

SHEET METAL

FABRICATION

UNIT

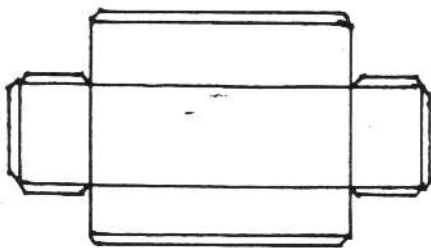
Sheet Metal

Introduction

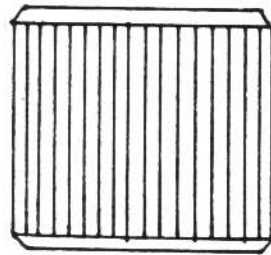
Terms to Remember:

- **Parallel Line Development:** All major lines are parallel or perpendicular to each other.
- **Radial Line Development:** All major lines radiate or arc from a common center point.
- **Stretchout:** Full size drawing of sheet metal object on paper.
- **Layout:** Full size drawing of object on metal.
- **Template:** Full size pattern to trace around for mass production purposes.

Parallel Line Development - (Examples: Prism or Cylinder) Parallel lines unfold into rectangular pattern.

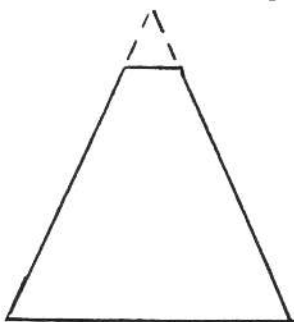


Prism



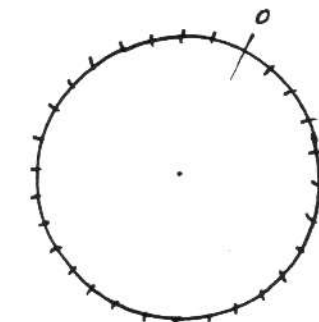
Cylinder

Radial Line Development - (Examples: Pyramid or Cone) Lines radiate or arc from a common center point.



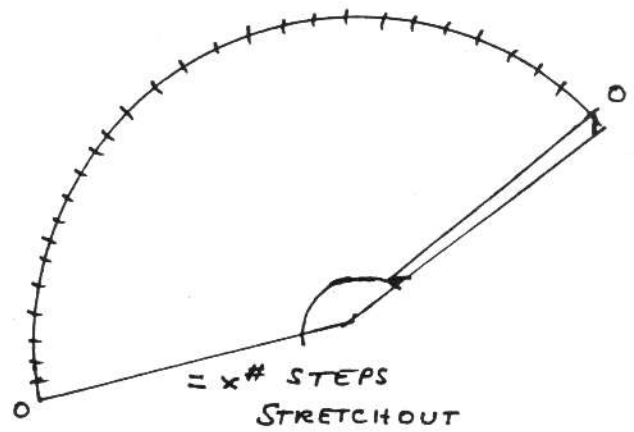
ALTITUDE

Step 1



BASE
x # STEPS

Step 2



STRETCHOUT

Step 3

Sequence to Develop Cone

Sheet Metal Allowances - Extra material must be allowed in the layout for **hems and tabs**. Hems and tabs are generally the same width (at least 1/4" in width, the average width in this lab., depending on the size of the object being made, is 1/2").

NOTE: All operations listed below are in the sequence order to be completed.

LAYOUT: All lines first (Place "X" on all fold lines).

****** GET INSTRUCTOR'S APPROVAL AT THIS POINT**

CUT: According to all cut lines on Notcher, Throatless Shears, Aviation Snips, Etc.

****** BE CAREFUL NOT TO CUT OFF ANY HEMS OR TABS.**

BEND: - All Hems (Use Bar Folder whenever possible)
- Sides parallel with tabs (Use Cornice Brake for this) Bend side, tab, side all at same time.
- Ends (Use Cornice Brake for this operation also)

DRILL / PUNCH: Chose the correct size drill/punch - equal to the diameter of the rivet shank.

RIVET: Use Rivet Set(s) and Riveting Hammer.

SOLDER: The metal must be **mechanically** clean - use abrasives to brighten.
The metal must be **chemically** clean - use an etch or soldering acid.
Solder is an alloy of tin and lead. The three common alloys are 40/60, 50/50, and 60/40, with the first number being the tin content. Because of the sheet metal fabrication work in this lab. 50/50 is the one used. 60/40 is common to electrical work. Solders come as acid flux core for sheet metal work, resin flux core for electrical work and solid.

APPENDAGES: Add all appendages at this time such as handles, hinges, catches, locks, etc. Make sure they are equally spaced from each end and that they are mounted square.

FINISH: Use **Metal Etch** to remove rust, dirt, oxides, etc. Rinse with water and dry. Use aerosol spray cans for applying finish - be sure to follow directions printed on can regarding the distance to hold the can from the surface of the metal. Thin coats are best. Spray interior surfaces before exterior, spraying corners first. The spray pattern should overlap the previous path by about 40%. Develop long straight passes. Preheat metal to 130 degrees F. for all lacquering. Clean nozzle of the aerosol when finished by turning the can upside down and spray until no pigment (if a color is present) or liquid (if the contents are clear) comes out. Then wipe the hole (orifice) clean.

Definition of Terms:

Propellent: The pressure material used to force the pigment and vehicle out of the can. In the past man has used deodorized butane (dangerous) and various members of the fluorocarbons (harmful to the earth's ozone layer).

Vehicle: The liquid that comes out of the can. The material could be a synthetic acrylic, a mineral spirit enamel, or a lacquer.

Pigment: The color that might be in the can.