What You Don't Know About European Saws

BY KELLY MEHLER

A well-mannered machine. *This Felder table saw and shaper has replaced my U.S.-made saws.*

Because of their unfamiliar features, unusual appearance and higher price tag, many Americans don't even consider buying a European saw. Here's why they should.

Perhaps when you think of table saws, the names that first come to mind are ones such as Delta, Jet, Grizzly and so on. Perhaps you're unfamiliar with brands such as Rojek, Felder, Mini Max, Laguna or others from Europe. Or maybe you're unaccustomed to the look of the European machines, the features or the price tags.

How are European table saws different than U.S.-style table saws? In this article we take a look at the real differences between these types of saws so that we can understand our choices. We will consider differences in the features that affect efficiency, effectiveness, user-friendliness, safety and cost. By understanding which table saw features are possible and which ones are desirable to woodworkers, we may encourage table saw manufacturers to make changes that benefit the end users – you and me.

Unusual but effective. *Features of European saws rarely seen on U.S. models include riving knives, blade guards with dust collection and sliding tables.*

General Differences: Electrical Safety Specs and Table Saw Power

There are many power-tool accidents that happen when the cutter runs longer than necessary. There are a couple of regulations for table saw electrics required in Europe that we don't have pertaining to table saw safety. On European saws the blade is required to stop in less than 10 seconds from the time the stop switch is engaged. The saws accomplish this by either an electronic or a mechanical stop to the motor.

The power and stop switches are required to be positioned at the front top-left corner of the cabinet. On larger panel saws they can also be on the top-left side or above the saw. We have no such requirements and until recently many saws had the switches on the right front. We typically work at the left side of the saw so it makes sense to have the controls in easy reach. I always felt vulnerable when I used an older Unisaw and had to reach over the machine with my face in line with the blade at table height. Additionally, European table saws are required to have a separate power switch that cuts all power to the tool and can be locked with a key or a lock. The off button is fairly standardized as a largish round red button and once it is depressed it has to be intentionally released before engaging the start button. These requirements aren't inconvenient and they help protect the user.

In Europe 220 volts (v) is standard, as is more-efficient three-phase power. In the United States, 110v is the standard voltage for contractor and portable saws that are typically under 1½ horsepower (hp). The 220 voltage is the minimum for over 2 hp. A table saw user benefits from having the additional power for the larger motor that 220v offers and the added cutting power that such voltage allows, particularly when cutting hardwood stock.

Superior switches. *European switches are placed at the top left of the cabinet, a convenient place for the user. This switch has an extra "on" button for the saw's scoring blade.*

Safety at the Blade

European table saws have a workable guarding system at the blade that is standard issue. U.S. table-saw regulations call for three devices for our safety at the blade. They are a blade cover, anti-kickback pawls and a splitter. U.S.-made table saws have chosen to implement these regulations into one device that is commonly known as "the guard." The guard comes on all U.S. table saws. As readers of this article may know, many woodworkers don't use this device. From my years of teaching about the table saw, anecdotal feedback has informed me that the overall average for woodworkers using the guard on U.S. table saws seems to be around 5 percent. The necessity to remove the guard for many cuts and then reinstall the device means that many people just don't bother. Even though the guard is not the most workable design for everyday woodworking, it does work for its intended safety purposes. (I believe that most woodworkers don't use the guard because they have been conditioned not to do so through seeing examples in many settings of professional woodworkers using an un-guarded table saw. But that is another discussion.)

On guard. *A U.S.-style guard actually on the saw is a somewhat unusual sight. Here you can see the splitter and blade cover.*

PHOTOS BY AL PARRISH

The European table saw has a more workable blade-safety system. It consists simply of a riving knife and a blade cover. Let's clarify some misunderstandings about the purposes of splitters and riving knives. The first is that there seems to be a need for clarification on the actual job that these devices do. It is widely believed that the sole purpose of the splitter and riving knife is to keep the kerf open after the cut, therefore keeping the wood from closing on the blade. This purpose is even described as such in the regulations that govern the manufacturing of table saws. In reality, the main job of these pieces of metal behind the blade is to deny the workpiece access to the back of the blade. Without a roadblock the back teeth of the blade can – and often do – bite into the workpiece, pick it up, and throw it toward the user at speeds of up to 120 miles per hour. Many woodworkers have experienced kickback and the number of accidents from this one phenomenon is astronomical. The use of a riving knife or a splitter makes kickback a non-issue.

What is the difference between a riving knife and a splitter? A splitter is attached to the carriage assembly behind the blade. The carriage assembly on U.S. table saws does not rise and fall with the blade. Two problems arise with this arrangement. A splitter is designed to be very close to the back of the blade when the blade is raised to its full height. The distance between the back of the blade and the splitter increases as it is lowered. The usual working height for cutting 4/4 stock leaves about a 2" gap between the blade and the splitter. This unprotected gap isn't ideal, but it is still better than no splitter. The second issue is that a splitter stands above the top of the saw blade thereby forming a barrier when making non-through cuts. Therefore the splitter, along with the rest of the device, needs to be removed from the saw when performing non-through cuts.

In contrast to the splitter, a riving knife is attached to the arbor assembly so it moves along with the saw blade. This means that once the riving knife is adjusted close to the blade, it always stays in this same relationship. Typically, a European riving knife can be adjusted in its closeness to the back of the blade and also in relationship to the blade height. When the riving knife is adjusted the least amount below the top of the blade, it is not an impediment for non-through cutting.

The first industrial table saws made in the U.S. had riving knives. American table saws are just beginning to come back to using a riving knife. A Standards Technical Panel at Underwriters Laboratory, one I have been a member of for a number of years, recently passed a proposal for new safety regulations for the table saw. The new regulations specify that, starting in 2008, all newly designed table saws will incorporate a riving knife in the design of the saw. Additionally, after 2014, the regulations require a riving knife on all table saws of the designs currently being manufactured. In both cases the riving knife is required to be below the top of the blade.

Follow the action. *The riving knife behind the blade moves up and down with the blade. The knife prevents kickbacks and doesn't have to be removed for typical operations, such as cutting joints.*

A few U.S. front-runners now offer table saws with their versions of a riving knife. The SawStop, Powermatic PM2000, and a Grizzly 12" are the first. On these saws, one difference from European riving knives is that instead of having one adjustable knife, two riving knives are offered. One of the riving knives, when attached, is taller than the top of the blade and holds the blade cover. The other, shorter, riving knife is offered without a blade cover for non-through cuts. The regulations call for a knife that is lower than the top of the blade, and so Powermatic added a second riving knife to the PM2000 after realizing the need. Powermatic has made the blade cover come off easily from its taller knife, but I do not see that there is a need for this. All three of these new table saws offer a quick release for the riving knife that makes the changes effortless.

Blade Covers

The blade cover is a necessary part of safety at the blade. It is a barrier between our hands and the blade, whether or not the blade is running. On European table saws there are a couple requirements for the blade cover. The maximum outside width of the cover is 40mm ($1\frac{1}{2}$") when it is mounted to a riving knife. The narrower the blade cover the less intrusive it is on your work. The amount of space between the fence and the blade cover becomes especially precious when ripping narrow work.

You cannot make non-through cuts on the table saw when a blade cover is attached to the riving knife. European regulations therefore made it mandatory for the blade cover to be able to be removed or reattached in less then 10 seconds. Compared to current U.S.-made saws, the ease of removal is significant. On U.S. saws the blade cover is permanently attached to the three-in-one guarding assembly. There are no size requirements for the blade cover and consequently they vary widely. When a non-through cut is needed, the whole guard assembly is typically removed.

Quick-change artist. *By twisting a knob and pulling upward, you can remove the blade cover in just a few seconds. Most U.S. saws have no such feature.*

Anti-kickback Pawls

Anti-kickback pawls are placed on both sides of the splitter on U.S. saws as a purported safety feature. The addition of the pawls is an attempt to address wood ejection problems. However, the only time wood can be ejected straight back is when you are cutting narrow strips less than 2" and the strips are not pushed beyond the back of the blade. Otherwise the pawls do not serve their intended purpose and, in fact, are a reason some people remove the entire guard system since the anti-kickback pawls actually get in the way of making narrow cuts.

There are no anti-kickback pawls on European table saws. In eliminating the requirement for anti-kickback pawls, European design reflects that the minor benefit that may accrue from the addition of pawls is not a good trade-off for the awkwardness of their use.

The new regulations will still require anti-kickback pawls and the regulations will also require that the pawls be able to be removed or reattached in less then 20 seconds without the use of a tool.

Dust Control

There are currently no dust-control regulations for U.S. table saw, and they typically have minimal dust collection. We are now increasingly aware of the health hazards of dust to woodworkers. Classified as a carcinogen, wood dust is responsible for a significant increase in respiratory diseases and nasal cancers as compared to the general population.

U.S.-style cabinet saws, at best, have what I call chip containment and inefficient dust collection. On both cabinet saws and contractor's saws the majority of dust and chips are thrown below the table by the front teeth of the saw blade. There is no efficient way on either type of U.S. saw to direct the dust and chips to a dust collector. Some newer U.S. table saws and most portable table saws do have a better system for collecting sawdust. Like the European table saw, the portion of the blade below the table is shrouded and then ported to an external connection port. The throwing force of the blade directs the sawdust toward the port, which is not only efficient but requires less suction.

European table saws also have a dust port above the table on the blade cover. No U.S.-style saws offer dust collection on the blade guard. Some after-market table saw blade covers offer this option although it does little good unless you have good dust collection below the table first. For effective protection from dust particles, a table saw needs dust ports above and below the saw.

Table Saw Rip Fences

By now you may not be surprised that there are also regulations in Europe that pertain to the rip fence. The regulations say the rip fence must offer two positions and be adjustable in length. There is a high position (50-90mm) and a low position (5-15mm). If you have seen a Delta UniFence you have seen a European-style rip fence. The high fence position, the one that U.S. table saws typically use, is for tall or wide work. The low position is for narrow work, allowing room for you to push the work through and still use the blade cover. European table saws have primarily right-tilting blades and the fence in the low position allows the blade to be tilted toward the fence without coming into contact with it. With an adjustable-length fence, the fence can be made shorter, which is especially handy for ripping short pieces.

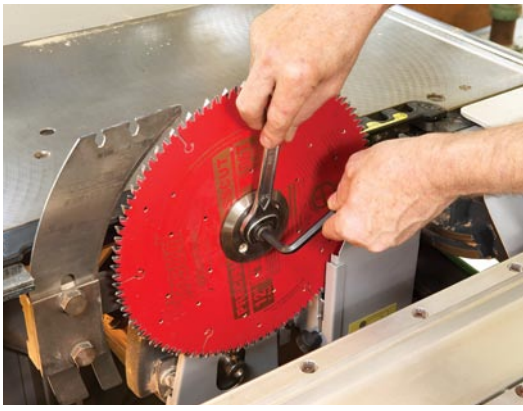
The Biesemeyer-style fence has become the standard for table saws in the United States. European fences generally seem less rigid when compared to the Biesemeyer-style fence. An extremely rigid fence is advantageous when cutting large panels. However because European table saws have depended more on the sliding table, not the fence, for accuracy when cutting sheet goods and large panels, the rigidity of the fence is not an issue.

Crosscutting

U.S. table saws use a miter gauge for crosscutting. The miter gauge is limited in its capacity and accuracy. We have had to resort to shop-made and aftermarket solutions and additional machinery to make up for the shortcomings of the miter gauge. Nearly all professional woodworkers I know who have a U.S. table saw have had to add a crosscut sled for cutting wide and heavy panels. In addition, I have found that aftermarket sliding tables are typically not sufficiently accurate and take up a lot of space. The addition of a miter saw in the woodshop has replaced the less accurate radial arm saw,

Anti-kickback pawls. *These toothed, spring-loaded devices are supposed to stop work from flying back at the operator. However, most woodworkers remove them.*

Another sucker. *In addition to dust ports in the cabinet, European saws also have a dust port on the blade cover to catch debris flung from the blade.*



Pop the hood. *You change the blade by sliding the table back, giving you lots of room to work. At the bottom right of the blade is an adjustable shroud that attaches to the dust-collection system.*

The advantage of a low fence. *When ripping narrow stock, the low fence gives you lots of room to work safely.*

but the miter saw is still limited in its capacity to cut wide boards. That leaves the necessity of using crosscut sleds. I had a large array for my U.S. saws.

European table saws commonly use a sliding table for crosscutting. Early U.S. table saws had this feature. A sliding table carries work of all sizes and weights. The sliding table is guided close to the saw blade resulting in increased accuracy. Additional tables and fences of all sizes can be attached to the sliding table and removed. I believe it is the most important component that is missing from U.S. table saws. The DeWalt hybrid (also made for the European market) and the Jet Supersaw are U.S. table saws that do incorporate a small sliding table as an option. Grizzly is starting to offer European-style table saws with sliding tables on some of their saws.

When ripping and crosscutting on a European sliding table saw, the user stands to the front left side of the stationary table for most cuts. This means that you are operating the saw similarly to how you would feed a workpiece on a router table. It takes a little getting used to, but once you become accustomed to this stance you will find it feels much safer and you have more control of the workpiece—especially after the cut. The sliding table is frequently used for ripping as well. For example a waney-edged board can be held on the sliding table for making a straight rip. There are also sliding table fence accessories that allow parallel ripping on the sliding table. A sliding table has at least one miter-type slot for other accessories such as hold-downs.

Dado Cutting

We have come to expect dado-cutting capacity on U.S. table saws, and so our saws offer arbors that can accept the standard $^{13}/_{16}$" stacked dado. Dado cutting is in reality a shaping cut

Crosscutting. *European saws have an array of fences for the sliding tables in different lengths. These can be used for mitering, crosscutting and compound cutting.*

Difficult cuts made easy. *Ripping the wane off a board or ripping a board with a crook can be a challenge. But with the European-style shoe attached to your sliding table, you can rip difficult woods with little effort or risk.*

Ripping looks unusual. *With a European saw you work to the side of the blade when ripping (above). This different body position allows you to pull your work from behind the blade (right). And the safety equipment allows you to keep your hands quite close to the blade with little risk (below right). This increases your control.*

and European standards prohibit dado cutting on table saws based on the belief that it can be a dangerous operation because it is difficult to guard. It is better done with a shaper or router. Because the U.S. market has become used to having dado capacity on table saws European saws that are marketed in the U.S. now have adapted these saws for dado cutting and now offer this feature to the U.S. market.

Scoring

Scoring is making a shallow precut with a small-diameter blade rotating opposite to the main saw blade. Scoring eliminates tear-out and is especially desirable when cutting veneered sheet goods and products such as Melamine. The solid wood woodworker can find it useful for clean crosscutting. This built-in feature is common on large commercial U.S. panel saws and is offered on most European table saws. Scoring can be done on a European saw, but no U.S. saw other than panel saws offer this as an option.

Throat Plates

U.S. table saws allow up to a 3/4" opening on throat plates. The size of this opening is problematic because narrow pieces of wood can drop into the opening and be thrown back out or can be stuck and thereby tempt the operator to reach for the stuck piece when the blade is spinning.

European table saws allow no greater than a 1/2" opening on throat plates and a 1/8" space on the fence side thereby minimizing the hazard of narrow pieces becoming lost or lodged in the spaces.

Space Considerations

In Europe space and energy are at a premium. That fact has driven the design and manufacture of some efficient table saw combination machines. Combination woodworking machines are common in Europe, from a table saw/shaper combination to a full combo-sliding table saw, shaper, jointer, planer and mortiser with three motors. These combination machines are not like a ShopSmith that is lathe-based. These combination machines are table saw-based and no change in tools takes more than a minute.

There are many advantages for space, energy and dust collection. A full combination machine takes up no more space than a U.S. cabinet saw with typical extension tables. As an added bonus, the shaper gets full use of the table saw's sliding table.

Mobility is as necessary on European tools as it is here for the garage and basement woodworker. The difference is that European tools typically have two wheels on one end and a yoke that accepts a wheeled lever on the other. U.S. table saw manufacturers typically install

the machine on a mobile base. The PM2000 has a unique solution that allows the table saw to sit on its cast base until it is jacked up on its internal wheels.

Table Saw Types: Contractor Saws and European Site Saws

Contractor's saws were originally developed for the housing boom after WWII for building contractors. The motor was put on the outside of the saw with quick-release holders so it could be removed for easier transport. This table saw was never intended to be used inside a woodshop where an open back and bottom and a motor extended to the rear are not necessarily desirable features. In Europe there is a saw for the construction jobsite called a site saw of all things. Typically it has at least a 12" blade that doesn't tilt. Primarily designed for ripping, it has a stand, usually with foldable legs and a foldable outfeed table. Because it is intended for outside use, the saw is not required to have dust collection. The saw assembly is enclosed below the table and there is a chute for the sawdust below the table.

Cabinet-style Table Saws

European and U.S. cabinet saws both have a large cast iron top mounted on a steel cabinet-style base. The U.S. style has been pretty much based on a Delta Unisaw design which dates back to 1939.

Generally there is a difference in the way that the saw assemblies work. Both the U.S. and European assemblies are mounted to trunnions at the front and back of the cabinet; these allow for tilting. For adjusting blade height, U.S. saws incorporate an arbor assembly that swings up in an arc independent of the carriage assembly. On the majority of European saws, the whole assembly travels vertically and tilts. I don't see any particular advantage either way except there is less complication for the manufacturer when designing a riving-knife assembly on the European saw.

Right Tilt, Left Tilt

An ideal table saw would allow the user to choose either a right-tilting or a left-tilting blade position. However, since this situation exists only in a limited market the questions you might have are: "Which is better?" and "Does it make a difference?"

Many U.S. saws have moved to having a left-tilting blade while the typical European saw has a right-tilting blade. As a rule, you will be safer and will get cleaner bevel cuts by tilting the blade away from the workpiece being cut. When ripping bevels it is better to have the blade tilt to the left because the fence is on the right. With a miter slot on either side of the blade on U.S. saws, the user has the option of using whichever slot is appropriate for blade tilt when crosscutting bevels. Because European saws have a sliding table affixed to the left side of the saw, having a right tilting blades works best for crosscutting bevels. Other than when making bevel cuts, the blade tilt is not particularly significant.

(The two contradictions are the DeWalt 746 and the Jet Supersaw which, when outfitted with a sliding table to the left of the blade, still have a left-tilting blade.)

Cost Differences

European table saws are generally more expensive than U.S. saws, depending on the number of features or additions on the saw. European saws have many desirable built-in features that woodworkers later add to their U.S. saws to improve them, including sliding tables, improved guarding and superior dust collection to name a few. Once you factor in these extra features, the price difference between European- and U.S.-style saws is reduced, and the European saws look more competitive. For me, after spending lots of money on aftermarket accessories and time building shop jigs for the table saw the price differences did not seem so substantial. Additionally, the increased accuracy and safety of the European saws outweighed the initial cost and have ended up paying worthy dividends.

Your budget, frequency of table-saw use, purposes for which you use the saw, and your expectations about the performance of the machine are all factors that weigh into your decision about which table saw to use. Fortunately for you, finding and using a table saw that suits your needs and purposes is very possible in both the U.S.-style saw market or the Euro-style saw market. Hopefully this article has provided you with some information that will enable you to make an active and informed choice so that you will be a safe and effective using the table saw of your choice. **PW**

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Sources

Felder
866-792-5288 or felderusa.com
- Hammer
- Format 4

Grizzly
570-546-9663 or grizzly.com

Laguna Tools
800-234-1976 or lagunatools.com

MiniMax
866-975-9663 or minimax-usa.com

Rojek
800-787-6747 or rojekusa.com

Tighten up. *Stock European throat plates are much narrower than those on U.S. saws, providing more support around the blade.*

Working together. *The right-tilting blade tips away from the operator when crosscutting and prevents the blade from cutting into the crosscutting fence.*