SAFETY ALERT

Safe use of nailing tools (nail guns)

Purpose
This safety alert highlights the hazards when using nailing tools, such as nail guns, and provides examples of their correct and safe usage.

The information provided is designed to help people meet their obligations under the Workplace Health and Safety Act 1995 in relation to the risks associated with the use of nail guns.

Background
Nail guns have often replaced hammers as tools of choice amongst builders.

There are many types of portable hand-held nail guns used throughout industry and, to a much lesser degree, in home handyman applications. They are powered by either:
- electromagnetism
- compressed air—pneumatic
- highly flammable gases—such as butane or propane
- powder actuated—requiring an explosive charge.

Since their introduction, the compressed air/pneumatic type (shown below) has become the most commonly used form.

![Photograph 1: Pneumatic type nail gun](image)

Investigations have identified that occurrences of serious nail gun incidents are increasing, not only within Queensland, but throughout Australia and other countries.

The main cause for many of these incidents, are associated with the use of **contact trip actuation** (also known as bump-fire, bounce-fire or simultaneous discharge) type nail guns.

These type of nail guns are significantly prone to unintentional firing when users accidentally make contact with the gun’s muzzle (i.e. safety yoke/work contacting element) while handling the equipment (e.g. while moving from one location to another) with their finger engaged on the tool’s trigger mechanism.

The contact trip actuation method of operation allows nails to be driven/fired by holding the trigger in the firing position, then bringing the muzzle into contact with any surface that provides enough resistance to counteract the spring compression forces of the muzzle assembly.

Principally, due to repetitive strain considerations and easier application for use, many designers have adopted relatively low intensity spring compression units within the muzzle assemblies, therefore providing little protection against unintentional discharge.

Today, nail gun penetration injuries have increased throughout the industry to dangerously high levels. Reports clearly show that a significant number of these incidents are a direct result of the gun’s muzzle being unintentionally struck into a part of the body (or nearby structure) while the user has hold of the tool’s trigger switch. These incidents resulted in people being left partially or
permanently disabled, blinded, and in some cases fatally injured.

Hazards
- Users and other people can accidentally place themselves into positions where they are directly exposed to the projectile path of a nail gun.
- As it currently stands, the safety of nail gun operations are mainly dependent upon the skill, knowledge and aptitude of the user.
- The nail gun is effectively a firearm which can release steel projectiles in excess of 130 mm in length.
- Contact trip actuation (bump-fire, bounce-fire or simultaneous discharge) type nail guns are much more prone to unintentional firing through accidental contact with the machine’s muzzle when handling the equipment from one position to another.

Risk
There is risk of steel projectiles penetrating into the human body: via direct contact with the muzzle of a loaded gun, deflection of a projectile when skewing off a hard surface or penetration through a soft material. The power generated within a nail gun is sufficient to drive a nail through human bone, thereby highlighting the vulnerability of other organs in the human body.

Control or prevention measures
Bump-fire nail guns (including those fitted with switchable levers that allow the gun to be used in another mode) must not be used:
- where the user is required to climb ladders or other elevated areas with a loaded gun
- in restricted and tight spaced areas where the gun’s actuation muzzle is at high risk of being bumped
- where other people are likely to come within the firing path of the nail gun or there is a foreseeable risk of them being struck by a flying nail (e.g. by ricochet or deflection).

Nail guns should be maintained to ensure correct operation of the actuation mechanism. If any problems occur, the tools should be repaired by a competent person (i.e. an authorised agent) or be replaced.

A safer design of operation is found within sequential actuation type nail guns, which allow for only one single driving operation via trigger, after the muzzle of the tool has been applied to the driving location.

All workers who use nail guns should be trained in their safe use. Training should address the safe operation of the nail gun, personal protective equipment (PPE) requirements and any other specific directions as stated in the manufacturer’s manual. Additional information on safe usage may also be available from training organisations, industry associations or manufacturers.

Due to the increasing number of serious nail gun penetration injuries taking place throughout the building and construction industry, Workplace Health and Safety Queensland considers that bump-fire type nail guns should only be used within this industry under the strictest of controls. Nail guns with safer actuation mechanisms are preferred.

Where certain high volume production and manufacturing jobs exist, the use of bump-fire type nail guns may be needed to reduce the risk of musculoskeletal injuries (e.g. strains and sprains). If this is the case, the application for these guns should only be allowed in designated exclusion zones, with specially laid out work areas and jigs to hold the work pieces in place. This will reduce the need for the user’s hands and legs to be near the job while the nailing operation takes place, and helps ensure that other persons are less likely to be nearby.

Employers allowing workers to operate bump-fire type nail guns need to ensure that the operational conditions are supported with evidence to demonstrate that appropriate risk assessments, control/safety measures and training have all been implemented to minimise the dangers involved.

Safety measures that should be implemented include:
- establishing an appropriate exclusion zone around the nailing operation
- placing signage to alert people that a nailing tool is in use
- re-assigning workers not directly involved in the nailing work away from the area where the nailing operation is taking place (where possible)
- ensuring users and other workers (located in or near that exclusion zone) wear appropriate eye and hearing protection and any additional PPE as specified within the user’s manual, and comply with all worksite rules.
**Legislative requirements**

The **Workplace Health and Safety Act 1995** (the Act) sets out the laws about health and safety requirements affecting most workplaces, work activities and specified high risk plant in Queensland. It seeks to protect the health and safety of everyone at a workplace.

In particular, Sections 32, 32a and b of the Act list obligations of designers, manufacturers and suppliers of plant.

**More information**

For more information visit the Workplace Health and Safety Queensland website at [www.worksafe.qld.gov.au](http://www.worksafe.qld.gov.au) or call the Workplace Health and Safety Infoline on 1300 369 915.