

# Fact Sheet: Occupational Exposure to Hand-Arm Vibration (HAV)

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*Resource produced by Acquisition Safety, U.S. Navy Safety Center Afloat Safety Programs Office, Washington DC*

## Vibration Exposure

In the U.S. alone about 2.5 million workers are exposed daily to Hand-Arm Vibration (HAV) from the power tools they use on-their-jobs.

## The Medical Effects of Hand Arm Vibration/ Treatment

It is well known and documented since 1918 that daily occupational exposure from many, but not all, pneumatic, electric, hydraulic, or gasoline powered vibrating hand-tools, have been causally linked to an irreversible medical condition of the fingers/hands (originally called Raynaud's Phenomenon of Occupational Origin; later called Vibration White Finger disease) now called Hand-Arm Vibration Syndrome (HAVS). Documented workplace prevalence of HAVS range from 20-50% in the U.S. for power tool users depending on the tools used, daily vibration exposure levels, work practices, etc.

## Symptoms

The common signs and symptoms of HAVS in the fingers and hands include:

- Pins and needles feeling.
- Tingling, numbness.
- Loss of finger sensation and dexterity.
- Nightly awakening with painful fingers and hands.

Advanced symptoms (typically during cold weather) are painful attacks lasting 5-15 minutes where one or more fingers turn "white or blanch". It is well known and documented that vibration, cold, and nicotine (from smoking) can each alone constrict blood vessels. Thus cold temperatures and/or smoking can worsen symptoms for those diagnosed with HAVS. Current medical treatment can only reduce the pain and suffering associated with HAVS attacks since HAVS is irreversible and without a cure. Thus the watchwords are vigilance and prevention to minimize the medical effects of HAV. Note that HAVS is not Carpal Tunnel Syndrome (CTS) although in some instances a person can have both occurring simultaneously in one or both hands. The Department of Defense has published guidance for medical evaluation of personnel with exposure to hand-arm vibration and other occupational exposures, available at [http://www.public.navy.mil/surfor/Documents/6260\\_NMCPHC\\_TM.pdf](http://www.public.navy.mil/surfor/Documents/6260_NMCPHC_TM.pdf) (see Exam 508-segmental vibration, page 223). Non-DOD personnel may wish to use this material as an information resource to share with health care providers.

## Hand Arm Vibration Health Standards

Modern methods of measuring and quantifying HAV have been developed and are used worldwide since 1918. These measurements are used with worldwide HAV occupational health standards, which have been developed both in the U.S. (ANSI S2.70-2006, consensus standard) and in the European Union, where laws were enacted in 2005.

## Hand Arm Vibration Workplace Protection

Since 1980, various tool manufacturers have introduced newer designed power tools with reduced vibration characteristics (called “Anti-Vibration or A/V tools”) as alternative choices to conventional power tool types. At this time, not all conventional power tools have been replaced with A/V models and some tools may never need replacement because of their inherently low vibration levels. Try to use A/V tools when necessary and possible.

The international standard ISO 10819 for reduced vibration gloves (called “A/V or Anti-Vibration gloves”) was introduced in 1996. Only full-finger protected gloves are tested since HAVS always begins at the finger tips and moves towards the palm. Finger exposed gloves are not recommended. Gloves which meet or exceed ISO 10819 are recommended, but using certified A/V gloves alone will not solve the HAV problem. Anti-vibration gloves should be used together with A/V tools and the following work practices:

- a. Keep fingers, hands, and body warm.
- b. Do not smoke.
- c. Let the tool do the work, grasping it as lightly as possible consistent with safe work practices.
- d. Do not use the tool unnecessarily and keep it well maintained.
- e. For pneumatic tools, keep the cold exhaust air away from fingers and hands.
- f. If signs and symptoms of HAVS appear, seek medical help.

## Obtaining Better Tools

Educated user demand is the long-term key to improving the availability of tools with low-vibration. These tools are typically quieter and commonly provide better ergonomics and higher productivity. Communicating interest in tools with lower noise and vibration levels, as well as other desirable safety characteristics, is vital in stimulating vendors to provide optimal products. Initial procurement may be more expensive, but lifetime productivity, quality, and safety factors tend to recover the investment quickly.

Both the National Institute for Occupational Health and the European Union ([http://resource.isvr.soton.ac.uk/HRV/VINET/pdf\\_files/Appendix\\_H4B.pdf](http://resource.isvr.soton.ac.uk/HRV/VINET/pdf_files/Appendix_H4B.pdf)) maintain on-line databases for power tool noise and vibration. Prospective buyers should review these sources. The English Health and Safety Executive also maintains an online guide for risk assessment at <http://www.hse.gov.uk/vIBRAtion/hav/advicetoemployers/assessrisks.htm>.

Government-industry collaboration has resulted in development of a consensus standard, Aerospace Standard AS 6228 *Safety Requirements for Procurement, Maintenance and Use of Hand-held Powered Tools*, which is available through SAE International at [www.sae.org](http://www.sae.org). It is used by the U.S. General Services Administration to evaluate products for marketing. For more information on GSA Program Offerings, please visit the following web site: <http://www.gsa.gov/portal/content/120150>.

## Resources About HAV and HAVS

“Acquisition Safety – Vibration.”

[www.public.navy.mil/navsafecen/Pages/acquisition/vibration\\_acquisition.aspx](http://www.public.navy.mil/navsafecen/Pages/acquisition/vibration_acquisition.aspx). Naval Safety Center, U.S. Department of the Navy. N.d. web.

“Centralised European Hand-arm Database on the Internet.”

[resource.isvr.soton.ac.uk/HRV/VINET/pdf\\_files/Appendix\\_H4B.pdf](http://resource.isvr.soton.ac.uk/HRV/VINET/pdf_files/Appendix_H4B.pdf)

*Hand-Arm Vibration: A Comprehensive Guide*. Beverly Farms, MA: OEM Press, [1998].

“Medical Surveillance Procedures Manual and Medical Matrix,”

[www.public.navy.mil/surfor/Documents/6260\\_NMCPHC\\_TM.pdf](http://www.public.navy.mil/surfor/Documents/6260_NMCPHC_TM.pdf). Navy and Marine Corps Public Health Center, Bureau of Medicine and Surgery. July 2011.

“Vibration Risk Assessment.”

[www.hse.gov.uk/vibrAtion/hav/advicetoemployers/assessrisks.htm](http://www.hse.gov.uk/vibrAtion/hav/advicetoemployers/assessrisks.htm). Health and Safety Executive. N.d. web.

“Vibration Syndrome”, [www.cdc.gov/niosh/docs/83-110/](http://www.cdc.gov/niosh/docs/83-110/). *Current Intelligence Bulletin 38*, National Institute for Occupational Safety and Health (March 1983): 83-110.