

Basics; Cutting Metal



Guillotine For rough cutting out of shapes.

Also known as a bench shear, this is a heavy duty tool to speed up cutting rough shapes from metal rod or sheet.

Do not use for fine cutting as it squashes and distorts the edge of your metal and you'll end up wasting time and metal filing back these edges!

Position your metal at the cutting edge towards the back of the blade and hold firmly. With your other hand bring the handle down to cut the piece. Do not cut right to the front of the blade as it distorts the metal more, so to cut a long section, make a short cut then move the metal up the blade and cut again.

Side Cutters For cutting thin / soft wire (NOT STEEL WIRES)

These are pliers with a cutting edge - for cutting wire up to about 1.5mm thickness. Not good for cutting sheet metal.



Tin Snips / Shears For cutting solder

These are used for cutting rough shapes from thin metal sheet (up to about 0.6mm thick, and are good for cutting solder pallions.



Tip - For cutting out rough shapes, use the guillotine or snips, but these distort the metal edges, so for neater, more precise cutting and intricate shapes you need to use a piercing saw.

Piercing Saw For precision

Piercing is cutting into your metal with a jewellers (piercing) saw.

Always support your work on your bench peg, hold your metal firmly with your free hand - always holding from behind the blade of your saw.

Hold your saw gently and keep it vertical - always sawing directly away from you and using long, slow moves - use the full length of the blade.

To cut a shape, turn the metal, not the saw. Never force the saw as this will break the blade. To turn a corner, saw 'on the spot' while you gradually turn the metal. Aim to cut directly on, or just to the outside of your line, take it slowly and be as accurate as you can - it's well worth practicing your piercing to improve your accuracy. To help the blade cut smoothly, use beeswax on the blade or the back of your metal.

Blades should always be fitted with the teeth pointing down towards the handle - if you carefully stroke the blade, it should feel smooth going down, and rough going away from the handle.

The blade should also be really tight - it should ring when plucked. Fit the blade by securing one end, then hold the saw pressing against the bench to secure the other end of your blade while compressing the saw frame to get the blade tensioned.



Mark out your line / shape first so you have a guide - either use a scribe, pencil or fine pen to mark directly onto the metal (or its protective coating), or use a drawing (or photocopy) and use double sided tape or pritt stick to attach it to the metal.

When marking out your shape, place it close to the edge of your sheet to make best use of your metal. Keep the protective coating on your metal if possible, to prevent the benchpeg scratching the back of the sheet.



Drilling

Drilling can be done by hand for small holes, small items and when absolute precision and control is needed, using a drill bit on its own, or held in a pin vice.

Electric drills can be used to speed up the process and could be a pillar drill or a drill bit set in a pendant motor, hobby drill or micromotor.



Mark the position for your hole first with a pen or scribe, then use a centre punch to create a small indent to give the drill bit somewhere to locate. Alternatively use masking tape over the metal allow the drill to grip.

Position the drill before you start - use one hand on the drill lever and the other to hold your piece of metal still, but don't start the drill while it's in contact with the metal.

Drill gradually - don't force the drill. If the drill overheats it is more likely to blunt and break. Use a little oil on the drill to help.

To drill a large hole (2mm diameter and above) or if drilling metal thicker than around 1mm, it's easiest to make a smaller hole first, and then enlarge it.

Saw Blade Comparisons

Blade Size	Teeth Per Inch	Sheet Gauge	Sheet mm	Drill Gauge	Drill mm
8/0	89	up to 26	0.4mm	80	0.34mm
7/0	84	24 - 26	0.4 - 0.5mm	80	0.34mm
6/0	76	24	0.5mm	79	0.37mm
5/0	71	22 - 24	0.5 - 0.65mm	78	0.41mm
4/0	66	22	0.65mm	77	0.46mm
3/0	61	22	0.65mm	76	0.51mm
2/0	56	20 - 22	0.65 - 0.8mm	75	0.53mm
1/0	53.5	18 - 22	0.65 - 1mm	73	0.61mm
1	51	18 - 20	0.8 - 1mm	71	0.66mm
2	43	16 - 18	1 - 1.3mm	70	0.71mm
3	40.5	16 - 18	1 - 1.3mm	68	0.79mm
4	38	16 - 18	1 - 1.3mm	67	0.81mm
5	35.5	16	1.3mm	65	0.89mm
6	33	14	1.6mm	58	1.01mm
7	30.5	12	2mm	57	1.09mm
8	28	12	2mm	55	1.32mm

Tip - Choose the saw blade size depending on the thickness of metal you want to cut and how detailed your shape is. To cut internal shapes, drill a hole to match your blade size then thread the blade through the hole ready to cut your shape.