



What is the gauge?

The gauge of a sawplate relates to the thickness of the material in which the teeth are cut. Typically this will be presented in a three-number sequence such as 015, 018, 020, for example. It's shorthand for 0.015in etc. and can sometimes be recorded as .015.



018 gauge dovetail saw typically for use on stock up to 30mm

The Continuum of a Toothline
(selecting the right plate gauge and ppi for the work you want to do)

Delicate .015	Thin .018	Slim .02	Regular .025	Thick .0315
<p><i>Thin plate, fine teeth, smaller plate dimensions = delicate work</i> Plate gauge, ppi and dimension work together for the task at hand <i>Thicker plate, coarser teeth, larger plate dimensions = robust work</i></p>				
.015 17-16-15 ppi	.018 16-15-14 ppi	.02 14-13 ppi	.025 12-11-10 ppi	.0315 10-9 ppi
DT saw for 1/4" stock (dedicated)	10" DT saw & up to 5/4 stock (recommended)	32" Carcase, 32" HST, & 12" & 24" Carcase saw	14" Saw, 16" & 18" Tenon, & 20" Mitre Saw	18" Heavy Ripping, Roubo Beadmaster
Pros: Delicate plate for dovetailing thin stock ONLY. Cons: Not versatile, prone to warping in 1/4" & thicker stock.	Pros: outstanding general purpose DT saw plate gauge. Cons: Not suitable for plates longer than 24" & deeper than 2 1/2"	Pros: outstanding gauge for dovetailing, small tenons & carcase work. Cons: warps when ripping tenon cheeks longer & deeper than 2 1/2"	Pros: Rip/cuts up to 1 1/2" - 4" tenons, vjry versatile for most work. Cons: warps when ripping tenon cheeks longer & deeper than 4"	Pros: perfect for dedicated ripping tenons more than 4". Best for timber framing. Cons: heavy size not suitable for general purpose work.
<p>Here's the takeaway: don't get a backsaw with a plate thinner than what you need for the work intended. Friction, heat, and potential metal expansion can warp your toothline if you ask more of the sawplate than what it is designed to do.</p> <p style="text-align: right; font-size: small;">© 2024 Mark Harrell / Bad Axe Tool Works</p>				

The saw doctor will see you now

Mark Harrell considers the continuum of a toothline and why it's crucial to select the right plate gauge and PPI for the work you want to do

So far in this series of articles we've been looking primarily at the condition and accuracy of the teeth on your sawplate and this attention to detail can and should be applied to all your back saws. What we haven't yet considered is the suitability of each saw in relation to the job at hand and how it fits into your general arsenal of hand tools. Extrapolate this a little further and you can start to bring into question the type of work you expect to be doing in the future.

Take any tool in the workshop and ask it to perform effectively at the limits of its capability and you may find that you're asking just a little too much of it. Let's put it another way. Would you reach for a Stanley No. 1 Bedrock smoothing plane to put a glassy-smooth finish on an expanse of walnut for a dining table or the sides of a cabinet? Or use a No. 8 jointer plane

to chamfer the corners of a bed rail? No, you'd select a No. 4 or 4 1/2 smoother for the table and cabinet, and a block plane for the bed rail. Likewise, would you use a .015-gauge plate to dovetail 18mm stock with occasional forays into 30mm? While you might just get away with it at the lower end of the scale at the top end you're going to be disappointed and here's why; the delicate plate just won't handle that robust of a cut without heating up, expanding and curling a nice s-roll into the toothline.

Similarly, would you use something like a 460mm long Bad Axe Roubo Beastmaster to craft the tenons of a bench you're assembling with a 95mm thick benchtop, with no intent of making cuts that large ever again? No, of course not – you'd want a more modest saw in the 410mm range that you can use for your more modestly sized projects down the road.

In our quest for cutting ever closer to the line and, dare I say it, cutting joints that come together straight off the saw, it's easy to get distracted from what's actually happening at the sharp end. Woodworkers the world over, be they hobbyist or professional, frequently make the same mistake that is 'finer equals better'.

So before you disappear down that same rabbit-hole and start to question your sawing skills, here's a simple guide designed to keep you on the straight but not necessarily narrow. There is a continuum of plate gauge selection that marries up with pitch (ppi), length and usable depth of plate, and the degree of set. These combined variables will deliver the kind of cut and action one seeks for a range of wood thicknesses, and the length and depth of cut one seeks to make in that range.

Heat



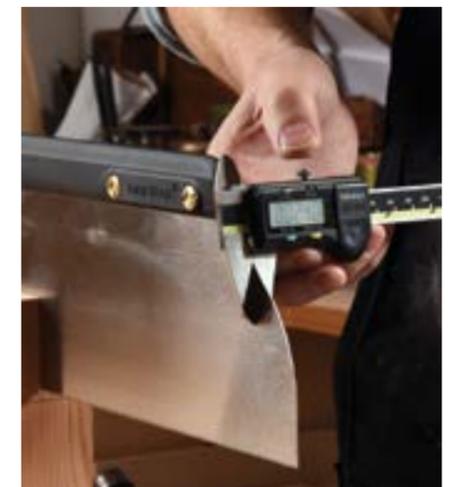
A 018 gauge 300mm long Bad Axe Stiletto dovetail saw can work at full capacity on stock up to 40mm thick

Any sawplate will heat up deep into a cut due to the friction incurred against the metal plate rubbing against the inside walls of a kerf. Just as humidity affects timber, heat brings about a similar change in metal. It expands and affects the toothline, warping it out of true and affecting the quality of your cut. That is, unless you have selected an appropriate gauge of metal, which on one hand won't heat and warp, nor be too heavy for the job at hand – but just the right thickness, with just enough of a heat sink to offset warping.

Think of it this way: the thinner and smaller the plate, the finer the pitch (more PPI or TPI if you prefer) so you'd only make fine, delicate cuts in fine, delicate stock. At the opposite end of the spectrum: the thicker and larger

the plate, the coarser the pitch (less PPI or TPI), so you'd use a large saw for big cuts in robust timbers.

The takeaway here, and you might need a crystal ball for this, is to identify your personal woodworking style and match that up with the kind of projects you want to undertake. Envision the kind of cuts these projects and their associated stock will require. Then you're on the road to building a nest of saws that work for you for most applications. As many experts will attest, you really only need about three backsaws, and at least two handsaws, possibly three. So as fun as the act of tool acquisition may be, it's better on the pocket (and quite possibly your marriage) to identify the saws you need, versus the saws you want.



024 is a typical gauge for 410mm long and over tenon saws



The finer gauge plate on the left has started to distort in the cut and run off

Here are some concrete examples

Scenario 1: the bench-building luthier

You're crafting a Roubo-style bench about 1.8m long with a 90mm-thick top. This is probably the only time you'll come anywhere near this scale of mortise and tenon joinery, since your forte as a luthier is to craft delicate pieces of wood together into a guitar. You therefore will want this one larger saw with a .025-gauge plate filed 12 ppi hybrid-cut for the bench-build, and fortunately, it will remain your go-to saw whenever it's time to cut the scarf joint at the neck with your next guitar build. Your dovetail saw with the .018-gauge plate filed 15 ppi rip, and your carcass saw with the .02-gauge plate filed 13 ppi hybrid or 14 ppi x-cut fleshes out the balance of your woodworking requirements.



A 020 gauge small tenon, dovetail hybrid saw is well within its working parameters on timber up to 50mm thick



More steel in both directions means deeper and longer cuts

Scenario 2: the bench-building timber-framer (with larger furniture pieces in mind)

You're crafting a Roubo-style bench about 2.4m long with a 120mm-thick benchtop, and you just love fitting big timbers together because you want to timber-frame your next workshop. Here's where a 460mm Roubo Beastmaster with its .0315-gauge plate filed 9 ppi rip comes into play, because this won't be the first timber-framing scale project on your horizon. You also tend to craft larger furniture pieces, so the balance of your arsenal consists of a 300mm long hybrid dovetail/small tenon saw filed 14 ppi hybrid-cut, and a 410mm long tenon filed 12 ppi hybrid-cut.

Conclusion

At the end of the day, you'll want to build your nest of saws in accordance with your woodworking style, and not through some formulaic, 'Moses-on-High, yea verily, this is what you MUST have' approach that too many online pundits would have you believe. Now chances are at some point you're going to get a DT saw, and you should. But again, you're best off with a .018-gauge plate, because it will dovetail 6mm thick stock just as handily as 30mm thick stock. Go for the .015-gauge plate long after you've mastered the craft and you WANT (not need) a dedicated thin-stock saw. Down the road (or slippery slope, some say), you may WANT more saws to fill the void – such as a 350mm long sash for those in-between cuts, and the 460mm long Roubo Beastmaster . . . well, BECAUSE. And – it's a great salve for the wounded ego of your average middle-aged man losing his hair. Sort of like the Viagra choice of saws. *F&C*



The 015 gauge 300mm-long Bad Axe Stiletto dovetail saw has relaxed tooth geometry at the toe to assist with the start of the cut