

Ergonomic Control Measures Hand Tool Operation

Powered and non-powered hand tool operation is found in many occupations, including:

- Assembly
- Construction
- Equipment/vehicle maintenance and repair
- Metalworking
- Woodworking

Each year, hand tools are a significant source of compensable injuries in the workplace. To eliminate/reduce/control the frequency and severity of these injuries, the following ergonomic control measures should be implemented:

Reduce vibration

- Only properly balanced tools should be utilized.
- Tool speed should be reduced.
- Duration of use should be reduced.
- Tool cushioning, suspension, exhausts ports/ vents should be improved.
- Workers should wear gloves to dampen vibration.
- Tool grips and handles should be wrapped with cushioning material.
- Replace one-finger activated tools with lever arm, air-operated or push start methods, or thumb switch tools.
- Personnel should be rotated to reduce their exposure time.

Reduce torque

- Slip clutches or torque limiters should be installed on the tools.
- Tool should be mounted on an articulated arm to keep torque from reaching the worker's hand(s).
- Extra handle should be provided to allow worker to use both hands to counter the torque.
- Torque settings should be kept as low as possible.
- Personnel should be rotated to reduce their exposure time.

Grips and handles

- Should be designed to keep wrists as straight as possible.
- Positive stop or flanged end should be provided to increase hand stability.

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- Sharp corners should be eliminated.
- The use of form-fitting handles should be avoided.
- Textured surfaces should be provided.
- Neutral-torque tool balances should be utilized.
- Clutch and tool extensions should be kept as short as possible to minimize balancing problems.
- If gloves must be worn, they should cover only the areas of the hands needing protection, not the entire hand.

Force requirements

- Tool handle should be altered to make it more efficient.
- Tool weight should be reduced.
- Tools should be held at their center of gravity.
- Use power tools rather than non-powered tools.
- Tools should be counterbalanced and suspended, to eliminate the need for the worker to hold the tool.

Hand positions

- Ergonomically-designed tools, which allow straight wrist positions and minimize bent-wrist positions, should be utilized.
- Alter or modify the work task to the current tools, to allow straight wrist positions and to minimize bent-wrist positions.
- Angle the work object/surface to improve accessibility.
- Reduce the force necessary to operate hand tools– switch to power tools.

Non-powered hand tools

- Utilize ergonomically-designed tools, which allow for straight wrist positions and minimize bent-wrist positions.
- Awkward hand positions (primarily bent-wrist positions) should be avoided.
- Force required to use the tool should be minimized.
- Adequate hand grips should be provided.
- Tool handles should extend past the palm of the worker's hand. Surfaces should be broad, in order to distribute pressures evenly. Surfaces should also be padded and slip-resistant.
- Sharp corners and edges should be eliminated.
- While using tools such as pliers, wire strippers, or scissors, distance between tools' handles should be kept between 2.5 to 3.5 inches, to maximize grip strength.

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301 E. Fourth Street, Cincinnati, OH 45202 F13633A-LP (01/13)

