

Tool Test: The Solar Jobsite

New tools and battery systems bring the off-grid solar jobsite a step closer.

BY MATT POWER, EDITOR-IN-CHIEF

WHEN RYOBI UNVEILED its new 18V One+ 10-Inch Miter Saw, the time seemed right to test the viability of an all-solar-powered jobsite. I already owned a number of the Ryobi tools that use the same battery, along with a Ryobi P131 in-vehicle charger (a must), so I had them round out the suite for me with the miter saw, a P5231 orbital jig saw, a five-inch random orbit sander P411—and a plug-in, six-port battery supercharger.

My friend Oscar van Loveren is a well-informed solar dabbler and airline pilot. He walked me through the basic mathematics of watts, amps and capacity when it comes to solar charging. He agreed that 200 watts of photovoltaic should be enough to bring a 100-amp, 12-volt battery up to charge over the course of a sunny day.

I included a 12-volt marine battery in my solar setup to act as a buffer. That way, when the sun went behind a cloud, my tool batteries would keep charging. Direct charging of Ryobi tools from PV panels (with a charge controller) is possible, but less consistent.

With the 12-volt battery at full charge, Oscar and I determined that I could expect to re-charge my Ryobi heavy duty tool batteries about three times per day, without draining them beyond the 50 percent capacity of the base battery. At times when the sun was shining, the 12-volt battery wouldn't lose any charge at all as I tapped the power for my tool battery charger.

Another reason I chose the 12-volt battery "buffer" is that the Ryobi P131 is designed for car cigarette lighters. It was an easy, flexible hookup. I just attached a pigtail with a female socket for a 12-volt charger to my 12-volt battery. The charger plugged right into the socket.

Longevity factors

One step I took before my day of field testing the tools with solar was to show up on site with all of my tool batteries and my 12-volt battery at full charge. Why not start on third base?

My field test added up to about eight hours of building a small, 16-foot boat storage shed. During this build, I put various tools through different kinds of cuts and uses, including cutting 2-by-4 and 2-by-6 framing lumber, 9/16-inch plywood and some pressure-treated 4-by-4 posts, and lots of drilling and deck screws.

Oscar pointed out that perhaps the biggest variable in a working solar jobsite is how heavily you use the tools. Are you single-handling the job, or are two people tapping the same power supply? Repetitive tasks are among the biggest battery drains. Ryobi says the new miter saw will make cut 400 4-by-4s. That's many more than I asked it to



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Photovoltaic workhorse. Ryobi's solar power-driven 18V One+ 10-Inch Miter Saw offers a way to tackle numerous cutting and carving projects without using fossil fuels.

handle, but I did test it on compound angles of 2-by-6 and 2-by-8 planks, and never had an involuntary shutoff. Of course, the miter saw is using two batteries, not one, so it should last longer than smaller hand tools. But if you drain both, you've used two-thirds of your daily solar budget. It's best to keep batteries in constant rotation on the charger. I found that five batteries was the magic number for my all-day project.

Straight and narrow

When you think about it, cutting a piece of plywood sheathing is probably the biggest job you will ask of your cordless kit. Ripping one piece of 8-foot, 9/16-inch ply is probably equivalent to cutting about 30 2-by-4s, depending on the wood moisture, blade sharpness and so on. That's asking a lot in one pass, but it can be done. In fact, I was able to make three or four cuts like these without incident—although I did not push the tool further.

It's easy to get into a bind, however, if you treat the cordless tools in the rough-and-tumble way you might a plug-powered circular

Rough and ready. The five-inch P411 is good for about 20 to 30 minutes of serious sanding with one standard battery.



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workhorse. One key to successful battery-driven carpentry is the use of sharp blades and straight cuts. Resistance is the enemy of battery-powered tools and will cause them to simply shut off until you reset. So, for example, when cutting sheets of plywood with the Ryobi circular saw, you want to keep the blade precisely on track. This is sometimes also true of the company scrolling saw if you try to round a corner too tightly.

The tools are more forgiving, of course, when the batteries are topped off. Remember: Keep one on the charger at all times.

Sometimes choosing a different tool for the job proved to be the easiest solution. In the case of my Ryobi cordless drill, I was having trouble with the tool shutting off when I used it to operate the screw on my aging trailer support jacks. I switched to the company's impact driver, which handles such resistance better, and haven't had the problem again.

Balancing demand and supply

During my day of heavy cutting with the miter saw, occasional use of the circular saw and jig saw, serious demand on the cordless drill, an hour or so of sanding with the palm sander, pushing 3-1/2-inch exterior deck screws through dimensional lumber, and batteries in constant rotation on the charger with the sun shining, I never reached a point where I couldn't power my tools. In fact, I didn't even have to recharge the miter saw batteries. Only the drill battery and the circular saw had to be switched out once each.

Still, if I were going to work a job like this day after day, I'd throw my tool batteries into a bag and take them home each night. Then I'd put them on one of Ryobi's six-battery chargers overnight. That would give the 12-volt base battery time to top off in the morning.

I'm eagerly waiting for the missing link in Ryobi's prosumer tool portfolio: a cordless table saw. For now, I'm comfortable recommending its existing tools as an off-grid solution when a noisy gas generator isn't desired or feasible. They're not as powerful or forgiving as AC tools, but they're ideal for small projects, when you just want to grab a tool and go. They also give you major bragging rights: You can tell your clients you're so green, you don't even burn fossil fuels to run your tools. **GB**



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Power up. Ryobi's orbital jig saw can handle small-diameter curves, but you'll need to start with a full battery.



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Stay on target. The 18-volt circular saw works best with a sharp blade and straight path.