

Choosing an Air Compressor

Hot dog, pancake, or twin tank?
Let your tools' appetite for air
determine which one to buy.

BY CHRISTOPHER ERMIDES

I bought my first air compressor—an oilless pancake—as part of a kit while framing a house. It came with a finish nailer, which I needed, but I had seen the same compressor in a kit with a framing nailer, so I assumed that the compressor would keep up with the task of building and sheathing walls. Nearly two years later, the compressor quit for good while I was framing another house.

What I didn't know at the time was that I was using a light-duty pancake that was built for occasional framing of the remodeling kind, like tacking together a wall here and there, or building a rough opening. The large tank size tricked me into thinking that large air storage meant high-volume nailing. My wallet felt the result of my naiveté. What I since have learned is that compressors you can carry fall into three categories, and each category is best suited for specific tasks.

In this article, I'll explain the specifications and features that matter most when choosing your next compressor, but I won't offer a review of every compressor. Instead, I'll present a representative sampling of the cost and capacity range in each category. We don't have room in the magazine or in our workshop to handle the large number of models available today. If you visit www.finehomebuilding.com, you'll find links to manufacturers' Web sites for more details on



HOT DOGS

These lightweight units are perfect for finish-carpentry work. For more, see pp. 50-51.

- Senco PC1005
- \$180
- Oil lube
- 2.4 cfm at 100 psi
- 2.5-gal. tank
- 38 lb.
- Tool capacity:
1 finish nailer
- www.senco.com

PANCAKES

Compact enough to move around inside, these midsize models still have enough air volume to power a framing nailer. For more, see p. 52.

- Bostitch CAP2560OL
- \$195
- Oil lube
- 3.6 cfm at 90 psi
- 6-gal. tank
- 50 lb.
- Tool capacity:
3 finish nailers, or
2 roofing nailers, or
1 framing nailer
- www.bostitch.com

TWIN TANKS

Parked in a central spot and connected to long hoses, a typical twin tank can give framing, roofing, and trim carpenters a good run for their money. For more, see p. 53.

- Ridgid 0F45150
- \$259
- Oilless • 6.2 scfm at 90 psi
- 4.5-gal. tank • 72 lb.
- Tool capacity: 6 finish nailers, or
2 roofing nailers, or 2 framing nailers
- www.ridgidtools.com

You Can Carry

WHICH ONE IS RIGHT FOR YOU?

Consider air volume first The right-size compressor to keep up with your workflow depends on what tools you're using and how demanding you are of them. Each time you pull the trigger on a pneumatic nailer, a small blast of pressurized air is used. That air is measured in units of cubic feet per minute, or cfm. Headless pin nailers use the least amount of cfm per shot, generally around 0.017, while framing and roofing nailers use the most, an average of 0.095. Framing nailers dedicated solely to sheathing require more cfm because they're used at a faster pace.

A COMPRESSOR'S CFM SHOULD EXCEED TOOL CFM BY 25%

A compressor's pumping power is measured in cfm (cubic feet per minute) or scfm (standardized cfm). The latter designation, which is used by some manufacturers, is more accurate because it accounts for factors that affect air pressure such as atmospheric pressure, temperature, and humidity.

You'll have to do some math to see if a compressor has the air-volume capacity (cfm) to power your pneumatic tools. First, write down the rating of the tool you plan to use that has the highest cfm number, and estimate how many times per minute you normally would fire it (fpm). Multiply the two figures, and add 25% as a cushion against overworking the pump.

Example:

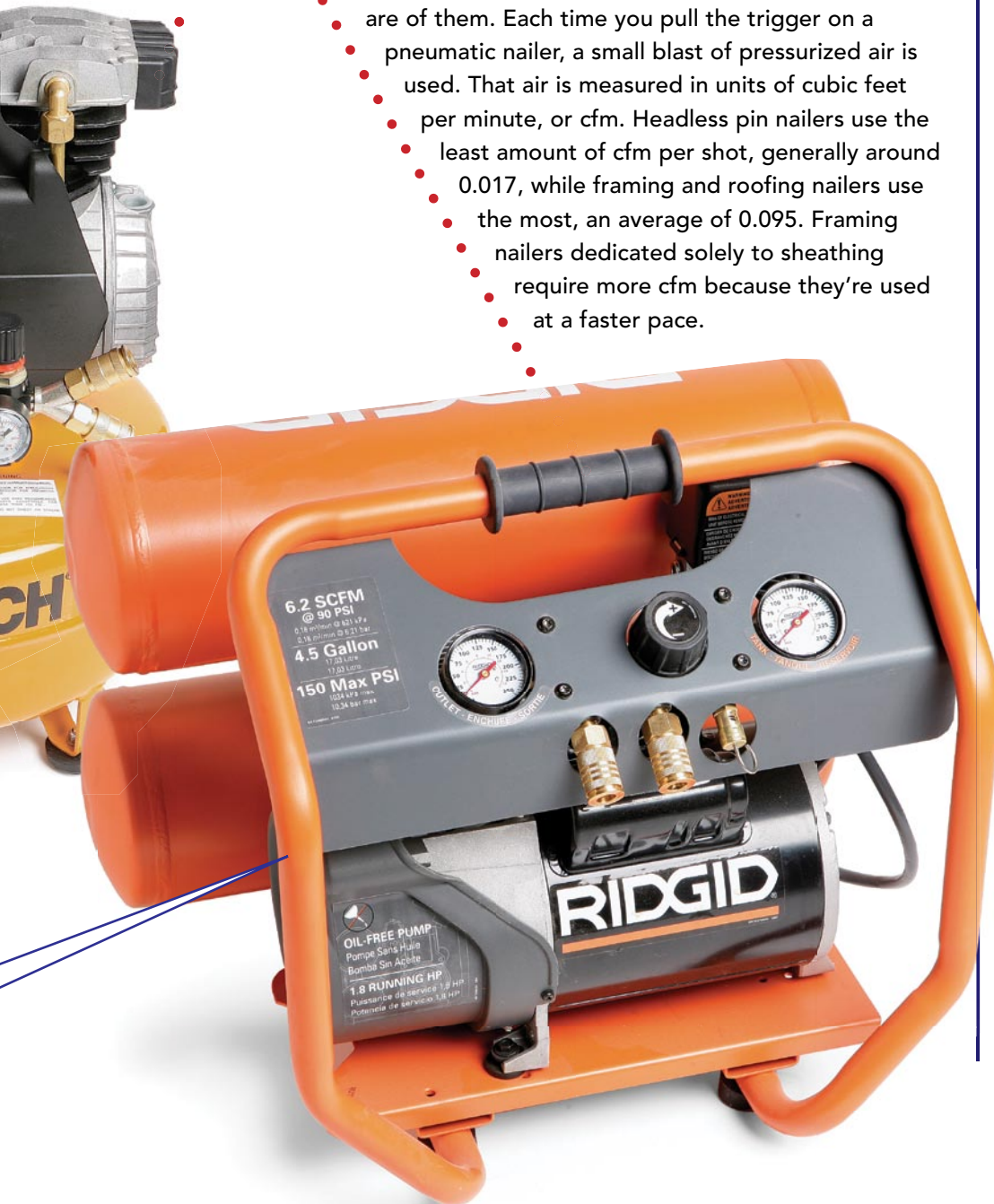
$$0.088 \text{ cfm per fastener} \times 30 \text{ fpm} = 2.64 \\ + 25\% = 3.3 \text{ cfm}$$

Your compressor should have at least a 3.3-cfm rating.

Note: If more than one tool will be used regularly with the compressor, add those numbers into the equation as well.

CONSIDER TANK SIZE AND STORAGE PRESSURE AS A SECONDARY AIR SOURCE

A compressor with a larger tank and/or a higher psi (lb. per sq. in.) storage pressure provides a larger reservoir of stored air. This enables the motor and the pump to rest longer between cycles.



model numbers, specifications, and purchasing information.

Portability vs. power is a tricky equation

It makes sense: Trading up for more power means you give up compact size. But with compressors, this formula isn't quite that simple. In each of the three portable categories, models of similar size and weight can have different air-supply capabilities.

As explained in the sidebar on p. 49, cfm rating and tank size can help you to determine if a compressor will handle the demands of the pneumatic tools you plan to use. But you'll also need to consider future needs and what the compressor manufacturer says about a pump's duty cycle, the percentage of time that the motor and the pump can run without risk of burning out.

Overworking the compressor

Once you've used the air in the storage tank and the pump kicks on, the gun may not drive nails all the way because it's not getting enough air. This may seem inconvenient, but it's really a warning. If you keep it up, you'll eventually burn out the compressor's motor.

Compressors have a duty-cycle rating that refers to the percentage of time it's OK to run. Most come with a duty cycle of about 50%, which means that the compressor shouldn't run more than a half-hour for every hour it's used. Running most compressors more than 50% of the time causes excessive wear on the pump and the motor. However, some manufacturers, like Thomas, have designed many of their compressors to run 100% of the time, making duty-cycle rating a nonissue.

To make sure you don't overwork your compressor, choose one that is 25% larger than the minimum size needed to power your most air-hungry pneumatic tool (see "Which one is right for you?" on p. 49).

Explaining rpm ratings

The compressor's rpm rating is important. A higher rpm rating means the piston is compressing air faster. But by running faster, it is creating heat, which wears down parts and fittings, adding strain to the pump's motor. Also, compressors with higher rpm tend to be louder than those with lower rpm.

Lower-rpm compressors use a longer piston stroke and/or a larger bore size. Because the stroke is longer or the bore is larger, they can draw and compress more air at once, so they

HOT DOGS LIGHTWEIGHT FOR MOBILITY

These compressors are ideal for moving from room to room. Although some models can handle moderate framing tasks like nailing together a wall or building a rough opening, most are designed for finish carpentry. Because their motors are relatively small, they are much quieter than larger portable models, so having them in the same room you're working in won't drive you nuts. Some models have highly efficient pumps, refilling the storage tank quickly.

Craftsman 151310

The lightweight design and cfm output make this a good choice for do-it-yourselfers and remodelers looking to supply a brad or finish nailer. Tire chucks, tire gauges, and sports inflation needles are also included, making this a perfect compressor to keep in the garage.

- Oil lube • 2.4 cfm at 90 psi
- 3-gal. tank • 38 lb.
- **Tool capacity: 1 finish nailer**
- www.craftsman.com



\$125

Bostitch CAP1516

It might look like a toy, but the oilless pump produces 1.8 cfm at 90 psi, enough to keep a professional finish carpenter moving all day. The 8-amp universal motor and 1.6-gal. reserve tank are protected in a durable plastic shell, and at 20 lb., this is one of the lightest compressors available. Although you should still wear ear protection, at 75 db., this compressor doesn't need to be banished to the garage.

- Oilless
- 1.8 cfm at 90 psi
- 1.6-gal. tank
- 20 lb.
- **Tool capacity: 1 finish nailer**
- www.bostitch.com



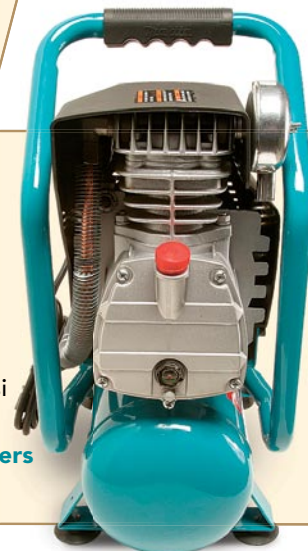
\$179

\$189

Makita MAC700

The cast-iron cylinder increases pump life, and although easily damaged, the aluminum fins mounted on the intake coil aid in cooling the air, which decreases the strain on the motor. The glass window on the oil pan makes it easy to monitor the oil level.

- Oil lube • 3.3 cfm at 90 psi
- 2.6-gal. tank • 30 lb.
- **Tool capacity: 3 finish nailers**
- www.makita.com



Choosing between oil-lube and oilless models

Oil-lubricated compressors tend to last longer and run quieter than oilless models. The piston and internal pump mechanism in an oil-lube compressor rely on oil to reduce friction and wear, just like a car engine. But oil-lube motors require maintenance much like automobiles. The oil level needs to be monitored and the oil changed regularly.

Oil-lube compressors must be level during use. If you operate one on an angled surface of more than 10° pitch, the piston won't dip into the oil reservoir, which can cause the pump to seize and the motor to burn out.

Starting oil-lube compressors in cold temperatures puts extra strain on the motor because the oil thickens, increasing the chance of tripping a circuit breaker. As with automotive engines, using the appropriate viscosity for the outdoor temperature will reduce the strain on the pump's motor.

Oilless compressors are becoming more popular because they don't require any routine maintenance. They tend to be louder than oil lube, but because they are oil-free, there isn't any worry of spilling oil on the job site, and possibly staining flooring and

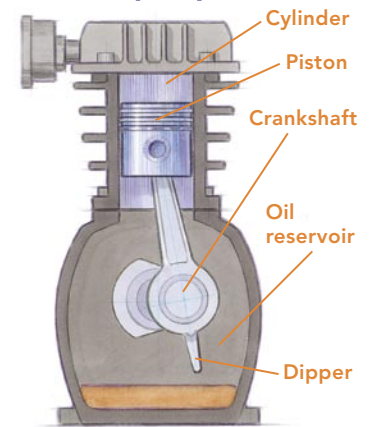
other finished surfaces. Without oil cycling through the motor, there's no chance it will cycle through the gun, which eliminates the possibility of damaging the worksurface.

Oilless compressors are easier to start in cold climates because there isn't any oil to thicken and bog down the motor. Finally, oilless units tend to require a lower amp draw, reducing or eliminating the possibility of blowing circuit breakers on the job.

The high-tech coatings that fight friction inside an oilless pump eventually will wear down, which is why these compressors don't last as long as

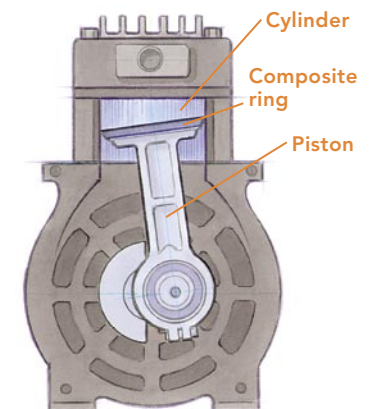
oil-lube models. Rebuilding an oilless pump is fairly easy and inexpensive. You can expect to pay from \$45 to \$65 for the parts and spend about an hour on a typical rebuild.

Oil-lube pump



Oil lube also can be referred to as *oil splash* or *oil bath*. The dipper drops into the oil reservoir as the crankshaft spins and splashes oil into the cylinder, lubricating the cylinder and the piston. Make sure the compressor is level, and keep tabs on the oil level to ensure the dipper splashes an adequate amount of oil.

Oilless pump



Oilless compressors rely on a highly compressed composite ring at the top of the piston that's designed to maintain an airtight seal through the piston's rotation. Special coatings lubricate the piston and cylinder connection. When the coatings wear out, the piston needs to be rebuilt.

Thomas T-635HD

Thomas is the original patent holder for the oilless piston technology used by other manufacturers today. Thomas's Perma-Lube pump design, combined with a 100% duty cycle, make this a heavy-duty compressor perfect for professional trim carpenters, but it also can support a framing gun for stud work and light sheathing.

- Oilless • 2.1 cfm at 80 psi • 2-gal. tank • 26 lb.
- **Tool capacity: 2 finish nailers, or 1 roofing nailer, or 1 framing nailer**
- www.thomasairpac.com



\$300



don't have to move through as many rotations. Fewer rotations means less wear on the cylinder and the motor, and a quieter, more efficient compressor that will last a long time.

What to know about psi ratings

A pressure switch turns the compressor on and off at certain psi settings, while a regulator valve allows you to dial in the exact pressure your tool gets. A high pressure rating doesn't necessarily mean a better compressor, though it can translate into more stored air.

Pneumatic tools are built to be used within a certain psi rating, so running more pressure through them can damage their components by causing excessive wear. It can damage the rubber foot on the nailer's tip or plunge the hammer too deep into the worksurface.

Some applications, such as nailing up hardwood trim or nailing LVLs together, require a higher-than-normal pressure setting, but manufacturers recommend staying on the lower end of the tool's operating psi range as often as possible. This prolongs the life of your pneumatic tools, and it keeps the pump from running as often as it would if you were using a higher psi. Working with more pressure than is needed means more cfm used in each shot, adding to the strain on the tool.

Other things to consider

Amp draw is important for many users. Know that not all manufacturers list their compressors' maximum (or full load) amp draw.

Also, if you need to run a compressor off an extension cord, check the manufacturers' specs. Some compressors are designed to handle longer cords than others. Moving farther from an outlet with an extension cord causes a drop in the voltage feeding the tool's motor, which can cause the motor to burn out more quickly.

While all the compressors discussed here are deemed portable, pancakes and hot dogs are much easier to carry than twin tanks. Twin-tank compressors are no joy to lug around, but some companies pay more attention to balance. The Senco and Thomas models I had in the shop were easier to carry than many of their competitors. But test them yourself. If you're going to be toting a compressor daily, make an informed decision your back won't regret. □

Christopher Ermides is an assistant editor at *Fine Homebuilding*. Photos by Scott Phillips, except where noted.

PANCAKES VERSATILE AND COMPACT

If you do a little bit of everything, the compressors in this category are a good place to start. Pancakes are ideal for jobs that demand high-cfm output in short spurts. Many compressors' cfm ratings indicate that they can keep up with multiple trim nailers, or one- to two-person roofing and flooring crews. Moderate framing is possible with some models as well. Many manufacturers agree, though, that pancakes are the most overworked compressors because of their large tank size. Keep your duty cycle in check.

\$175

Porter-Cable CPFAC2600P

The large tank size complements the lower cfm rating, giving this model the capacity for light framing and roofing tasks. The universal motor draws only 10 amps, making it safe for extension-cord use.

- Oilless • 2.6 scfm at 90 psi
- 6-gal. tank • 35 lb.
- **Tool capacity: 4 finish nailers, or 1 roofing nailer, or 2 framing nailers**
- www.portercable.com



\$280

Rol-Air D2002HPV5

The tank configuration and roll-cage design help to protect the gauges and switch. All aspects of this unit were built to last on the job site.

- Oil lube • 4.0 scfm at 100 psi
- 4.5-gal. tank • 35 lb.
- **Tool capacity: 4 finish nailers, or 2 roofing nailers, or 2 framing nailers**
- www.rol-air.net



DeWalt 55155

The motor and pump are well protected, and the dashboard of fittings puts all the controls in a convenient position. Its best feature, though, might be the sleek design that makes it easy to carry.

- Oil lube
- 4.5 cfm at 100 psi
- 4-gal. tank
- 26 lb.
- **Tool capacity: 4 finish nailers, or 2 roofing nailers, or 2 framing nailers**
- www.dewalt.com



\$325

TWIN TANKS

LARGER PUMP FOR HIGHER-CFM OUTPUT

Twin-tank compressors (also called twin stacks) offer multiple users the convenience of running off a single unit. Tank capacities hover in the 4-gal. range, but the pumps on these units provide larger air volume, which often means that four finish, two framing, or two roofing guns can be powered at one time. The protective roll cages some manufacturers now offer protect the pump, and panel-mounted gauges and fittings are becoming more common. However, panel-mounted fittings that aren't well placed can grab knees and other things while being carried. Twin tanks are considerably heavier and more awkward to carry than pancakes or hot dogs.

\$140

Campbell Hausfeld HL5502

The cast-iron cylinder and the cfm rating make this model perfect for do-it-yourselfers or remodelers who need a heavy-duty compressor for larger projects.

- Oil lube • 4.0 scfm at 90 psi
- 4.0-gal tank • 62 lb.
- **Tool capacity: 3 finish nailers, or 1 roofing nailer, or 1 framing nailer**
- www.campbellhausfeld.net



\$215

Hitachi EC12

The cast-iron sleeve and ball-bearing components make this model a bargain. Regulator, pressure switch, and gauges all are placed together, and the ball-valve drain-cock design makes this compressor easy to use.

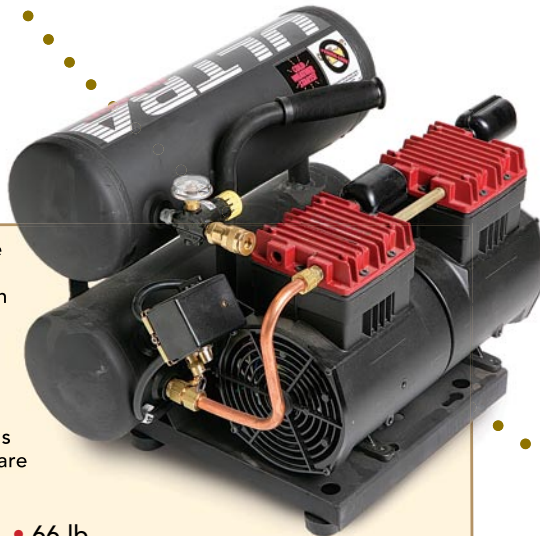
- Oil lube • 4.0 cfm at 90 psi
- 4.0-gal tank • 66 lb.
- **Tool capacity: 4 finish nailers, or 2 roofing nailers, or 1 framing nailer**
- www.hitachi.com



Thomas T2820ST

According to Thomas, this unit can power multiple nailers, impact wrenches, a paint sprayer, or a sandblaster. Like all Thomas compressors, this twin tank is designed to run on extension cords, and with ball-bearing construction throughout, it's guaranteed to be by your side for years. The motor recovers the tank in 9 sec., giving it the fastest recovery rating on the market. With a five-year warranty on all electrical components, Thomas stands firm in the conviction that its compressors are well worth the investment.

- Oilless • 5.0 cfm at 100 psi • 4-gal. tank • 66 lb.
- **Tool capacity: 5 finish nailers, or 3 roofing nailers, or 3 framing nailers**
- www.thomasairpac.com



\$500

Aluminum is lighter than cast iron, and less durable, too

An aluminum cylinder saves weight in a compressor's air pump, which is important in any portable model. But aluminum isn't typically as durable as cast iron, and it's more susceptible to the damage that can be caused by high operating temperatures when a compressor's motor is working hard. Because most aluminum is softer than cast iron, exposed aluminum cooling fins are more likely to break if a compressor is jostled frequently in the back of a pickup. To improve durability without adding a lot of weight, many manufacturers are using cast iron selectively. For example, some aluminum cylinders have a cast-iron sleeve in them. The aluminum dissipates heat better, and the cast iron is more durable. Other manufacturers build the cylinder of cast iron and design the rest of the compressor to create less heat.