POWER NAILERS and STAPLERS

The new pneumatics are smaller, lighter, and more flexible.

By Steve Carlson

Paslode's new airless power nailer at work banging down roof sheathing.

Only a few years ago, power nailers and staplers were largely confined to assembly-line applications. They provided a constant staccato background for the manufactured housing industry, furniture plants, upholstery shops, and huge tract building projects. Among site builders and remodelers, the overwhelming tool of choice was one that had proved its value over centuries—the hammer.

That's changing fast. By some estimates, pneumatic fasteners are now used in over 40 percent of building and remodeling projects nationwide. Those figures are hard to verify, but by even the most casual observation, power nailers and staplers are gaining in popularity.

Most manufacturers estimate that pneumatics cut in half the time spent on projects like roofing, sheathing, siding, framing, and sub-floor installation.

When Do Power Nailers Make Sense?

Obviously, power fasteners aren't suited to every project. If you have a minor remodeling project that involves a few dozen nails, it wouldn't make sense to lug a compressor to the site and take the time to set it up. If such projects are the major part of your business, air equipment is probably not a good investment.

But if you or your employees spend a large percentage of your time swinging a hammer, power equipment is worth serious consideration. Today's pneumatic tools can be used for nearly any nailing or stapling application. And most manufacturers estimate that pneumatics cut the time spent on projects like roofing, sheathing, siding, framing, and sub-floor installation in half. This can mean greater productivity, and increased profits.

Payback on Investment

The key question to ask is how fast the pneumatic tools would pay for themselves.

The capital outlay can vary a lot, depending on the makes and models of equipment you buy. But typically, if you buy a compressor, two or three tools, and all the related paraphernalia, you can eat up as much as $2,000 pretty quickly.

The time it takes to recoup that investment can be figured by multiplying your hourly rate by the number of hours you expect to save. If you value your time at $20 an hour, for example, you'll have to save 100 hours to pay for $2,000 worth of equipment. If you pay a helper $10 an hour, you'll have to save 200 hours. (Actually, your time savings will have to exceed that a little, to account for equipment upkeep, energy use, and an increased cost for fasteners—the fasteners can cost two or three times as much as bulk nails.) But once the equipment has paid for itself, any savings after that are a bonus.

Of course, you won't know exactly how much your productivity will increase until after you have the tools and put them to use. Even the most enthusiastic manufacturers' reps don't guarantee a 50 percent increase in productivity in every case. Therefore, you should make a conservative estimate.

According to John Kurtz, technical director of the International Staple, Nail, and Tool Association (ISANTA), most contractors experience very rapid payback.

If you're a roofer, Kurtz says, "One large roof isn't going to pay for a power fastener, but you won't have to go much past a couple of jobs for payback." The payback will, of course, be far slower for jobs in which nailing or stapling constitutes a smaller percentage of the task.

Other Advantages

Although payback is the key consideration—that is, you should only invest in equipment that will save you time and money—there are other advantages as well. They include the following:

• Pneumatic tools can extend the building season. You can wear gloves while you're driving nails and staples. That saves you from trying to hold nails with gloves—or from having to stop every ten minutes to thaw your fingers. The equipment may balk at

extremely cold temperatures (the tolerance varies according to the make and model) but generally it functions in any temperature that humans can tolerate. Of course, there are many building materials that should not be installed in cold weather, even if you and your tools are willing. An obvious example is asphalt shingles, which are likely to crack and fail to seal properly.

• The tools can be operated with one hand. No more holding the nail with one hand and the hammer with the other. That's particularly helpful if you're on top of a staging—you can use one hand to hold on! Also, you can hold your work in place with one hand and nail with the other.

• If you regulate air pressure properly and use the right attachments, virtually every fastener will be uniform-Guesswork is eliminated. If the nail should be flush, it will be. If it should be loose (as with vinyl siding, to avoid buckling), you can drive each nail to a precise depth. If it should be set, you can drive and set it with one pull of the trigger.

• Finish work can be improved. You can nail thin strips of molding, for example, with less chance of splitting the wood or accidentally denting it with your hammer.

• Hand-held work can be fastened without moving it significantly. This can make toenailing easier, and help with miscellaneous chores like installing an extra block for drywall.

• Because some of the more mundane, time-consuming jobs are sped up, there is some relief from drudgery. As a result, the last fastener of the day goes in as well as the first fastener of the morning.

• It's easier to use the right kinds of fasteners. Screw nails or ring shank nails, for example, will hold a subfloor better and longer, but are sometimes avoided because they require more hammer blows. With a power nailer, these nails go in as easily as anything else.

Disadvantages

As with any other tool, there are disadvantages to power fasteners. Here are a few we have heard about:

• Because the tools are expensive, some builders have tried to speed up the payback by using them at breakneck speed, compromising quality. If your reputation for quality suffers, so will your payback.

• In some cases, the uniformity of a machine is no substitute for the experience of a craftsman. For example, when you're hand-nailing shingles over an existing roof with a concealed substrate, you can tell whether the nails are "grabbing" properly. If they're not, you can adjust the spacing, use longer nails, or do whatever else it may take to overcome the problem. With a power fastener, because you get less feedback from the tool, you might not even notice the problem until the shingles start blowing off.

• You can't "persuade" the materials into position with a power tool as you can with a hammer. For example, in rough-wall framing, you can bang joints together with repeated hammer blows. Or you can use a bowed 2x6 for roof decking, with appropriate toenailing and some extra persuasion. Pneumatic tools won't do that kind of work.

Evolution of the Tools

One reason for the booming demand for power fasteners is that the tools themselves have evolved to become more convenient, flexible, and suitable for specific applications.

In the early 1970s, a few contractors were using big guns for framing, truss-building, and flooring. Gradually, the industry began developing lighter, more specialized machines for other applications where rapid-fire nailing was needed: subflooring, roof decking, and wall sheathing.

A big breakthrough came in 1978, when ISANTA teamed up with the Asphalt Roofing Manufacturers Association (ARMA) to develop and approve specifications for stapling asphalt shingles. That brought power staplers to the roof, possibly the single place where their labor-saving potential was greatest. Then, five years later, coil-fed nailers were introduced, and power fasteners began to hit the roof in a big way. The coil-fed nailers—which don't have to be reloaded as often as magazine or "stick"-fed machines, also became popular for siding.

There are other recent improvements that have made power fasteners even more attractive to contractors. (See sidebar.)

Buying the Right Equipment

It pays to shop around carefully before you buy your first power fastening equipment. After all, it's a big investment, and you're likely to be using it for a long time. There are big variations in prices and features. At the end of this article, we've listed the seven major manufacturers who belong to ISANTA: it may be worth your while to contact each of them, or their local dealers in your area (look under "staples" in your Yellow Pages).

Because everybody has different needs, we can only offer a few general tips.

Compressors. If you're hauling a compressor around to job sites, portability is important. Also consider its power supply. You don't want a 220-volt machine if you work in areas with only 110-volt outlets. And if you work in locations with no electricity, you'll want a gasoline powered compressor.

It's also important that the compressor have sufficient capacity to run your tools. If you've got a big framing gun, or if you run more than one tool at once, a rating of one-and-a-half horsepower should suffice. If you use it only for roofing or finish work, a smaller compressor rated at three-quarters to one horsepower may well meet your needs.

Tools should be run only with a compressor, never with any type of bottled gas because it can cause a ruptured hose or an explosion in the tool if the regulator fails.

Hose comes in 50-foot lengths, and you'll need at least that much to start with. You might eventually want 200 feet or more; compressed air works efficiently over long distances, so it's easier to use a long hose than to move your compressor around.

You'll need a filter/lubricator/regulator unit with your compressor. The filter keeps the air clean and dry, which is essential for efficient operation. The regulator adjusts the air pressure—the appropriate pressure setting is almost always stamped on your tools. The lubricator mixes oil with the air to help lubricate the tool.

Tools. Kurtz suggests that most contractors need more than one power fastener. Staplers generally will drive only one gauge of staples, although they will accommodate a variety of staple lengths. Nailers offer greater flexibility, but "you're not going to find one machine that will drive both a 7/8-inch nail and a 3-1/2-inch nail," he notes. Therefore, a typical contractor may

NAILS VS. STAPLES

For nearly all applications, you can use either nails or staples as long as you choose the right size and right spacing of the fasteners. However, you won't readily find nailing schedules for staples in the code books. For example, the *CABO One and Two Family Dwelling Code* lists staple equivalents for only a few applications. For a more complete listing, you'll have to go to the CABO National Evaluation Report NER-272 (excerpt shown below). This report, like other model-code evaluations, is based entirely on test data submitted by the applicant—in this case, the pneumatics trade association ISANTA. Your local code official can go to such an evaluation report for guidance on acceptable alternatives to the code. In the language of CABO, the report can serve as "supporting data to assist in this determination of equivalence."

Table # XIV is reprinted with permission of CABO. The reader must go to the full report to establish scope and limitations of this data. The report is available from ISANTA, 435 N. Michigan Ave., Chicago, IL 60611; or from any of the major model codes: CABO, ICBO, or SBCCI.

FASTENING SCHEDULE FOR FRAMING *(NER—272, Table No. XIV)*

CASE 1 FRAMING

Fasteners Approved for All Listed Connections[4]	Fastener Length in Inches (All Fasteners and Connections)	Connection Description	Number of Fasteners Required
.113 P-Nail 8d Cooler 8d Sinker 8d Box 8d Common 8d Screw Nail 8d Ring Nail No. 14 Gauge Staple	2 3/8	Joist to sill or girder, toe nail	3
		Bridging to joist, toe nail each end	2
		1" x 6" subfloor or less to each joist, face nail	2
		Wider than 1" x 6" subfloor to each joist, face nail	3
		Stud to sole plate, toe nail	4
		Ceiling joists to plate, toe nail	3
		Continuous header to stud, toe nail	4
		Rafter to plate, toe nail	3
		1" brace to each stud and plate, face nail	2
		1" x 8" sheathing or less to each bearing, face nail	2
		Wider than 1" x 8" sheathing to each bearing, face nail	3

CASE 2 FRAMING

Fasteners Approved for All Listed Connections[4]	Fastener Length in Inches (All Fasteners and Connections)	Connection Description	Number of Fasteners Required
131 P-Nail 16d Sinker 16d Box 16d Common 16d Screw Nail 16d Ring Nail No 14 Gauge Staple	3	2" subfloor to joist or girder, blind and face nail	2
		Sole plate to joist or blocking, face nail	16" o.c.
		Top plate to stud, end nail	2
		Double studs, face nail	24" o.c.
		Double top plates, face nail	16" o.c.
		Top plates, laps and intersections, face nail	2
		Continuous header, two pieces	16" o.c.[3]
		Ceiling joists, laps over partitions, face nail	3
		Ceiling joists, to parallel rafters, face nail	3
		Built-up corner studs	24" o.c.
		2" planks	2
		Sole plate to stud, end nail	2

FASTENING COMBINATION SUBFLOOR-~~U~~NDERLAYMENT TO FRAMING

Fastener Description[4]	Fastener Length in Inches	Thickness of Combination Subfloor—Underlayment	Fastener Spacing
6d Screw Nail 6d Ring Nail	2	1/4" and less	See Footnotes 1 and 2
No. 14 Gauge Staple	1 3/4		
8d Screw Nail 8d Ring Nail	2 1/2	7/8" to 1"	
No. 14 Gauge Staple	2 1/4		
10d Common .148 P-Nail No. 14 Gauge Staple	3	1 1/8" to 1 1/4"	
8d Screw Nail 8d Ring Nail	2 1/2		

[1]Fasteners spaced 6 inches on center at edges, 10 inches at intermediate supports for floors and 12 inches on center at intermediate supports for roofs.

[2]Fasteners spaced 6 inches on center at all supports where spans are 48 inches or more.

[3]Along each edge.

[4]Staples shall have a minimum crown width of 7/16-inch O.D.

want a big gun for framing, and a smaller one for, say, finish work. But if you're a specialist who does only roofing and siding, for example, you may need only one tool.

The choice between power staplers and nailers is largely a matter of personal preference. For most applications, either staples or nails will work, as long as the proper fastening schedule is followed. The Council of American Building Officials (CABO) lists acceptable stapling schedules in its National Evaluation Report NER-272 (see box). In framing, for example, CABO says a 14-gauge, 3-inch nail can replace a 16d nail.

Staples are cheaper than nails and less likely to cause splitting, Nailers, on the other hand, are generally preferred in applications where cosmetics are important—such as siding and finish work, So look around, compare, and make your choice.

You'll also want to check what attachments are available for the machine you buy—the gauges and plates that allow proper placement and depth of fasteners for your specific applications.

Other obvious considerations are price, flexibility, and comfort of use (a factor that can be affected by balance as well as weight). As when you buy a car, it's a good idea to take a test drive.

Maintenance

Dirt, moisture, and insufficient lubrication are the main cause of most breakdowns of power fasteners and compressors. The air intake should be kept away from dirt and sawdust. The filter should be cleaned regularly. There is a drain cock on the filter to remove excess water that has condensed from the air—it should be opened and drained daily. The oil level of the compressor should be checked frequently, and your tools should be lubricated according to manufacturers' recommendations.

Making maintenance and cleaning part of your daily set-up procedure can be far less disruptive to your job schedule than down-time for a broken tool.

Safety Rules

Nearly all power fasteners are equipped with safety devices. The most significant one prevents you from firing unless the nose of the gun is pressed against your work. That doesn't slow you down—in fact it can help you work faster because you can keep the trigger squeezed and fire as quickly as you can position the fastener. Whatever you do, don't try to override this device, or to pull it back manually to shoot at a target.

Manufacturers also caution that the tools should be run only with a compressor—never with bottled gas. Oxygen can cause an explosion by igniting the lubricant in the tool. And any type of bottled gas can cause a ruptured hose or an explosion in the tool if the regulator fails. Bottled gas can also freeze the regulator.

Air should be drained from your compressor at the end of each day. That makes it safer to transport. Arid, keeping your tools and hoses away from dirt and mud will improve safety as well as reduce wear and tear.

But Will They Ever Replace The Hammer?

Despite the increased popularity of power fasteners, nobody is predicting that the trusty old hammer will ever be relegated to a museum of obsolete artifacts.

Even Kurtz, a leading advocate of power fasteners, says you'd be foolish not to keep a hammer handy at your job site. For one thing, he notes, "our tools only drive fasteners in. They won't pull them out."

In addition, he points out that if you have to drive only a few nails of a particular size, a hammer is the most efficient tool to use.

And, no matter how dependent you may become on power' fasteners, there will always be manual adjustments to make. If, for example, a fastener is under-driven because it hit a knot, the only reasonable solution is to whack it with a hammer. ■

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What's New in Power Fasteners—

Power fasteners have increased in popularity among builders and remodelers in recent years, largely because the products have become better adapted to their needs.

The trend has been toward lighter, easier-to-use, more flexible tools. Many tools now weigh only five or six pounds—heavier than a hammer, but leaving you far less fatigued at the end of a day than the big guns of a decade ago.

You won't find a single tool that can handle both framing and roofing, but most tools can be used for more than one task. For example, some can take more than one type of magazine—even converting instantly from a nailer to a stapler.

Attachments. A multitude of attachments make tools more ideally suited to specific jobs. Wear plates protect the nose of a tool from abrasive surfaces such as asphalt shingles. Guide plates allow you to position tools precisely for specific applications such as vinyl or aluminum siding. Other attachments control depth—for example, a special device allows you to shoot nails to the precise depth recommended for vinyl siding, to keep it from buckling.

Coil nailers. Power fasteners began hitting the roof in the late 1970s, when staples were recognized by many codes for asphalt shingles. But because many roofers prefer big, round-headed nails, the trend really began taking hold in 1983, when Bostitch introduced the coil-fed nailer—which didn't need reloading as often as stick-fed nailers. One loading was sufficient for a bundle of shingles. The new nailers proved so popular that they are now offered by nearly every manufacturer of pneumatic tools. John Kurtz of ISANTA says their use is increasing at an extremely rapid pace, although "there are still a lot of roofing staplers in place." The coil-fed nailers are also widely used for siding and other applications.

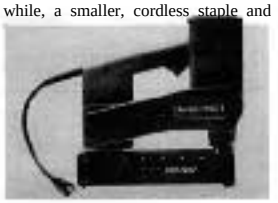
The Senco coil nailer weighs in at a mere 5.6 pounds and holds 120 nails for roofing or siding.

Pictured here is a recent entry by Senco, the SCN200R. This model weighs 5.6 pounds, and can be loaded in seconds with a coil of 120 nails. Senco says the tool is well suited to roofing, reroofing, and foam sheathing.

Repair kits. If you're depending on a power fastener, your construction schedule can turn to confetti if you have to send the tool to the shop for a few days. Most manufacturers now offer convenient repair parts and maintenance kits, so you can make your own repairs in the field and avoid costly down-time. Bostitch, for example, has carded kits for replacing O-rings, bumpers, and various other parts that are subject to wear and tear.

Most manufacturers now offer kits so you can do basic maintenance and repairs in the field.

Electric fasteners. For jobs where it's not practical to hook up a compressor, Duo-Fast offers its Electro-Drive series of electric fasteners. Now all you have to do is plug in your tool, load it up, and go to work. Different models can drive finish nails up to two inches long, or staples up to 1½ inches long. It's no substitute for the big guns used for framing or the coil nailers used for roofing and siding, but is convenient for many finish or remodeling jobs (see photo). Meanwhile, a smaller, cordless staple and pin tacker is offered by BeA. Its Cordless Tacker shoots light duty staples and nail pins up to 3/4 inch in length. BeA says its tool is suitable for paneling, insulation, trim work, and other jobs where freedom of movement is required (see photo).



New electric nailers like this Duo-Fast model can drive finish nails up to 2-inches long—making them ideal for light work.

The cordless electric BeA Tacker shoots staples and nail pins up to 3/4-inch long.

Airless nailer. If you want a "big gun" without an umbilical cord hooked to a compressor, Paslode offers its Impulse 300 power nailer. It runs on a tiny, self-contained internal combustion engine, powered by a disposable fuel cell. Ignition is provided by a rechargeable battery. It shoots a wide range of nails up to 3 inches long. Paslode says it's possible to drive as many as 1,400 nails with a single fuel cell. In the long run, replacing fuel cells is more expensive than running a compressor. But for some jobs, like shooting a few nails in a hard-to-reach place or building a big farm fence, Paslode's new tool may be the only reasonable alternative to hand nailing (see photo).

No cord or hose is needed with the Paslode Impulse, which uses a disposable fuel cell and drives nails up to 16d.

Get as much information and advice as you can before deciding which tools are suited to your job. The seven major manufacturers of pneumatic tools, all of which are members of ISANTA, are:

BeA: BeA Fasteners, Inc., 50 Williams Parkway, East Hanover, NJ 07936; 201/428-9595.

Bostitch: Stanley-Bostitch, Briggs Drive, East Greenwich, RI 02818; 401/884-2500.

Duo-Fast: Duo-Fast Corporation, 3702 North River Road, Franklin Park, IL 60131; 312/678-0100.

Atro and **ISM:** International Staple & Machine Company, Division of ATRO Group, P.O. Box 629, Butler, PA 16001; 412/287-7711.

Paslode: Paslode Corporation, A Signode Company, Two Marriott Drive, Lincolnshire, IL 60015; 312/634-1900.

Senco: Senco Products, Inc. 8485 Broadwell Road, Cincinnati, OH 45244; 513/388-2000.

Spotnails: Spotnails, Inc. 1100 Hicks Road, Rolling Meadows, IL 60008; 312/259-1620.