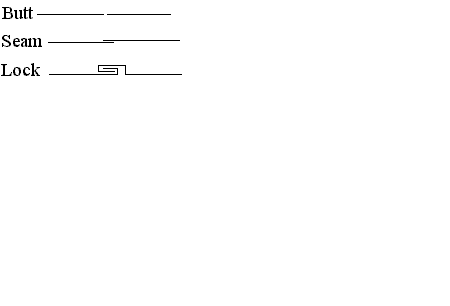
1. SHEET METAL – Ranges from .004” to 3/16”. Plate steel is anything 3/16” and over.
   1. Pattern – One-dimensional object that can be folded into a 3 dimensional product. Often drawn on paper and transferred to the metal. A scribe and prick punch are used to transfer the drawing to the metal.
   2. Stretch Out – When layed out directly on the metal. No pattern is used.
   3. Template – This is a permanent pattern, usually made of metal or something hard enough to be traced around. Usually slightly smaller than the finished product.
2. HEMS
   1. Single hem – To improve strength, appearance and eliminate sharp edges. Always use at least a single hem when working with sheet metal.
   2. Double Hem – When extra strength is needed. Add 1/16” extra metal to allow for the double bend.

Example: 3/16” double hem = 3/16” + 3/16” + 1/16” = 7/16”

* 1. Wire Edge – For additional strength or appearance. Add 2-1/2 times the dia. of the wire for the hem.

Example: 1/8” wire hem = 2-1/2 X 1/8” = 5/2 X 1/8” = 5/16”

1. SEAMS



A.

B.

C.

1. HAND TOOLS
   1. Scratch Awl / Scribe – Hard steel tip used to mark on sheet metal.
   2. Gage – Used for determining the thickness of sheet metal in gage size and thousandths of an inch.
   3. Snips – Used for cutting light gage sheet metal. To prevent over-cutting, place end of snips at end of the line to be cut. An over-cut is called a crow’s foot.
      1. Curved (Rights, Lefts, and Straight)
      2. Seamers
      3. Aviation
   4. Whitney Punch – Punch holes in sheet metal for use with rivets. Light gage sheet metal only.
   5. Combination Square: Used for general layout. Do not loose the gold tightening screw!
      1. Three heads/attachments:
         1. Combination 90° - 45°
         2. Center Finding
         3. Protractor
   6. Hammers – used to form or shape sheetmetal.
      1. Two types:
         1. Hard Faced – ball peen or sledge
         2. Soft Faced – rubber or wooden mallet.
   7. Punches
      1. Center punch 90°point used to mark centers for drilling holes.
      2. Pin punch flat face for driving out bolts or pins.
   8. Measuring devices
      1. Steel Scale – found on combination squares, usually grades in 1/8ths, 1/16ths, and 1/32nds. 1/64th is the smallest division of the inch on a steel scale.
      2. Circumference rule, large like a yard stick, has conversions for diameters to circumference
2. MACHINES
   1. Square Shear – Used for cutting long straight lines up to 54” – also cuts square 90° corners.
   2. Bar Folder – Used to fold hems on projects. 18 gage capacity. Depth of fold is adjustable. Use steel scale.
   3. Box and Pan Break – For folding sides and ends of your project. Adjustable fingers can be set at different widths.
3. METAL FASTENING METHODS
   1. Cold Rivets – Set with ball peen hammer and rivet set. Not commonly used today.
   2. Pop Rivets – As with cold rivets, should extend 1-1/2 times the diameter of the rivet. Aluminum or steel rivets.
   3. Spot Welding – Fusion welding using a resistance welder.
4. SAFETY
   1. Edges of sheet metal are very sharp. Take care to prevent cutting yourself.
   2. Do not use scribe for anything but drawing lines on sheet metal.
   3. Watch fingers and toes when using the square shear.
   4. Always wear eye protection.
   5. Do not weld on Galvanized metal. Metal that has a galvanized coating will melt and form toxic fumes. The coating is there to protect the metal from rusting.