

Loss Prevention Standards – Casualty Classes

Vibration at Work

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Controlling work related exposure to hand-arm vibration and whole-body vibration.



Introduction

The effects of exposure to vibration can have a negative effect on the health of your employees. It can damage joints, muscles, circulation and sensory nerves. This could lead to considerable pain, time off work, or even disability.

Exposure to vibration at work is commonly split in to two categories:

- Hand-arm vibration (HAV)
- Whole-body vibration (WBV)



What is Hand-Arm Vibration (HAV)?

Hand-arm vibration is vibration transmitted into workers' hands and arms. This can come from use of hand-held power tools (such as grinders or road breakers), hand guided equipment (such as powered lawnmowers or pedestrian controlled floor saws) or by holding materials being worked by hand-fed machines (such as pedestal grinders or forge hammers).

The vibration transmitted from the tools or materials to the hands and arms could damage sensory nerves, muscles and joints which can cause ill-health in two forms: Hand-arm vibration syndrome (HAVS) and Carpel tunnel Syndrome (CTS).

What is Whole-Body Vibration (WBV)?

Whole-body vibration is caused by shaking or jolting of the human body through a supporting surface (usually a seat or the floor), for example when driving or riding on a vehicle along an unmade road, operating earth-moving machines or standing on a structure attached to a large, powerful, fixed machine which is impacting or vibrating.

Using vehicles off-road increases the risk of jolts and jarring. For this reason, employees that drive or operate heavy plant and vehicles such as construction plant, agricultural machines and quarry vehicles are especially at risk.

Vibration transmitted through the feet can also be a problem for employees that stand on the platforms of stationary plant such as rock crushers.

What Should I do to Protect People?

Employers have a duty of care to protect their employees and anyone else who may be affected by their work from risks to health and safety, which includes exposure to dangerous levels of vibration. In order to protect people from exposure to vibration, the following steps should be taken:

- Assess the risks to health and safety from vibration to employees and anyone else who may be affected
- Reduce the vibration levels as much as possible, then implement further control measures if further protection is still needed to ensure the exposure limits are not exceeded
- Ensure any training and instruction required is given
- Carry out suitable health surveillance where there is still a risk to health

Reducing the Effects of Vibration at Work

Wherever possible, you should seek to eliminate work practices which expose employees to vibration. This will remove the need to implement further control measures and will provide collective protection to all, rather than just those to which the control measures have been applied. It can be achieved by measures such as choosing equipment and machinery which do not create high levels of vibration.

If it is not possible to remove exposure to vibration from the workplace, then you will need to use other means to control the exposure to workers and others who may be affected. Some suggestions are:

- Think about the tasks employees are carrying out and which ones involve exposure to vibration, both HAV and WBV
- Use tools which do not produce vibration or produce less vibration
- Ensure equipment is maintained properly, as defective equipment may produce higher levels of vibration
- Reduce the amount of time that workers are exposed to vibrations
- Gloves and other warm clothing can help vibration-exposed workers maintain good circulation. However please note that although several different types of anti-vibration gloves are available, all are generally ineffective at reducing the lower frequencies of vibration. However, low hand or body temperature increases the risk of finger blanching because of reduced blood circulation

Risk Assessment

- Assess the risks, by identifying where there may be high levels of vibration and who may be at risk from exposure
- Carry out a reliable estimate as to what the level of exposure is and compare this with the Exposure Action Values (EAV) and Exposure Limit Values (ELV). This should be carried out by competent person, particularly where specialist equipment is required such as vibration monitoring equipment
- Identify what control measures need to be put in place to reduce the exposure to a safe level (see below – Control of Exposure)
- Implement the control measures and ensure that appropriate persons have been assigned responsibilities and ensure suitable information, training and instruction has been provided to those who may be affected
- Review the risk assessments at appropriate intervals to ensure they are still fit for purpose. If changes to the workplace have been carried out, such as changes to machinery, then measurements of vibration may need to be rerevised

Measuring Vibration Exposure

To be relevant, the vibration magnitude you use for your assessment must be representative of the equipment you plan to use and the way in which you plan to use it. There are several possible sources of suitable information on vibration magnitudes. These include:

- Vibration emission values declared in the equipment handbook
- Additional information from the equipment supplier
- Internet databases
- Research organisations
- Vibration consultancies
- Health and Safety Executive (HSE) website
- Trade associations
- Measurements made in your own workplace

What are the Exposure Action Values and Exposure Limit Values?

The [Control of Vibration at Work Regulations 2005](#) require you to take specific action at certain action values.

If employers comply with the Control of Vibration Regulations and follow guidance, it may be possible to reduce instances of ill-health from vibration. There are simple, non-technical and common-sense measures which can be introduced to reduce exposure to vibration.

The regulations introduce exposure action and exposure limit values for hand-arm and whole-body vibration.

The values are:

Hand-arm vibration

The regulations introduce an:

- EAV of 2.5 m/s² A(8) at which level employers should introduce technical and organisational measures to reduce exposure
- ELV of 5.0 m/s² A(8) which should not be exceeded

Whole-body vibration

The regulations introduce an:

- EAV of 0.5 m/s² A(8) at which level employers should introduce technical and organisational measures to reduce exposure
- ELV of 1.15 m/s² A(8) which should not be exceeded

Control of Exposure

You should **introduce control measures whenever an employee's daily exposure to vibration is likely to reach or exceed the EAV and also ensure that you do not expose anyone above the ELV**. Wherever possible, you should take action to eliminate the risks from vibration when it is reasonably practicable to do so. You will need to consider whether there are alternative processes, better equipment and/or better working methods which would largely eliminate vibration risks. If it is not reasonably practicable to eliminate the risks completely, you should reduce them to 'as low a level as is reasonably practicable'.

Once you have identified what the risks of exposure to vibration are, you should reduce the exposure to a safe level. This should always seek to implement the hierarchy of controls in the following order:

- Eliminate the vibration wherever possible, such as by changing the type of work process
- Substitute by replacing with alternative, such as machinery which produces less vibration
- Use Engineering Controls. Jigs and similar aids incorporating anti-vibration mounts can help avoid the need to grip vibrating surfaces. In some cases, the machine manufacturer may supply, or endorse the retrofitting of anti-vibration handles to their product
- Using Administrative Controls, such as reducing the amount of time employees are exposed to harmful levels of vibration
- Personal Protective Equipment (PPE) is the last option in the hierarchy of control and should be used as a last resort after all efforts to eliminate or reduce the vibration levels have been exhausted

HSE Exposure Calculators and Ready-Reckoners

The HSE have developed some useful guidance and tools which can be used to help organisations to develop suitable risk assessments of vibration in the workplace. In order to use these tools, you will need to establish what the vibration levels are, which can be done by monitoring using specialist equipment, obtaining information from suppliers of equipment or from manufacturers' specifications.

Vibration exposure calculator

The vibration exposure calculators can help you work out your daily vibration exposure and weekly vibration exposures.

- [Vibration exposure calculator](#)
- [Guide to using HSE hand-arm vibration calculator](#)

Vibration exposure ready-reckoner

The vibration exposure ready-reckoners allow you to estimate daily or weekly vibration exposure. To use the daily exposure ready-reckoner you will need to know the levels of vibration and durations of exposure which make up a person's working day. For weekly vibration exposure, appropriate where somebody's vibration exposure varies markedly from day to day, you will need to know the daily vibration exposure for each day in the working week. These ready-reckoners can be printed for completion by hand.

- [HSE Daily vibration exposure ready-reckoner](#)

Checklist

A generic Vibration at Work Checklist is presented in Appendix 1 which can be tailored to your own organisation.

Specialist Partner Solutions

Aviva Risk Management Solutions can offer access to a wide range of risk management products and services at preferential rates via our network of Specialist Partners, including:

- [Innovate Healthcare](#) – Occupational Health and Wellbeing Services

For more information please visit:

[Aviva Risk Management Solutions – Specialist Partners](#)

Sources and Useful Links

- [The Control of Vibration at Work Regulations 2005 – Guidance on the Regulations](#)
- [HSE vibration at work](#)
- [Vibration exposure calculator](#)
- [HSE Whole-body vibration at work](#)
- [HSE Hand-arm vibration at work](#)
- [Examples of enforcement action taken by HSE inspectors](#)

Additional Information

Relevant Loss Prevention Standards include:

- Claims Defensibility
- Hand Tool Safety
- Prevention of Musculoskeletal Disorders
- Top Tips for Trips

To find out more, please visit [Aviva Risk Management Solutions](#) or speak to one of our advisors.

Email us at riskadvice@aviva.com or call 0345 366 6666.*

*Calls may be recorded and/or monitored for our joint protection.

Appendix 1 – Vibration at Work Checklist



Location	
Date	
Completed by (name and signature)	

	Vibration at Work Checklist	Y/N	Comments
1.	Is there a risk that vibration exposure to employees in your workplace may be at a harmful level?		
2.	Have you carried out a suitable written risk assessment by establishing what the vibration levels are and who may be at risk from high levels of vibration?		
3.	Have you reduced the levels of vibration as far as reasonably practicable by selecting processes and equipment with consideration of vibration reduction?		
4.	Have you identified and implemented suitable control measures to effectively reduce the exposure to harmful levels of vibration to a level which no longer presents a risk to health and safety?		
5.	Have you given adequate levels of information, instruction and training for those who may be affected?		
6.	Have you implemented a suitable machinery maintenance regime to avoid increased vibration levels?		

Vibration at Work Checklist Contd.		Y/N	Comments
7.	Have you identified areas of vibration levels which are in excess of EAV, made those who may enter the area aware and issued PPE as appropriate?		
8.	Is there an effective defect reporting and repair process in place for machinery?		
9.	If required, have you implemented a suitable health surveillance programme?		
10.	Additional comments:		

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