

ENG 3

Competency D504.00

Construct various types of thread and fastener representations and their annotations.

Objective D504.01

Specify threads and fasteners on a technical drawing.

Purpose of this unit:

Provide the draftsman with an understanding of the basic types of fasteners used in the assembly of parts and the method in which they are represented on a technical drawing.

Purpose of Fasteners:

Name 4 purposes of fasteners:

- a.
 - b.
 - c.
 - d.
-

Define the following terms:

helix -

external -

internal -

major diameter -

minor diameter -

crest -

root -

pitch -

lead -

single threads -

multiple threads -

class of fit -

Name the 4 standardized classes of fit and describe each:

1)

2)

3)

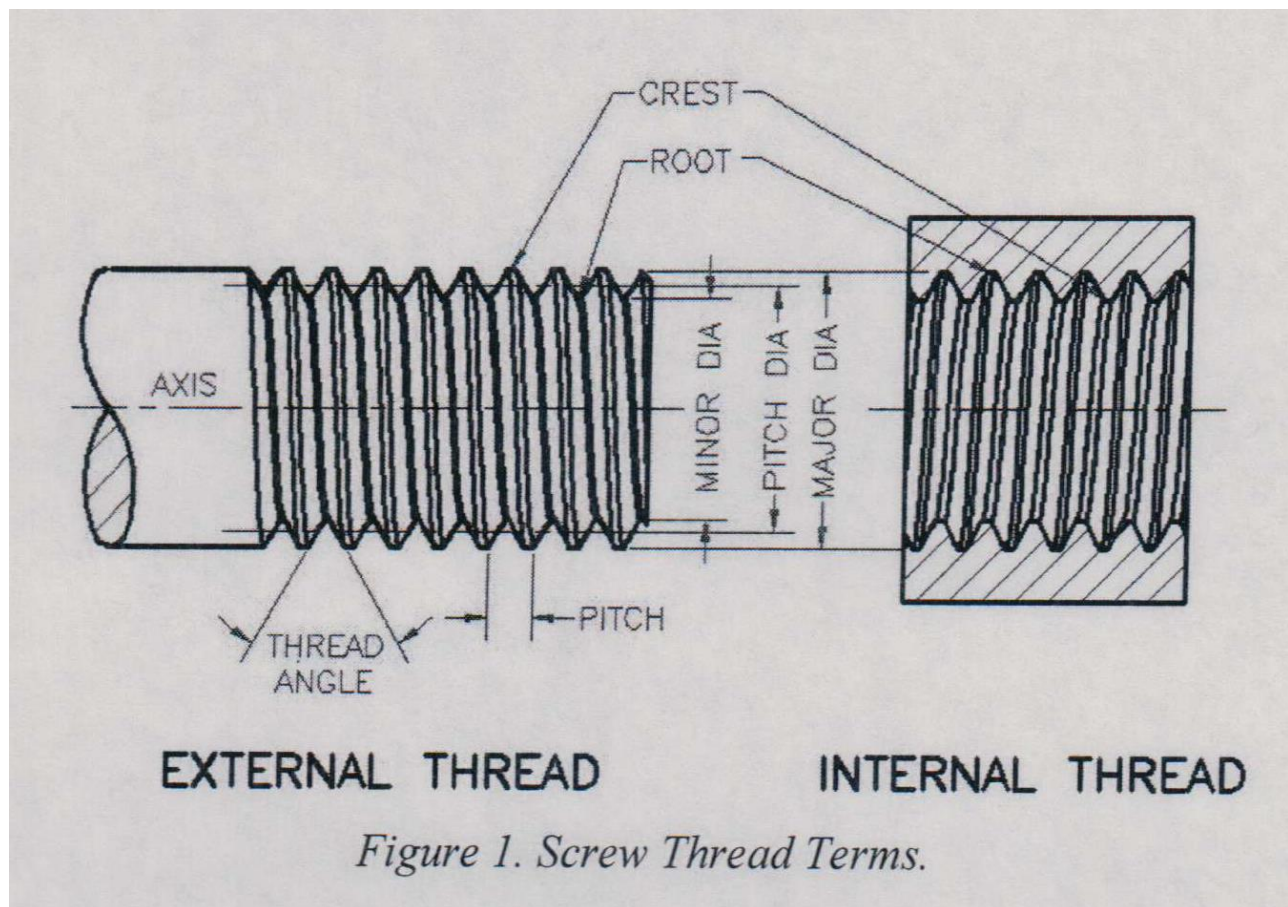
4)

thread depth -

thread angle -

right-handed (RH) -

left-handed (LH) -



Thread-Cutting Tools

Name 2 thread cutting tools and describe each:

a.

b.

American National Standard for Unified Threads

- + The American National Standard Institute (ANSI) established ANSI B1.1 as the American Standard for Unified Screw Threads.
- + It is referred to as the Unified system because it has been agreed upon by the United Kingdom and Canada as well as the United States.
- + Unified threads are the basic American standard for fastening type screw threads.
- + Fasteners with constant pitch threads are sized by the basic major diameter and by the number of threads per inch. These two dimensions are combined to create the various thread series.

Describe the following types of threads and what makes them unique:

A. Unified National Coarse (UNC) -

+

B. Unified National Fine (UNF) -

+

What is tensile strength?

C. Unified National Extra Fine (UNEF) -

+

+

D. Metric Thread -

+

+

E. Square Thread -

+

+

Example of square threads:

F. ACME Thread -

+

+

+

G. Sharp - V Thread -

+

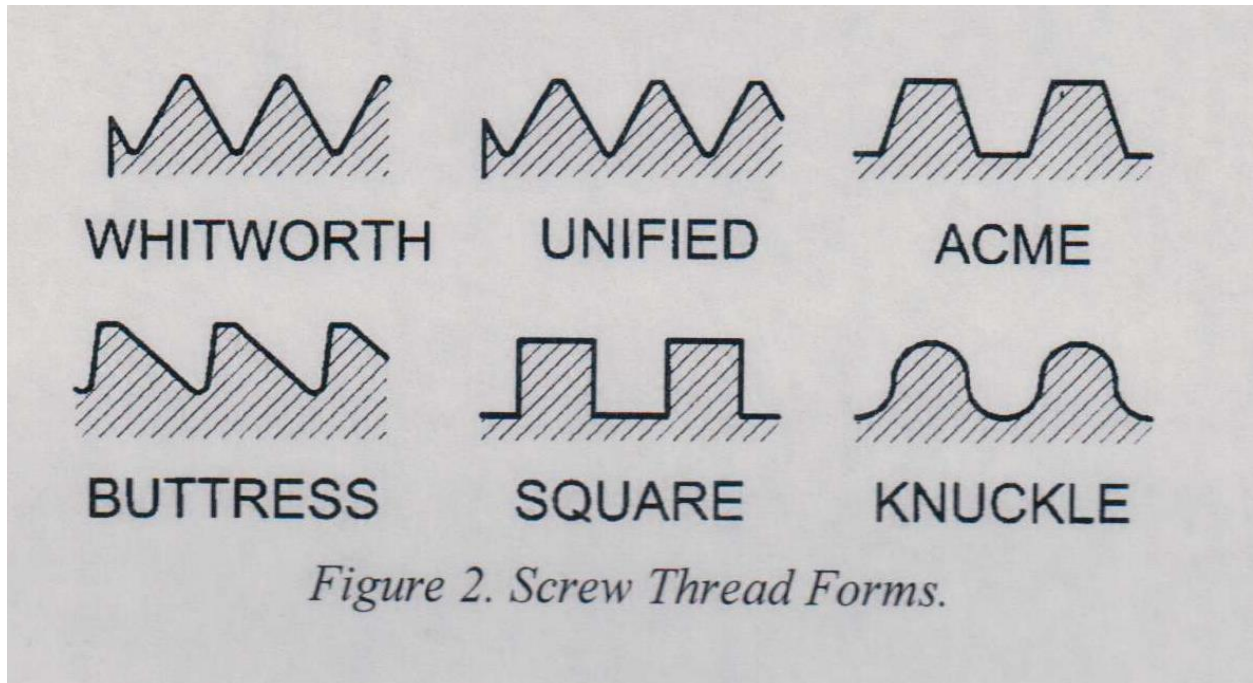
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H. Knuckle Thread -

+

I. Buttress Thread -

+



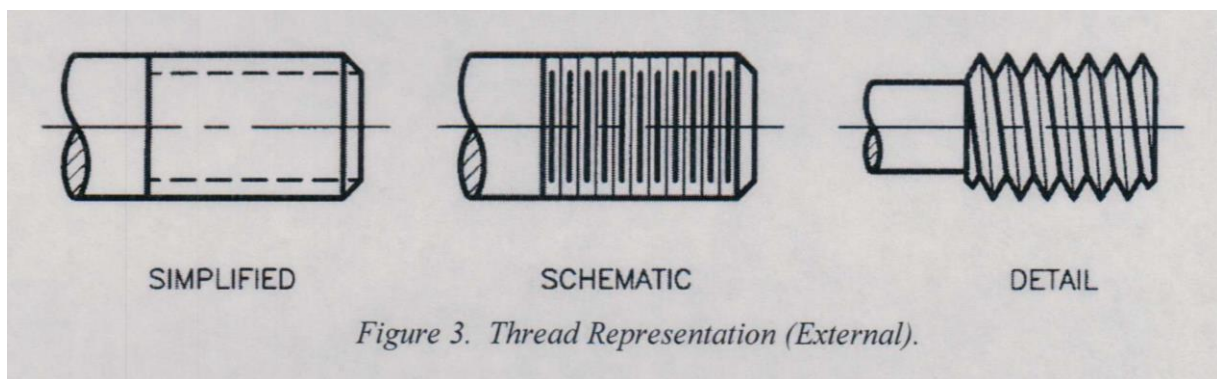
Thread Representation

Describe each type of thread representation:

A. Simplified Method -

B. Schematic Method -

C. Detailed -



Thread Annotations/Specifications

Unified Annotations

- + screw thread is specified by giving its nominal (major) diameter.
- + number of threads per inch.
- + class of fit.
- + external (A) or internal (B).
- + if left-handed (include LH after the class symbol).
- + size of the thread may be given on the drawing by using either fractional-inch or decimal-inch sizes.

EXAMPLE:

.75-10UNC-2A

- _____ = Major diameter of the thread.
- _____ = Threads per inch.
- _____ = Unified threads.
- _____ = Coarse thread.
- _____ = Class fit.
- _____ = External thread.

EXAMPLE:

.88-14UNF-2B

- _____ = Major diameter of the thread
- _____ = Threads per inch.
- _____ = Unified threads.
- _____ = Fine thread.
- _____ = Class fit.
- _____ = Internal thread.

EXAMPLE:

.375-32UNEF-4A-LH

- _____ = Major diameter of the thread
- _____ = Threads per inch.
- _____ = Unified threads.
- _____ = Extra Fine thread.
- _____ = Class fit.
- _____ = External thread.
- _____ = Left-hand thread.

Metric Annotations

- + ISO metric screw threads are specified by its nominal size (basic major diameter) and pitch - both expressed in millimeters.
- + Include a "M" to denote that the thread is an ISO metric screw thread.
- + Place the unit of measure ("M" for metric) before the major diameter.
- + Use "X" to separate the major diameter from the pitch.

EXAMPLE:

M10 X 1.25

- _____ = Designates it as an ISO metric thread.
- _____ = Major diameter.
- _____ = Separation between the diameter and pitch.
- _____ = Thread pitch.

EXAMPLE:

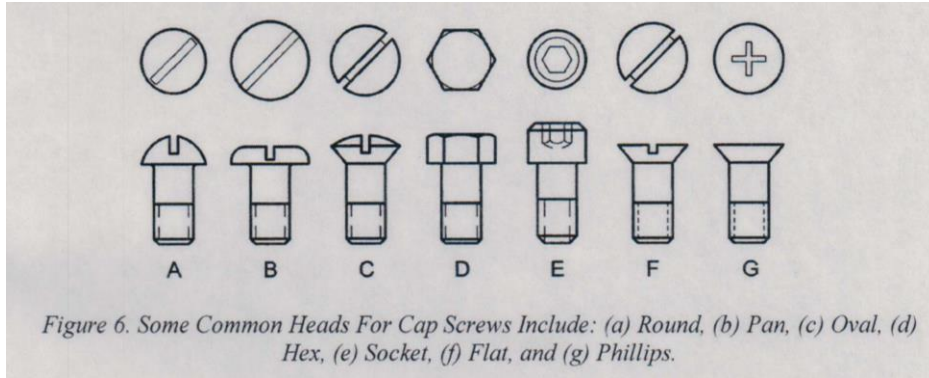
M10

- _____ = Designates it as an ISO metric thread.
 - _____ = Major diameter.
- (This type annotation denotes a coarse metric thread).*

EXAMPLE:

M10 X 1.25 X 25

- _____ = Designates it as an ISO metric thread.
- _____ = Major diameter.
- _____ = Separation between the diameter and pitch.
- _____ = Thread pitch.
- _____ = Separation.
- _____ = Thread length.



Threaded Fasteners

Describe each threaded fastener and its characteristics:

a. Bolt -

- 1)
- 2)
- 3)
- 4)
- 5)

b. Nut -

- 1)
- 2)
- 3)

c. Cap screws -

- 1)
- 2)
- 3)

d. Machine screws -

- 1)
- 2)
- 3)
- 4)
- 5)

e. Set screws -

- 1)
- 2)
- 3)

f. Wood screws -

- 1)
- 2)

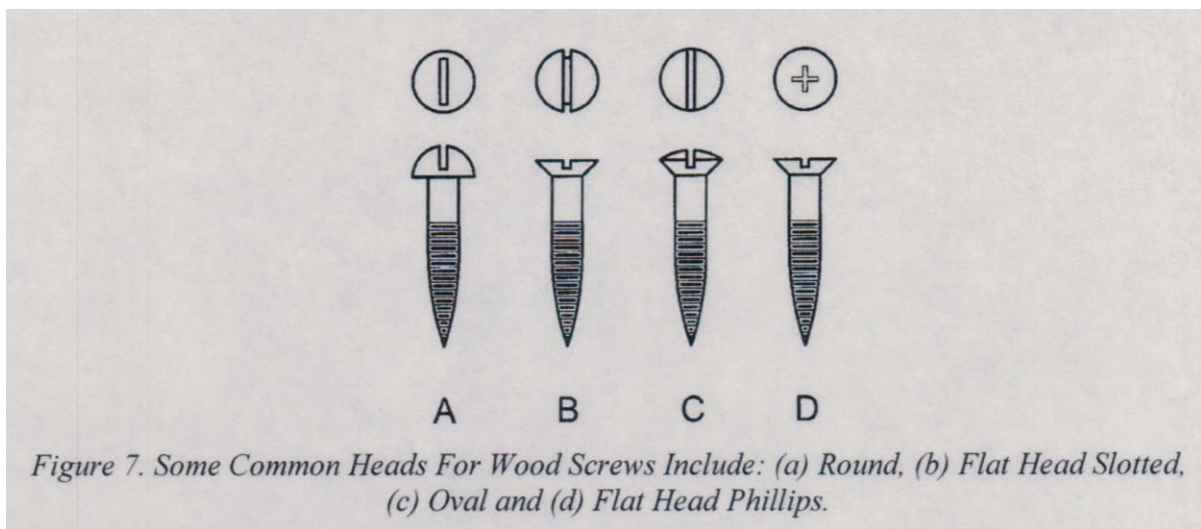
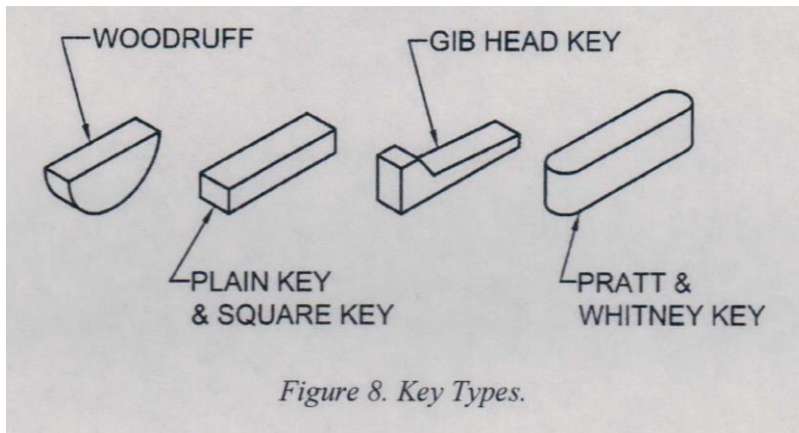


Figure 7. Some Common Heads For Wood Screws Include: (a) Round, (b) Flat Head Slotted, (c) Oval and (d) Flat Head Phillips.



Non-threaded Fasteners

Describe each non-threaded fasteners:

A. Keys -

1) Woodruff Key –

2) Square Key -

a.

b.

c.

2) Gib Head Key –

3) Pratt & Whitney Key –

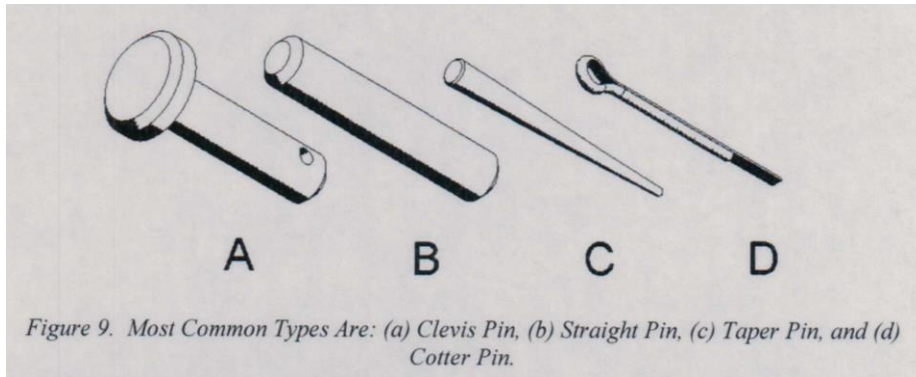
B. Pins -

1)

2)

3)

4)



C. Rivets -

1)

2)

