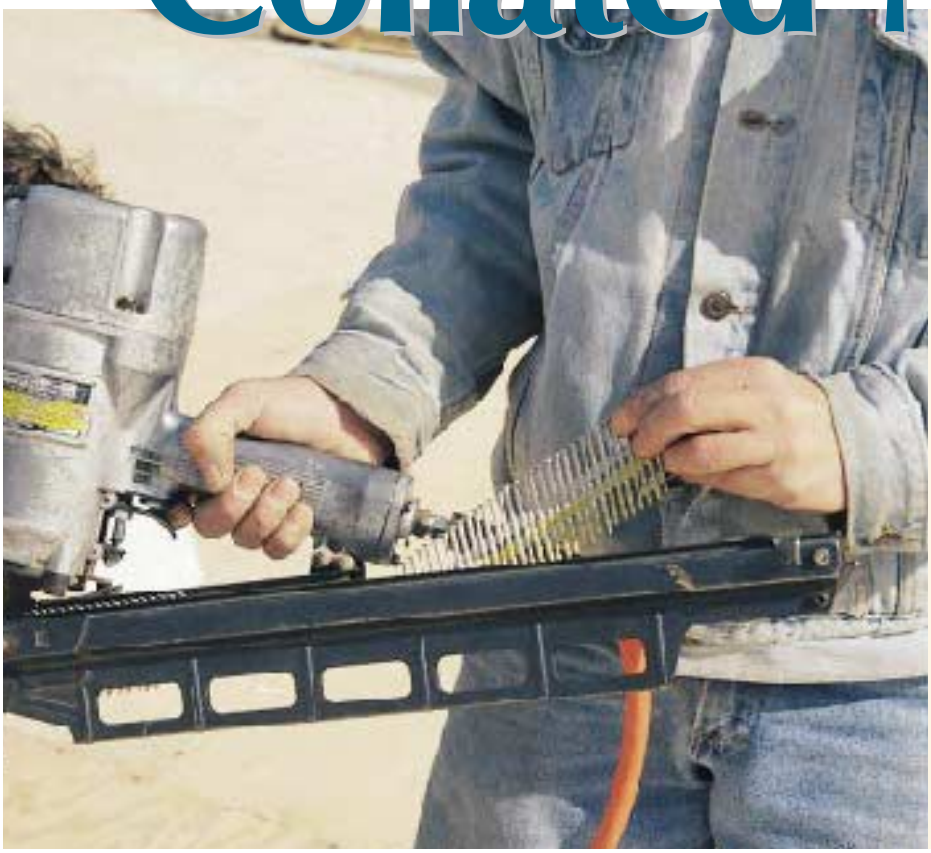
CHOOSING Collated Nails



Saving money with cheap collated nails could cost you in time, tools, and code violations

by Dave Crosby

These days, it's hard to stay competitive without using stick nailers, so most builders give plenty of thought to the purchase and maintenance of pneumatic tools. But when it comes to the fasteners we run through them, you might think, "What's the difference? Nails are nails." At the very least, the difference between nails affects the performance and reliability of the air tools used to drive them. In some cases, the strength of your structural connections and even the legality of your trade practices could be in question. With more choices than ever in collated nails, it's best to make sure you have the right nail for the job.

Clipped- or Round-Head?

The decision to go with clipped-head or round-head nails is one of the first choices you have to make when buying a nail gun. Clipped-head nails are popular because the collation angle allows for more nails per stick than with round-heads. Strengthwise, both types exceed current code requirements, and recent research shows no difference in lateral strength for sheathing and framing connections.

Pull-through resistance is a different matter, because there is more bearing pressure per square inch on the smaller head of a clipped-head nail. Although these differences are accounted for in the code book nailing tables, there is still concern among some code officials about the pull-through performance of clipped-head sheathing nails. In certain high-wind and seismic areas, building officials are now requiring the use of round-head nails. For those who prefer or have already bought clipped-head nailers, several companies (including

Paslode, Senco, Hitachi, and Halsteel) offer offset round-head nails that are collated at the same angle as clipped-head nails, but provide appearance and performance similar to round-head nails (see Figure 1).

With properly driven sheathing nails, withdrawal resistance is the limiting factor for both clipped- and round-head nails assuming (as your code book does) that the material being nailed can resist the pull-through forces. Overdriven nails will reduce the pull-through resistance, weaken the connection, and possibly compromise the overall integrity of the structure. Overdrive is more common with clipped-head nails, and has many causes, including an improperly adjusted gun, a careless operator, or air pressure that's set too high — often to compensate for a compressor that is worn out or too small for the job. Whatever the reason, overdriving sheathing nails is bad practice.

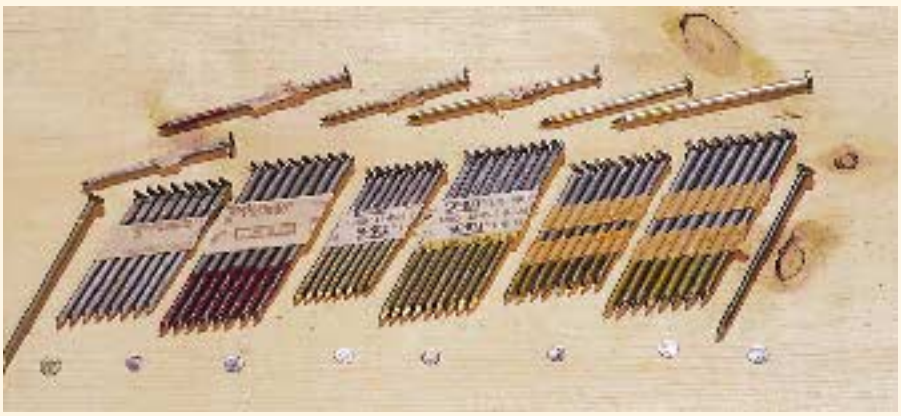


Figure 1. The offset head on these nails is designed to provide the close collation of clipped-head nails with more head-surface area and the finished appearance of a round-head (right). In the photo above are offset-head nails from Paslode, Senco, and Hitachi in two sizes: $2\frac{3}{8}$ x .113-inch, and 3 x .131-inch. A 12-penny sinker (above, far left) and standard round-head 3 by .131-inch pneumatic nail (above, far right) are shown for comparison.

What About Interchangeable Nails?

Most builders are familiar with the major tool manufacturers' name-brand nails. Because these nails are typically made with good-quality materials as part of an integrated tool design, you can generally trust their performance. But some contractors own more than one brand of air nailer. Rather than buy several brands of nails, they use so-called "generic" nails manufactured to fit a variety of tools. Not surprisingly, the quality varies, and so does the price. If you buy these nails, it's important to recognize the difference.

What's the difference? Nails that don't have the same brand name as your nail gun, or nails that are designed to fit a variety of tools, are often referred to as "generic." This confuses the issue. All nails have a brand name — it's just that some brands are better than others. For reliable performance and safety you need to look at the quality of materials, manufacturing, and the design of your nails. You can generally be pretty comfortable with name-brand nails that match your nail gun, although bad batches of nails do occasionally make it out into the field. Of the "aftermarket" interchangeable nails, some are made with top-quality materials to exacting standards by reputable manufacturers (see list, page 6); others are made from inferior materials with poor collation technology by companies that may not care what you think of their product or be liable for their shortcomings. Because these "Brand X" nails typically cost substantially less than the better-quality nails, some contractors find themselves asking, "Why not save a few bucks?"

There are several good reasons why not. Collated nail technology isn't as simple as it looks. For a pneumatically driven nail to end up where it's supposed to, many things must happen in the proper order. When there's a problem, it could be that the gun needs cleaning, the air pressure is too low, the gun is too cold, the wood is unusually hard, or the operator is unskilled. Or it could be the nails. The strength of the alloy used, the mechanics of the production process, dimensional accuracy, collation angle, and the quality of the collation material all combine to produce a reliable (or unreliable) product.

What Makes a Good Nail?

Top-quality fasteners that have been carefully designed to fit a variety of tools are a far cry from the cheap "generic" nails that may or may not work reliably in your nail gun. Some of the better nails are "reverse-engineered," which means the manufacturer carefully studies each tool to determine exactly how the original equipment manufacturer's fastener performs. This can mean firing millions of fasteners through hundreds of new and used tools until the engineers understand precisely what factors influence failures, including jams, misfeeds, bent fasteners, double drives, and loading problems. After thoroughly testing the design of the OEM nail in that tool, they test their nail in the same tool to make sure that it meets or exceeds the performance of the OEM fastener.

Although most guns will work within a few degrees of the nominal collation angle, tool manufacturers would rather

you didn't exceed that. Some manufacturers will draw the line at 1 1/4 degrees either way, some will go as far as +/- 2 1/2 degrees. But the point remains that the nails you feed through your nailer are part of an engineered system.

There are manufacturers of interchangeable nails who "split the difference," producing nails with a collation angle of 33 degrees for use in both 30-degree and 35-degree tools, for example. Tool manufacturers who also sell nails will tell you this is not a good idea, while the nail manufacturer will tell you there's no problem. I have spoken with builders who report consistently good results from the better-quality interchangeable nails, but I have also heard of tools being damaged by the poorer-quality brands.

Bad Nails

Modern nail guns typically feed stripnails down a track, which the nail head rides on. Nails with oversized or undersized heads, sharp edges on the heads, or poor collation will wear out the gun's feed track over time. Once that happens, neither cheap nails nor good nails will feed correctly. Irregular shank or head dimensions can also cause more jams on the way through the gun. This will not only slow down your productivity, but could also damage the tool.

Collation problems. Humidity and normal handling will often uncover bad collation before you even load the nails into your nail gun. If you open up the box and find broken up plastic, peeling paper, or nails falling off the wire collation, you have a problem. And if you try to run these nails through the gun, it's going to get worse.

Inferior collation materials can be annoying, for example, when they cause "flagging," or plastic shrapnel hitting the operator. Bad collation also results in waste, as when the collation material shatters, leaving uncollated nails in the feed track.

Another place inferior collation shows up is in nail spacing, particularly where two sticks of nails meet in the magazine. Bad manufacturing means more jams when you fire the first nail in the second stick. It doesn't take too many of these interruptions in work flow before you've used up the money you saved buying the cheaper nails.

Can you see the difference? If you only go by looks, you probably won't be able to tell the difference between a good-quality and a poor-quality interchangeable nail. A large part of the manufacturing cost of collated nails is in steel, so one way the "Brand-X" manufacturers save money is to use a cheaper alloy or skimp a few thousandths of an inch on nail dimensions. Although you couldn't tell by looking, these nails might be significantly weaker than a well-made nail. The collation angle may exceed the proper tolerance. You probably can't pick this up by eye, but it may cause problems in the gun later.

The View from the Repair Shop

For authoritative opinions on nail quality and tool damage, I spoke with Pat Gordzelik at PGP Fastening Systems and Solutions of Amarillo, Tex., and John Wallace of Albuquerque Winfastener. Pat has over 23 years in the pneumatic nailer business with all of the major brands. Asked if he had ever seen problems resulting from inferior nails, he said, "Yes, I have seen some tools damaged from this. If you try to run nails which aren't collated at the proper angle, sometimes the driver will try to pick up two nails at once and drive them both through the guide body. In the worst case, nails can be driven backward through the magazine toward the operator. Those nails that try to hit the middle ground will perform, but they perform poorly, especially in harder woods."

John Wallace has been selling, servicing, and repairing most major brands of nail guns for over ten years, and has sold a lot of nails in his time as well. John's advice to builders is to buy tools you can easily get fasteners, parts, and service for, follow the recommended maintenance procedures, and keep the big picture in mind when you're buying nails. When I questioned him about the difference between name-brand nails, good-quality aftermarket nails, and the inexpensive "generic" nails, he replied, "What's your time, your crew's time, and your reputation worth?" He explained that all of his customers were production-oriented construction professionals. In his experience, long before an inferior fastener could damage a tool, the builder would recognize that these nails weren't working very well anyway and switch back to a good-quality nail. As long as the tool performs well with whatever nail you're using, and the nail meets the code requirements, he didn't see any problem.

Figure 2. Unlike some, these nails are labeled clearly for code compliance, making it easy to make an informed buying decision.

Make Sure your Nails Are Strong Enough

Quality of manufacture is important when it comes to complying with the nailing schedules in your local code book. Those schedules assume several things about the nails you use: that they are made from a wire with a specific bending yield strength for a given diameter; that the fastener production tolerances described by ASTM F1667 (*Standard Specifications for Driven Fasteners: Nails, Spikes, and Staples)* have been adhered to; and that the nails will provide the lateral strength described by the *National Design Specification for Wood Construction* (published by the American Forest and Paper Association).

If the nails have been tested and proven to conform to these standards,

A Wealth of Nail Choices

With the variety of collated nails on the market today, it's possible to use air nailers for almost any task. There are many situations where you ought to be using specialty nails. For example, you shouldn't be shooting regular steel nails into pressure-treated lumber for any purpose, because the chemicals in the lumber can weaken the nails over time. Below are some other options you may want to consider.

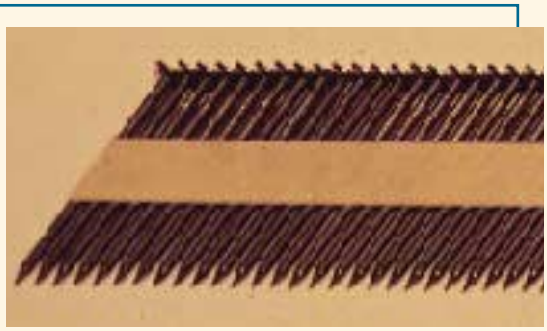
Paslode corrosion-resistant nails for pressure-treated lumber

Roofing, drywall, and Plasticap coil nails, from Hitachi

Fasco's collated duplex nails

Stainless steel nails from Swan Secure

Nails for the Senco metal-connector gun



Fasco/Beck 2 1/4 x .113-inch clipped-head high carbon nails for concrete

Maze collated nails for fiber-cement siding and pressure-treated lumber

Weather-resistant nails from Senco

it will usually say so right on the box (Figure 2, page 3). Manufacturers who submit their product for testing will typically label their nails as meeting the requirements of a model code, or conforming to the specifications described in a particular code evaluation report. For example, the 20 manufacturers who belong to the International Staple, Nail, and Tool Association (ISANTA) use National Evaluation Service report NER-272.

Unfortunately, it's not always that easy. For example, I have found packages of nails on the shelf of the local lumberyard that I know are listed in NER-272, but weren't labeled as such. Likewise, some nail manufacturers are covered by other reports, but not all of them say so on the label. There are also manufacturers who have not submitted their product for evaluation at all, as well as distributors who, under the same brand name, sell nails that actually come from a variety of sources, including foreign manufacturers using steel of substandard quality.

Don't take chances. Untested nails might be strong enough, but there's no way of knowing. Using nails of undetermined strength compromises your ability to demonstrate code-compliance and could affect your liability in case of structural failure. In particular, for engineered connections, or in high-wind, coastal, or seismically active areas, it is unwise to use nails that do not meet code requirements.

The Bottom Line

With all the different nails available today, your nail gun can make you a lot more productive than you might have realized. But don't try to save money by buying inferior quality nails. You'll make up the difference in price for good quality nails with increased productivity, fewer problems, less damage to your nail gun, and more confidence in the strength of your connections.

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