

a closer look

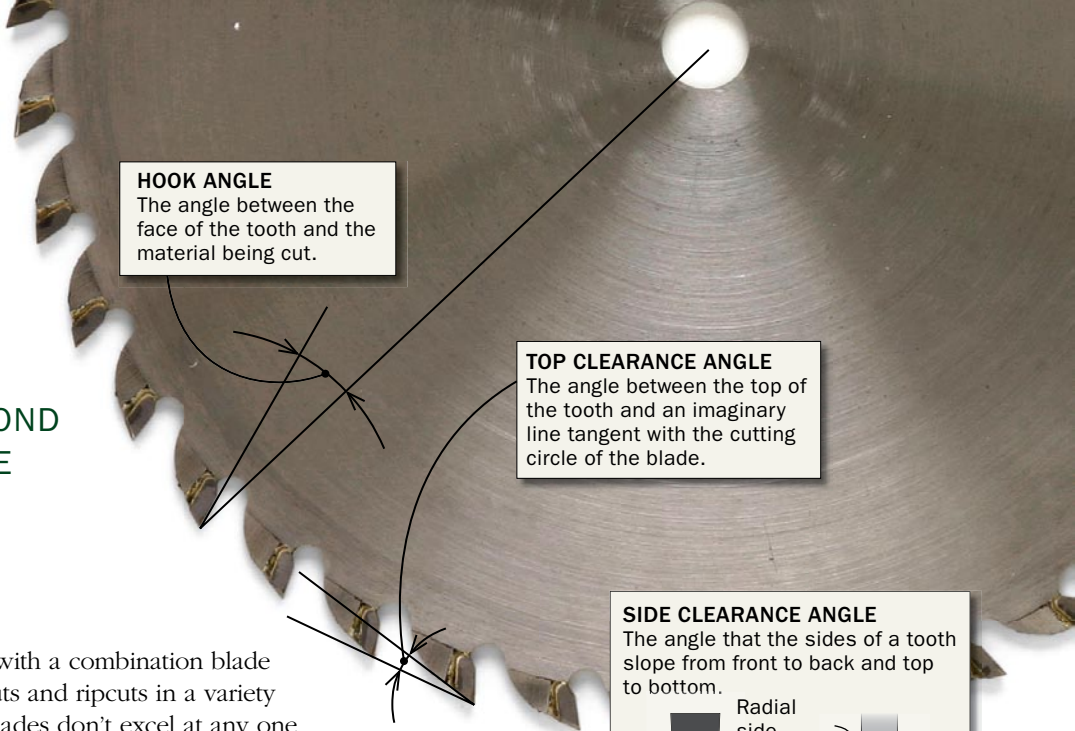
Sawblades

FOR CLEANER CUTS, LOOK BEYOND THE BASIC COMBINATION BLADE

BY TOM WALZ

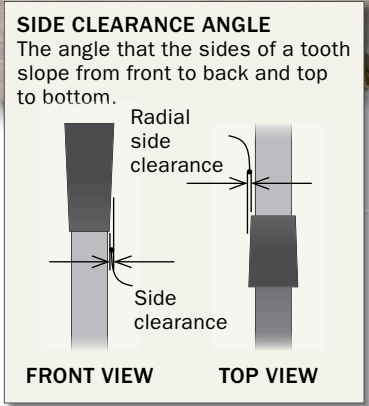
Most tablesaws come equipped with a combination blade designed to make both crosscuts and ripcuts in a variety of materials. However, those blades don't excel at any one task, which is why manufacturers make blades designed specifically for crosscutting or ripping, and for cutting chip-prone materials such as melamine-coated plywood.

With one of these specialized blades, you can get cleaner cuts with less effort. But before you buy one, you need to understand some basic sawblade geometry, which blades match up to the woodworking you do, and what to look for when buying a blade.



HOOK ANGLE
The angle between the face of the tooth and the material being cut.

TOP CLEARANCE ANGLE
The angle between the top of the tooth and an imaginary line tangent with the cutting circle of the blade.



Rip blades

NEED FOR SPEED

Ripcuts are easier to make than crosscuts, so they can have a faster feed rate. To help clear chips, the typical 10-in.-dia. rip blade has 24 teeth, leaving wide gullets between the teeth to accommodate the chips while the tooth is still in the cut. The top edge of each tooth is flat (perpendicular to the plane of the saw plate). Known as a flat-top grind (FTG), it is durable and relatively economical to sharpen. It has the advantage of cutting both sides of the kerf simultaneously, which reduces sawblade stresses and vibration and leaves a cleaner cut.

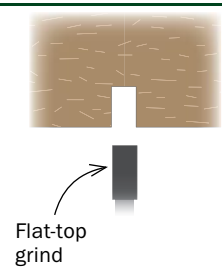
To accommodate a higher feed rate, the teeth have a hook angle of 20° to 25°, meaning that each tooth leans forward. This helps pull the wood into the blade.

To counteract tearout, many rip blades have low clearance angles that cause the chips to drag on the side of the teeth, creating friction, heat, and residue buildup. If you tend to make one or two ripcuts at a time, this may not matter. But in a production shop, this blade will need cleaning more frequently than other blades. A rip blade will help anyone get cleaner cuts, but where time is money, a rip blade pays for itself very quickly.

GENERAL RIPPING



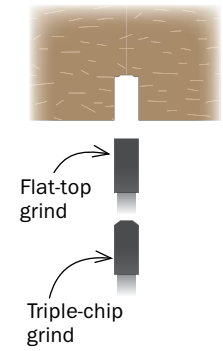
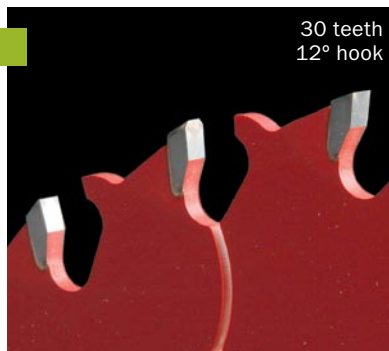
Big teeth, far apart. A typical 10-in. rip blade has 24 teeth, each with a flat-top grind (FTG) and a hook angle of 20° to 25°, which helps pull the stock into the blade. The deep gullets help clear the large volume of chips created by ripping. A rip blade will cut thick stock far quicker than a combination blade and with less user effort.



FOR PANEL GLUE-UPS



Ready for glue. The Glue-Line Rip Blade from Freud (item No. LM74R010) is designed to leave supersmooth edges that won't need jointing—but only on boards up to 1 in. thick. The 30 teeth alternate between FTG and triple-chip grind (TCG).



Crosscut blades

MORE TEETH MEAN CLEANER CUTS

When crosscutting, the problem is not getting rid of chips, but minimizing tearout and chipout. Everything else being equal, while few teeth mean a faster cut, lots of teeth equate to a smoother cut. And the first thing you'll notice about a crosscut blade is the number of teeth. A typical blade has 80 teeth packed together with only a very small gullet between each one. The hook angle is low—usually in the 5° to 15° range—to accommodate the slower feed rate used in crosscutting.

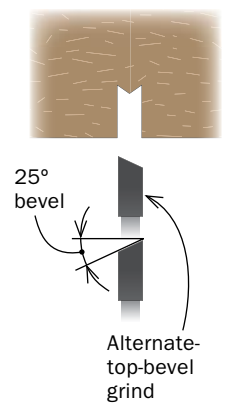
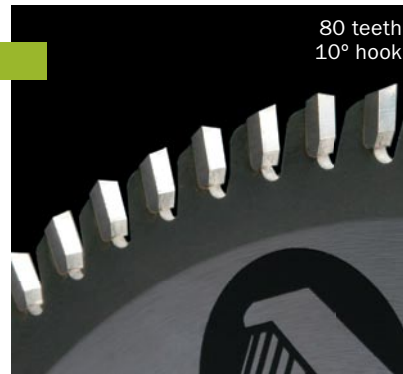
The teeth are ground with an alternate top bevel (ATB). One tip comes to a point on one side while the next has its point on the opposite side. This profile allows the teeth to cut with a scoring action, reducing the cutting pressure and almost eliminating tearout.

The ATB design has its disadvantages.

CROSSCUT SOLID WOOD



Lots of teeth. The 80 teeth of a crosscut blade have alternate top bevels to score the sides of the kerf, designed to cut solid wood without tearing out either the top or bottom surface. Because each tooth creates relatively little dust, only small gullets are needed. The hook angle ranges from 5° to 15°.



There is a greater likelihood of damage to the leading points of the teeth. That could mean more frequent sharpening, which is more expensive because it is difficult to maintain an equal bevel and equal diameter across the points of the teeth around the blade. ATB

blades are generally used for crosscutting wood, and for all cuts on plywood, veneer, hardboard, fiberboard, and particleboard.

If you work with large quantities of expensive, hardwood-faced plywood, an ATB crosscut blade is certainly worth buying.

Laminate blades

ELIMINATE CHIPS IN MAN-MADE MATERIALS

When cutting brittle surfaces, such as veneered plywood, laminates, or phenolic plywood, even an ATB crosscut blade has trouble preventing tearout. To cater to this need, manufacturers offer two modified versions of the ATB blade. One, called a high ATB, has teeth ground to a higher bevel angle, around 40°. The other has teeth ground to an angle on their tops and on their faces. With this alternate top, alternate face (ATAF) grind, you get a sharper, more pointed cutting edge to slice the most brittle materials.

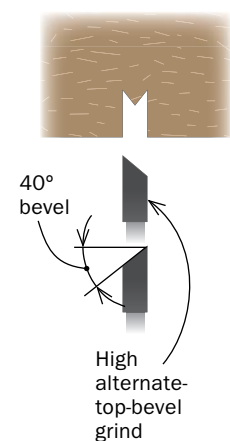
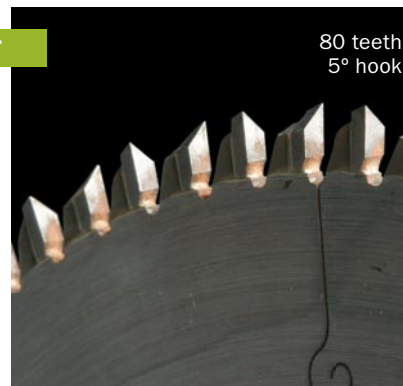
You also can get a blade with a triple-chip grind (TCG). The first, or lead tooth, has a 45° bevel on each corner that leaves a kerf with sloped corners. This is followed either by a pair of beveled teeth that square up the corners, or by a flat-topped raker tooth ground slightly lower than the lead tooth. In this way, tearout or cracks from the lead tooth are removed by the teeth that follow.

If you work extensively with brittle sheet goods, it is well worth buying one of these specialist crosscut blades. You'll get a durable blade and clean cuts, and you'll save wear and tear on your combination blade.

SHARP TEETH, NO TEAROUT



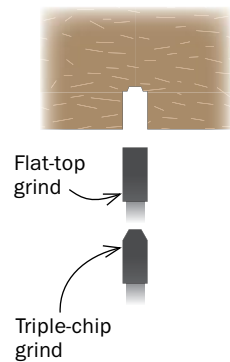
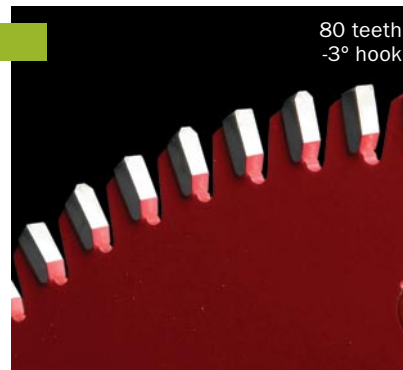
No tearout. Some sheet goods are notoriously difficult to crosscut cleanly. A high-ATB blade cleanly shears the most brittle of veneers. However, the sharp tips on the teeth of a high-ATB blade are more easily damaged than those on rip or combination blades.



MORE DURABLE OPTION



Clean cuts for the long haul. If you cut large amounts of double-sided laminate or melamine, the 80-tooth TCG blade makes cuts that are almost as clean as a high-ATB blade, but is more durable.



Combination blades

TWO GREAT OPTIONS

Most woodworkers use a combination blade for convenience. But you don't have to settle for sloppy results. Better blades have a combination grind (also known as a planer combination) that is a mixture of ATB and FTG teeth (40 in all). Four ATB tips cut a kerf with minimal tearout but leave a V-shaped ridge down the middle. A square-tipped raker tooth—slightly lower and narrower than the ATB teeth—follows to remove the central ridge. The raker also helps make cleaner cuts by keeping the blade running straight and square in the cut.

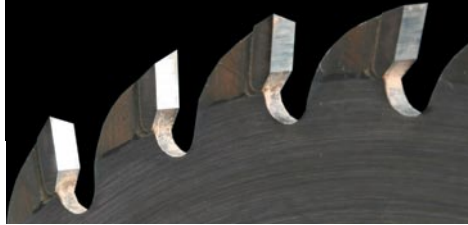
If you work mostly with solid wood, a planer combination blade will fit your needs. But if you mostly use plywood, a Plymaster combination blade is a better choice. This combination blade has 10 ATB teeth followed by a single raker tooth. Although it will crosscut better, it will not rip as fast and freely as other combination blades.

Special blades, special sources

Your local hardware store or home center may carry a choice of brands, but few blade styles. You'll have better luck buying a special-purpose sawblade from a specialist source. Fortunately, there are online sites with excellent information and clear descriptions. These include www.amanatool.com, www.forrestsawbladesonline.com, www.freudtools.com, and the author's own company's Web site, www.carbideprocessors.com.

A BETTER COMBINATION

40 teeth
20° hook



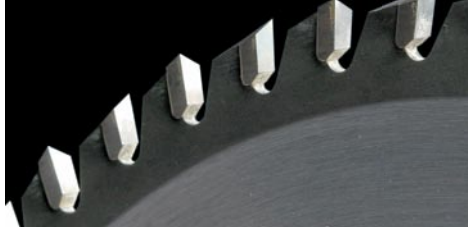
Cleaner cuts. Most all-purpose blades have only ATB teeth. A combination-grind blade has one FTG tooth between four ATB teeth, which reduces vibration.



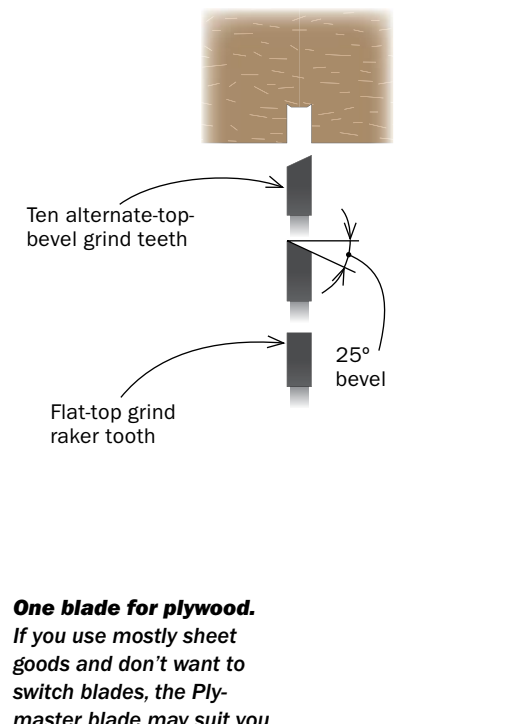
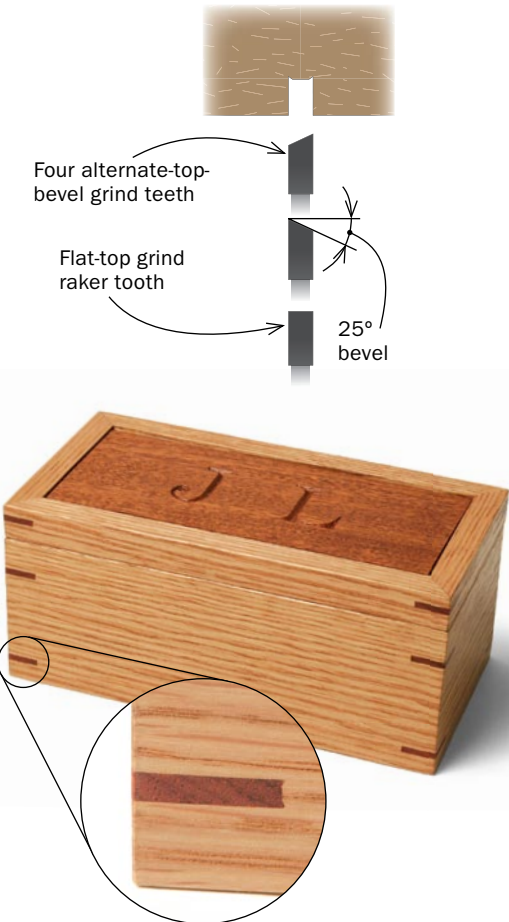
Good for joinery. Made for ripping and crosscutting, a blade with a combination grind (ATB and FTG teeth) will leave a kerf with a nearly flat bottom. This is useful for joinery. In this example, it leaves no visible gap between the spline and the box.

FOR PLYWOOD USERS

55 teeth
15° hook



Plymaster combination blade. The sequence of 10 ATB teeth and a single FTG tooth leaves clean cuts on plywood, particularly crosscutting.



One blade for plywood. If you use mostly sheet goods and don't want to switch blades, the Plymaster blade may suit you.