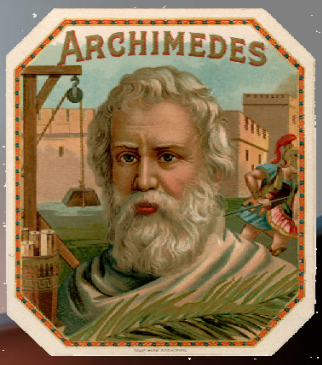
Reverse Engineering-

Thread Introduction

Mechanical Design and Engineering

Threads

- The concept of a screw thread first occurred in the third-century by the mathematician Archimedes who wrote briefly on spirals and invented simple device applying the screw principle.



Threads

- Threads and fasteners are the principal fastening devices used for assembling component parts.
- The shape of the helical thread is called the **thread form**.
- The **metric thread** form is the international standard, although the **unified thread** form is common in the United States, Canada and Great Britain.

Threads

- In the early times, there was no such thing as standardization. Nuts and screws made by one manufacture would not fit with other manufacturers.


Threads

- It wasn't until after World War II and so many obstacles and inconveniences with allies productions of equipment that the Americans, British and Canadians decided to agree on a unification of screw threads. (**Unified Screw Thread**)
- In 1946 an International Organization for Standardization (ISO) committee formed to establish a single international system of metric screw thread forms

Threads

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- What does UN stand for?

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- What does UN stand for?

UN= Unified Thread, the standard thread agreed upon to be used in the U.S., Canada and Great Britain.

Threads

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- What does the 11/16” stand for?

Threads

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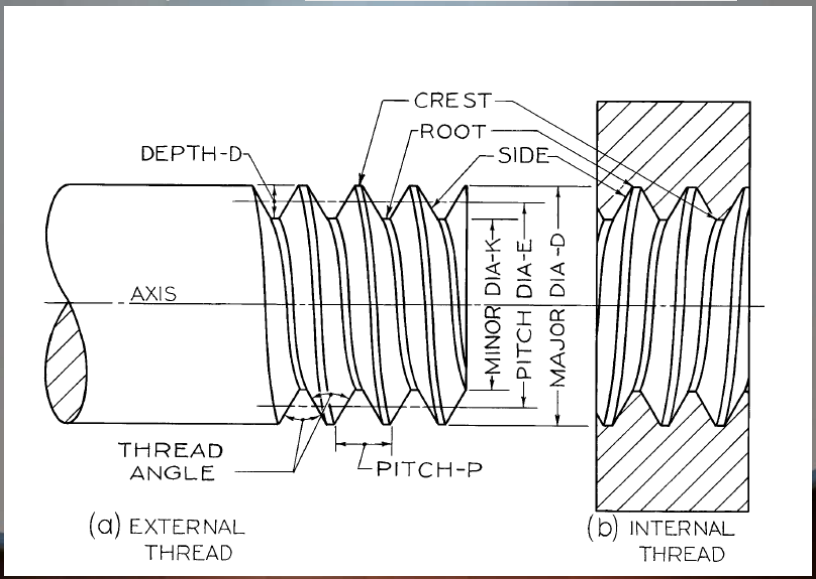
- What does the 11/16” stand for?

11/16” = The Major Diameter of the screw thread.

…But what the “Major Diameter” ???

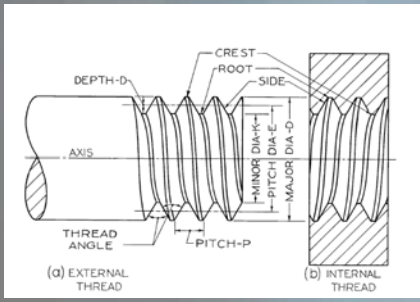
Threads

- Below is a picture of **Screw Thread Nomenclature**



Threads

- Below is a picture of **Screw Thread Nomenclature**



Screw Thread: *A ridge of uniform section in the form of a helix on the external or internal surface of a cylinder.*

External Thread: *A thread on the outside of a member, as on a shaft.*

Internal Thread: *A thread on the inside of a member, as in a hole.*

Major Diameter: *The largest diameter of a screw thread (applies to both internal and external members).*

Minor Diameter: *The smallest diameter of a screw thread (applies to both internal and external threads).*

Pitch: *The distance from a point on a screw thread to a corresponding point on the next thread measured parallel to the axis. The pitch P is equal to 1 dived by the number of threads per inch.*

Pitch Diameter: *The diameter of an imaginary cylinder passing through the threads to make equal the widths of the threads and the widths of the spaces cut by the cylinder.*

Lead: *The distance a screw thread advances axially in one turn.*

Angle of Thread: *The angle included between the sides of the thread measured in a plane through the axis of the screw.*

Crest: *The top surface joining the two sides of a thread.*

Root: *The bottom surface joining the sides of two adjacent threads.*

Side: *The surface of the thread that connects the crest with the root.*

Axis of Screw: *The longitudinal center line through the screw.*

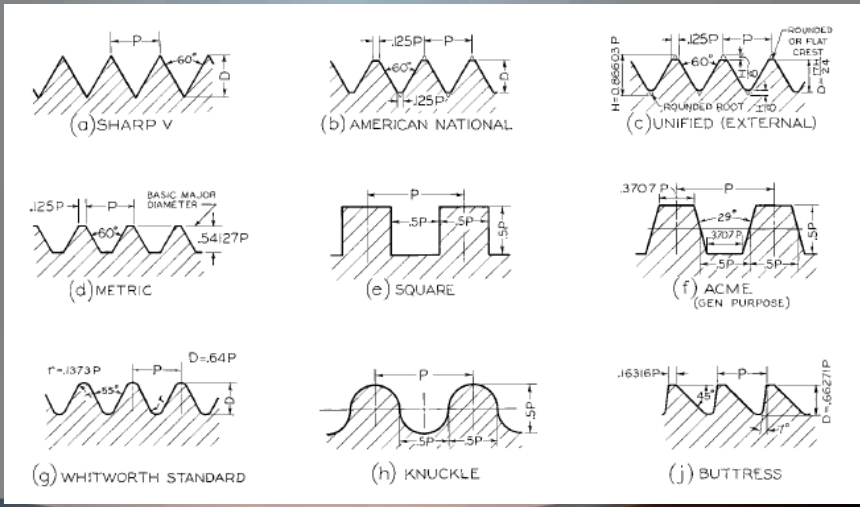
Depth of Thread: *The distance between the crest and the root of the thread measured normal to the axis.*

Form of Thread: *The cross section of thread cut by a plane containing the axis.*

Series of Thread: *Standard number of threads per inch for various diameters.*

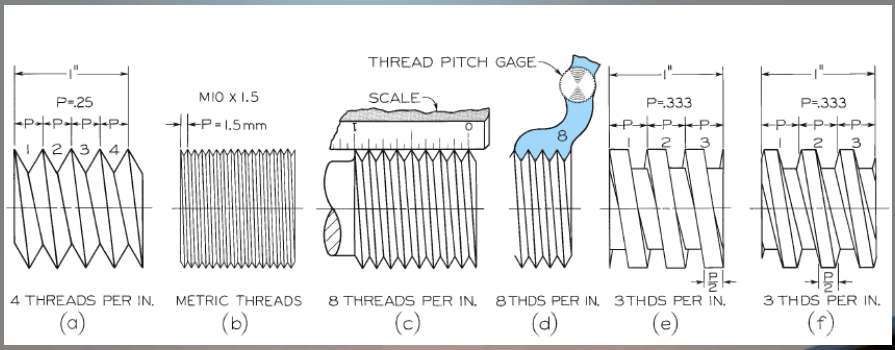
Threads

- Below is a picture of **Screw Thread Forms**



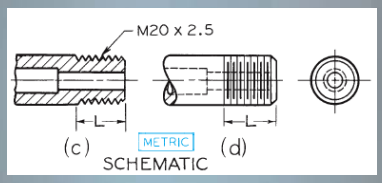
Threads

- Below is a picture of **Pitch on Threads**
- *The pitch of any thread form is the distance parallel to the axis between corresponding points on adjacent threads.*

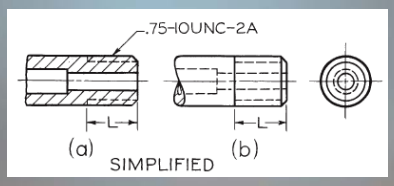


Threads

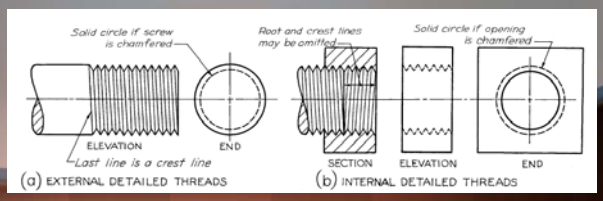
- There a 3 methods of representing screw threads on a drawing.
- SCHEMATIC



- SIMPLIFIED

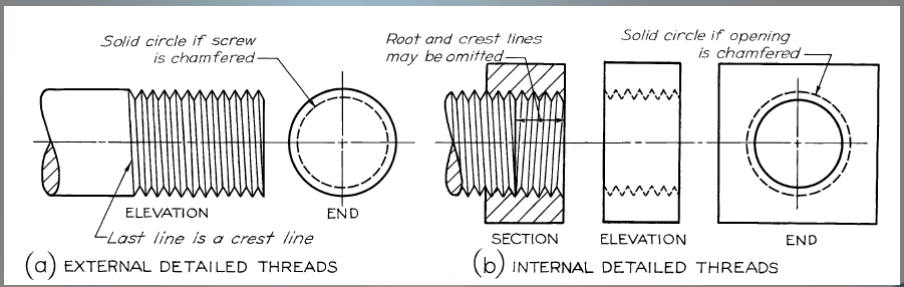


- DETAILED



Threads

- You will draw your 11/16” UN Thread using the Detailed representation.
- DETAILED



Threads

- What is the decimal equivalent of 11/16”?

  This will be your

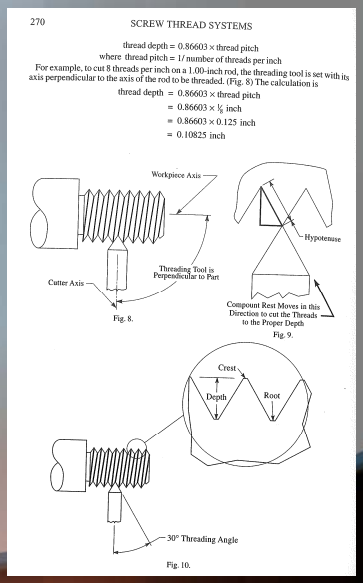
  Major Diameter=

The Thread Pitch is the number of threads per inch.

Pitch, P=

The Thread Depth= .86603 x thread pitch, P =

D=



270 SCREW THREAD SYSTEMS

thread depth = 0.86603 × thread pitch
where thread pitch = 1/ number of threads per inch
For example, to cut 8 threads per inch on a 1.00-inch rod, the threading tool is set with its axis perpendicular to the axis of the rod to be threaded. (Fig. 8) The calculation is
thread depth = 0.86603 × thread pitch
= 0.86603 × ⅛ inch
= 0.86603 × 0.125 inch
= 0.10825 inch

Workpiece Axis
Cutter Axis
Threading Tool is Perpendicular to Part
Fig. 8.
Hypotenuse
Compound Rest Moves in this Direction to cut the Threads to the Proper Depth
Fig. 9.
Crest
Depth
Root
30° Threading Angle
Fig. 10.

Threads

- What is the decimal equivalent of 11/16”?

  This will be your

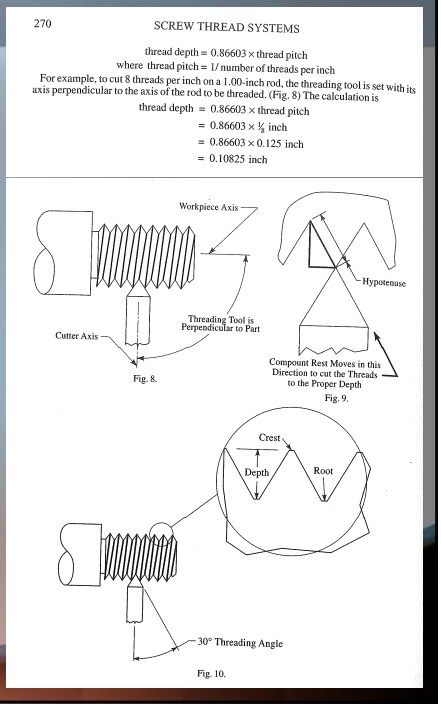
  Major Diameter= 0.6875”

The Thread Pitch is the number of threads per inch. ***16 Threads in an inch***

Pitch, P= 1/16 or 0.0625

The Thread Depth= .86603 x thread pitch, P = .8663 x .0625

D= .05414375”



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Threads

- **Major Diameter= .6875" Depth, D = .05414375" Pitch, P= 0.0625**