

STUDY of SHEET METAL

Safety Precautions

- 1) Avoid touching the cut portion while cutting with snip
- 2) use snip only for metal that can be cut by applied hand force
- 3) Do not reach behind the shear blade to hold small pieces being cut off.
The tips of the fingers cannot be seen and can easily be placed under the blade
- 4) Do not try to hold small pieces of metal while they are being cut
They are liable to flip up and flip your finger into the blade
- 5) Do not try to bend the sheet with hands
- 6) Use shoes and leather gloves.

SHEET METAL SHOP

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HOPPER MAKING

Exp No: 5

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AIM:

To make a hopper of a given specification from a sheet metal piece.

Application:

Flour mill, chimney and A/C duct etc

Material specification

Material: Galvanised iron

Sheet of dimension: 300 mm X 170 mm, thickness 33 gauge

Tools Required

- | | | | | |
|---------------|------------|------------|--------------|------------------|
| 1) steel rule | 2) scriber | 3) Divider | 4) Dot punch | 5) straight snip |
| 6) mallet | 7) Anvil | 8) stake | | |

Sequence of operation

- 1) checking
- 2) Layout marking
- 3) shearing
- 4) folding
- 5) Locking and Finishing

Working steps:

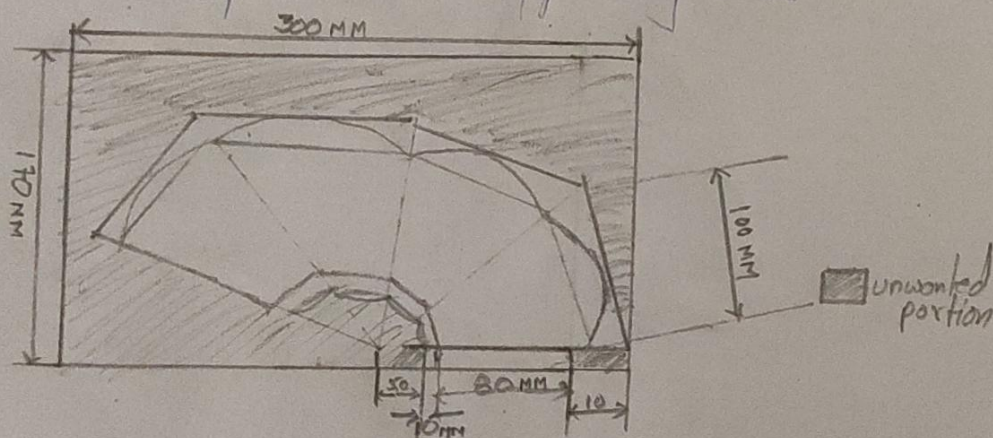
Checking:

Check whether the given sheet is having its dimensions as 300 mm X 170 mm. If the dimension is excess trim off using hand shear. If it is less change the given sheet.

Layout marking:

- 1) Place the given sheet over working table, so that the side of dimension 300 mm is horizontal
- 2) From left bottom corner, draw the 10 mm horizontal line

- 3) Then Mark the mid point on horizontal line. From that point to mark 50 mm, 10 mm, 80 mm and 10 mm on, and make dot with punch
- 4) From the middle point draw an arc of radius 50 mm, 60 mm, 140 mm and 150 mm.
- 5) Using divider Keep 100 mm between legs and with 140 mm as center draw an arc
- 6) Similarly cut arc as shown in figure.
- 7) From the midpoint draw an intersection line through and till the end.
- 8) In each division lines have four intersection points and make dot with punch.
- 9) Joint the punch mark in horizontal in each division these lines are reference lines for cutting and folding.
- 10) Hatch unwanted portion as shown in figure using marker



Shearing

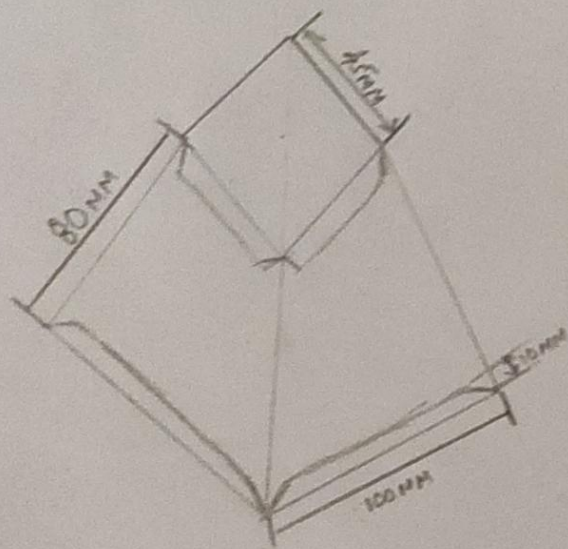
- 1) To remove unwanted portion cut along the dark line.
- 2) Make a small diagonal cut at all corners of the seam portion as shown in figure

Folding

- 1) Keep the pattern over taper stake such that the line locking portion with edge of the stake. Using mallet fold the seam portion 180° outwards
- 2) Similarly fold all the seams except last seam in portion
- 3) Place the sheet over stake such that edge of aligns with stake edge and fold the hem portion 90° downwards
- 4) Now it's got hopper shape without locking.

Locking and Finishing

- 1) overlap the locking portion 10mm on last division, hemming the 10mm portion both bottom and top fold outwards
- 2) Use proper stake and make mallet make perfect shape
- 3) check for the dimension



Pre Lab Questions

Q1 How many sides in hopper?

There are 4 sides in hopper

Q2 Define sheet metal work?

The manufacturing of products, components and part made of metal

Q3 What is the use of hopper?

Hopper is used in flour mill, chimney and A/C duct etc.

Q4 Which device is used to measure angles?

Protractor

Q5 How many inches in one foot?

12 inches.

Post Lab Questions

- Q1 what are the application of sheet metal work?
Sheet metal is used in various industries such as manufacturing, construction, agriculture etc.
- Q2 Write the difference between divider and jenny caliper?
Divider is used for marking/scribing where as jenny caliper is used for measuring diameter of solids
- Q3 Mention the angle of dot punch.
 60°
- Q4 what is the use of mallet?
Mallet is used for bending sheet metal without damaging it
- Q5 How to call the shape forming tools
Forming tools are tools that act as dies that bend, stretch or otherwise form sheet metal

Result

Thus the required hopper is made out of the given sheet metal piece

