

Vibration

Summary

1. Workers in the construction, mining, manufacturing and automotive industries are often exposed to vibration when working with power hand-tools.
2. Around 1.5-2 million workers in the US are exposed to Hand-Arm Vibration (HAV).
3. HAV Syndrome (HAVS) starts with tingling, numbness and blanching (whitening) of the fingers.
4. Cold weather and smoking (nicotine) can exacerbate the problem as they, along with vibration, cause vasoconstriction, restricting blood vessels and blood flow to the ends of the fingers.
5. HAVS is also known as White Finger Syndrome.
6. ANSI S2.70-2006 is the latest standard document outlining actions that should be taken to protect employees from HAV.
7. Preventative measures include reduced vibration tools and anti-vibration gloves.

Overview

Workers are often exposed to vibration, through machine or vehicle operation, causing symptoms collectively known as vibration syndrome. It is estimated that 1.5-2 million workers in the US are exposed to Hand-Arm Vibration (HAV) caused by the regular use of vibrating hand-held power tools, gasoline chainsaws, hydraulic tools and pneumatic drills. HAV is therefore most likely to be experienced by workers in the construction, manufacturing, mining and automotive industries.

The debilitating condition

Early signs of HAV Syndrome (HAVS) include tingling sensation or numbness of one or more fingers on one or both hands. Those who suffer from this condition experience the sensations regardless of whether they have just used machinery exposing them to HAV. The sensations usually last from five to 15 minutes and are often accompanied by whitening of the fingers and brought on in the presence of cold temperatures or exacerbated by smoking.

Vibration causes the blood vessels in the fingers to constrict, thus restricting blood flow to the fingertips. The condition is often known as Raynaud's Phenomenon and is also known as Vibration White Finger or Hand-Arm Vibration Syndrome. With increased exposure to HAV, the frequency and severity of the condition progresses, causing a worker to become debilitated and unable to work. In the very worst case, fingers can become gangrenous and require amputation.

Standards and preventative measures

The European Union (EU) has issued Directives (89/391/EEC; 2002/44/EEC) to protect workers in member nations against physical agents in the workplace such as HAV and Whole Body Vibration (WBV). Currently, there is no OSHA standard in the regulations in relation to workplace exposure to vibration, although OSHA recognizes the problems associated with HAVS. However, the American National Standards Institute (ANSI), under the Acoustical Society of America, formed a Working Group to develop standards documents in relation to the issue of human vibration. The latest standard to be approved by the Working Group is ANSI S2.70-2006. It outlines actions to be undertaken by employers to protect their workers from vibration such as providing them with reduced vibration tools, anti-vibration gloves and workplace prevention programs. A research/study document entitled 'Hand-Arm Vibration Standards: the New ANSI S2.70 Standard' provides an excellent overview of the main sections of the standard. Click on the first of the 'Essential Links' in the adjacent panel of this page to read more.