THE GUIDE TO FILES AND FILING

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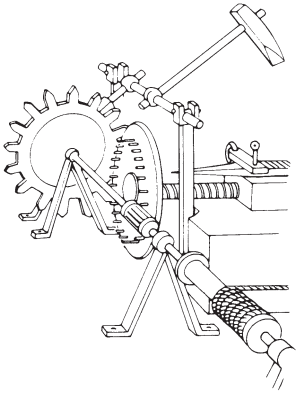
Introduction

Choosing the right file can be confusing, with so many sizes, shapes and cuts available it is difficult to decide the right one for the job.

The range of Nicholson® files available from Apex Tool Group covers every job task requirement.

This booklet has been specially produced to simplify file selection and application for any file user.

History



The file has been with man now for many years and one of the first recordings is in the Bible during the reign of King Saul.
This would be approximately 1090 BC and at that time files would have been used for sharpening various types of primitive tools. From the first files the development and evolution can be traced from stone implements to files with teeth running at right angles across the file blank to present day quality machine produced files.

The first attempt to cut files by machine was approximately 1490 AD and resulted from an invention by Leonardo da Vinci. However the first machine which actually cut files was that made by the Frenchman, Chopitel in 1750.

At this time files were made from mild material and did not require annealing. To produce a hardened surface various preparations were used to carburize the file teeth. But it was the inventions of such men as Bernot, Nicholson, Whipple and Weed that provided machines capable of producing better files than those produced by hand.

How a file is made

Today various kinds of material, product finish and working condition make file development an industrial science. File manufacture involves the study of file steels, file design and file performance for all file applications.

1. File Steel: Is cut to proper length from various width thickness and cross sections such as rectangular, square, triangular, round and half round.

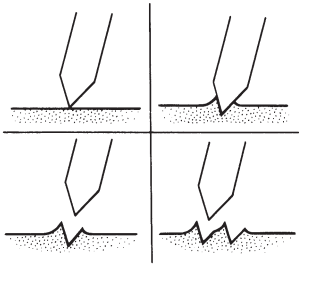
2. Rough shaping: The blank is punched to shape or is heated and forged with drop hammers and rollers to shape the tang and point.

3. Annealing: The forged blank is heated to an elevated temperature and then cooled slowly under controlled conditions to soften the steel for tooth cutting and to make internal steel structure uniform.

4. Final Shaping: The annealed blanks are ground or milled to produce a surface necessary for the uniform formation of the teeth. This is followed by drawfiling that produces the perfectly true flat or curved surface necessary for the uniform formation of the teeth.

5. Forming teeth: The teeth are formed by a rapidly reciprocating chisel that strikes successive blows on the file. The hardened chisel cuts into the soft blank displacing and raising the steel into the desired tooth structure.

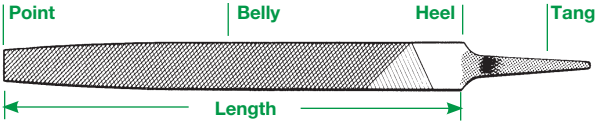
6. Hardening: The file is then hardened by heating it in a molten bath to a predetermined temperature. This is followed by immersing the file in a quenching solution. This combination of heating and cooling under carefully controlled conditions brings the file to the maximum hardness to the very top of the cutting edges.



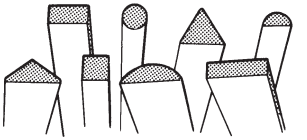
7. Finishing: The file is cleaned and sharpened by bead blasting. The tang is reheated to give strength without brittleness. It is then given a series of tests by trained inspectors, and oiled to prevent rust.

File Terminology

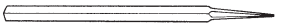
Each part of the file has a name and there are many different shapes and sizes of files. Furthermore, there are varying types of file cuts available, all with their own names. This section of the booklet will help you understand the file and the terms used:



Type: The cross-sectional shape or style of the file i. e. quadrangular, circular, triangular or irregular. These sections are further classified according to their contours i. e. blunt, taper etc.



Blunt: A file whose edges are parallel from end to end and of constant width.

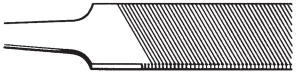


Taper: The reduction in cross section of the file from its heel to the point. A file may taper with width, in thickness or in both.

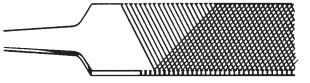
Coarseness: The number of teeth per inch length of the file.

Cut: The character of the file teeth with respect to the coarseness (bastard, second-cut and smooth.)

A **single-cut** file has a single set of parallel, diagonal rows of teeth. Single-cut files are often used with light pressure to produce a smooth surface finish or to put a keen edge on knives, shears or saws.

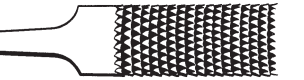


A **double-cut** file has two sets of diagonal rows of teeth. The second set of teeth is cut in the opposite diagonal direction, and on top of the first set. The first set of teeth is known as the overcut while the second is called the upcut. The upcut is finer than the overcut. The double-cut file is used with heavier pressure than the single-cut and removes material faster from the workpiece.

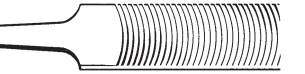


File Terminology

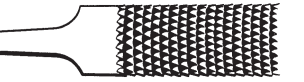
A **rasp-cut** has a series of individual teeth that are formed by a single-pointed tool. This produces a rough-cut and is used primarily on wood, hooves, aluminum and lead.



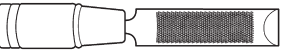
A **curved-cut / mill tooth** file has its teeth arranged in curved contours across the file face and is normally used in automotive body shops for smoothing body panels.



Plater's Rasp: A rasp file combination that is used primarily by farriers in the trimming of horses' hooves.

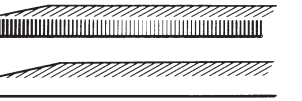


Woodchuck: A multi-purpose Wood chisel / rasp combination tool used by cabinetmakers, homebuilders, and construction workers.



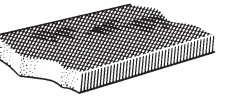
Bastard: File coarseness between "Coarse and Second Cut."

Back: The convex side of a half-round or other similarly shaped file.



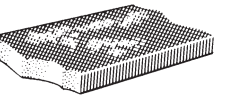
Edge: The intersection of two adjacent faces of the file.

Safe Edge: A smooth or uncut edge of the file.

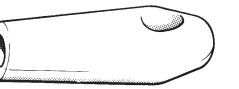


Pinning: Filings wedged between the file teeth.

Shelling: The breaking of file teeth, usually caused by using too much pressure reverse filing, filing sharp corners, or edges.



Handle: A holder into which the tang of the file fits. If the file has an integral holder this is known as a solid handle file.

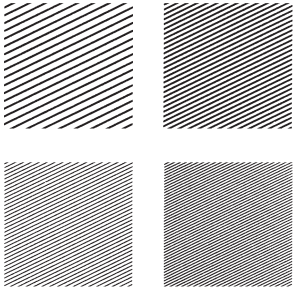


Choosing the right file

To achieve the desired results it is essential that the right file be used for the job. In selecting the right file the user should consider the shape, size and coarseness of the file.

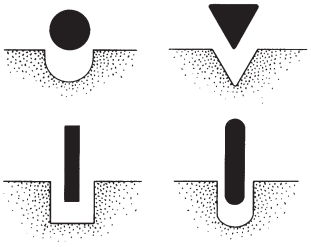
The size and the coarseness of the file are directly related, so the larger the file the more stock it will remove and the smaller the file the finer the finish it will achieve.

Most files also have three grades of cut: bastard-cut, second-cut and smooth-cut. The coarser the cut of the file, the rougher the finish of the work. Therefore, the size of the file and the grade of its cut must be taken into account against the amount of stock to be removed and the fineness of fi nish that is required.



Generally speaking bastard and second-cut grades of double-cut files would be chosen for the fast removal of stock while single-cut files and smooth double-cut files would be chosen for finishing. It is however almost impossible to lay down exact guidelines for the right file for the job, but using the basic facts given here the user should have a reasonably clear picture in mind, the nature, size of the work, the kind of finish required, the working tolerance allowed and the risks (if any) of spoiling the work.

In addition to the amount of stock to be removed, the contour of its removal is equally important and is determined by the shape of the file. For example, a triangular file should be used on acute internal angles, to clear out square corners and in sharpening saw teeth.



A flat file should be used for general-purpose work, a square file for enlarging rectangular holes and a round file for enlarging round holes. A half-round file can be used for dual purposes, the flat face for filing flat surfaces and the curved face for grooves.

How to use a file correctly

Filing is an industrial art - grip, stroke and pressure may vary, to fit the job. There are three elemental ways a file can be put to work They are:

Straight filing: This consists of pushing the file lengthwise-straight ahead or slightly diagonally-across the workpiece.

Drawfiling: This consists of grasping the file at each end, pushing and drawing it across the workpiece.

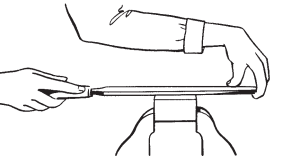
Lathefiling: This consists of stroking the file against work revolving in a lathe.

For normal filing, the vice should be about elbow height. When there is a great deal of heavy filing it is better to have the work slightly lower. If the work is of fine and delicate nature, the work can be raised to eye level.

For work that could become damaged in the vice through pressure, a pair of protectors made of zinc, copper or aluminum sheet should be used between the workpiece and vise jaws.

The Grip

For files needing two-handed operation, the handle should be grasped in one hand and the point of the file in the other hand.



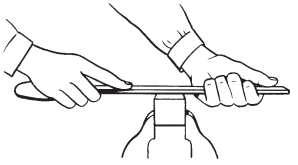
The file handle should be rested in the palm with the thumb pointing along the top of the handle and the fingers gripping the underside.

The point of the file should be grasped between the thumb and the first two fingers with the thumb being on the top of the file.

When heavy filing strokes are required, the thumb on the point is normally in line with the

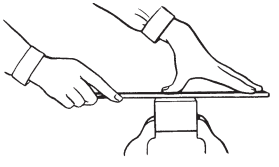
file; the tip of the thumb pointed forward. For lighter strokes however, the thumb can be turned to as much as right angles to the direction of the stroke

If the file is being used one-handed for filing pins, dies or edged tools not being held in a vise, the forefinger, and not the thumb is placed on top of the handle in line with the file.



Carrying the file

For normal flat filing, the operator should aim to carry the file forward on an almost straight line in the same plane, changing its course enough to prevent grooving. Too much pressure often results in a rocking motion causing a rounded surface.



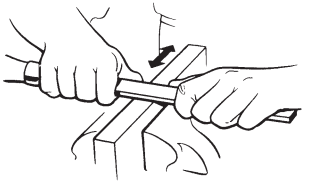
Keep the file cutting

One of the quickest ways to ruin a good file is to apply too much pressure, or too little, on the forward stroke. Different materials of course require different touches; however, in general, just enough pressure should be applied to keep the file cutting. If allowed to slide over the harder metals the teeth of the file rapidly become dull, and if they are overloaded by too much pressure, they are likely to chip or clog.

On the reverse stroke, it is best to lift the file clear of the workpiece, except on very soft metals. Even then pressure should be very light, never more than the weight of the file itself.

Drawfiling

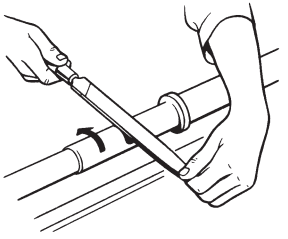
Drawfiling consists of grasping the file firmly at each end and alternatively pushing and pulling the file sideways across the work. Since files are made primarily to cut on a longitudinal forward stroke, a file with a short-angle cut should never be used, as it will score and scratch instead of shaving and Shearing. When accomplished properly, drawfiling produces a finer finish than straight filing.



Normally, a standard Mill Bastard file is used for drawfiling, but where a considerable amount of stock has to be removed, a Flat or Hand file (Double Cut) will work faster. However, this roughing down leaves small ridges that will have to be smoothed by finishing with a Single Cut Mill file.

Lathe filing

When filing work revolving in a lathe, the file should not be held rigid or stationary, but stroked constantly. A slight gliding or lateral motion assists the file to clear itself and eliminate ridges and grooves.



While a Mill file is capable of good lathe filing, there is a special Long Angle Lathe file with teeth cut at a much larger angle. This provides a cleaner shearing, self-clearing file, eliminates drag or tear, overcomes chatter and reduces clogging. Uncut edges on this file protect any shoulders on the work, which are not filed, and the dog, which holds the workpiece.

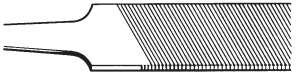
Lathe filing is usually employed for fitting shafts. Where stock is to be removed, a 12"/300mm or 14"/350mm Long Angle Lathe file is preferable. This file will provide the finish suitable for a drive fit. For a running fit a Mill file will provide a smooth finish. Where

a fine finish is required a Swiss Pattern and or Pillar file in No. 4 should be used.

Recommended Surface Feet per Minute for Lathe Filing:

Cast Iron	Approximately	150
Annealed Tool Steel	Approximately	175
Machinery Steel	Approximately	350
Soft Yellow Brass	Approximately	500

Many lathe filers make a practice of not using a new file for work requiring an extremely fine finish.



In using the Long Angle Lathe file, care should be taken at shaft ends as this fast cutting file may cut too deeply.

Do not run a hand over lathe work, as oil and moisture can coat the surface and make it difficult for the file to take hold. For lathe work that has oval, ecliptical or irregularly round form, the finer Swiss Pattern files are most satisfactory.

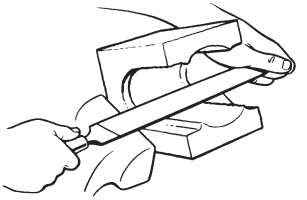
Filing different metals

Different metals vary greatly in character and properties, some are softer than others are, and some are more ductile and so on. The nature of the metal has to be taken carefully into account when choosing the right file and applying it to the job. For instance, a soft ductile metal requires a keen file and only light pressure must be applied during filing if the work is not to be deformed. Conversely, a hard and less ductile metal may require a file with duller teeth to avoid them biting too deep and breaking off when pressure is applied.

When filing a material the user can normally feel whether or not he is using the right file, and filing in the correct manner. All things being correct, a smooth cutting action and a good clean finish on the work is achieved. If there is stubborn resistance, chances are the wrong file is being used, the file is damaged or the wrong method is being used.

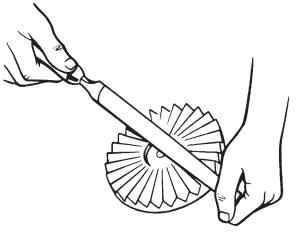
Filing rough castings

Snagging castings, removing fins, spurs and other projections, is hard on normal files. Their teeth are for fast cutting and do not possess the ruggedness for driving against hard projections and edges. This filing engages only a few teeth, thus putting a strain on each. For such work, it is better to use a Foundry file with sturdier teeth and heavy-set edges to resist shelling or breaking out.



Filing die castings

Like foundry castings, die castings usually have sharp corners, webs, fins or flashing which are liable to damage a normal file. In addition, die castings consist of magnesium, zinc, aluminum, alloy or similar combinations of metal which have the tendency to clog regular files.



Depending on the shape, Apex Tool Group has a variety of files that will meet the required application. Suggested files are found in the "job by job" file selector of this book, or you may contact your Apex Tool Group Customer Service Representative.

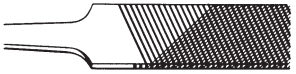
Filing stainless steel

The use of stainless steel and alloy steels has created other filing techniques. These steels with hard chromium and nickel content are tough and dense. This causes them to be abrasive, which shortens the life of the normal file.

To overcome these problems, files have been developed with good wearing qualities. These files, when used with a light pressure and a slow, steady Stroke, will remove metal and provide a good finish.

Filing aluminum

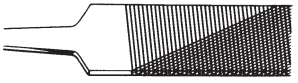
Aluminum is soft and is difficult to file, file teeth clog even under moderate pressure. Filing aluminum is divided into:
1) Filing roughness from aluminum castings,
2) Filing sheet and bar aluminum,
3) Filing aluminum alloys.



To produce a good finish, the Aluminum Type A file has been developed. The file upcut is deep with an open throat, the overcut fine which produces small scallops on the upcut. This breaks up the filings and allows the file to clear. This also overcomes chatter and prevents too large a bite. By using a shearing stroke toward the left, a good finish can be obtained.

Filing brass

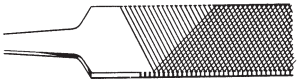
Brass is difficult to file because it is softer than steel, but tough. This demands teeth that are sharp, sturdy and cut to prevent grooving and running the file off the work.



The Brass file has a short upcut angle and a fine long angle overcut which produces small scallops to break up filings and enable the file to clear. With pressure, the sharp high-cut teeth bite deep, with less pressure, the short upcut angle smoothes.

Filing Bronze (Copper, tin or other alloying elements)

Bronze is similar in nature to brass in some aspects, but varies according to the percentages of alloying elements.



Average sharpness of the file is satisfactory for some bronzes, while for others, a file that can maintain its sharpness for longer periods is required. Thus, for the harder bronzes, a file with a more acute angle at the top of the tooth is desirable. This is known as a thin topped tooth.

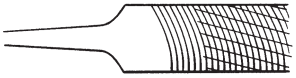
The direction of stroke of the file should be crossed frequently to avoid grooving with bronze and brass.

Filing Wrought Iron

Wrought iron is relatively simple to file. It is soft but only moderately ductile so it is not necessary for a file to be very sharp to obtain good results.

Filing plastics

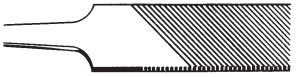
Hard plastics are dense and brittle, and material is removed as light powder. The abrasiveness of hard plastics requires files with high sharp teeth. Soft plastics are filed in shreds so Shear Tooth files should be used for this application.



Depending on the density of the material, Apex Tool Group has the file that will meet the required application. Suggested files are found in the "job by job" file selector of this book, or you may contact your Apex Tool Group Customer Service Representative.

Filing soft materials

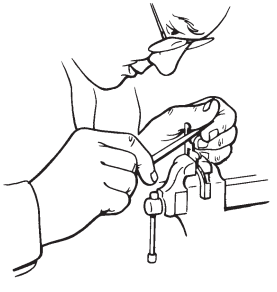
Soft materials such as Aluminum, Brass, Copper, Plastics hard rubber and Wood, a Shear Tooth file provides fast material removal with good smoothing qualities. The combination of the Single Cut and the Long Angle helps the Shear Tooth file to clear. Because of the Long Angle the file has a tendency to run to the left on narrow surfaces. This can be overcome by filing with a diagonal stroke to the right.



Precision filing

For filing such as that employed by the instrument industry, there is a range of Swiss Pattern files. The delicate precision work calls for these files be made to exacting measurements and finer cuts.

The flat Precision file should be used with a slow smooth stroke moving the file laterally along the work on the forward stroke. In using Round or Half Round types, the filing should be clockwise to ensure a deeper cut and a smoother finish.

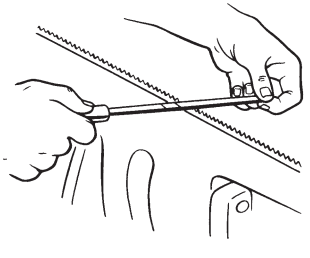


Saw Filing

Efficient saw filing demands, first of all, a steady hand and a good file. Also, the file must be correct in design, cut and size for the type of saw and the type of teeth to be filed.

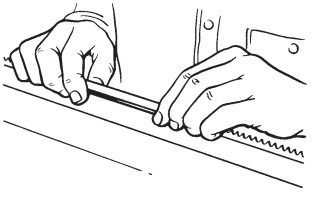
The stroke must be absolutely level, as the slightest rocking will affect the cutting edge of the saw-tooth. The file must be lifted off the work when drawing back for the next stroke.

The teeth have to be set at the correct angle in relation to each other. This is best done with a "Saw Set" usually before filing. However, some filers prefer to do this after the saw has been filed. To file saw teeth, provisions must be made to hold the saw. A saw vise should be used, to be sure there is no chatter or vibration in the saw. This will shorten the life of the file.



Sharpening hand saws

Handsaws of two types, the Crosscut and the Rip must be reset, normally every fourth or fifth filing. Check that teeth are of equal height. This can be accomplished by passing the file lightly lengthwise along the tops of the teeth. Some may be flattened, others are hardly touched. The flattened teeth will require more filing to put them in shape.

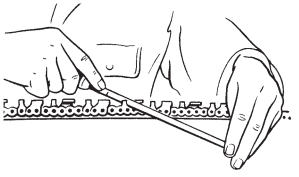


These files should be used:

Five	7"/175mm Regular Taper or 6"/150mm Heavy Taper
Five and a half	7" /175mm Regular Taper or 6" /150mm Heavy Taper
Six	7" /175mm or 8" /200mm Slim Taper
Seven	6" /150mm, 7" /175mm Slim Taper and 9" /225mm or 10" /250mm Double Ender
Eight	6" /150mm Slim Taper or 7" /175mm Extra Slim Taper or 9"/225mm Double Ender or 8"/200mm Double Extra Slim Taper
Nine	6" /150mm Extra Slim Taper, 7"/175mm Double Extra Slim Taper or 8"/200mm Double Ender
Ten	5" /125mm or 6" /150mm Extra Slim Taper, 6"/150mm Double Ender

Filing chain saw teeth

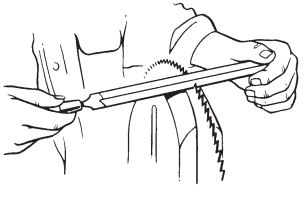
Rounded hooded chain saws:
These type of chain saws require Round Chain saw files specifically designed for the task. These files are available in various diameters to fit a sizes of Round Hooded chain saws. Place the file against the beveled cutting surface of the teeth that face both sides and provide their own clearance at an angle of 20∞ to 45∞ with the saw blade, depending on manufacturers specifications. The direction of the filing stroke is off the cutting edge. It is essential that the file be held level and it should be pressed back and slightly up during the filing stroke. Every other tooth is filed, and then the chain saw is reversed. The depth gauges of this type of saw control the depth of the cut that the saw will take. As the cutting teeth are sharpened, they become lower, and it is necessary to lower the depth gauges an equal extent. The difference in height between cutting teeth and depth gauge should be between 020"/ 5mm and 030"/ 75mm.



File the depth gauge only as required to maintain dimensions between cutter and gauge as cutter is filed back. Do not file off too much. This overloads motor and chain and the chain will clog. Use a depth gauge, chainsaw file, or a mill file.

Sharpening circular saws

Before removing the saw blades from saw, lower the blade until only 1/64" (4mm) protrudes above the table. Place a file over the opening in the table and by hand, revolve the saw backward against the file. Be sure that the file touches each tooth top. Remove the saw blade and sharpen, using the following:
6"/ 150mm and 7"/175mm saws use 6"/150mm Cantsaw file.
8"/200mm and 9"/225mm saws use 8"/200mm Cantsaw file.
10"/250mm and up use 10"/250mm Cantsaw file.



Some large size circular saws may be sharpened without removing them from the saw as long as there is no chatter. Large circular saws with insert type teeth are sharpened with a Mill file. The larger the saw, the larger the file.

Filing the hand crosscut saw

The teeth of the crosscut saws cut with their edges and points: edges must be beveled and sharp. Start at the point of the saw and work towards the handle. Place the file in the gullet to the left of the first tooth set away from you. Hold the file level with the angle of the saw blade. At this angle, it should touch on the bevels of both teeth. When filing the flattened teeth, only half should be filed away at a time. Miss the next gullet and file the one following until every other gullet has been filed.

Reverse the saw and begin process from second gullet away from saw point.

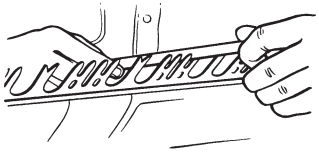
Filing hand ripsaws

For pointing and filing, follow the same procedure as the Crosscut saw. It must be remembered that the Rip saw is filed so that the tooth points do the cutting, not the edges. Teeth should be filed at right angles to the blade. Every other tooth is brought to a square edge, the saw is reversed and the remaining teeth filed.

Sharpening crosscut saws

The Crosscut saw has two types of teeth, cutters and rakers. The cutters do the cutting, the

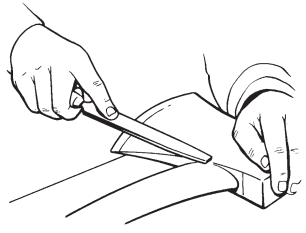
rakers clear the cut. This is filed at an angle of 45° from the filer. This permits access to cutters and enables the teeth to be filed at the correct angle.

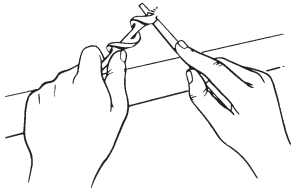


Teeth should be checked for levelness, the raker teeth being between 1/100"/25mm to 1/64"/.4mm below level of cutting teeth. The filer should use a Crosscut Saw file or a Mill file and file all cutter teeth to a point. The saw is placed vertically and the file used across the rakers. Should the gullets of the teeth require deepening, a Round file or a Mill file with round edge can be used, or use the back of the Crosscut file.

Sharpening tools and implements

There are many tools and implements in industry, agriculture and gardening that require regular sharpening. Such tools may be filed towards or away from the edge, the former for the early part of the task and the latter for the light finishing touches. For coarse steel cutting edges for hoes, ploughs etc., Home and Garden files, as well as Axe and Handy files are available. For harder carbon steels in cutter knives, shears etc., the Second Cut or Smooth Mill provides a sure, but smoother bite. It is essential that the work glaze be removed in the first few strokes, so apply extra pressure in very slow, deliberate strokes at the beginning.

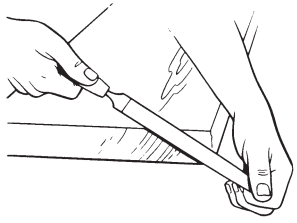




Rasps

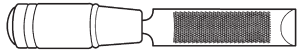
Rasps are broadly classified as wood, cabinet and horse Rasps. Also available are rasp combinations known as Four-in-Hand (or Shoe Rasp) and Wood Craft Rasp.

The Wood Rasp is a coarser cut than the Cabinet Rasp and is made primarily for the rapid removal of stock. For finer woodwork, the Cabinet Rasp provides a means of bringing mortise-and-tenon joints to a proper fit. The Horse Rasp is used for shoeing horses. The Plater's Rasp is available for light hooves such as racehorses.



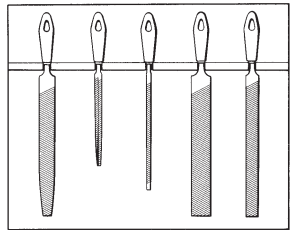
Woodchuck

Woodchuck rasp is a chisel / rasp combination tool used for a variety of wood working tasks. Each tool features a flat wood rasp on one side and a half-round wood rasp on the other. There are edge teeth for those hard to get spots. The chisel point features an extremely sharp, polished and ground blade.

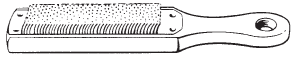


Care of the file

The teeth of the file should be protected when the file is not in use by hanging it in a rack or keeping it in a drawer with wooden divisions. Files should always be kept clear of water or grease, since this impairs the filing action. It is advisable to wrap the file in a cloth for protection when it is carried in a toolbox.

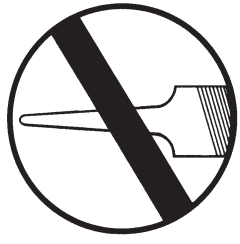


The file teeth should be kept clean at all times by using a file card, or a wire file brush, to clear the grooves between the teeth.



Safety

For safety reasons, a file should never be used without a tight fitting handle. Serious accidents can result if the handle becomes detached exposing the sharp point of the tang.



Apex Tool Group offers a variety of different size file handles produced in traditional wood, or from modern plastics. If you need help in selecting which handle is right for your file, contact your Apex Tool Group Customer Service Representative today.

'Job by Job' file selector

Aluminum alloy	Flat Bastard File, Aluminum File, Magicut®
Auger Bit	Auger Bit File
Auto Body	Bodifiles
Babbitt	Flat Babbitt, Super Shear®, Flat Files
Bearing, brass	Magicut®
Bearing, bronze	Flat Bastard File, Magicut®
Beveling	Flat Bastard, Mill File
Blacksmith	Rasp and Flat Bastard, Half-Round Bastard, Flat Coarse File
Bolt threads	Taper, Mill or Knife File, Mill Bastard
Brass	Flat Bastard File, Magicut®, Super Shear®
Bronze	Flat Bastard File, Magicut®
Cabinet, wood	Cabinet File, Cabinet Rasp or Woodchuck
Cast iron	Flat, Half-Round, Square or Round File, according to shape of material
Casting rough	Flat Bastard File
Contact points	Mill Bastard, Second Cut, and Tungsten Point Files
Copper	Flat Bastard File, Magicut®
Cutter, Machine tool	This tool is generally ground and sharpened by an emery wheel. Can be filed only when in an annealed condition. Use file to suit shape or surface.
Cutter, milling	See Cutter, Machine tool
De-scaling	Flat Bastard File
Die block	Flat Bastard File
Die casting	Flat Bastard File, Half-Round Bastard File, Round Bastard File, Square Bastard File, or Mill Bastard File, according to shape of the die casting and finish desired.
Die forging	Flat Bastard File or Half Round Bastard File, according to shape of the die forging.

'Job by Job' file selector

Die shop	Swiss Pattern Files of appropriate shape
Electric Connections (cleaning)	If surface is large, use Mill Bastard File, otherwise use Tungsten point.
Fender, auto	Bodifiles
Fiber	Flat Bastard File or Rasp
Fine work	Swiss Pattern Files
Finishing	Mill Bastard File. For lathe filing, use Mill Bastard File or Long Angle Lathe File
Foundry casting	Flat Bastard File
Furniture, making	Cabinet File, Cabinet Rasp, or Mill Bastard File
Garden Tool	Home and Garden File
Grooving	Square Bastard, Round Bastard, Half-Round Bastard, or Slim Taper, according to shape of groove
Hard rubber	Flat Bastard File
Hole	Round Bastard File or Square Bastard File
Horse-shoeing	Horse Rasp, Plater's Rasp
Hot metal, filing	Flat Bastard File
Iron	Bastard-Cut File according to shape of material
Joint, mortise and tenon	Cabinet File or Cabinet Rasp
Key way	Square Bastard or Pillar Bastard File
Keys, filing	Warding Bastard File
Knife	Mill Files
Lathe-turned Section	Mill Bastard File or Long Angle Lathe File
Laminate	Laminate File, Plastic File, Mill Bastard File

'Job by Job' file selector

Lawn mower	Mill Bastard File or Home and Garden File.
Lock, mending	Warding Bastard File.
Machinists' work	Machinists' File such as Flat, Half Round, Square or Round. Also Mill or Tapers, in cuts according to work.
Millwrights' work	Flat, Half-Round, Round, Square Mill Files.
Model, metal	Swiss Pattern Files.
Molded part	Flat Bastard File or Mill Bastard File.
Notch	Taper or Knife File.
Ornaments, wood Making	Files, including Cabinet File, Cabinet Rasp. Round Bastard Mill Bastard. and Slim Taper File.
Pattern making, Wood	Files, including Cabinet File, Cabinet Rasp, Pattern Makers Rasp, Woodchuck, Round Bastard, Square Bastard, Mill Bastard and Slim Taper File.
Pipe fitting	Half-Round Bastard File.
Planer knife carbon steel	Mill Bastard File.
Plastics	Flat Bastard File. Also Mill Bastard File, Plastics File, Laminate File, sharpened for plastics.
Plumbers' work	Half-Round Bastard.
Rotary mower Blade	Home and Garden File, Handy File, Flat Bastard.
Rough filing	Bastard File depending on shape to be filed.
Slot	Knife File, Slim Taper or Warding.
Snagging	Flat Bastard File.
Soft metal	Flat Bastard.
Stainless Steel	Flat, or Mill File sharpened for stainless
Steel	Flat Bastard File.

'Job by Job' file selector

Steel alloy	Use file applicable to the shape of the material. File steel alloy only when it is annealed.
Switch contacts	Contact Point File or Mill Bastard File, according to surface area of switch contacts.
Switch, electric	Mill Bastard File or Contact Point File, according to size of switch.
Template	Files, including Flat Bastard File, Half-Round Bastard File, Mill Bastard File, or Round Bastard File.
V-groove	Files, including Knife, Taper, Slim Taper, X Slim Taper, XX Slim Taper.
Wood working	Cabinet File or Cabinet Rasp.
Zinc	Babbit File.

SAWS

Band Saw	Band Saw Taper Single-Cut File
Cant Saw	Cantsaw or Mill Bastard File.
Chain Saw	Round, Special Square, Lozenge File* (Special Mill File for Depth Gauge)
Circular Saw	Mill Bastard, Cantsaw and Slim Taper Files
Cross-Cut Saw	Special Crosscut, Mill, Round, or Round Edge Mill File.
Hand Saw	Slim Taper, Extra Slim Taper, or Double Extra Slim Taper File, according to points of saw. File recommended for saw points per inch. **Saw points shown in Bold**. **5** - 7" Regular Taper **5** 1/2 - 7" Regular Taper **6** - 7" or 8" Slim Taper **7** - 7" or 8" Slim Taper **8** - 6" Slim Taper, 7" Extra Slim Taper or 8" Double Extra Slim Taper **9** - 6" Extra Slim Taper or 7" Double Extra Slim Taper **10** - 5" or 6" Extra Slim Taper
Wood or Buck Saw	Mill Bastard and Slim Taper Files

Profile Selector for Machinist's Files

Cross Section	Name	Shape	Character of Teeth	Taper	General Uses
	Flat	Rectangular	Usually bastard. Also second-cut and smooth	Taper in width	A general purpose file
	Hand	Rectangular	One-edge safe. Bastard second-cut and smooth	Uniform in width	Finishing flat surfaces
	Pillar	Almost square	One-edge safe. Bastard second-cut and smooth	Uniform in width	Keyways, slots narrow work
	Warding	Thin	Usually bastard. Also second-cut and smooth	Width sharply tapered thickness uniform	Filing ward notches in keys. Narrow work
	Square	Square	Bastard, second-cut and Smooth	Tapered	Enlarging holes or recesses Mortises, keyways and splines
	Three Square	Triangular	Sharp edges. Bastard second-cut and smooth	Tapered	Filing acute angles, corners, grooves, notches
	Round	Circular	Usually bastard. Also second-cut and smooth	Either tapered ("Rat Tail")* or blunt	Enlarging holes; shaping curved surfaces
	Half Round	Third-Circular	Usually bastard. Also second-cut and smooth	Uniform in width	Concave corners crevices, round holes
	Knife	Knife-Shaped	Usually bastard. Also second-cut and smooth	Tapered curving to a narrow point	Cleaning out acute angles, corners, slots

Profile Selector for Special Purpose Files

	Aluminum	Flat Rectangular	Made in one cut only. Fast-cutting teeth	Tapered	Filing aluminum alloys and other soft metals
	Aluminum	Half-Round	Made in one cut only. Fast-cutting teeth	Slightly tapered	Filing aluminum alloys and other soft metals
	Long Angle	Flat Rectangular	Made in one cut only. Both edges safe	Slightly tapered	Lathe work where smooth finish is desired. Also soft metals

Profile Selector for Swiss Pattern Files

Cross Section	Name	Shape	Character of Teeth	Taper	General Uses
	Hand	Rectangular	Double-cut on two flat faces and one edge. Other edge safe or uncut	Uniform in width	Flat surfaces
	Pillar	Width narrower than Hand File	Double-cut on two flat faces. Both edges safe	Uniform in width	Flat surfaces
	Warding	Thin Rectangular	Double-cut on two flat faces. Single-cut on two edges	Tapered in width uniform in thickness	Slots, locks and keys
	Square	Square	Double-cut	Tapered	Corners, holes
	Three-Square	Triangular (Equilateral)	Double-cut on three Faces. Single-cut on edges	Tapered	Corners, holes
	Round	Circular	Double-cut	Either tapered or uniform (straight)	Corners, holes
	Half-Round	Third Circular	Double-cut	Tapered	Corners, holes
	Knife	Knife-Shaped	Double-cut on flat faces. Single-cut on edges	Tapered	Slots
	Cant	Triangular	Double-cut on three faces. Single-cut on two sharp edges	Tapered	Corners