

## **4123:1-5-06 Portable explosive-actuated fastening tools.**

(A) Reserved.

(B) Reserved.

(C) Design requirements.

(1) High-velocity tools.

Tools of the high-velocity type shall have the following characteristics:

(a) The muzzle end of the tool shall have a protective shield or guard at least three and one-half inches in diameter, mounted perpendicular to and concentric with the barrel, and designed to confine any flying fragments or particles that might otherwise create a hazard at the time of firing.

(b) Where a standard shield or guard cannot be used, or where it does not cover all apparent avenues through which flying particles might escape, a special shield, guard, fixture, or jig, designed and built by the manufacturer of the tool being used, which provides this degree of protection, shall be used as a substitute.

(c) The tool shall be so designed that it cannot be fired unless it is equipped with a standard protective guard or shield, or a special shield, guard, fixture or jig.

(d) Firing the tool.

(i) The firing mechanism shall be so designed that the tool cannot fire during loading or preparation to fire, or if the tool should be dropped while loaded.

(ii) The firing of the tool shall be dependent upon at least two separate and distinct operations of the operator, with the final firing movement being separate from the operation of bringing the tool into the firing position.

(e) The tool shall be so designed as not to be operable other than against a work surface, and unless the operator is holding the tool against the work surface with a force at least five pounds greater than the total weight of the tool.

(f) The tool shall be so designed that it will not operate when equipped with the standard guard indexed to the center position if any bearing surface of the guard is tilted more than eight degrees from contact with the work surface.

(g) The tool shall be so designed that positive means of varying the power are available or can be made available to the operator as part of the tool, or as an auxiliary, in order to make it possible for the operator to select a power level adequate to perform the desired work without excessive force.

(h) The tool shall be so designed that all breeching parts will be reasonably visible to allow a check for any foreign matter that may be present.

(2) Low-velocity - piston-type tools.

Tools of the low-velocity piston type shall have the following characteristics:

(a) The muzzle end of the tool shall be designed so that suitable protective shields, guards, jigs, or fixtures, designed and built by the manufacturer of the tool being used, can be mounted perpendicular to the barrel. A standard spall shield, when supplied, shall be utilized with each tool.

(b) Firing the tool.

(i) The tool shall be designed so that it shall not in ordinary usage propel or discharge a stud, pin, or fastener, while loading or during preparation to fire, or if the tool should be dropped while loaded.

(ii) Firing of the tool shall be dependent upon at least two separate and distinct operations of the operator, with the final firing movement being separate from the operation of bringing the tool into the firing position.

(c) The tool shall be so designed as not to be operable other than against a work surface, and unless the operator is holding the tool against the work surface with a force at least five pounds greater than the total weight of the tool.

(d) The tool shall be so designed that positive means of varying the power are available or can be made available to the operator as part of the tool, or as an auxiliary, in order to make it possible for the operator to select a power level adequate to perform the desired work without excessive force.

(e) The tool shall be so designed that all breeching parts will be reasonably visible to allow a check for any foreign matter that may be present.

(D) Minimum instructions for qualifying operators.

Instructions to operators in order to teach them the use of portable explosive-actuated fastening tools shall include, but shall not be limited to, the following items:

(1) Before using a tool, the operator shall inspect it to determine to his satisfaction that it is clean, that all moving parts operate freely, and that the barrel is free from obstruction.

(2) When a tool develops a defect during use, the operator shall immediately cease to use it, until it is properly repaired.

(3) Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any employee, and hands should be kept clear of the open barrel end.

(4) No tools shall be loaded unless being prepared for immediate use, nor shall an unattended tool be left loaded.

(5) In case of a misfire, the operator shall hold the tool in the operating position for at least thirty seconds. He shall then try to operate the tool a second time. He shall wait another thirty seconds, holding the tool in the operating position; then he shall proceed to remove the explosive load in strict accordance with the manufacturer's instructions. Misfired cartridges should be placed carefully in a metal container filled with water, and returned to the supervisor for disposal.

(6) The tool shall never be left unattended in a place where it would be available to unauthorized persons.

(7) Fasteners shall not be driven into very hard or brittle materials, including, but not limited to, cast iron, glazed tile, surface-hardened steel, glass block, living rock, face brick, or hollow tile.

(8) Driving into materials easily penetrated shall be avoided unless such materials are backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side.

(9) Driving distance from edge

(a) Fasteners shall not be driven directly into materials such as brick or concrete closer than three inches from the unsupported edge or corner, or into steel surfaces closer than one-half inch from the unsupported edge or corner, unless a special guard, fixture, or jig, is used.

(b) Exception: Low-velocity tools may drive no closer than two inches from an edge in concrete or one-fourth inch in steel.

(c) When fastening other materials, such as a two- by four-inch wood section, to a concrete surface, it is permissible to drive a fastener of no

greater than seven-thirty-seconds-inch shank diameter not closer than two inches from the unsupported edge or corner of the work surface.

(10) Fasteners shall not be driven through existing holes unless a positive guide is used to secure accurate alignment.

(11) No fastener shall be driven into a spalled area caused by an unsatisfactory fastening.

(12) Tools shall not be used in an explosive or flammable atmosphere.

(13) All tools shall be used with the correct shield, guard, or attachment recommended by the manufacturer.

(14) Any tool found not in proper working order shall be immediately removed from service. The tool shall be inspected at regular intervals and shall be repaired in accordance with the manufacturer's specifications.

(E) Strength of charge - identification.

All explosive charges (cartridges and shells) to be used in portable explosive-actuated tools shall be marked by color, in accordance with table 4123:1-5-06(E) to this rule, "Identification of Cased Loads," to designate the strength of the charge.

**Table 4123:1-5-06(E)**

**IDENTIFICATION OF CASED LOADS**

Power Level	Color Identification		Nominal Velocity (=45 f.p.s.)
	Case Color	Load Color	
1.	Brass.	Gray.	300
2.	Brass.	Brown.	390
3.	Brass.	Green.	480
4.	Brass.	Yellow.	570
5.	Brass.	Red.	660
6.	Brass.	Purple.	750
7.	Nickel.	Gray.	840
8.	Nickel.	Brown.	930
9.	Nickel.	Green.	1020
10.	Nickel.	Yellow.	1110
11.	Nickel.	Red.	1200
12.	Nickel.	Purple.	1290

Note: The nominal velocity applies to 3/8-inch diameter 350-grain ballistic slug fired in a test device and has no reference to actual fastener velocity developed in any specific size or type of tool.

Effective Date: 1/1/86  
Prior Effective Dates: 4/1/64; 8/1/77