

Stay Safe Using Powder Actuated Tools

Powder Actuated Tools or PAT's are a common site at virtually every jobsite. A Powder Actuated Tool or PAT is a nail gun used to join hard materials like steel, masonry and concrete. PAT's are based on technology referred to as "direct fastening" which uses a controlled explosion that is created by a small chemical propellant charge. This technology is very similar to the technology used to fire a firearm.

PAT's are classified according to several different criteria. The PAT can be direct acting where the charge acts directly on the head of the fastener or indirect action which used an intermediate piston to hit the fastener. Another classification is based on how the charges are loaded into the tool. There are single shot or magazine-fed tools where the many charges are loaded on a plastic strip and fed into the PAT. The next classification deals with whether the charges are automatically fed into the PAT or manually fed. These many classification lead to many different types of PAT's available to the consumer.

The PAT offers the user a high level of convenience for attaching materials that are difficult to attach. This convenience comes at a price. These tools can be extremely dangerous, even lethal, if not handled correctly. Due to this heightened level of danger Federal OSHA requires that anyone using a PAT be trained and certified on the particular tool that is in use. It is also required that all qualified operators carry a valid certification card. There are two types of certification available to PAT users depending upon where they live. California has its own certification requirements and the other 49 states have a common certification. A glaring difference between the certifications is how long they are valid; in California the certification is valid for only three years and in any other state the certification lasts a lifetime. A large amount of the training for PAT certification involves safety. This is imperative because a PAT is a potentially lethal weapon. Australia takes this threat so seriously that PAT's are classified and controlled as firearms.

It is crucial that even those certified and experienced in using PAT's take time to read and understand the operating instructions. These instructions will remind the user of the correct way to handle the tool as well as information about fastener length, which types of base materials are too hard or too soft and the correct way to determine powder load. Many times serious injuries are caused by improper usage of the PAT and could have been prevented by rereading the tools operating manual. Here are some safety tips to remember when using a PAT to help ensure everyone's safety.

The powder loads used by PAT's are a very precise amount of a special powder to sustain a consistent driving speed for the fastener. The powder level of the charge is designated by color. It is important to use the correct load for the work being done. The charges are color coded according to the velocity that they fire at. The colors are ranked from lowest velocity to highest as follows; gray, brown, green through yellow, red and purple. Here the owner's manual is an excellent resource to determine the appropriate color and level powder load. As a rule of thumb, the harder the base material, the more powder is needed.

Before firing the PAT it is important to know the thickness and type of base material present and to test the fastenings starting with the lowest powder level. When the base material may chip like concrete or spark like steel it is important to use a Spall Shield to help reduce injury from chipping or sparks. When ready to load the PAT to start fastening it is important to insert the fasteners into the tool **before** the powder load. A PAT should never be loaded until it is needed and a loaded PAT should never be left unattended.

Safety features have been built into the PAT to help prevent injuries. One such feature is that the tool cannot be fired unless the muzzle is completely compressed against the work surface until the sliding action of the barrel stops. This will prevent the PAT from firing into anything other than the desired surface.

Additional safety tips include:

- ANSI/OSHA approved eye and ear protection and a hard hat must always be worn when operating a PAT
- When loading or handling the tool ALWAYS point the tool away from your body
- NEVER put any part of the body in front of the muzzle
- Be certain that the work area is clear on all sides
- Be certain that the work area is posted with warning signs to notify coworkers and bystanders that a PAT is in use
- Always unload a PAT before disassembling, assembling, replacing the barrel or cleaning the tool
- Never carry fasteners or other hard objects in the same pocket or container with powder loads
- When the PAT is not in use it should be unloaded and locked in the storage container with the charges.

Although some of these safety precautions may be seen as excessive and time consuming they are more than made up for by the convenience of the Powder Actuated Tool and having all employees leave the jobsite safely.

For additional help with safety and OSHA compliance, take advantage of the resources available through NCMA. These resources include the NCMA Block Plant Safety Software. The software is available from NCMA at (703) 713-1900 at a cost of \$150 for up to 3 plants/year (nonmember \$450).