Selecting the Proper Powered Hand Tool can Make Your Work Safer and Easier

FACT SHEET 88-020-0511

Powered hand tools allow heavier work to be performed with greater speed and efficiency. However, as with regular hand tools, the improper design and use of powered hand tools can contribute to work-related musculoskeletal disorders (WMSDs).

Ergonomic Selection Criteria for Powered Hand Tools

Select tools that can be used without bending the wrist.

Use the right tool for the job. The design of the workstation and the layout of the work piece will influence your handle choice. Work surfaces may need to be angled to match the tool, or vice versa, in order to keep the body in a neutral posture. Pistol grip tools are best for work on vertical surfaces to maintain a neutral wrist posture.

Select the right tool for the particular job to keep the person's wrist in a neutral posture.

Select tools that are as light as functionally possible.

Tools that weigh more than 10 pounds can cause extreme forearm discomfort in a few minutes. For tools greater than 4 pounds, a second handle can help disperse the weight. Tools that are used frequently and weigh more than 1 pound should be counterbalanced.

Power tool with second handle. *Courtesy of Mikita.*

Counterbalance for power tool.

Consider the design of the handle.

Choose tools with vibration-damping handles (i.e., rubber, plastic, or cork). Choose handles that are located close to or below the center of gravity of the tool. Select tools with rounded and smooth handles to aid grip and with a trigger strip instead of a trigger button.

U.S. Army Public Health Command (Provisional)
Ergonomics
Aberdeen Proving Ground, MD 21010-5403
Commercial (410) 436-3928/DSN 584-3928

Select tools that will minimize vibration exposure.

Vibrating tools can cause vascular spasms or a constriction of blood vessels in the fingers, which then appear white or pale. Vascular constriction may lead to numbness and swelling of hand tissue, with a loss of grip strength. Vibration-induced white finger, also known as VWF or “Raynaud’s phenomenon,” and hand-arm vibration syndrome (HAVS) cause tingling, numbness, or pain that can be brought on or intensified by exposure to cold. There are preventive actions that can be taken to reduce the impact of vibration:

- Reduce the number of hours or days vibrating tools are used in accordance with the American Conference of Governmental Industrial Hygiene Threshold Limit Values.
- Arrange tasks to alternate use of vibrating and nonvibrating tools.
- Schedule tool maintenance so tools remain sharp, lubricated, and properly tuned.
- Select tools that perform satisfactorily with the least vibration. Ask tool manufacturers to furnish vibration and frequency data on their tools.
- Use gloves with vibration-damping materials in the palms and fingers. Ensure workers keep warm at work, especially their hands. To be effective, gloves should fit, be full finger, and comply with ANSI S3.40-2002 or ISO 10819 standards.
- Use tools with vibration-damping handles.
- Keep hands warm and dry.
- Avoid using tobacco or stimulant drugs that may restrict blood flow to the skin by as much as 40 percent.