

## Knowledge Organizer – Year 9 Engineering

### Filing techniques:

- **Cross Filing:** moving the file **across** your work piece to remove waste material quickly to shape it at 45° angle
- **Draw Filing:** moving the file **parallel long** the work piece edge to create a smoother finish.

### Finishing techniques:

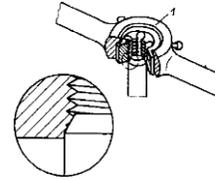
- **Emery Cloth:** wrapped around a file, using the same technique and direction as draw filing to remove larger scratches
- **Wet n Dry:** wrapped around a file, using the same technique

### Joining Engineering Materials:

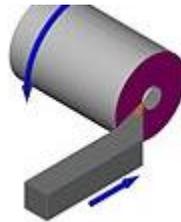
- Glues like PVA will not work on materials like metals and plastic as they are not porous enough
- Metals can be joined using **heat**; examples of this are **welding, brazing and soldering**.
- **Welding** uses a very high current to 'melt' the 2 metals fusing them together e.g. MIG welding.
- **Brazing** uses a brazing rod filler (copper/brass) to join 2 metals, the metal is heating the metal to 925°C
- **Soldering** uses silver solder as the filler material, e.g plumbing, solder melts at 625°C
- Note: all process need a **Flux** – this is used to keep the metal surfaces clean, allowing the filler materials to flow into the joints.

### THREAD CUTTING:

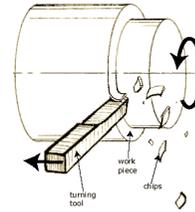
- 1) Put die in die stock
- 2) Put a chamfer on the end of the bar
- 3) Start the Die off on the Lathe held against the Tailstock – turning the chuck by hand
- 4) Twist ¾ clockwise, ¼ back again to break the swarf.
- 5) Continue process until the screw thread is complete.



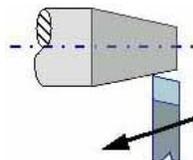
### Turning processes – lathe work



**Facing off:** cleans and squares the end of the work piece.



**Parallel turning:** Reduces work piece diameter



**Taper turning:** puts a chamfer or point on the workpiece



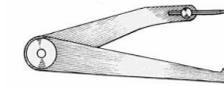
**Centre Drilling:** Drilling a hole in centre of the workpiece



Counter sink

Tapping tool

Die insert for thread cutting



Odd Leg Callipers



Machine Vice



3 Jaw Chuck



4 Jaw Chuck



Centre Drill

## TOOL TYPES

### KEY VOCABULARY:

Welding	Tempering
Tapping	Facing off
Malleable	Draw filing
Brazing	Abrasion
Fabrication	Brittle

You should be able to spell and explain the meaning of each of these terms by the end of this rotation.