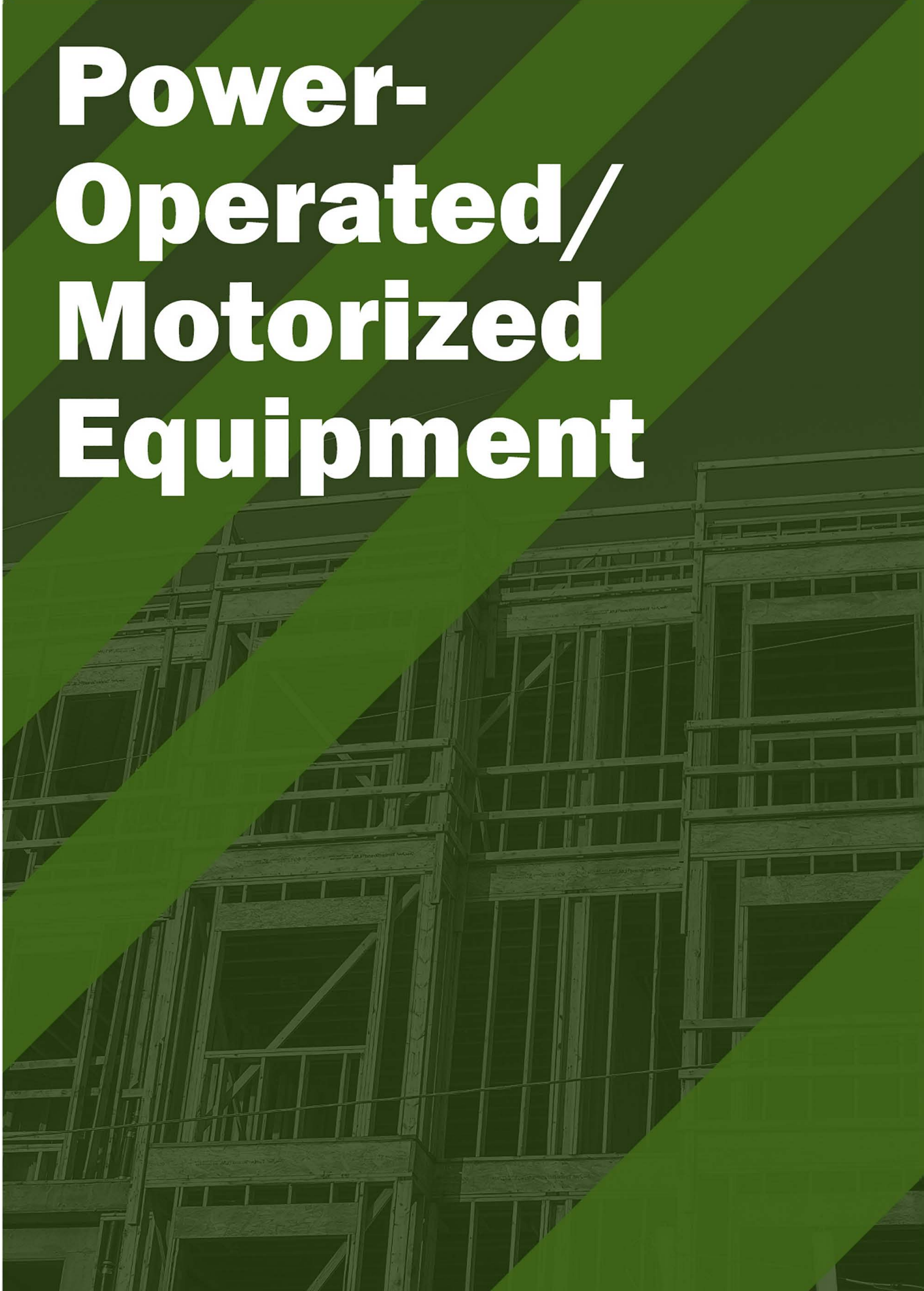
CONSTRUCTION FIRE SAFETY COALITION

Power-Operated/ Motorized Equipment



Power Operated -Motorized Equipment

Why should you be concerned about motorized vehicles?

Because they can cause fires if not used properly.

Model Code Requirements

All power operated equipment should be located so that the exhaust does not discharge directly against combustible materials.

If possible exhausts should be piped to the exterior of the building.
If the equipment is using fuel it should not be re-fueled while it is in operation. It should be off.

If a fuel is involved, it should always be stored in an approved container and kept outside of the building.

Recognition of Hazards

Power tools are such a common part of the construction business that it is difficult to remember that they may pose specific hazards through their use. While it is true that all power operated tools are manufactured with safety in mind, they can be used improperly and those safety features bypassed. For example, internal - combustion powered construction equipment is a potential source of heat that can cause fire ignition, especially in light and finely divided fuels like wood shavings, paper, plastic or cardboard remnants.. The purpose of this section is to provide a list of things that should be done to minimize the potential of causing a fire buy using these tools.

General Safety Precautions

All employees who use power tools and who are exposed to the physical hazards of falling, flying, abrasive and splashing objects, or exposed to harmful dusts, fumes, mists, vapors, or gases must be provided with the appropriate personal protective equipment necessary to protect them from the hazard.

All hazards involved in the use of power tools can be prevented by following five basic safety rules:

- Keep all tools in good condition and complete all regular maintenance.
- Always use the right tool for the job.
- Examine each tool for damage before use.
- Operate the tool according to the manufacturer's instructions.
- Use the proper protective equipment.

Employees and employers both have a responsibility to work together to establish safe working procedures. If a hazardous situation is encountered, it should be brought to the attention of the

proper individual immediately.

Power Operated tools

There are several types of power tools, based on the power source that can be used:

1. Electric
2. Pneumatic
3. liquid fuel powered
4. hydraulic,
5. and powder-actuated.

Employees should be adequately trained in the use of all tools - not just power tools. But, they should understand the potential hazards of how the energy source can cause a fire if not done properly

The following general precautions should be observed by power tool users:

1. Never carry a power tool by the cord or hose.
2. Never yank the cord or the hose to disconnect it from the receptacle.
3. Keep cords and hoses away from heat, oil, and sharp edges.
4. Disconnect tools when they are not in use, before servicing, and when changing accessories such as blades, bits and cutters.
5. All observers should be kept at a safe distance away from the work area.
6. Secure work with clamps or a vise, freeing both hands to operate the tool.
7. Avoid accidental starting. The worker should not hold a finger on the switch button while carrying a plugged-in tool.
8. Tools should be maintained with care. They should be kept sharp and clean for the best performance. Follow instructions in the user's manual for lubricating and changing accessories.
9. Be sure to keep good footing and maintain good balance when the tool is activated.
10. The proper PPE should be worn. Loose clothing, ties, or jewelry tht can become caught in moving parts needs to be removed.
11. All portable electric tools that are damaged shall be removed from use and tagged "Do Not Use."

All moving parts of a power tool need to be safeguarded when they are in use.

All moving parts of equipment must be guarded if such parts are exposed to contact by the user.

Safety guards must never be removed or compromised when a tool is being used. For example, portable circular saws are always equipped with guards. The upper guard must cover the entire blade of the saw. A retractable lower guard must cover the teeth of the saw, except when it makes contact with the work material. The lower guard must automatically return to the covering position when the tool is withdrawn from the work. they should never be

compromised.

Safety Switches

Most hand-held powered tools are equipped with a momentary contact "on-off" control switch drills, These same tools also may be equipped with a lock-on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.

Other hand-held powered tools such as circular saws having a blade diameter greater than 2 inches, chain saws, and percussion tools without positive accessory holding means must be equipped with a constant pressure switch that will shut off the power when the pressure is released.

Electric Tools

Employees using electric tools must always be aware that the danger they are exposed to can be of several different types; the most serious is the possibility of electrocution.

Among the chief hazards of electric-powered tools are burns and slight shocks which can lead to injuries or even heart failure. Under certain conditions, even a small amount of current can result in fibrillation of the heart and eventual death. A shock also can cause the user to fall off a ladder or other elevated work surface.

To protect the user from shock, tools must either have a three-wire cord with ground and be grounded, be double insulated, or be powered by a low-voltage isolation transformer. Three-wire cords contain two current-carrying conductors and a grounding conductor. One end of the grounding conductor connects to the tool's metal housing. The other end is grounded through a prong on the plug. Anytime an adapter is used to accommodate a two-hole receptacle, the adapter wire must be attached to a known ground. The third prong should never be removed from the plug.

Double insulation is more convenient. The user and the tools are protected in two ways: by normal insulation on the wires inside, and by a housing that cannot conduct electricity to the operator in the event of a malfunction.

These general practices should be followed when using electric tools:

1. Electric tools should be operated within their design limitations.
2. Gloves and safety footwear are recommended during use of electric tools.
3. When not in use, tools should be stored in a dry place.
4. Electric tools should not be used in damp or wet locations.
5. Work areas should be well lighted.

Powered Abrasive Wheel Tools

Powered abrasive grinding, cutting, polishing, and wire buffing wheels all create special safety problems because they may throw off flying fragments.

Before an abrasive wheel is mounted, it should be inspected closely and sound- or ring-tested to be sure that it is free from cracks or defects. To test, wheels should be tapped gently with a light non-metallic instrument. If they sound cracked or dead, they could fly apart in operation and so must not be used. A sound and undamaged wheel will give a clear metallic tone or "ring."

To prevent the wheel from cracking, the user should be sure it fits freely on the spindle. The spindle nut must be tightened enough to hold the wheel in place, without distorting the flange. Follow the manufacturer's recommendations. Care must be taken to assure that the spindle wheel will not exceed the abrasive wheel specifications.

Due to the possibility of a wheel disintegrating (exploding) during start-up, the employee should never stand directly in front of the wheel as it accelerates to full operating speed.

Portable grinding tools need to be equipped with safety guards to protect workers not only from the moving wheel surface, but also from flying fragments in case of breakage.

In addition, when using a powered grinder:

1. Always use eye protection.
2. Turn off the power when not in use.
3. Never clamp a hand-held grinder in a vise.

Pneumatic Tools

Pneumatic tools are powered by compressed air and include all chippers, drills, hammers, and sanders.

There are several hazards encountered in the use of pneumatic tools. The primary one is the danger of getting hit by one of the tool's attachments or by some kind of fastener the worker is using with the tool.

Eye protection is required and face protection is recommended for employees working with pneumatic tools.

Noise is another hazard. Working with noisy tools such as jackhammers requires proper, effective use of hearing protection.

When using pneumatic tools, employees must check to see that they are fastened securely to the hose to prevent them from becoming disconnected. A short wire or positive locking device attaching the air hose to the tool will serve as an added safeguard.

A safety clip or retainer must be installed to prevent attachments, such as chisels on a chipping hammer, from being unintentionally shot from the barrel.

Screens must be set up to protect nearby workers from being struck by flying fragments around chippers, riveting guns, staplers, or air drills.

Compressed air guns should never be pointed toward anyone. Users should never "dead-end" it against themselves or anyone else.

Powder -Actuated Tools

Powder-actuated tools operate like a loaded weapon and should be treated with the same respect and precautions. In fact, they are so dangerous that they must be operated only by specially trained employees.

Safety precautions to remember include the following:

- These tools should not be used in an explosive or flammable atmosphere.
- Before using the tool, the worker should inspect it to determine that it is clean, that all moving parts operate freely, and that the barrel is free from obstructions.
- The tool should never be pointed at anybody.
- The tool should not be loaded unless it is to be used immediately. A loaded tool should not be left unattended, especially where it would be available to unauthorized persons.
- Hands should be kept clear of the barrel end. To prevent the tool from firing accidentally, two separate motions are required for firing: one to bring the tool into position, and another to pull the trigger. The tools must not be able to operate until they are pressed against the work surface with a force of at least 5 pounds greater than the total weight of the tool.

If a powder-actuated tool misfires, the employee should wait at least 30 seconds, then try firing it again. If it still will not fire, the user should wait another 30 seconds so that the faulty cartridge is less likely to explode, than carefully remove the load. The bad cartridge should be put in water.

Suitable eye and face protection are essential when using a powder-actuated tool.

The muzzle end of the tool must have a protective shield or guard centered perpendicularly on the barrel to confine any flying fragments or particles that might otherwise create a hazard when the tool is fired. The tool must be designed so that it will not fire unless it has this kind of

safety device.

All powder-actuated tools must be designed for varying powder charges so that the user can select a powder level necessary to do the work without excessive force.

If the tool develops a defect during use it should be tagged and taken out of service immediately until it is properly repaired.

Fasteners

When using powder-actuated tools to apply fasteners, there are some precautions to consider. Fasteners must not be fired into material that would let them pass through to the other side. The fastener must not be driven into materials like brick or concrete any closer than 3 inches to an edge or corner. In steel, the fastener must not come any closer than one-half inch from a corner or edge. Fasteners must not be driven into very hard or brittle materials which might chip or splatter, or make the fastener ricochet.

An alignment guide must be used when shooting a fastener into an existing hole. A fastener must not be driven into a spalled area caused by an unsatisfactory fastening.

Hydraulic Power Tools

The fluid used in hydraulic power tools must be an approved fire-resistant fluid and must retain its operating characteristics at the most extreme temperatures to which it will be exposed.

The manufacturer's recommended safe operating pressure for hoses, valves, pipes, filters, and other fittings must not be exceeded.

For additional information see:
http://www.powertoolinstitute.com
https://www.osha.gov/Publications/osha3080.pdf