

Safety Services Guidance



Hand Arm Vibration

Key word(s):	Vibration, exposure action value, exposure action limit, machinery, hand held power tools, trigger times, maintenance, surveillance
Target audience:	Managers, staff who operate / use hand held powered machinery or tools, gardeners, maintenance operatives

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Plan	1, 15, 16, 19
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Introduction

1. The Control of Vibration Regulations 2005 (the "Regulations") places a duty on the University to identify and control workplace activities which may place its employees at risk of harm as a result of Hand-arm vibration.
2. The Regulations require the University to take necessary steps to reduce the exposure of employees to excessive levels of vibration. These include:
 - Assessing the vibration risk to employees; and
 - Taking action to reduce vibration exposure that produces those risks to as low as reasonably practical.
3. The Regulations require the University to take specific action when the daily exposure reaches a certain action value or action level.

Hand-arm vibration

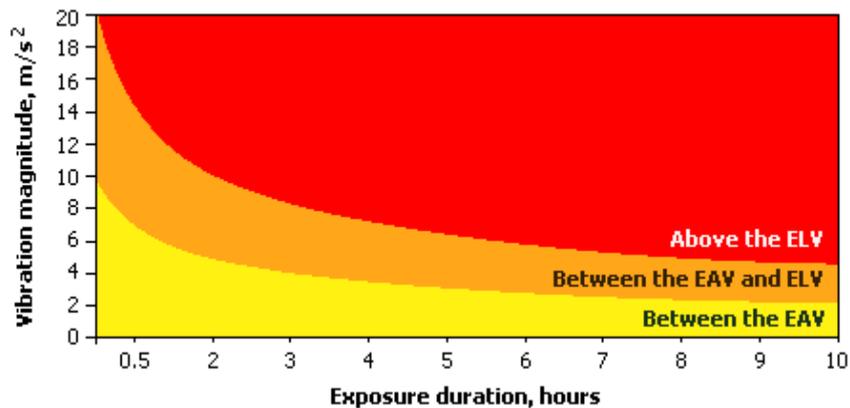
4. Hand-arm vibration syndrome is a condition that has the potential to affect any employee who operates or uses hand held powered machinery or tools as a part of their job.
5. Hand-arm vibration is vibration transmitted from work processes into operatives' hands and arms, typically caused by operating hand held powered machinery. Regular and frequent exposure to hand-arm vibration can lead to undesirable permanent health effects, which include a range of conditions generally known as Hand-arm vibration syndrome (HAVS).
6. Employees whose hands and arms are regularly exposed to high vibration may suffer from different types of conditions to the hands and arms; these include: - impaired blood circulation and / or damage to the nerves and muscles.
7. The high levels of vibration emitted when using certain types of work equipment have the potential to cause permanent damage to a person's hand. The risk will be dependent on:-
 - the level of vibration magnitude received;
 - How long the equipment is actually in use (trigger time);
 - How difficult it is to use the equipment;

- How tightly the hand is required to grip the equipment;
 - The environmental conditions the employee is exposed to when using the equipment.
8. Physical related problems associated with HAVS can manifest themselves months or years after use; this will be dependent on the level of exposure and period of use. Sensations such as loss of strength in the hands, 'tingling' or 'numbness' in the fingers, blanching (fingers appearing to go white), or fingers becoming red and painful on recovery may all indicate early symptoms of HAVS.
9. Work involving employees who regularly use hand held vibrating tools and equipment in areas such as grounds maintenance, workshops and engineering processes and cleaning activities may pose the highest risk of HAVS. Equipment that has the potential to cause HAVS in the workplace include:-
- Chainsaws, strimmer's, blowers, hedge-trimmers, powered lawnmowers, etc;
 - Grinders, rotary burring tools, powered hammers, drills polishers, etc;
 - Wood cutting tools, reciprocating saws, jig-saws, circular saws etc;
 - Percussive metal-working tools, lathes, pillar drills, band-saws, milling machines etc
 - Buffing machines, hand-held sanders.

Exposure Limits

10. The Regulations define two types of exposure:-
- i. The **Exposure Action Value** (EAV) is the amount of vibration exposure above which the University is required to take action to reduce or control exposure. The EAV for Hand arm vibration is a daily exposure of 2.5m/s^2 normalised to an 8 hour reference period (A(8)).
 - ii. **The Exposure Action Level** (EAL) is the maximum amount of vibration exposure of an employee may be exposed to on any single day. The EAL for Hand arm vibration is a daily exposure of 5m/s^2 normalised to an 8 hour reference period (A(8)).

Figure 1. How vibration level and duration affect exposure



11. If there is a significant risk of HAVS, ie where an individual's vibration exposure exceeds 2.5m/s², then the individual must be referred to Occupational Health for a medical assessment. The aim is to identify at an early stage any employee who may be presenting signs of developing HAVS.
12. If at any time between the routine checks, an employee notices any of the signs of HAVS, they should report it as soon as possible to their line manager who will refer them back to Occupational Health.

Management responsibilities to staff who may be exposed to HAVS

13. The Regulations require managers of staff who may be exposed to HAVS to:-

- a. Assess the vibration to employees; and
 - Determine whether the employee is likely to exceed the daily exposure limit value (ELV), and if they are:
 - Take immediate action to reduce their exposure below the exposure limit value.
 - Determine whether they are likely to be exceed the daily exposure action value (EAV) and if they are:
 - Introduce a programme of controls to eliminate risk or reduce the exposure to as low a level as is reasonably practicable;

- Ensure health surveillance is undertaken to those employees who continue to exceed the daily exposure action level.
- b. Provide information and training to employees on the health risks and the actions to take to control those risks;
- c. Retain a record of the risk assessment and control measures;
- d. Provide clothing to protect employees from cold and damp conditions;
- e. Maintain health records for employees under health surveillance; and
- f. Regularly review and update the risk assessment.

14. The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 requires certain events which occur in the workplace to be reported to the enforcing authority. Safety Services must be notified of any instances where an employee has contracted HAVS as a result of occupational exposure to Hand arm vibration. An incident form must be completed as soon as reasonably possible.

Eliminating or controlling of exposure to vibration in the workplace

15. **Breaks:** Operatives who operate or use hand held powered machinery are more likely to reduce the risk of developing HAVS by taking regular breaks; it is considered better to have many short periods of operation than to have a few long periods of operation. Operatives should be encouraged to exercise their hands and fingers during rest breaks to increase blood circulation.

16. **Purchasing / Selection of equipment:** Prior to purchasing new / second hand equipment, information on equipment's vibration levels should be sought from the manufacturer / supplier. It is important to check with the manufacturer / supplier that the vibration data provided represents the way in which the equipment will actually be used. Where possible, purchasing equipment with high vibration should be avoided when there are lower vibration equipment alternatives.

Tools which are easier to hold do not require such a firm grip and less vibration is therefore transmitted. Air powered tools fitted with metal handles can become cold and cold hands with poorer circulation are more likely to be susceptible to the effects of vibration. The air exhaust route from the tool should also be taken into account for the same reason.

17. **Maintaining equipment:** Equipment should be subject to routine inspection and maintenance to minimise deterioration. Manufacturer's instructions should

stipulate the period for servicing and maintenance. Records of maintenance and servicing should be maintained.

18. **Training and Information:** Employees using work equipment should be suitably trained to operate the work equipment correctly and safely; they should also be informed of the risk assessment details in relation to the piece of equipment and the work activity.
19. **Managing:** Managers should plan schedules that minimise vibration exposures to employees and ensure exposures are below the exposure limit value ie job rotation.
20. **Reporting:** Should an employee feel that the performance of a piece of equipment has deteriorated in terms of vibration, they should report it at the earliest opportunity to enable management to investigate.
21. **PPE:** There are a number of 'anti-vibration' gloves on the market which claim to reduce vibration exposure. Most anti-vibration gloves will reduce the transmission of the high frequency vibrations to the hand. However, studies suggest that none are particularly effective against lower frequencies; when assessing the risk of HAVS, it is the lower frequencies which are of concern. Some anti-vibration gloves have been shown to actually increase the transmission of vibration due to the increased grip of the user required to hold the power tool.

The use of thermal gloves can provide warmth and protection to the hands during cold or wet weather. Gloves may also be of particular use where contact with the tool is on bare cold metal or the tool exhausts air over the hand, or entrains air across the hand.

Where gloves are issued there are requirements under the Personal Protective Equipment Regulations 2002 that must be adhered to, these being:

- The gloves should not pose any additional hazard through their use;
- Provision should be made for the safe and hygienic storage of gloves;
- Operators should keep gloves in good condition and use the storage facilities provided;
- Operators should report any defect with gloves to their line manager.

Competent Advice

22. Advice should initially be sought from local Safety Advisors / Health and Safety Officers. Safety Services is able to provide further advice in this subject area.

Further information and guidance

The Control of Vibration at Work Regulations 2005: Approved Code of Practice and Guidance L140 Guidance on Regulations. HSE Books 2005 ISBN 978 0 7176 6125 1

Hand arm vibration at work. A brief guide 2012. HSE Publication INDG175 (rev3). ISBN 978 0 7176 6488 7

www.thetoolAdvisor.com provides published 'in-use' information from different manufacturers on vibration levels of equipment

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