

Ergonomic Tools

Are You Using the Right Tools for the Job?

We use hand tools on a daily basis at home and at work, whether for hanging a picture, opening a bag of milk or performing tasks at work. Prolonged use of "non-optimal" hand tools can often be linked to Musculoskeletal Disorders (MSDs). The following are reasons hand tools can lead to MSDs or discomfort:

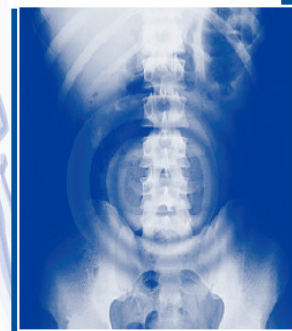
- Result in repetitive or static hand work
- Require awkward postures
- Have sharp edges
- Are heavy & unsuspended
- Exert force to the hand
- Vibrate
- Have a poor handle design
- Are improper tool for the task

Hand tools should fit the characteristics of the user and be suitable for the task. The handle of the tool should fit the dimensions of the user's hand and optimize the user's own strength and motion capabilities. As working populations range in size, so must the tools being used. The following criteria should be evaluated before selecting a tool for a job:

- Tool dimensions: size, weight & shape
- Posture required for use
- Tool handle design
- Vibration, exhaust emissions and/or torque reaction forces
- Worker characteristics

As the handle of a tool is the interface between the tool and the user, the design of the handle can contribute significantly to the effectiveness of the tool. The grip of a tool will often dictate its use. For instance, smaller tools with a precision grip are often used in fine manipulation tasks. Tools that allow for a power grip are better to exert force. Thus, the relationship between handle size and hand size is important. If the handle is too long for the hand, increased force will be placed on the wrist joint. If the handle is too small, pressure points can occur in the muscle tissues of the hand and fingers.

When evaluating a hand tool, it is important to assess if the tool is promoting awkward postures of the hand, arm and back. The wrist should be kept straight to avoid overexertion of tissues, tendons, nerves and blood vessels. A tool causing awkward postures may be deficient in the grip, size or may be an improper choice for the task.



Ergonomic Tools

It is always best when selecting a tool that the user be considered first and foremost. Approximately 92% of the population is right handed; however, that does not mean that the remaining 8% of the population should be ignored. Hand tools should be selected so that they can be used with the right or left hand and accommodate the size and shape of the hand.

The following are several general design rules for hand tools:

- ☑ Push or pull in the direction of the forearm, keeping the wrist straight
- ☑ Provide good coupling between hand and handle by shape and friction
- ☑ Avoid pressure and pinch points in the handle
- ☑ Use rounded and padded surfaces
- ☑ Avoid tools that transmit vibration to the hand
- ☑ Do not operate tools frequently and forcefully by the hand

(Kroemer et al., 2001)

With increases in workload and repetitive work, it is essential that we use the proper tools. For a free Ergonomic Tool Evaluation Audit contact ERGO Inc.

