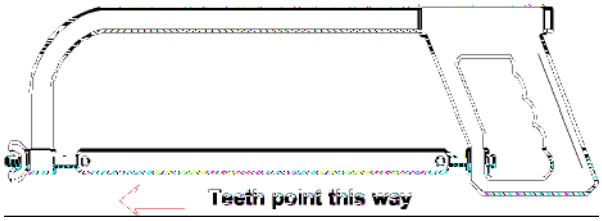
Design & Manufacture

Homework 41

Sawing

Hacksaws are used for hand sawing metals. The frame is adjustable to take blades of different length.



Hacksaw Blades

The blades can be easily replaced when worn. Flexible, **High Carbon Steel** blades are used for general work on mild steel and non-ferrous metals. Rigid, **High Speed Steel (HSS)** blades are used for cutting hard steel.

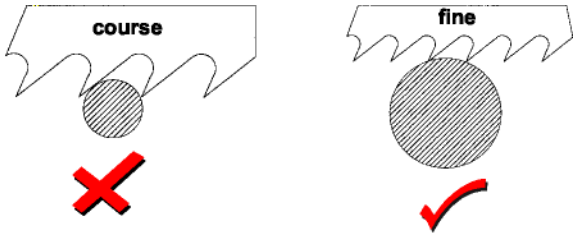
Blades can be purchased with different size teeth:

Coarse - 14 or 18 TPI (teeth per inch) - thick metal.

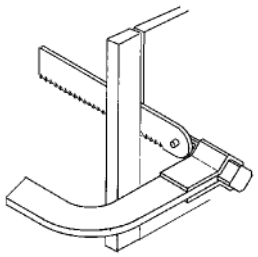
Medium - 24 TPI- general work.

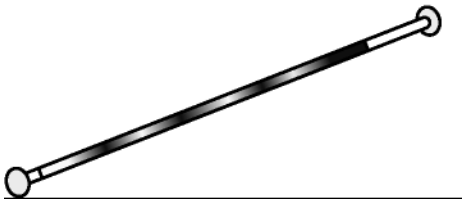
Fine - 32 TPI - thin metal.

If a coarse tooth blade is used on thin metal, the metal will catch between the teeth and the blade will jam.



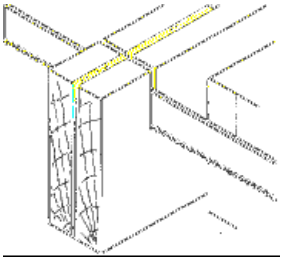
For long cuts, the blade can be attached at right angles to the frame, so that the frame does not get in the way.



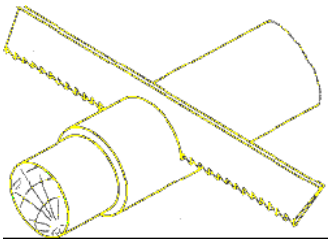


For cutting curves, the standard blade can be replaced by a **Tension file**, a round file held in the frame by special clips.

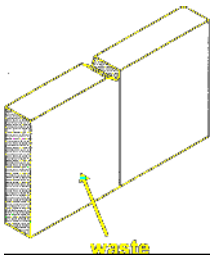
Thin metal can be cut easily by sandwiching it between two pieces of wood and then sawing through both the wood and the metal.



Thin wall tubing will collapse unless it is supported by placing a close fitting piece of dowel inside. Both the tube and the dowel are sawn.



To stop the saw blade from sliding over the metal when starting a cut, use a triangular file to file a groove on the waste side of the line. The saw teeth should fit into the groove.



Questions

1. Why is a hacksaw frame adjustable?

……
……

2. Specify the blade that you would use for cutting 50mm off a 200mm length of 3mm diameter mild steel.

……
……

3. Why should a 32TPI blade be used for cutting thin metal?

……
……

4. Show how you would set up the hacksaw to cut a long strip off a sheet of brass.

……
……

5. What would you use to cut a curved cut in a sheet of copper?

……
……

6. Illustrate how you would cut a thin sheet of aluminium without it bending.

7. How can you solve the problem of holding and sawing a length of thin walled brass tubing without it getting squashed?

……
……

8. How can you start to cut a piece of mild steel in exactly the right place?

……
……