TDI Safety @ Work
Division of Workers' Compensation

Nail Gun Safety Fact Sheet

HS05-022E (12-20)

Nail guns are powerful, easy to operate, and boost productivity. They are also responsible for about 37,000 emergency room visits each year in the U.S.[1] In the last four years, nearly 25% of all on-the-job nail gun-related injuries resulted in employees missing more than two weeks of work.[2] About 14% of those injuries required employees to remain off the job for more than a month.[3] Proper training and practical safety steps can help employers and employees reduce nail gun risks and prevent injuries.

Know Nail Gun Triggers

Nail gun safety starts with understanding the various trigger mechanisms. The Occupational Safety and Health Administration's Nail Gun Safety: A Guide for Construction Contractors offers the following information:

How triggers differ

All nail gun users rely on two basic controls: a finger trigger and a contact safety tip located on the gun's nose. Trigger mechanisms can vary based on the order in which the controls are activated and whether the squeezed trigger discharges multiple nails or one nail at a time. Combining these variations gives four kinds of triggers. Each trigger type is described below, along with a summary of how the controls are activated.

Full Sequential Trigger

This is the safest type of nail gun trigger. A full sequential trigger only fires a nail when the controls are activated in a specific order. First, the safety contact tip is pushed into the workpiece, and then the user squeezes the trigger to discharge a nail. Both the safety contact tip and the trigger must be released and activated again to fire a second nail. This type of trigger is also known as a single-shot trigger, restrictive trigger, or trigger fire mode.

Contact trigger

Contact triggers fire a nail when the safety contact and trigger are activated in any order, for example, by pushing the safety contact tip first and then squeezing the trigger, or by squeezing the trigger first and then pressing the safety contact tip. If the trigger is held down, a nail fires each time the safety contact is pushed (known as bump firing). Contact triggers are also known as bump triggers, multi-shot triggers, successive triggers, dual-action triggers, touch trip triggers, contact trip triggers, or bottom fire triggers.

Single Sequential Trigger

Like the full sequential trigger, this trigger only fires a nail when the controls are activated in a specific order. First, push the safety contact tip into the workpiece and squeeze the trigger to discharge a nail. To fire a second nail, release the trigger. The safety contact tip can stay pressed into the workpiece, but nails are not bump fired.

Single Actuation Trigger

Like the contact trigger, this trigger fires a single nail when the safety contact and trigger are activated in any order. A second nail is fired by releasing the trigger, moving the tool, and squeezing the trigger again without releasing the safety contact tip. The first nail can bump fire with a single actuation trigger but not with a single sequential trigger.

Know Nail Gun Triggers

Begin with Training

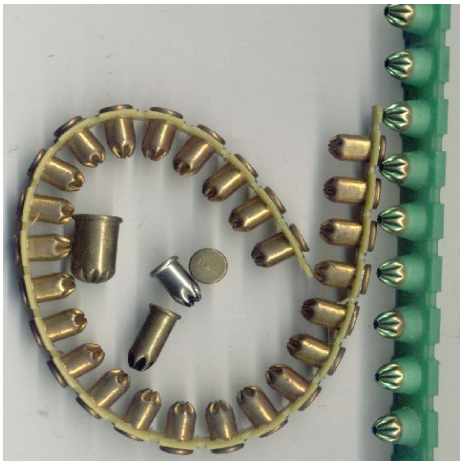
Employers should provide training on nail gun rules and procedures annually and for all new hires. Nail guns are either driven by compressed air, a one-cylinder butane engine, battery power, or, in the case of powder-actuated tools, a small explosive charge. Training on powder-actuated tools is regulated by OSHA Standard 1926.302(e)(1). Also, OSHA Standard 1926.21(b)(2) requires employers to provide training covering all potential job-related hazards. Examples of nail gun training topics may include, but are not limited to, explaining:

- how the nail gun works;
- how to safely load and unload the nail gun;
- how to discharge nails;
- how to use the device's safety features;
- how to position the nail gun;
- how to hold lumber or other materials during work; and
- how, if using a pneumatic nail gun, to operate the attached air compressor.

Always carefully review the owner's manual with all operators. Have someone familiar with the tool demonstrate safe operating procedures. Then, have each employee take a turn using the tool and watch how each one performs.

Pneumatic nail guns require air hoses to fire.

Some cordless nail guns use a fuel and electric igniter to fire.



Cartridges used in powder actuated nail guns.

Choose Sequential Nail Guns

As previously discussed, sequential firing and contact firing nail guns differ by how the user operates the trigger and the safety tip on the gun's nose. Contact firing, or bump firing, lets the user press the safety tip against a surface to fire nails continually. These types of multi-shot contact trigger nail guns can double-fire or accidentally discharge, causing injuries. The safer choice is to use a single-shot sequential trigger nail gun, which requires the user to press the gun's safety tip to a surface, then pull the trigger to fire each nail. Studies suggest that nail gun injury risk is twice as high when using contact trigger nail guns versus sequential trigger nail guns.[4] Recent research also indicates that sequential nail guns account for less than a 1% decrease in productivity, a small price to pay for safety.[5]

Limit the Use of Nail Guns in Awkward Positions

Nail guns can recoil and are more difficult to control in tight spaces. If the job requires the worker to place the nail gun in an awkward position, consider using a hammer instead. Nailing above shoulder height, with the non-dominant hand, or in a tight space increases the chances of accidents. Anytime the nail gun's tip does not make full contact with the workpiece, the hazard potential increases. Always keep the nail gun flush to the workpiece to prevent slipping and discharging an airborne nail. In addition to flying nails, nail guns can blow fragments off the nailing surface or fire a nail into electrical wires. Invest in a nail gun with teeth so that it grabs onto the workpiece to help prevent slippage.

Use Nail Guns Only on Intended Materials

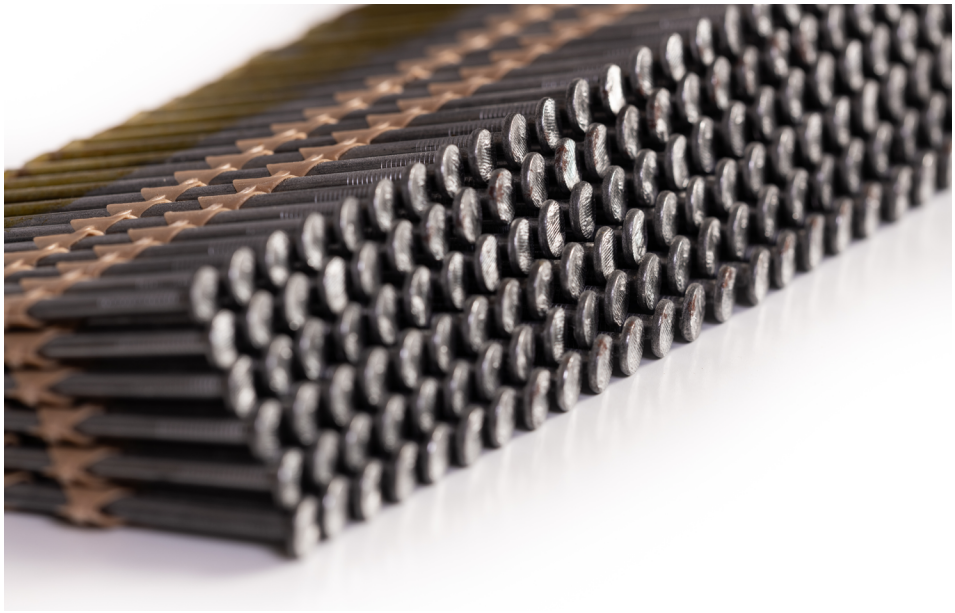
Using nail guns on any area that creates a weak or hard spot on the workpiece – such as wood knots or metal framing hardware -- can cause nails to ricochet or pass through the material. This can cause a nail to strike the worker or fly off and hit a co-worker. Nail penetration is especially a concern when a worker is holding a piece of lumber by hand. If the nail misses or breaks through the lumber, it can injure the worker's non-dominant hand holding the workpiece. Workers should position themselves and their free hand out of the line of fire and watch for co-workers behind the nailing surface.

Never Bypass, Modify, or Disable Safety Features

Enforce a strict policy that tampering with a nail gun in any way is not allowed. Actions like removing the spring from the safety-contact tip or taping the trigger so pressing it is not needed increases the chances that the nail gun will fire accidentally.

Provide Personal Protective Equipment

When using nail guns, always wear safety shoes to prevent toe and foot injuries. Employers should provide, at no cost to the employees, hardhats, high impact eye protection with a side shield



(marked ANSI Z87.1), and earplugs or earmuffs for hearing protection.

Remain Aware of the Nail Gun Trigger and Direction

Stay alert and aware of the direction of the nail gun. Never point a nail gun at someone. Always encourage workers to keep their fingers off the trigger when holding or carrying a nail gun. This is especially important when descending ladders. In short, treat a nail gun as if it were a loaded firearm.

Learn Air Compressor Hose Safety

Fatigue can result in impaired judgment and injury. Despite the few steps it might save, never lower a nail gun from above or drag it by the hose. If the nail gun hose gets caught, find the problem, and release the hose. Never pull on the hose. Ensure that the hose is secured when working on scaffolding. This prevents the hose's weight from dragging the tool off the scaffold when setting the device down. Remember to disconnect the nail gun from the hose or whip before performing maintenance or clearing jams.

Remove Defective Tools

Take all broken or faulty nail guns out of service immediately.

Nail gun injuries are painful and can cause severe injuries or death. These injuries are preventable as more employers and contractors make changes to improve nail gun safety.

For more information on nail gun safety, download OSHA's Nail Gun Safety: A Guide for Construction Contractors or contact a Texas Department of Insurance, Division of Workers' Compensation-Workplace Safety Training Specialist at 800-252-7031, option 2 or www.txsafetyatwork.com.

References

[1]Occupational Safety and Health Administration. Nail Gun Safety: A Guide for Construction Contractors. https://www.osha.gov/Publications/NailgunFinal_508_02_optimized.pdf. PDF download. Accessed November 20, 2020.

[2]Bureau of Labor Statistics. Occupational Outlook Handbook. 2016-2019. https://www.bls.gov/ooh/construction-and-extraction/carpenters.htm#tab-9. Accessed November 20, 2020.

[3]Bureau of Labor Statistics. Occupational injuries/Illnesses and Fatal Injuries Profiles. 2016-2019. https://data.bls.gov/gqt/InitialPage. Accessed November 20, 2020.

[4]Occupational Safety and Health Administration. Nail Gun Safety: A Guide for Construction Contractors. https://www.osha.gov/Publications/NailgunFinal_508_02_optimized.pdf. PDF download. Accessed November 20, 2020.

[5]Lipscomb H, Nolan J, Patterson D, Makrozahopoulos D, Kucera K, Dement J [2008]. How Much Time is Safety Worth? A Comparison of Trigger Configurations on Pneumatic Nail Guns in Residential Framing. Public Health Reports 123:481-486. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2430644/. Accessed November 20, 2020.

TDI Safety @ Work
Division of Workers' Compensation

Safety Violations Hotline
1-800-452-9595
safetyhotline@tdi.texas.gov

The Texas Department of Insurance,
Division of Workers' Compensation (DWC)
E-mail **resourcecenter@tdi.texas.gov**
or call 1-800-687-7080 for more information.
