Circular Saw Blades--- An Overview

The secret to proper cuts on the stock in your woodworking projects is to use the right saw blade. Of course, the saw blade that you use should be sharp enough to cut cleanly through the stock without burning or tearing the wood.

Types of Saw Blades

The two primary types of circular saw blades are the same as the two primary types of traditional hand saws:

- rip blades and
- crosscut blades.

A rip blade is designed to cut with the grain of the stock. It has a limited number of very deep teeth, to help clear away the material that is cut. A rip blade will cut with the grain very quickly, but won't leave the cleanest of finishes.

A crosscut blade cuts with kerf using chisels or carbides that alternate between cutting wide left and wide right every other tooth. This can produce a very fine finish on most materials when crosscutting.

Kerf is the width of the cut of a saw blade. It is typically created by chisel-like teeth that protrude slightly wider than the edge of the blade, alternating left side-right side every other tooth.

Combination blades are those that combine the benefits of both rip and crosscut blades.

Combination blades come in a variety of tooth counts, typically ranging from as low as 24-tooth to as high as 80-tooth. The rule to remember is:

- ✓ the more teeth, the finer the finish.

Blades with a low tooth count will cut very aggressively but leave a relatively rough finish, whereas a greater number of teeth will leave a cleaner finish.

Specialty blades, such as plywood blades, will have a much higher tooth count and will leave a smooth finish with little tearout, but cut comparatively slowly.

Blade Sizes

Saw blades come in many different sizes, ranging anywhere from 5" to 12", but only certain sizes are available for use on each particular type of saw.

Circular Saw Blades--- An Overview

Crosscut

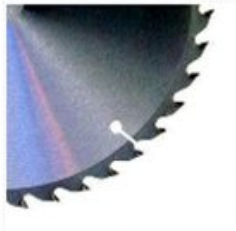
Rip Cut

More & Other

Plywood Saw Blade

Rip Saw Blade

Crosscut Saw Blade



Thin Kerf Saw Blade

Trim Saw Blade

Circular Saw Blades--- An Overview

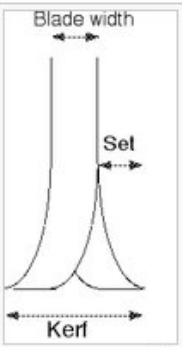


Diagram showing the teeth of a saw blade when looking front-on. The teeth protrude to the left and right, so that the saw cut (kerf) is wider than the blade width. The term *set* describes how much the teeth protrude.

- Kerf describes the width of the saw cut. On most saws the kerf is wider than the saw blade because the teeth are flared out sideways (set). This allows the blade to move through the cut easily without binding.
- Some saws are made so that the teeth have no set on one side so that the saw can lie flat on a surface and cut along the surface without scratching it. These are referred to as flush cutting saws.
- Although kerf is often used to refer to the width of the saw blade, it actually means the width of the cut, which is affected by the width of the blade, the amount of wobble created during cutting, and amount of material pulled out of the sides of the cut. This distinction can be important because the use of a blade that is too thin can result in excessive wobble and a wider kerf.

- Circular saws come in a few different sizes (based on the diameter of the saw blade), from 4" up to the most common size, 7-1/4". They also are typically rated by horsepower and/or RPMs of the saw blade.

- Saw Adjustments ---- Circular Saws have controls for adjusting the depth of the cut (from zero to about 2-3/8" on a typical 7-1/4" model) and the bevel of the cut (the saw blade can be beveled from zero to 45-degrees).

Saw Blade Teeth Numbers
(examples)

✓ the more teeth, the finer the finish.

All Purpose Circular Saw Blade, 7 1/4"
24 tooth

All Purpose Bulk, 7 1/4"
40 tooth

All Purpose Bulk, 7 1/4"
60 tooth

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The following members have offered their help to anyone interested in learning skills or new techniques in their area of interest. Contact each person to arrange times to get together if interested.

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Contact me if you have any tools, wood or services for sale. This section is offered for free.

Shopping for Saw Blades

By Charles Self

The world's greatest table saw can't give you good work when it has a poor blade bolted to its arbor. The table saw (as well as the miter saw and radial arm saw) sees its single greatest improvement in work results when you install a properly sharpened, top quality blade suited to the job you are getting ready to do.

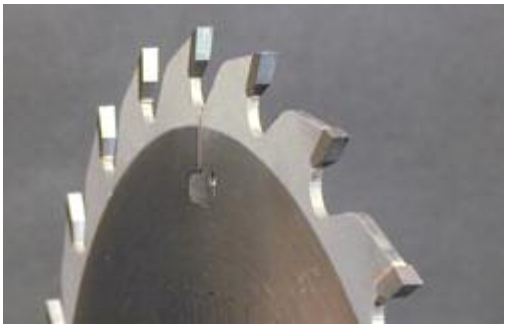
A rough and ready blade produces rough and ready work. What is suitable for cutting framing lumber is totally unsuitable for general woodshop use, and even less suitable for fine cabinetry or furniture building.

Select the best blade you can afford, keep it clean and sharp, and use it only for those jobs for which it was designed.

Saw Blade Types

It may look like there is a saw blade type for almost every piece of wood to be cut, but the selection chore isn't quite that bad. For many woodworkers, a top quality general or combination blade can do all that is needed. For others, a blade designed and made for each job is a better bet.

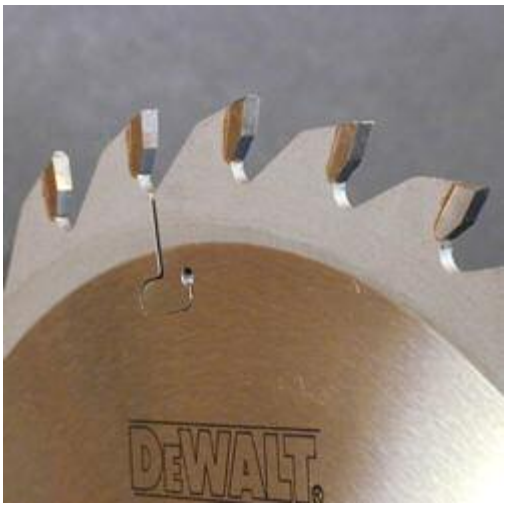
The basic blade division starts with rip and crosscut blades. A rip blade cuts with the wood grain, often removing a great deal of wood with long cuts. A crosscut blade is designed to cut across the grain, most often in shorter miter cuts.



DW7612 Fast Ripping Blade is ideal for fast cuts in natural wood. Flat-top grind, aggressive hook and low tooth count provide fast and easy cutting in thick stock without burning.

Rip Blades for Every Woodworker

For most woodworkers, a rip blade and a crosscut blade for the table saw suffice. Rip blades should produce a clean, reasonably smooth, but not slick, finish cut for glue joints. These blades usually have 24 teeth in their 10" size and are used exclusively on table saws. Gullets are large and deep, which leave plenty of room for the large amounts of cut material to escape from the kerf. The hook angle on the fast ripping blade is an aggressive 20 degrees, and a flat top grind (FTG) chisels wood out along the grain.



Fast Ripping Blade with its Triple Chip Grind reduces saw marks in the workpiece.

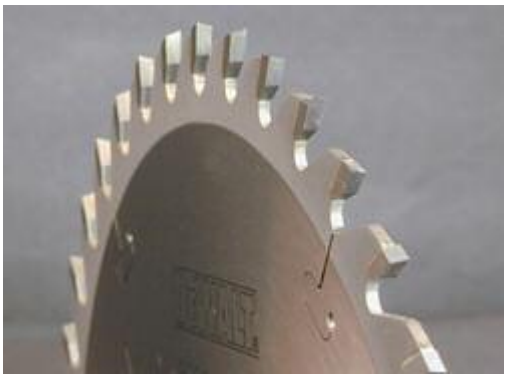
Rip blades are essential for a table saw and should be chosen with great care. The thin kerf blade is a consideration here, as the power needed to rip is great and lower horsepower table saws can benefit from a thin kerf (as low as .079", compared to a standard .120"). The downside to some thin kerf blades is that they can more easily deflect and warp from heat because of their thinner plate (plate thickness may be as little as .055", as compared to a standard plate that is usually about .087"). Some thin kerf blades use an industrial anti-stick coating on this blade body to reduce friction and increase blade life.

Woodworkers sometimes need a rip blade to produce a smother rip cut. For these situations, finish rip blades are a good bet. These blades have more teeth (30 in a 10") and a less aggressive hook for glue-line applications. Often finish rip blades will offer a triple-chip grind (TCG) instead of the FTG to reduce saw marks and extend blade life. The higher tooth-count rip blades are typically recommended for cutting hardwood-laminated plywood, veneers and laminates.

Across the Grain: Crosscut Blades

Crosscut blades vary widely in tooth number, though most have 60 to 80 teeth in the most popular 10" size. Most crosscut blades are offered with an alternate top bevel (ATB) tooth grind since this grind works best in cutting against the wood grain. When using a crosscut blade on a table saw, a hook angle in the +10 degree range allows a fast feed without creating overfeed problems.

Since the cutting action of a slide miter saw is markedly different than with a table saw (or fixed head miter saw), it is important to select a blade for a slide miter that has a less aggressive hook angle. Slide compound miter saws, as well as radial arm saws, require a blade with a hook angle of –5 degrees to 0 degrees. Both types of saw have a tendency to overfeed, which result in torn up work surfaces. In some cases, especially with the radial arm saw, this type of overfeed can create potentially dangerous situations for the woodworker. For these tools, a blade with a less aggressive hook angle is a big help in reducing such problems.



60 Fine Crosscut Blades use a High Alternate Top Bevel Tooth grind to produce mirror smooth finishes.

Single Blades for the Small Shop

For some woodworkers, “one size fits all” may apply when it comes to saw blade selection. Combination and general purpose blades are similar approaches to designing a single blade to both rip and crosscut well enough to please even persnickety woodworkers. Some of the best ones are amazingly good at both jobs, and can save the small shop woodworker a lot of time that might otherwise be lost in changing blades.

Combination blades feature a series of four tips with small gullets, followed by one tip with a deep gullet. The deep gullet is necessary to clean out the kerf on rip cuts, while the small gullets between cutting tips helps produce a smooth cut. The alternate top bevel plus raker (ATB + R) grind is a pair of alternately beveled tips, followed by a flat raker tip. A 15 degree hook makes the blade suitable for both ripping and crosscutting on a table saw, although ripping is limited to relatively slow feeds and woods 2" thick and under.

Combination Blades are ideal for small cabinet shops when minimal blade changes are desired.

General-purpose blades are super-useful and seldom changed cutters. The 10" general-purpose style blade has 40-50 teeth, an ATB grind, and a fairly aggressive 15 degree hook on the tip (and a 15 degree bevel on the tip, too, which is a lot more aggressive than the 10 degrees on a combination blade). Gullets are deep, almost as deep as on a rip blade, and allow for higher feed speeds during rips. My personal ideal for an all-around blade is closer to the general purpose blade than with any other.

Manufactured Wood Products Blades

Many woodworkers use melamine, which has been laminated to particle board for cabinet interiors, shop surfaces and in other places. It is easy to clean and very durable. It is also abrasive and rough on saw blades. The particle board interior uses glues that are abrasive, and the melamine itself is abrasive. The melamine also chips like crazy if extreme care and the right blade isn't used.

The High Alternate Tooth Bevel of a melamine and veneer blade provides chip-free cutting on both top and bottom surfaces of melamines and veneers.

A melamine blade is a good choice if you expect to cut a lot of this material. A blade that works well in melamine also works well with standard wood veneers on plywood. Important considerations here are ease of cutting, finish of the entire cut surface, and reduction or elimination of chip-out in the melamine coating or the veneer.

The blades that best handle melamine and veneer come in 60 and 80 tooth versions (the more teeth, the smoother the cut, but also the shallower that cut must be). These blades use an H-ATB (High Alternate Top Bevel) grind to slice through the material. The hook angle is 0 degrees, and the gullet is small. When combined on a .087" saw plate these features give a smooth almost slick cut with minimal, if any, chip-out.

Laminate Blades

The thicker final material of factory-installed laminates, along with a different chemical make-up of the plastic, means we need a different blade than that used for melamine (though melamine blades will work decently in a short-term pinch).

Laminate Blades use a Triple-Chip Grind to provide long cutting life in laminates, particle board and MDF.

The ATB tooth grind changes to a TCG (triple chip grind). One tooth is ground flat on top, while the next tooth (and the one preceding) is ground with an angle at each edge and a flat center, which delivers a lower edge tear out. Another important benefit of this tooth design is that the blade will last longer since there are no sharp angles on the tooth (like an ATB grind) to break or chip. A 10-degree hook angle is used to reduce force needed to feed wood into the blade. These blades work very well with table saws, and excel at cutting MDF (medium density fiberboard), which is often a substrate (base material) for laminates. The 10-degree hook angle makes them too aggressive to work well with slide miter saws.

Slide Miter Saw Blades

This board was cross cut with a 96-tooth Fine Cross Cut Blade on a Sliding Compound Miter Saw.

A specifically designed blade for the power miter box may also be needed. For woodworking, a glass smooth cut is a desirable characteristic when making crosscuts with a sliding miter saw. There are a number of blades today that produce such cuts. Most often, these blades have a –5 degree hook angle, very small gullets and a very large number of teeth. Generally, the bigger the blade, the greater the need for the negative hook, which helps keep feeds under control. In addition to the negative hook angle, look for at least 72 or 60 teeth (12", and 10" respectively). Tooth count may rise to 96 in 12" slide miter saw blades, and 80 in 10" blades. The bevel (side-to-side) angle on the ATB tips is 20 degrees, making an HATB, or high alternate tip bevel for clean cuts.

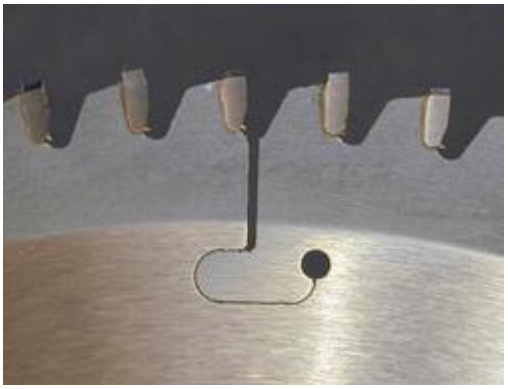
Other Features To Find

Today, carbide is nearly ubiquitous, though there are some times when it is best to use a blade that doesn't have carbide tips. When cutting wood that might have metal inclusions, whether nails, bullets or other items, a relatively cheap non-carbide blade is a much better possible sacrifice than is your top-of-the-line rip blade.

When selecting carbide tipped saw blades, look carefully at the size of the tips. The tips must have enough material to allow multiple re-sharpenings before they're beyond help.

Look for C3 or C4 carbide in the tips. These are super fine micro grain carbide that takes, as well as holds, a very sharp edge. C4 is used only in premium blades.

Sharpening should be carried out with grits from 400 to 600, depending on blade quality (the finer the grit—600—the smoother the cut). Get to know a reputable saw sharpening shop in your area, and your blades will last a long time.



Expansion slots in the blade are laser cut and reduce vibration and noise.

Expansion slots in the blade body serve to prevent warping problems that can happen as the blade heats up from cutting friction.

All premium woodworking blades on the market today feature laser cut plates.

Blade Care

Compared to the steel-tooth saw blades of the past, the modern carbide-tipped saw blade doesn't take a whole lot of care, and doesn't require sharpening very often (intervals between sharpening with carbide may be as much as 30 or 40 times greater than those with steel blades). Most saw blades will withstand an amazing amount of on-saw abuse (too fast feed, too slow feed, green wood, pressure treated wood, wood thicker than the blade is designed for, use when gummed, and on).