OSHA®
Fact Sheet

Safe Use of Portable and Hand-Held Power Tools

Portable and hand-held power tools that grind, cut, polish, and wire buff help workers in shipyard employment perform difficult tasks in a more efficient manner. However useful, if these tools are not used properly or poorly maintained, workers can be severely injured.

Approximately 200 workplace incidents involving portable and hand-held power tools occur in the maritime industry each year. This document focuses on the hazards associated with such equipment and how employers can prevent worker injuries. For guidance on other types of hand and power tools, see OSHA's informational booklet on Hand and Power Tools as well as Safety and Health Topics Page, which outline associated OSHA standards, hazards and solutions, and additional resources.

Identifying and Preventing Hazards

Employers must assess work activities to determine hazards or potential hazards, and implement measures to protect workers. The assessment must include evaluation of the equipment necessary (e.g., portable and hand-held power tools) for the task and any hazards that they might produce. Noise, respirable dust, flying projectiles, contact with sharp objects, as well as fire from heat generation and sparks, are some of the hazards associated with the use of portable and hand-held power tools. OSHA's Shipyard Employment eTool provides detailed guidance on conducting an assessment, personal protective equipment (PPE) selection, and the use of PPE.

To prevent injuries with the use of portable and hand-held power tools, employers should train workers to:

- Keep all tools in good condition with regular maintenance;
- Use the right tool for the job;
- Examine each tool for damage before use and do not use damaged tools;
- Operate tools according to the manufacturers' instructions, including proper tool orientation and use of accessories or attachments; and
- Use the right PPE provided for the task (e.g., gloves, respiratory protection, safety glasses, goggles, or face shield)

Employers and workers should work together to establish and maintain safe working conditions. If a hazardous situation arises, it should be brought immediately to the attention of the appropriate individual(s) for hazard abatement.

Portable Abrasive Wheel Tools

Portable abrasive wheel tools create safety concerns, such as ejecting wheel and workpiece fragments that can strike workers in the eyes, face, and other exposed skin. To protect workers, employers must ensure that abrasive wheel tools are equipped with guards that: (1) cover the spindle end, nut, and flange projections; (2) maintain proper alignment with the wheel; and (3) do not exceed the strength of the fastenings.

The orientation of the tool with respect to the work surface is an important aspect for ensuring safe operation. During use of horizontal and vertical grinders, the full grinding face width of the wheel should contact the grinding surface. For right-angle grinders, the grinding face of the wheel or disc should be held at an angle between 5 and 15 degrees from the grinding surface.

OSHA standards prohibit the use of accessories that are not specifically designed or recommended by the manufacturer for use with that equipment. For example, accessories such as saw blades are often used in place of abrasive wheels (e.g., grinding or cut-off wheels, sanding disks, and wire brushes) to make equipment more versatile. Although a saw blade may fit in an abrasive wheel tool, this does not assure safe operation. The substitution of manufacturer-intended fittings with saw blades can lead to loss of control and injury, including lacerations and amputations.

Before an abrasive wheel is mounted, it must be inspected for damage and sound or ring tested to ensure that it is free from cracks or defects. To test, first suspend the wheel by placing a rod through its arbor hole. Then, using a light, non-metallic instrument (e.g., handle of a screw driver), tap the wheel gently at a point of

45 degrees from the vertical center line and one to two inches from its edge on each side. Do not use wheels that sound cracked or dead, which have the potential to fly apart during operation and cause injury. A sound and undamaged wheel, when tapped, will give a clear metallic tone or ring. However, sound or ring testing is ineffective for wheels four inches in diameter or less or for wheels shaped like plugs and cones.

To prevent an abrasive wheel from cracking, it must fit freely on the spindle. The spindle nut must be tightened sufficiently to hold the wheel in place without distorting the flange. Always follow the manufacturer's recommendations. Also, monitor the spindle speed of the machine to ensure that it does not exceed the maximum operating speed designated on the wheel.

An abrasive wheel may disintegrate during start-up and operation. To help prevent injury, never stand in the plane of rotation of the wheel as it accelerates to operating speed and allow the tool to come up to operating speed prior to grinding or cutting. Portable grinding tools must be equipped with safety guards to protect workers not only from the moving wheel surface, but also from flying fragments in case of wheel breakage.

When using power grinders:

- Always use eye or face protection.
- Disconnect tools when not in use, before servicing or cleaning, and when changing accessories.
- Never disable the pressure switch or control, such as by clamping the hand-held grinder in a vise.
- Ensure that angular exposure of the grinding wheel periphery and sides do not exceed 180 degrees of safety guards in place.
- Only replace accessories with those recommended by the manufacturer.

Where Can I Get More Information?

OSHA's On-Site Consultation Program offers free and confidential occupational safety and health services to small and medium-sized businesses in all states and several territories, with priority given to high-hazard worksites. On-Site Consultation services are separate from enforcement and do not result in penalties or citations. Consultants from state agencies or universities work with employers to identify workplace hazards, provide advice on compliance with OSHA standards, and assist in establishing and improving safety and health programs. To locate the OSHA On-Site Consultation Program nearest you, call 1-800-321-6742 (OSHA) or visit www.osha.gov/consultation.

Workers' Rights

Workers have the right to:

- Working conditions that do not pose a risk of serious harm.
- Receive information and training (in a language and vocabulary the worker understands) about workplace hazards, methods to prevent them, and the OSHA standards that apply to their workplace.
- Review records of work-related injuries and illnesses.
- File a complaint asking OSHA to inspect their workplace if they believe there is a serious hazard or that their employer is not following OSHA's rules. OSHA will keep all identities confidential.
- Exercise their rights under the law without retaliation, including reporting an injury or raising health and safety concerns with their employer or OSHA. If a worker has been retaliated against for using their rights, they must file a complaint with OSHA as soon as possible, but no later than 30 days.

For additional information, see OSHA's Workers page (www.osha.gov/workers).

How to Contact OSHA

Under the Occupational Safety and Health Act of 1970, employers are responsible for providing safe and healthful workplaces for their employees. OSHA's role is to ensure these conditions for America's working men and women by setting and enforcing standards, and providing training, education and assistance. For more information, visit www.osha.gov or call OSHA at 1-800-321-OSHA (6742), TTY 1-877-889-5627.

U.S. Department of Labor

OSHA® Occupational Safety and Health Administration

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