

**MEC1000**  
**Hand Tools**  
**Layout, Punch, Drill, and Deburr**

**USE THE RIGHT TOOL FOR THE JOB!**



Speaking of tools...



And finally, the winner is



## Hack Saws

### Cutting

Metal can be cut with a hacksaw, cold chisel, or in the case of sheetmetal, snips. Generally speaking, hacksaws are used with blades in three levels of coarseness: 18, 24 or 32 teeth per inch (Photo 3). Blade coarseness depends on the thickness of the stock to be cut. A coarse-tooth blade is used for heavy stock and a fine-tooth blade for thin stock. An important rule of thumb is that at least two, but ideally three, teeth should always be in contact with the edge of the stock.

There are two different kinds of hacksaws: high-tension and standard. High-tension hacksaws hold the blade with greater tension than standard types. This keeps the blade straight even during heavy cutting, helping you to cut accurately. High-tension saws are used when making cuts that could subject the blade to twisting and bending, or when the cut could be suddenly interrupted. It's important to use a bimetal blade in a high-tension hacksaw. A bimetal blade is made from two different types of metal in such a way that it can withstand the stretching forces imposed on it by the hacksaw frame and by the cutting. A standard blade, made from one piece of metal, will shatter when used in a high-tension hacksaw frame, especially during the demanding cutting for which such a hacksaw is used.

To use a hacksaw properly, grip the frame firmly with both hands, apply pressure on the forward stroke, and very slightly lift the saw on the return stroke (Photo 4).

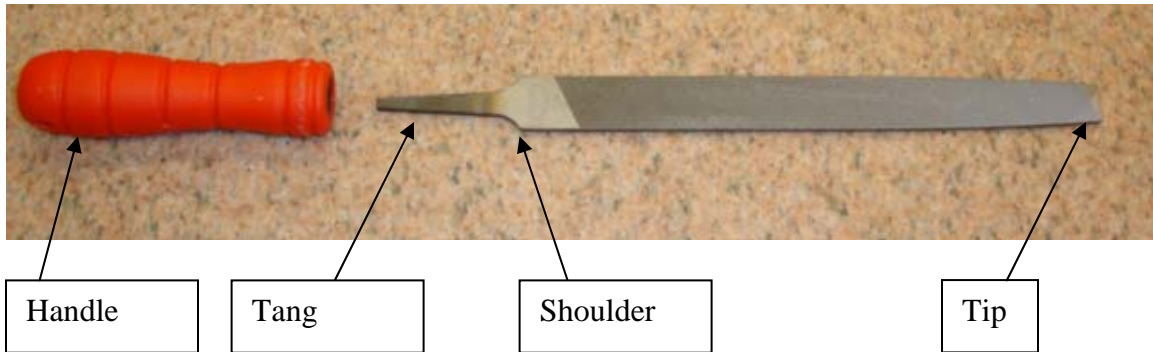


A coarse-tooth hacksaw blade (top) is used for heavy cutting in thick stock. The other two are used for finer cutting.



A high-tension hacksaw stretches the blade tightly within its frame. This keeps the blade straight and makes for a clean cut.

## Files for use in a Machine SHop



Files are classified according to:

- Crosssection (shape)
  - Quadrangular
  - Circular
  - Triangular
  - Special
- Outline (contour)
  - Tapered, crosssection is reduced from tang to tip
  - Blunt, uniform crosssection from tang to tip
- Pitch (tooth spacing); coarse, bastard, second and smooth
- Cut; single or double



**There are five main classes of files**

- Mill Files
  - Designed for sharpening mill or saw blades and for general smooth filing.  
This is what we primarily use in
    - Bastard single and double cut
    - Second finish in single cut
- Machinist Files
  - Used for rapid metal removal when not concerned w/finish.
  - Mostly double cut
- Curved tooth files
- Swiss Pattern Files
  - Tool and die makes files for detail work
- Rasps
  - Used for soft materials wood, leather and lead.



## Deburr Tools

- There are many types...too many to list but here is a few
  - Whirly gig
  - Hole Chamfer

