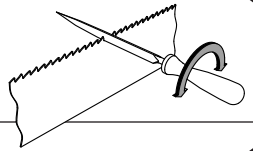
ELEMENTS OF SAW TOOTH DESIGN

CARPE SERRANUS!

RAKE
(angle of attack)

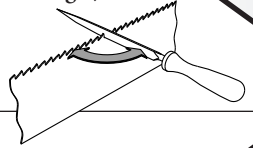


NEGATIVE: Ideal for western crosscut to minimize snagging and promote incising across wood grain fibers. Easier to start and less prone to jamming. More forgiving. A stronger tooth. Saw has more tendency to slide over the wood without cutting

ZERO: Rake angle exactly perpendicular to the direction of cut. Commonly found on ripsaws because it strikes a balance between a keen tooth and a smooth cut.

POSITIVE: Aggressive angle of attack common to Japanese teeth and saws designed to cut on the pull stroke Can be harder to start and jam in the work. Extreme cases of positive rake leave a weaker, undercut tooth which can break off.

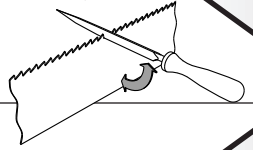
FLEAM
(bevel angle)



LESS: Filing without fleam leaves the points like a row of chisels. This is the very essence of a rip pattern. Some fleam is required for cross cutting

MORE: forms two rows of alternating knife points. This is the very essence of a crosscut pattern. Too much fleam will allow teeth to dull easily

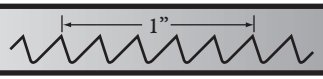
SLOPE
(file attitude)



LESS: Filing without sloping the gullets keeps the surface area of the gullet down, and easier to file.

MORE: Can achieve keener tooth with a standard saw file, but can also make the saw prone to tearing. Gives more space in the gullet for sawdust.

PITCH
(teeth per inch [tpi] or points per inch [ppi])



LESS: Coarser pitch means there will be deeper gullets and more pressure per tooth tip. Harder to start. Fast cutting but leaves rough cut marks.



MORE: Finer pitch means less pressure per tooth tip. Yields smoother cutting, easier starts, and finer cut marks. Numerous and smaller teeth increase sharpening difficulty.

GULLET DEPTH
(file corner radius)

LESS: Shallower gullets have less space for sawdust and the saw will stop cutting if the gullets fill up during a stroke.

MORE: Deeper gullets give more space for sawdust to accumulate and so you can cut without clogging in thicker material.

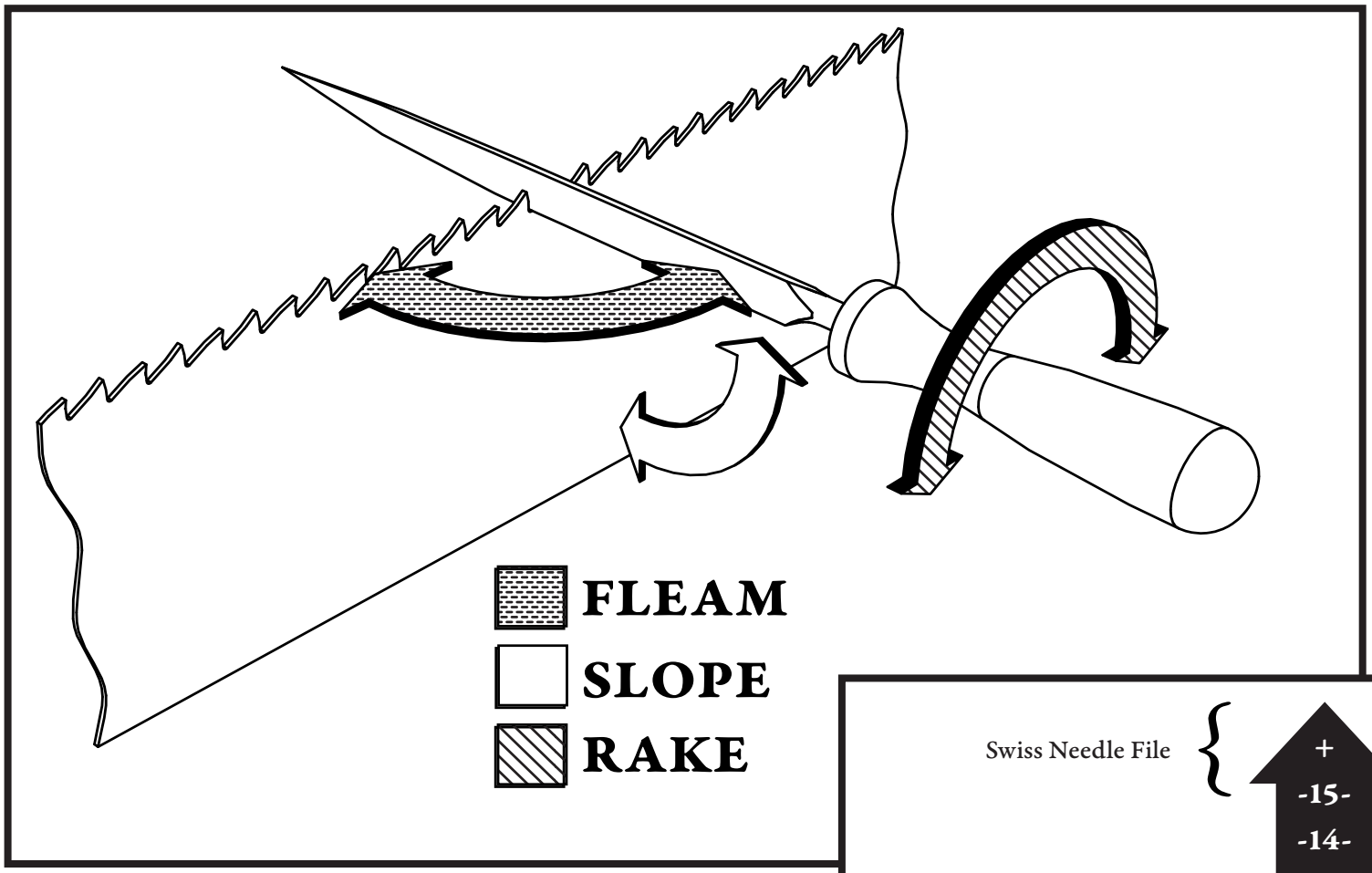
SET
(alternate tooth offset)

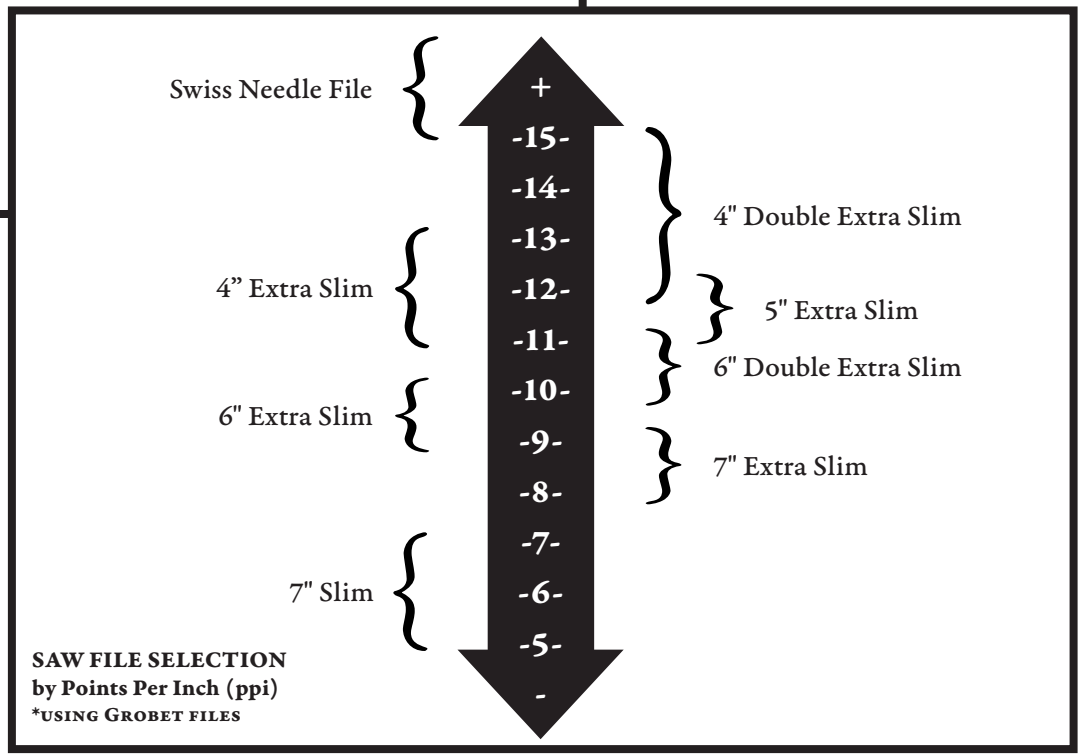
LESS: Makes the saw track better, once it is started correctly. A thinner cut requires less force to make.

MORE: Cuts a wider kerf with more clearance for the saw plate. Prevents binding in the cut. Extra ‘wiggle room’ allows for adjusting the direction of cut. More space for sawdust. More wood removed per cut, which takes more work.

Courtesy of the design department at Gramercy Tools ™ Brooklyn, NY

© Copyright 2008, toolsforworkingwood.com. All rights reserved.


FLEAM
SLOPE
RAKE


Swiss Needle File
4” Extra Slim
6" Extra Slim
7" Slim
+
-15-
-14-
-13-
-12-
-11-
-10-
-9-
-8-
-7-
-6-
-5-
-
4" Double Extra Slim
5" Extra Slim
6" Double Extra Slim
7" Extra Slim
SAW FILE SELECTION
by Points Per Inch (ppi)
*using Grobet files