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Powder Actuated Tools Procedure

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1.0 PURPOSE

Powder actuated tools are used in performing a technique called “direct fastening”. This technique may be used to support maintenance activities when joining materials to hard substrates such as steel and concrete. Because technology incorporates a small controlled explosion from a chemical propellant charge such as gun powder, it can be highly dangerous due to its inherent hazards. Therefore, it is mandated for Entities, and/or their facility management contractors, to implement this procedure to control the use of these tools. This procedure will give guidance on the minimum training requirements needed to ensure safe operations of such tools.

2.0 SCOPE

The scope of this procedure is to provide means to the user to create a safety procedure for the control of hazards associated with powder actuated tools, outlining and detailing the requirements and responsibilities for the identification of such hazards and the management of subsequent controls. This procedure applies to Operations and Maintenance functions and activities performed using powder actuated tools in government owned facilities throughout the Kingdom of Saudi Arabia.

3.0 DEFINITIONS

Definitions	Description
ANSI	American Nation Standards Institute
Authorized Personnel	Trained and Certified to use equipment
JHA	Job Hazard Analysis
Powder Actuated Tool	Often called a Hilti or Ramset after their manufacturer, is a type of nail gun used for direct fastening. They are commonly used in construction and maintenance activities to join materials to hard substrates such as steel and concrete. These tools rely on a controlled explosion created by a small chemical propellant charge, such as gun powder. The process is similar to the process that discharges a firearm.
PPE	Personal Protective Equipment

4.0 REFERENCES

- 29 CFR 1915.135 Powder Actuated Fastening Tools.
- 29 CFR1926.302(e)(1) Training
- ANSI A103 Standards

5.0 RESPONSIBILITIES

5.1 Facility Manager

Facility Manager’s responsibilities include the following:

- Overall responsibility for this procedure and for supporting this process and verifying personnel actively participate.

5.2 Supervisor

The Supervisor is responsible for monitoring that the site is in compliance.

- Providing the resources to implement the requirements of this procedure.
- Communicating with management concerning HSE expectations concerning powder actuated tools storage, handling and use practices.
- Providing leadership regarding HSE requirements and conveying management expectations.

5.3 HSE Representative

HSE Representative's responsibilities include the following:

- Auditing this procedure.
- Confirming that this procedure meets the government requirements and regulations in the location of the facility.

5.4 Facility Personnel

Facility personnel's responsibilities include the following:

- Complying and abiding by this Procedure for any work they perform.
- Requesting additional information and further clarification before starting work if personnel receive assignments they do not understand.

6.0 SAFETY PRECAUTIONS

Lacking proper equipment safeguards and safe operating procedures, powder-actuated fastening tools can be as dangerous as a small caliber firearm (Figure 1). This procedure outlines the specific safety requirements that must be followed whenever powder-actuated tools are used, the tool selection must be in accordance with ANSI A103 standards.

Figure 1: Examples of Powder Actuated Tools

Manufacturers' instructions shall be followed. Nothing contained herein, is intended to take the place of or conflict with any specific manufacturer requirements. In the event of a conflict, the most stringent rule shall always apply. The following safety precautions shall be adhered to when operating powder-actuated tools:

- Only personnel who have been trained and certified in the operation of the particular tool in use shall be allowed to operate a powder-actuated tool.
- The user must ensure that correct caliber is used (Figure 2).
- When the tool is removed from the container box it should be checked to ensure the cartridge is not loaded in the tool.
- The tool shall be inspected each day before loading to see that the safety devices are in proper working condition. The method of inspection shall be in accordance with the manufacture's operating manual.
- A Job Hazard Analysis shall be completed for tasks requiring the use of powder actuated tools.

- Any tool that is found not to be in proper working order, or develops a defect while on use, shall be immediately removed from service, tagged “Out of Service,” and not used until properly repaired or disposed.
- In the event of a misfire, the tool shall be held in the operating position against the working surface for not less than one full minute.
    - If it is uncertain that the tool is defective, it shall be unloaded, placed in its container, and returned to the tool room (or other such lo-cation) with a “DANGER-DO NOT USE” tag attached.
- If the powder-actuated tools are to be used in areas occupied by other personnel, ensure that no one is endangered.
    - All personnel in the affected area must be notified prior to firing/using the tool.
    - Warning signs shall be posted in areas where powder-actuated tools are being used.
- 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, live rock, face block, or hollow tile.
- A thorough and complete study of the job (per the required JHA) shall include the type of material, its thickness, and general condition.
- Occupied areas behind the firing location shall be cleared prior to task start.
- The use of powder-actuated tools on materials or surfaces that may be completely penetrated by the fastening stud shall be avoided.
- Provide solid protection behind the stud when driving into concrete 5cm (2 inches) or less in thickness, or steel .6 cm (.25 inch) or less in thickness.
- Fasteners shall not be driven directly into materials such as brick or concrete, closer than 7cm (3 inches) from the edge or corner, or into steel surfaces closer than 1.25 cm (.5 inch) from the edge or corner, unless a special guard or fixture is used.
- The operator shall know what is behind the surface or between the surfaces or walls (e.g., electrical wires, fluid lines, gas lines, personnel, etc.) into which the stud is being driven.
- A tool shall never be loaded until it is ready for use and all safety devices are verified to be operational.
- Tools shall be used with the correct shield, guard, or attachment recommended by the manufacturer.
- A tool shall never be carried from one job to another loaded.
- The operator shall never point or direct a tool in the direction another person, whether it is loaded or un-loaded.
- Tools shall not be fired when there is an obstruction in the barrel.
- The operator shall never fire a tool into a pre-drilled hole.
- At no time, shall a tool be left unattended unless it is in its proper container and locked or otherwise secured.
- A tool shall never be tested with the breech plug still in the barrel.
- A fastener shall not be used without a cap or guide.
- A long breech plug charge shall never be used in a short breech barrel.
- PPE for using powder actuated tools shall include a full-face shield, hearing protection, and hand protection.
- Tools shall not be used in an explosive or flammable atmosphere.

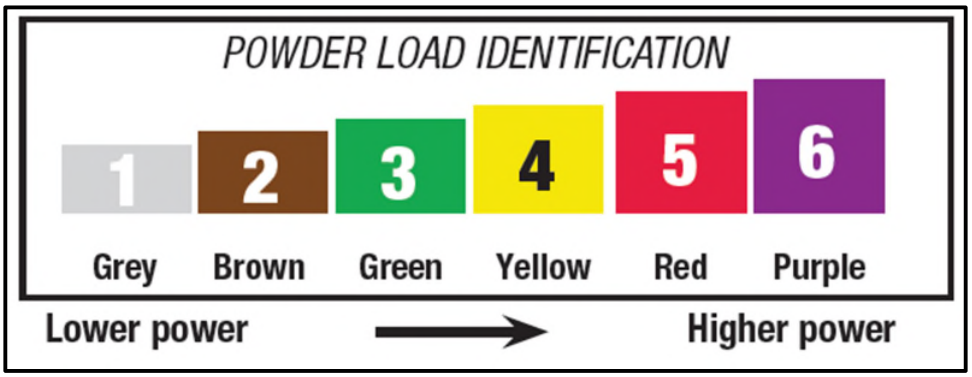

Figure 2: Powder Load Color Codes

6.1 Misfires

In the event of a misfire, the operator should comply with the following requirements:

- In the event of a misfire, observe the manufacturers misfire precautions and procedures. When the manufacture has not provided specific instructions, the operator should comply with the following:
  - First wait one full minute, then release the powder-actuated tool from its depressed position.
  - Second, release the powder -actuated tool from the work surface without changing the direction in which the tool is pointing.
  - Finally, remove the charge and store it safely for later disposal.
  - Any charges which have misfired should not be used again.
    - If numerous misfires occur from one batch of charges, that batch should be returned to the supplier for destruction.

7.0 STORAGE

- The tool shall be stored in a lockable, fireproof cabinet, the access to the cabinet should be kept clear of any obstacle (Figure 3).
- Warning signs should be placed on the storage area, “Danger, No Smoking or Open Flame“.
- Storage area must be well ventilated.
  - Temperature conditions must be monitored and in compliance with the manufacturers’ instructions.
- The tool and cartridges should be stored separately and must be kept in boxes; no loose cartridges should be allowed.
- Powder actuated tools and cartridges shall not be left on the job site, facilities must produce procedures to control issue and return process, as a minimum the following requirements apply:
  - A log with signatures must be maintained for issuing and returning powder actuated tools.
  - Only authorized personnel are allowed to draw and return the tools and cartridges.
  - Used cartridges must be collected and returned to the store, damaged tools and cartridges must be labeled.
  - Lost tools or cartridges must be reported to the site manager immediately.

Figure 3: Example of Lockable Cabinets

8.0 TRAINING

Personnel who will use a powder actuated tool must be trained and be able to demonstrate competence in its safe operation. Training and certification for one type does not allow personnel to operate all types of powder actuated tools. Only the specific tool for which training has been provided is authorized for use. Personnel must receive training and be certified in the use and operation of each specific powder actuated tool to be used. All training records must be made available upon request from relevant parties.