

Strategies to Reduce Hand-Arm Vibration

It is always better to dampen the source of the vibration (equipment) rather than the worker.

Engineering	• Optimize tool handle surface and diameter to reduce gripping requirements • Optimize orientation of work to promote neutral wrist and arm postures • Implement vibration damping into tool (e.g., polyurethane or polyviscolas bushings) • Suspend the tool's weight on a balancer • Use electric powered tools for lower vibration • Consider remote operation such as when using a plate tamper • Mechanization of work such as mounting jackhammer on forklift • Purchase only ergonomically designed anti-vibration power tools e.g., 'Gentle Jack' jackhammer which has 50% fewer parts than a conventional jackhammer, 50% less noise and 99% less vibration
Administrative	• Minimize length of time on tool (30 min max before microbreak) • Implement a preventative maintenance program • Keep tools sharp e.g. chisels, blades, bits, chains, grinding wheels • Ensure workers are trained in proper maintenance and sharpening techniques • Ensure rotary tools are dynamically balanced • Replace anti-vibration mounts and suspended handles before they deteriorate • Reduce workers' daily exposure e.g., job rotation • Follow WorkSafe BC Vibration Exposure Guidelines • Train workers in microbreak techniques including appropriate exercises to enhance recovery from vibration
PPE	• Consider anti-fatigue tool wraps • Provide gloves that protect the wrist from cold air being discharged from the tool • Follow ISO 10819 guidelines for the purchase of anti-vibration gloves
Personal	• Use lower operating speeds • Let the tool do the work, grasping it as lightly as possible consistent with safe work practices • Don't smoke; nicotine constricts blood vessels increasing the risk for vibratory damage • Inspect all tools and equipment before use • Monitor for blanching of the fingers or other hand symptoms every 3-6 months See a physician immediately if signs and symptoms appear (i.e., ongoing tingling, numbness or whitening in fingers) • Keep your hands warm and dry to avoid possible HAVS attacks • Use power tools only as necessary • Keeps wrists in the neutral position as much as possible • Take microbreaks to give the tissues a rest

Selecting Anti-Vibration Gloves

It is recommended that employers follow the anti-vibration glove standard (EN ISO 10819) to attenuate hand-arm vibration over a wide frequency band. Gloves meeting this standard are not only desirable but are vastly improved in their ability to damp vibration over early version anti-vibration gloves where there were no uniform testing methods.

In addition to vibration reduction, a truly effective anti-vibration glove must do the following:

- 1) Keep the fingers and hands warm.
- 2) Keep the fingers dry by wicking hand perspiration.
- 3) Provide full-finger coverage. Avoid gloves where the fingers are exposed to vibration and cold while only the palm is protected. White Finger Disease always begins at the finger tips and works its way down towards the palm.
- 4) Fit correctly so that proper tactile feedback is maintained, thus permitting workers to safely and effectively operate the tool with minimum, but safe, grip strength. Air-bladder gloves are thinner over gel or polyviscolas products, improving tactile feedback, reducing grip requirements and demonstrating better results at attenuating vibration.

Anti-vibration gloves are not recommended for use with high acceleration tools such as jackhammers or chipping hammers. With these devices, the hands have to grip hard to feel and control their operation, but adding a padded glove reduces the ability to feel the device, so the individual has to grip even tighter, which greatly increases the risk for carpal tunnel syndrome.