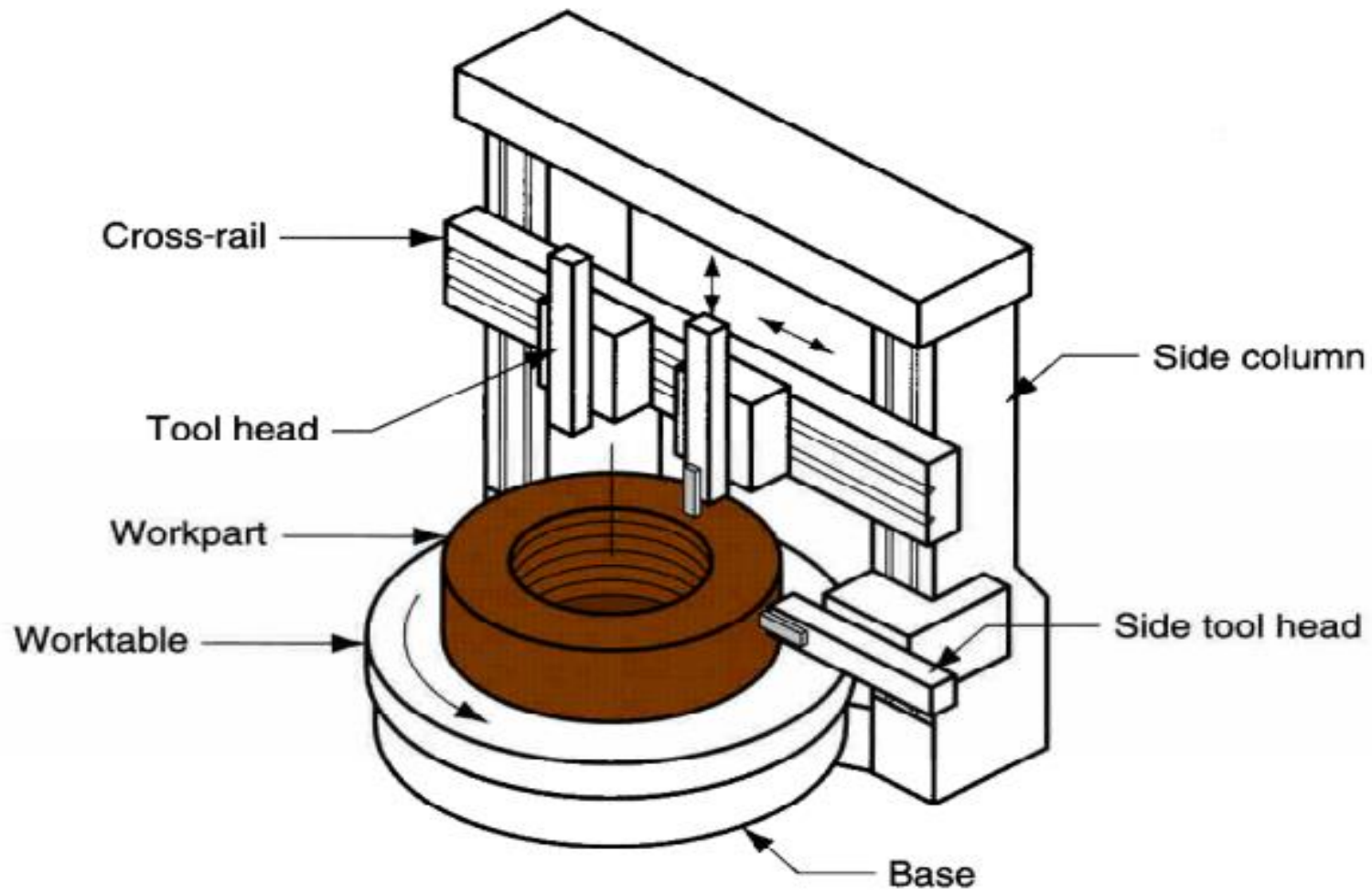
Boring is performed on the inside diameter of an existing hole

Turning is performed on the outside diameter of an existing cylinder

- In effect, boring is an internal turning operation
- Boring machines

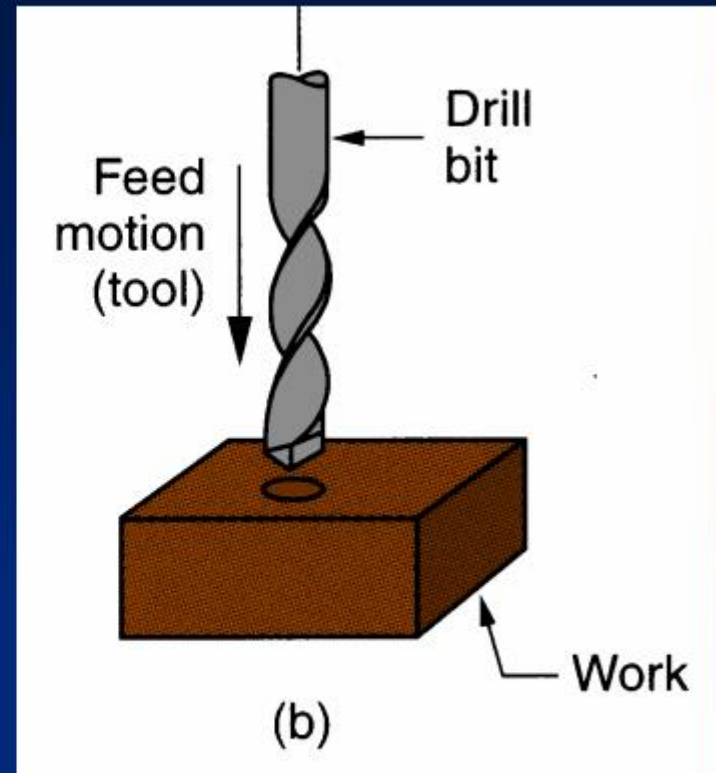
Horizontal or vertical - refers to the orientation of the axis of rotation of machine spindle





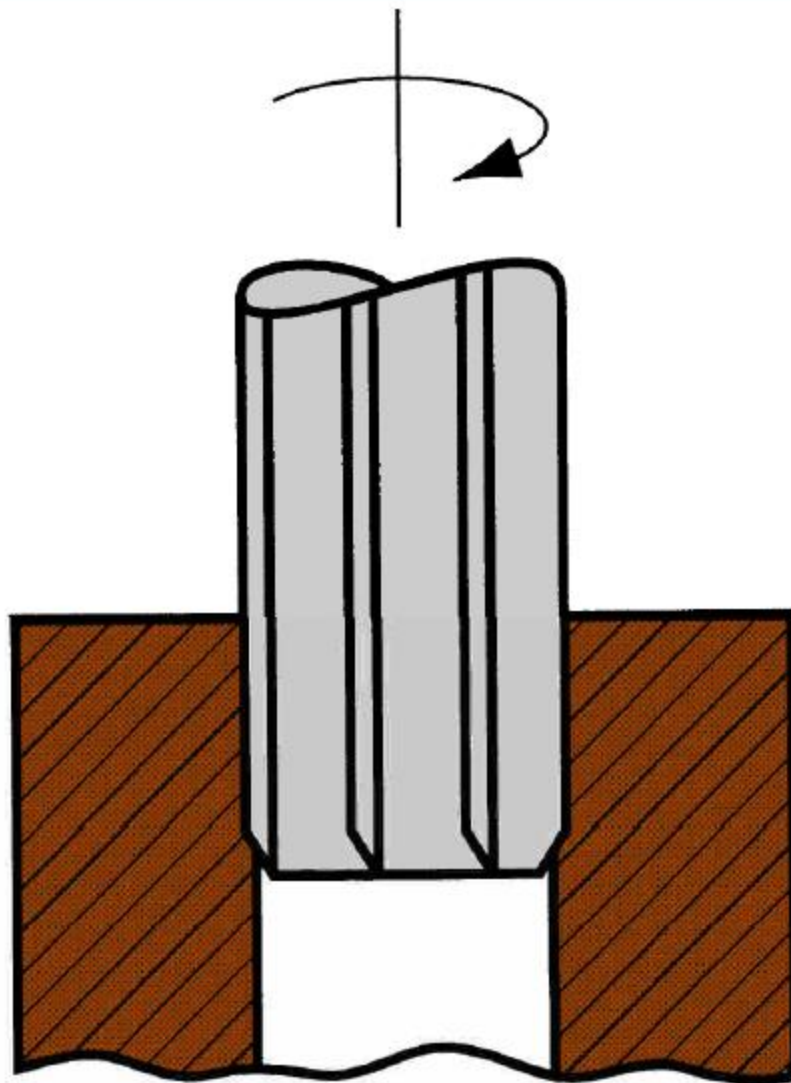
## Drilling

- Creates a round hole in a workpart
- Contrasts with boring which can only enlarge an existing hole
- Cutting tool called a *drill* or *drill bit*
- Customarily performed on a *drill press*



# Reaming

Used to slightly enlarge a hole, provide better tolerance on diameter, and improve surface finish



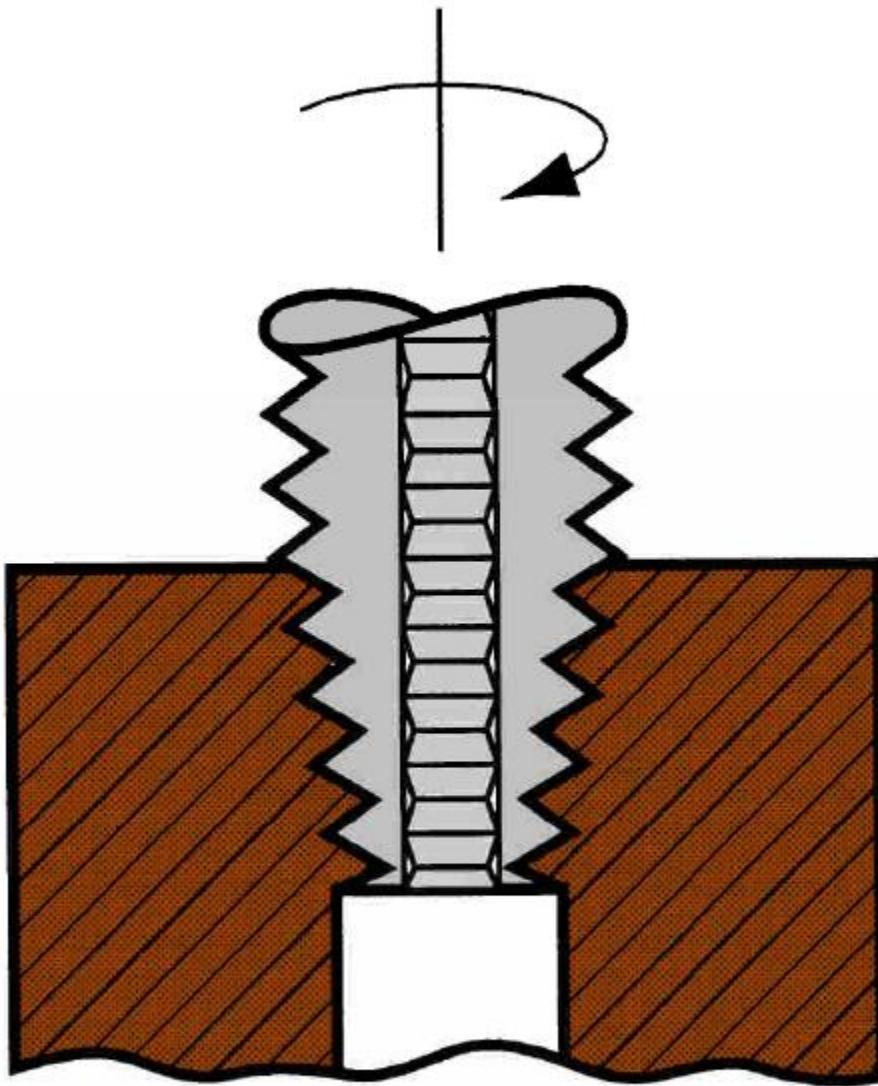
(a)

Machining operations related to drilling:  
(a) reaming

# Tapping

Used to provide  
internal screw  
threads on an  
existing hole

Tool called a *tap*

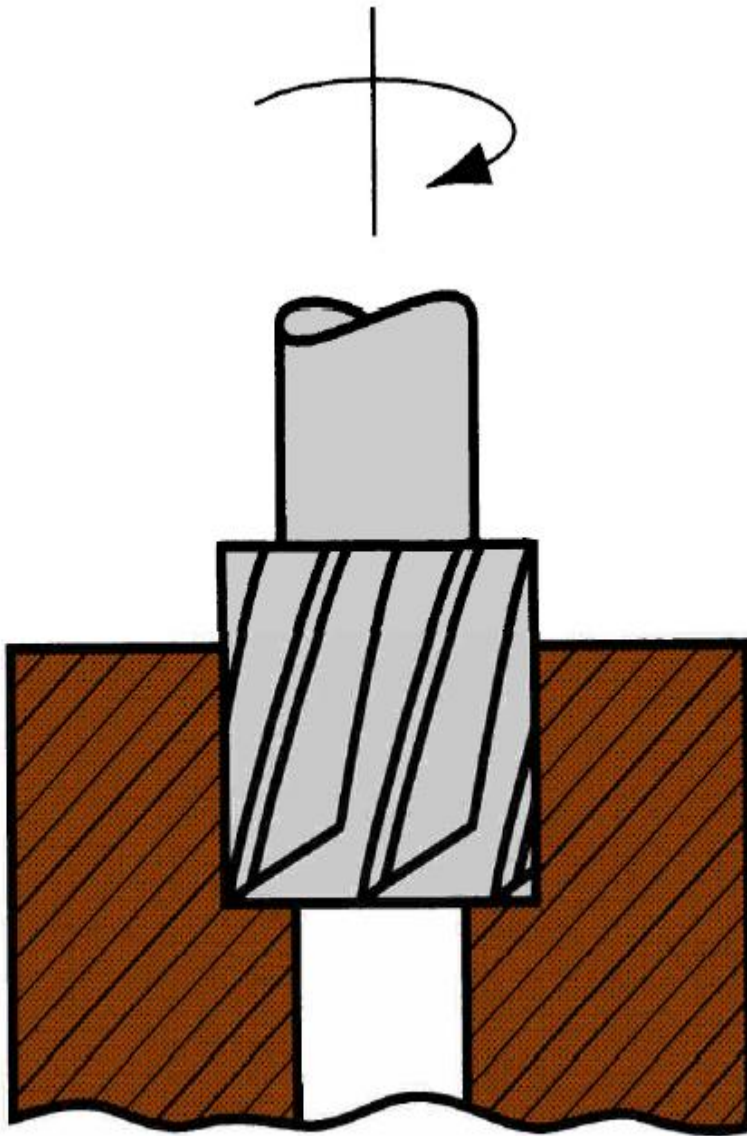


(b)



# Counterboring

Provides a stepped hole, in which a larger diameter follows a smaller diameter partially into the hole



(c)

# Work Holding for Drill Presses

- Workpart can be clamped in a vise, fixture, or jig
  - *Vise* - general purpose workholder with two jaws
  - *Fixture* - workholding device that is usually custom-designed for the particular workpart
  - *Drill jig* – similar to fixture but also provides a means of guiding the tool during drilling