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CENTRAL WORKSHOP

SUBJECT: WORKSHOP PRACTICES (INTRODUCTION TO TIN-SMITHY SHOP)

CONTENT

INTRODUCTION

- Sheet metal work has its own significance in the engineering work. Many products, which fulfill the household needs, decoration work and various engineering articles, are produced from sheet metals.
- Tin smithy deals with the production of components in a wide variety of shapes and sizes from a sheet of metal by using hand or machines.
- Common examples of sheet metal work are hoppers, containers, guards, covers, pipes, hoods, funnels, bends, boxes etc. Such articles are found less expensive, lighter in weight.

OBJECTIVES

1. To understand different types of raw-materials useful for sheet metal process.
2. To understand different types of tools useful for sheet metal work.
3. To understand different types of joints in sheet metal process.
4. To understand entire manufacturing process of sheet metal object.

MATERIALS USED IN SHEET METAL WORK

- A wide variety of metals, in the form of sheet are used in sheet metal workshop. The most commonly used are explained below.

1. **Galvanized Iron (G.I.) Sheet-** It is a sheet of soft steel coated with zinc. GI sheet is one of the least expensive metals used in sheet metal shop.
2. **Copper-** It has reddish color and is used for water pipes, roofing, gutters and other parts of the building.
3. **Tin Plate-** Tin plate is the iron or steel coated with pure tin. It has bright silvery appearance.
4. **Stainless Steel-** The 18-8 type steel is used in sheet metal work from the available different type of stainless steel.
5. **Black Iron-** It is an uncoated sheet of metal with bluish appearance.
6. **Aluminum-** It is an uncoated sheet of metal with sliver appearance.

TOOLS USED IN SHEET METAL WORK

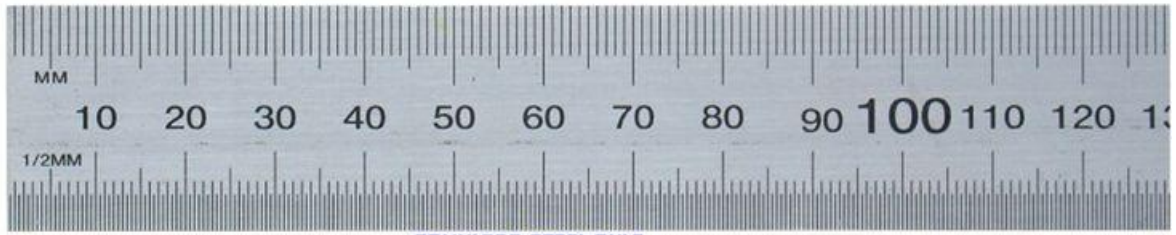
- For accurate sheet metal operation various types of hand tools and machine tools are used in sheet metal operation. A list of them is given below,

1. MEASURING TOOLS
2. MARKING TOOLS
3. CUTTING TOOLS
4. FORMING TOOLS
5. JOINING TOOLS

CONTI…

- MEASURING TOOLS – The following types of tools are commonly used in sheet metal shops to measure the dimensions of work pieces:

1. Steel rule
2. Vernier caliper
3. Micrometer
4. Sheet Metal gauge



STAINLESS STEEL RULE

VERNIER CALIPERS

MICROMETERS

CONTI…

- MARKING TOOLS –

The following types of tools are commonly used in sheet metal shops to marking the dimensions on work pieces:

1. Scriber
2. Trammel
3. Punches- It is used in sheet metal work for marking on sheet, locating centers. There are two types of punches. a) Dot punch and b) Prick punch.

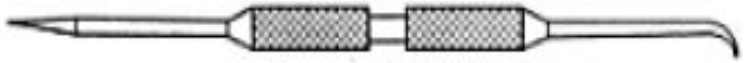


Fig . Scriber

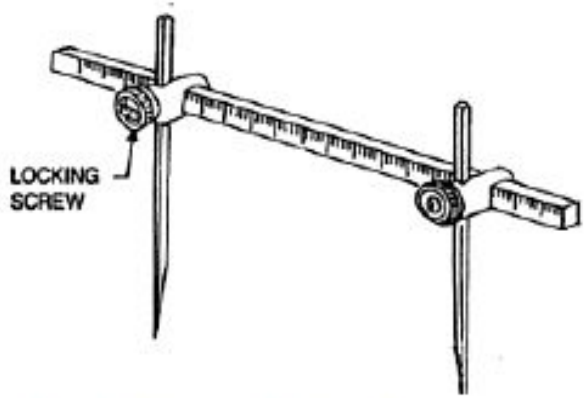


Fig . Trammel Points

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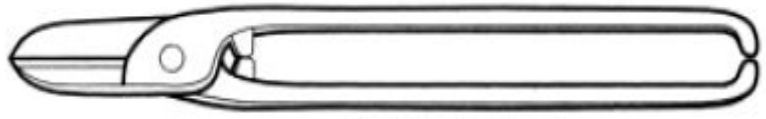
•CUTTING TOOLS –

The following types of tools are commonly used in sheet metal shops to cut the sheet metal work piece into required shape-

1. Straight Snip
2. Bent Snip
3. Mechanical Shearing Press



(a) Straight snip

(b) Bent snip

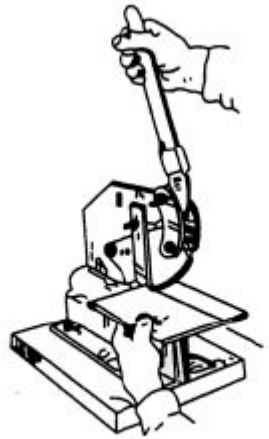


Fig. Mechanical Shearing press

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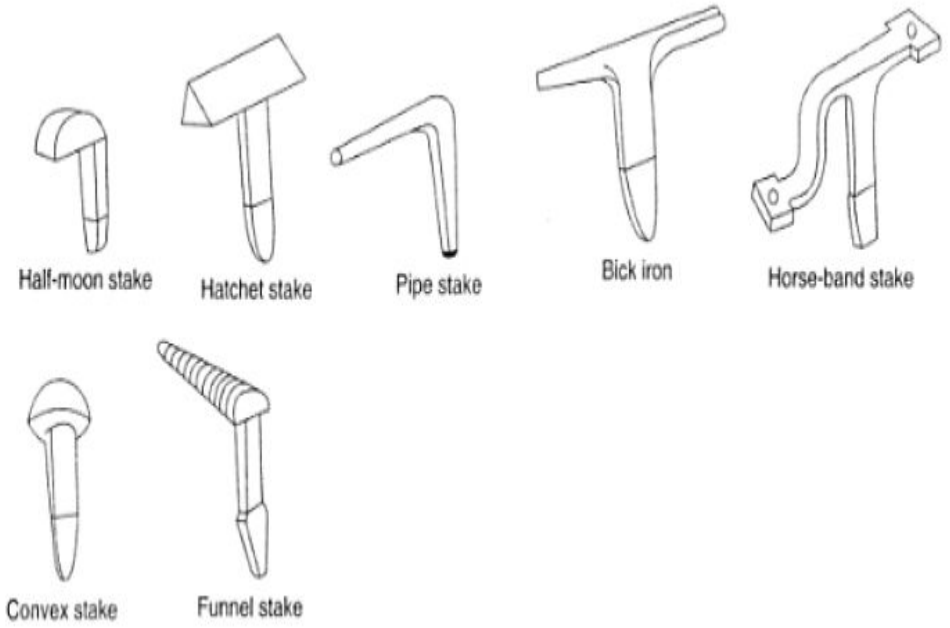
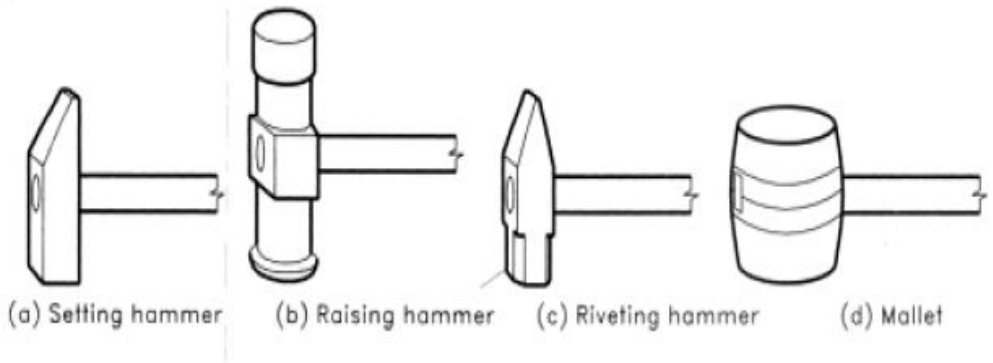
- FORMING TOOLS –

Shaping of the sheet metal such as folding, bending, curling, etc., are done by using the following types of forming tools.

1. Stakes
2. Hammers





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•JOINING TOOLS –

The tools exclusively used for making and finishing joints are:

1. Hand groves - Hand groves are used to flatten and shape joints made in sheet metal.
2. Rivet Set
3. Soldering Iron

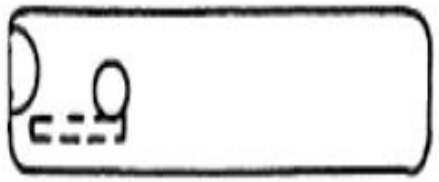


Fig. Rivet set

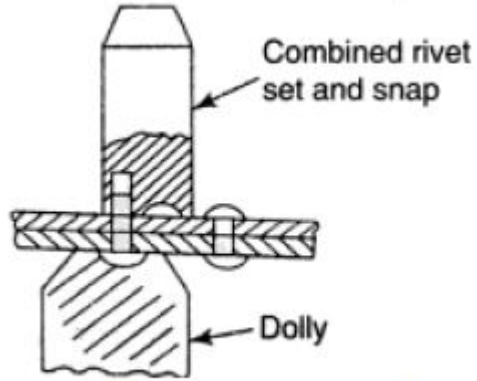


Fig. Rivet set and dolly

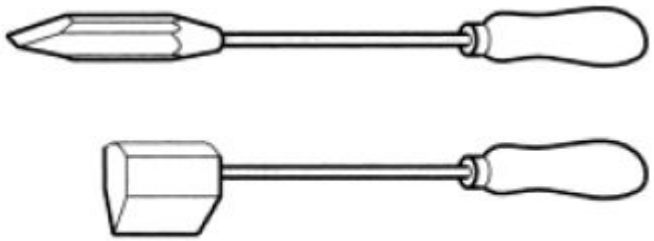
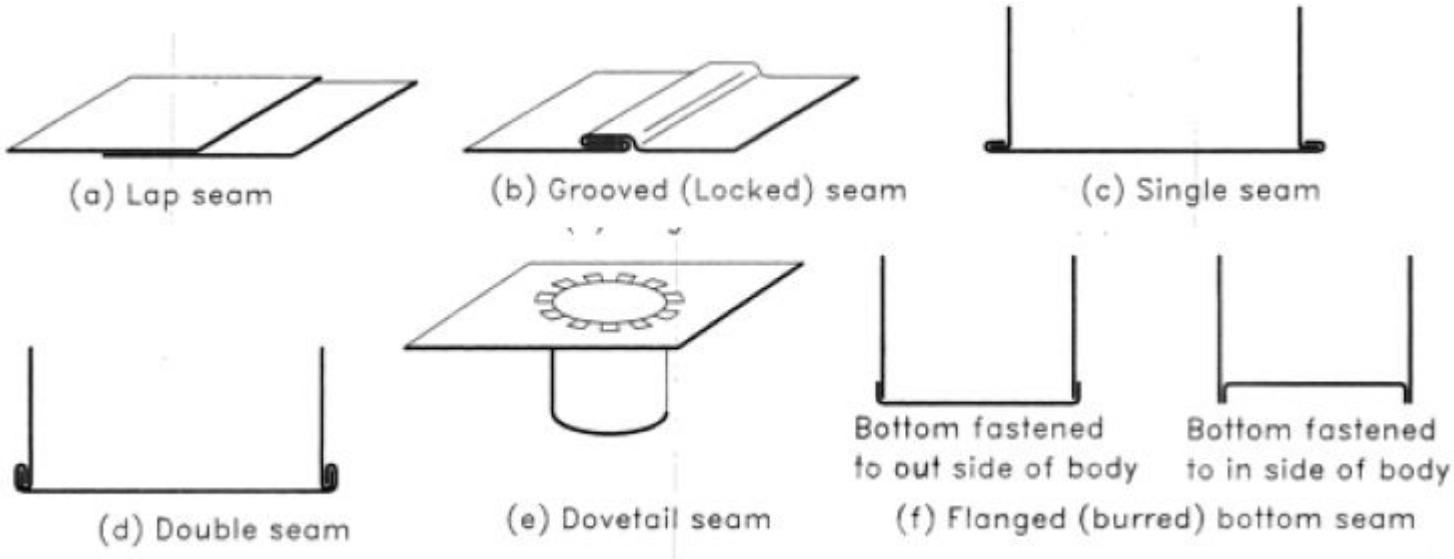


Fig. Soldering Iron

SHEET METAL JOINTS

- The line of joint on a sheet metal pieces is called **SEAM.** The most common types of **SEAMS** are as follows:

1. Lap seam
2. Grooved seam
3. Single seam
4. Double seam
5. Dove-tail seam
6. Flanged (burred) bottom seam



MANUFACTURING PROCESS OF SHEET METAL OBJECT

- Following steps should follow for manufacturing of sheet metal or Tin-Smithy Job.

1. The size of the given sheet is checked with steel rule.
2. Mark the measurement and make the development surface sketch diagram.
3. The layout of the given job is marked on given metal sheet.
4. The layout of the given job is cut by using the straight snips.
5. The sheet is bent to the required shape using stakes and mallet.
6. Now the bent edges are made to overlap each other and stuck with a mallet to get the required joint.
7. The joint is soldered.

Advantages In Sheet Metal Processing

1. High Strength
2. Good Dimensional Accuracy
3. Good Surface Finish
4. Relatively Low Cost
5. For Large Quantities, Economical Mass Production Operations Are Available.

APPLICATION OF SHEET METAL OBJECT

- Following are main application of sheet metal process,

1. Industrial As Well As Domestic Hopper
2. Different Types Of Containers
3. Different Types Of Protective Guard
4. Protective Covers
5. Different Diameter Pipes
6. Hood
7. Funnels
8. Bends
9. Boxes

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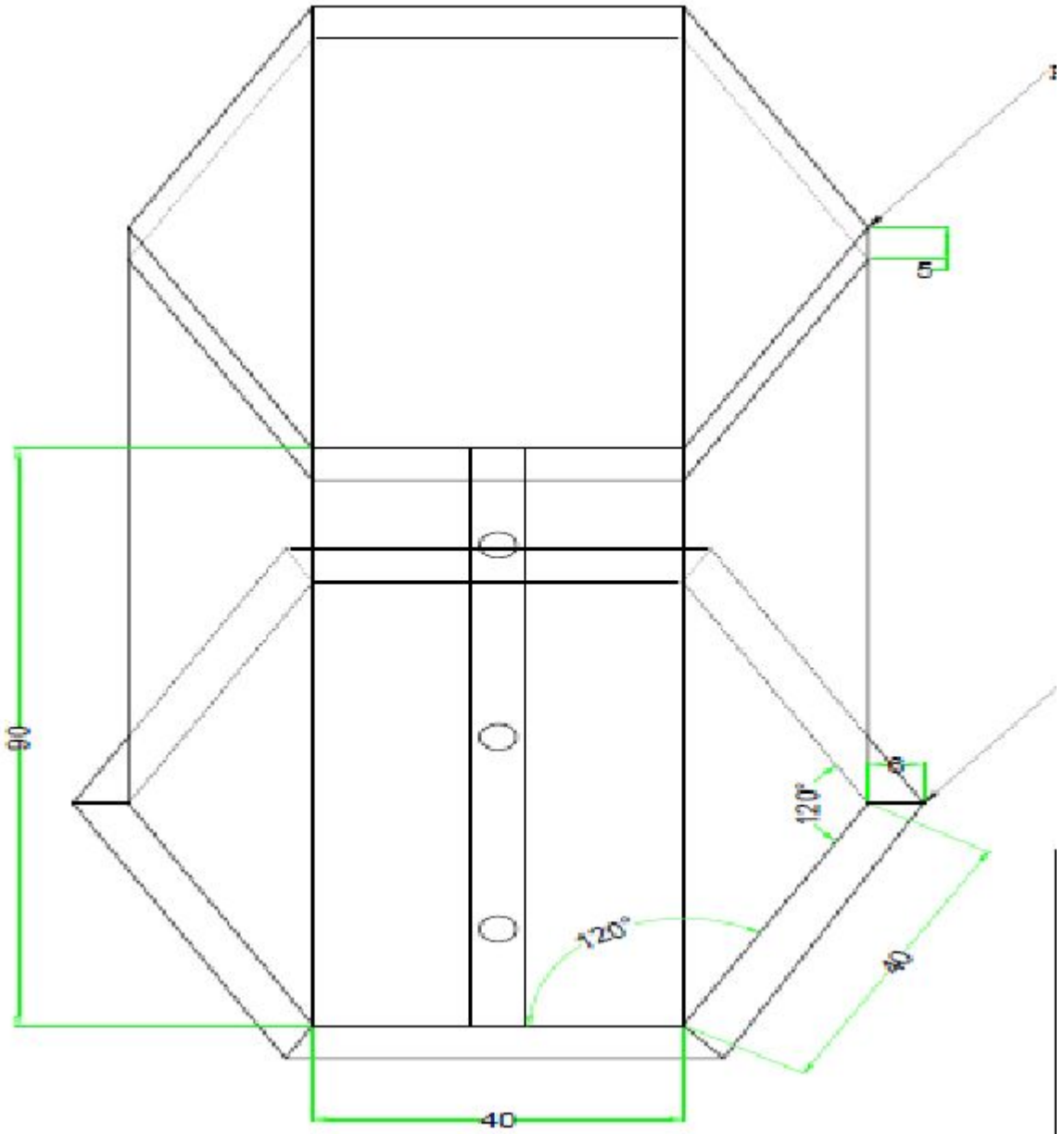

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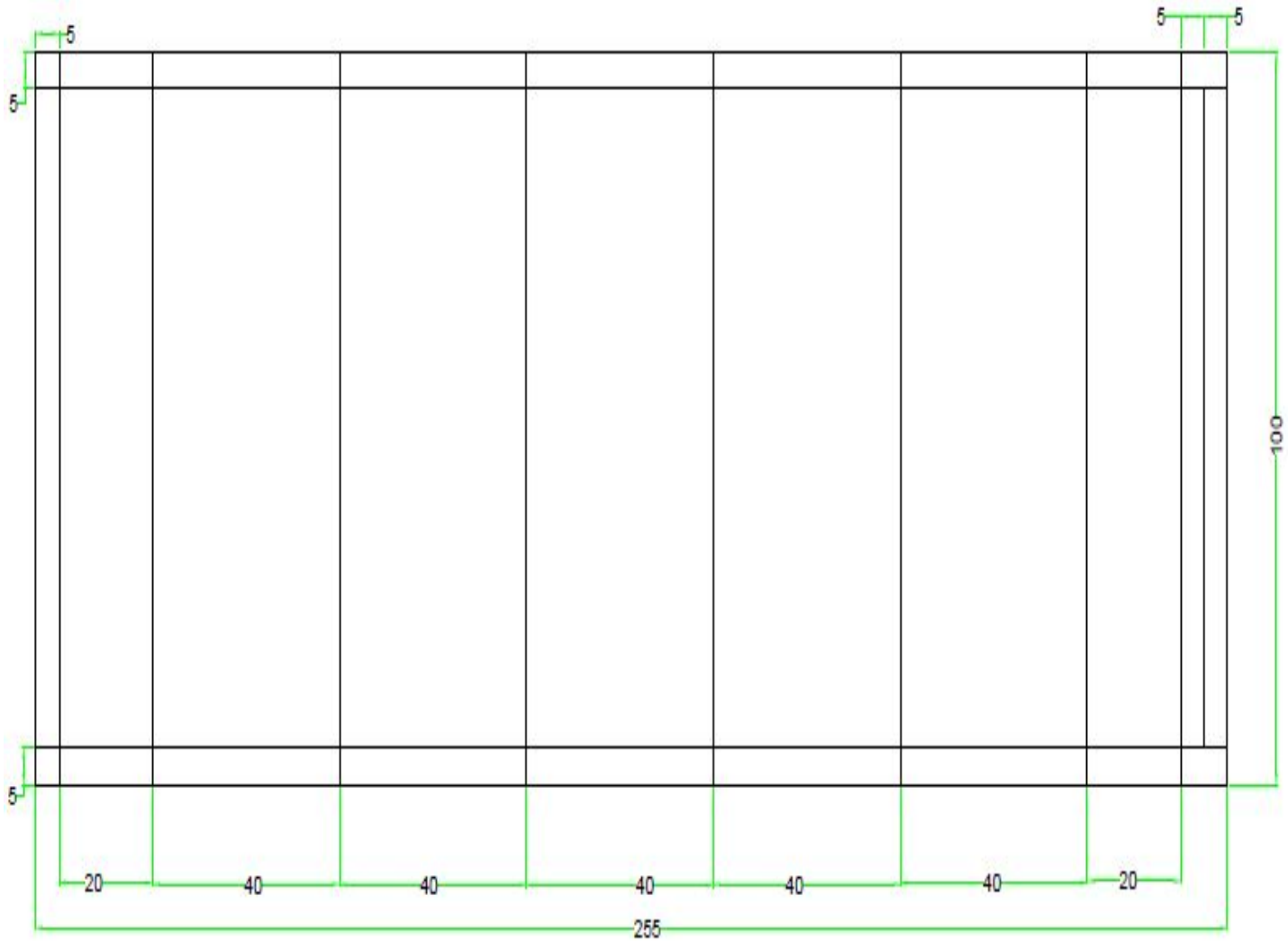
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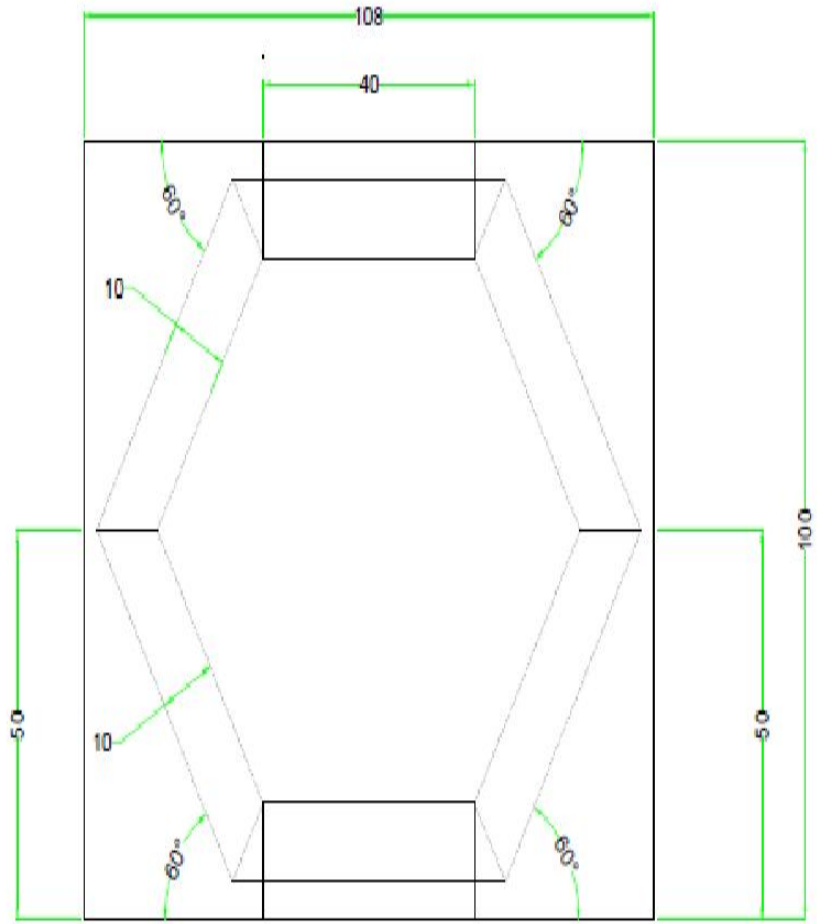
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- **THANK YOU**