

Should you cut the cord?

The ample power and go-anywhere versatility of today's cordless tools could doom your electric tools to a loooooong life on the shelf.



Cordless tools have been around for a few decades now, but they've never completely replaced corded tools in a woodworking shop. That day may be at hand. Changes in battery technology have made cordless tools lighter, more compact, more ergonomic, and more capable of delivering the kind of results a woodworker demands.

It's all about the batteries

All cordless-tool battery packs consist of multiple cells linked together to harness their collective strength. (See the photos on the *next page*.) The more cells wired together in a pack, the higher the voltage, and the more torque a tool can deliver, similar to horsepower in a car engine. Early cord-

less tools relied on nickel-cadmium (NiCd) battery packs for power (and later, some manufacturers offered "greener" nickel-metal-hydride [NiMH] packs). Users demanded more and more power, and before long, we saw 36-volt tools with bulky, heavy battery packs to match. NiCd and NiMH had hit their practical limits.

Comparing the common chemistries

Nickel-Cadmium (NiCd)

- 1.2 volts per cell
- When the battery is charged, remove the pack from the charger or unplug it to prevent cell damage from overheating.
- 30–60 percent heavier than equivalent Li-Ion packs
- Works better in extreme hot or cold temperatures than Li-Ion-powered tools
- Performance drops off gradually as the battery loses charge.
- Charge times are about twice that of comparable Li-Ion battery packs.
- The battery loses most if not all of its charge if left idle for a month.
- Cadmium is a heavy metal, and must be recycled according to federal guidelines.

Lithium-Ion (Li-Ion)

- 3.6 “working” volts per cell; 4 “no-load” volts (briefly) on a full charge. Manufacturers market some tools by the no-load voltage for a perceived advantage.
- Different amp-hour packs let you choose the battery to best suit your need (lighter weight versus longer run time) without losing power capability. However, some high-demand, heavy-duty tools won’t run on low-amp-hour packs.
- You can safely leave battery packs on the charger even when fully charged.
- Because of potential reactions to heat—from both the working environment and demanding use—these packs require greater electronic controls and safeguards, adding cost.
- The battery delivers consistent power until electronic controls shut it down when “dead.” This prevents complete discharge, which can damage the cells.
- In storage, holds a charge about 8–12 times longer than a comparable NiCd pack, depending on brand
- Performance tends to drop off quickly in extreme cold or heat; battery packs typically will not charge below about 10°F and above 120°F.

BATTERY SIZE: MORE CELLS MEANS MORE WEIGHT

This 18-volt NiCd battery pack links together 15 cells and weighs 2½ lbs.



This 18-volt, compact 1.5-amp-hour Li-Ion battery pack uses five cells and weighs just under 1 lb. (Its 3-amp-hour sibling weighs just under 2 lbs.)



Then, in the early 2000s, manufacturers turned to lightweight lithium-ion (Li-Ion) technology, which had proved itself in laptop computers, cellular phones, and other electronic products. Li-Ion enabled manufacturers to chop

the size and weight of battery packs, as well as the tools, without sacrificing power. (Today, only a couple of companies still sell new NiCd-powered tools, but all still sell replacement NiCd packs for older tools.)

Most tools these days come in either 12- or 18-volt Li-Ion platforms. We bet you’ll love newer 12-volt drills and impact drivers for building projects in a workshop because they’re light and compact, yet pack enough power for most drilling

and driving tasks. And 18-volt tools, such as drills, impact drivers, circular saws, and jigsaws, deliver all the power you'll need in a woodworking shop, without an electric cord getting in the way or limiting your reach. We especially like cordless circ saws for breaking down sheet goods and rough-cutting boards to length.

And because most Li-Ion battery packs charge in about 30–45 minutes, you'll always have a refreshed one waiting by the time you exhaust the other. Most woodworkers, though, could go days if not weeks before exhausting a battery in normal use. But if you need longer run time per charge, buy battery packs with higher amp-hour ratings. Think of amp-hours as the size of a car's fuel tank: It defines how long you can drive before refilling it. So a 1.5-amp-hour pack has half the run time of a 3-amp-hour pack of the same voltage. Just like the size of your car's fuel tank has no bearing on the engine's horsepower, amp-hour ratings don't impact a tool's torque. (Packs with greater amp-hour ratings have twice as many cells, but draw from only half of them at a time during use.)

TWO CHARGES, ALMOST NO WAITING



Dual-voltage chargers, such as this one from Milwaukee, can charge both 12- and 18-volt battery packs quickly, freeing up shelf space in your shop.

More cordless-tool tidbits

■ Although you get a lot of tools for one price in multi-tool combo kits, you might find you don't often use that reciprocating saw or hammer drill. So consider buying a smaller set of tools

(with two battery packs and charger), and then buying "bare" tools (without batteries) as you need them to save money. The cordless tools we use most: drill, impact driver, circular saw, jigsaw, and flashlight. Others that are nice to have: planer, reciprocating saw, oscillating multi-tool, and radio/charger.

■ Although it might be tempting to buy a lower-cost generic replacement battery pack when yours dies, we've had the best results over the years using replacement packs from the maker of the tool. This is especially true with Li-Ion packs, which contain electronic chips that optimize each brand's technology. They cost 20–40 percent more, but you can trust them without worry of failure or overheating because they were made specifically for those tools.

■ All batteries contain hazardous chemicals, so recycle old packs rather than tossing them in the trash. Contact the Rechargeable Battery Recycling Corporation (877-723-1297, call2recycle.org) to find a drop-off center near you. 🌱

Produced by Bob Hunter

Brushless motors deliver greater performance

Nearly all cordless-tool manufacturers now offer some tools with brushless motors. They replace the traditional motors that use carbon brushes to transmit electrical energy from the batteries to the commutator, powering the motor. But a brushed motor generates a lot of heat from this friction, making it less efficient, and the brushes eventually need to be replaced.

A brushless motor gets its power directly from the batteries electronically, allowing it to generate greater torque, run cooler—in some cases, doubling the battery pack's run time—and extending the life of the battery and tool. You'll pay about 20–50 percent more for a brushless tool than for a comparable tool with a brushed motor.

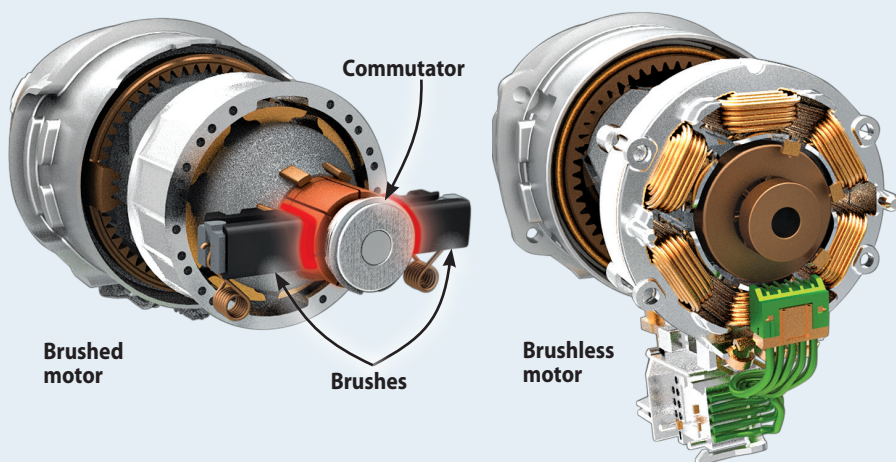


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WE NEED YOUR HELP!

► We'll be testing corded jigsaws for an upcoming issue, and we'd like to hear how your jigsaw performs. Write a review of it at woodmagazine.com/reviewjigsaws.

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