

Vibration

Level 3 Health and Safety in the Workplace

Introduction

Vibration can be particularly harmful if it is not dealt with appropriately, so it's essential that any workers who come into contact with vibration are suitably trained and efficient at using the machinery.

As an employer, you need to have a good knowledge of the risks surrounding vibration and understand what control measures you can put in place to reduce the risks to your employees.

This section covers assessing and reducing the risks from vibration in the workplace.

Topics to be Covered

The topics covered in this section are:

- Ill health from vibration
- The Control of Vibration at Work Regulations
- Employer duties
- Manufacturers and suppliers
- Vibration risk assessment
- Eliminating and reducing risks
- Health surveillance

Ill Health from Vibration

The prolonged use of equipment and tools that expose your hands to vibration can cause permanent health problems. The most common problems are hand-arm vibration syndrome (HAVS), carpal tunnel syndrome and vibration white finger.

Vibration can cause long-term, painful damage to your hands and fingers. The shocks and jolts from driving certain types of vehicles can also cause severe back pain.

HAVS comes from the use of hand-held power tools and causes significant ill health, such as painful and disabling disorders of the blood vessels, nerves and joints.

Whole-body vibration (WBV) is transmitted through the seat or feet of employees who drive mobile machines or other work vehicles, or who drive over rough and uneven surfaces as a main part of their job.

Symptoms and effects of HAVS include:

- Tingling and numbness in the fingers which can result in an inability to do fine work, such as assembling small components, or everyday tasks, such as fastening buttons.
- Loss of strength in the hands which might affect the ability to do work safely.
- The fingers going white (blanching) and becoming red and painful on recovery, reducing the ability to work in cold or damp conditions.

Symptoms and effects of carpal tunnel syndrome include tingling, numbness, pain and weakness in the hand which can interfere with work and everyday tasks and might affect the ability to do work safely.

Symptoms of both may come and go, but with continued exposure to vibration they may become prolonged or permanent and cause pain, distress and sleep disturbance. This can happen after only a few months of exposure but in most cases it will happen over a few years.

Examples of equipment that may cause HAVS, carpal tunnel syndrome and vibration white finger include:

- Hand-held power tools.
- Rock drills.
- Electric drills.
- Disc cutters.
- Angle grinders.
- Sanders.
- Circular saws.
- Planers.
- Wacker plates.
- Strimmers.
- Jet washers.

The Control of Vibration at Work Regulations

The Control of Vibration at Work Regulations 2005 require employers to ensure that:

- Risks from vibration are controlled.
- Information, instruction and training is provided to employees on the risks and the actions being taken to control them.
- Suitable health surveillance is provided.

Vibration is measured against an exposure action value (EAV) determined by the regulations. This is the daily amount of vibration exposure above which employers are required to take action to control exposure.

The regulations require employers to take action if the daily vibration exposure reaches a certain value.

The exposure limit value (ELV) is the maximum amount of vibration an employee may be exposed to on any single day.

Under the regulations, the action and limit values for hand-arm and whole-body vibration are as follows:

For HAV:

- A daily EAV of 2.5 m/s² averaged over 8 hours. This represents a clear risk requiring management.
- A daily ELV of 5 m/s² averaged over 8 hours. This represents a high risk above which employees should not be exposed.
- For WBV:
 - A daily EAV of 0.5 m/s² averaged over 8 hours at which level employers should introduce technical and organisational measures to reduce exposure.
 - A daily ELV of 1.15 m/s² averaged over 8 hours which should not be exceeded.

Employer Duties

Under the Control of Vibration at Work Regulations, employers are required to reduce the risks from vibration as much as they can and to reduce exposure to vibration as much as possible.

Employers must provide health surveillance to identify any harm early on and take action to prevent disability. They should consult safety or employee representatives on proposals to control risks and provide health surveillance.

Furthermore, certain cases of HAVS, and all cases of vibration-related carpal tunnel syndrome, must be reported in accordance with the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR).

Manufacturers and Suppliers

Tool and machine manufacturers and suppliers are obliged by the Supply of Machinery (Safety) Regulations 2008 to design equipment that will reduce vibration risks to as low a level as possible, making use of the latest technology.

The equipment should be CE marked to show that it complies with this requirement, and health and safety information should be provided in an accompanying instruction book.

The instruction book should include:

- Warnings about any vibration-related risks from using the equipment.
- Information on safe use and, where necessary, training requirements.
- Information on how to maintain the equipment.
- A statement of the vibration emission together with information on the test method used.

For most types of tools, manufacturers use internationally-agreed methods for vibration testing. This allows you to compare the vibration performance of different brands and models of the same type of tool.

Unfortunately, many of these test methods do not represent the way tools perform at work, and vibration levels in the workplace may be much higher than those in this type of 'laboratory' test.

In some industries, employers' organisations, equipment manufacturers and hire companies have adopted colour-coding systems to mark tools to show which are high, medium and low risk.

These 'traffic light' systems are intended to help users manage the use of tools to control risks from vibration.

Vibration Risk Assessment

During your risk assessment, you will need to identify whether there is likely to be a significant risk of harm from vibration. You should:

- Find out from your employees and their supervisors which processes or vehicles (if any) involve regular exposure to vibration.
- Look to see whether there are any warnings about vibration risks in equipment handbooks.
- Ask employees if they have any symptoms, and whether the equipment or vehicles being used produce high levels of vibration or uncomfortable strains on hands, arms or other areas of the body.

The competent person carrying out the risk assessment will need to:

- Make a list of all equipment or vehicles that may cause vibration and what sort of work they are used for.
- Collect information about the equipment or vehicles from handbooks, e.g. the make, model, power, vibration risks, vibration information etc.
- Make a list of employees who use the vibrating equipment or vehicles and which jobs they do.
- Note, as accurately as possible, how long employees' hands or bodies are actually in contact with the equipment while it is vibrating. In some cases, this 'trigger time' may only be a few minutes amongst several hours of work with the equipment.
- Ask employees which equipment seems to have high vibration and about any other problems they may have using it. For example, its weight, awkward postures needed to use the tool, or difficulties in holding and operating it.

Work activities should be grouped according to whether they are high, medium or low risk. The high risk activities are the ones you want to implement control measures for first.

Employees who regularly operate hammer action tools for more than one hour per day, or some rotary and other action tools for more than two hours per day, are considered high risk.

Employees who use vehicles which are likely to cause high vibration exposure for several hours a day are also high risk.

The limit value could be exceeded in a much shorter time in some cases, especially where the tools are not the most suitable ones for the job.

Eliminating and Reducing Risks

When aiming to control the risks:

- Always look for alternative work methods which eliminate or reduce exposure to vibration. Trade associations, equipment suppliers and journals may help to identify good practice.
- Mechanise or automate the work where possible.
- Make sure that equipment selected or allocated for tasks is suitable and can do the work efficiently. Equipment that is unsuitable, too small or not powerful enough is likely to take much longer to complete the task and expose employees to vibration for longer than is necessary.
- Select the lowest vibration tool that is suitable and can do the work efficiently. Limit the use of high vibration tools wherever possible.

You should also review the purchasing policy for replacing old equipment and tools. Work equipment is likely to be replaced over time as it becomes worn out and, where possible, it's important that you choose replacements that are of lower vibration. Discuss your requirements with a range of suppliers before committing to a purchase.

Check with suppliers that their equipment is suitable and will be effective for the work at hand. Compare vibration emission information for different brands or models of equipment, ask for vibration information for the way you plan to use the equipment, and ask for information on any training requirements for safe operation.

Get your employees to try the different models and brands of equipment and take account of their opinions before you decide which equipment to purchase.

Furthermore, be sure to find out about the equipment's vibration-reduction features, as well as how to use and maintain the equipment to make these features effective.

You should also:

- Train purchasing staff on the issues relating to vibration so that they can effectively deal with equipment suppliers.
- Improve the design of workstations to minimise loads on employees' hands, wrists and arms caused by poor posture.
- Use devices such as jigs and suspension systems to reduce the need to grip heavy tools tightly.
- Introduce appropriate maintenance programmes for equipment and vehicles to prevent avoidable increases in vibration, following the manufacturer's recommendations.
- Not use blunt or damaged concrete breaker and chipping hammer chisels, and replace consumable items, such as grinding wheels, so that equipment is efficient.
- Limit the time employees are exposed to vibration. Plan work to avoid individuals being exposed to vibration for long, continuous periods. Several shorter periods are preferable.
- Where tools require continual or frequent use, introduce employee rotas to limit exposure times. You should avoid employees being exposed for periods which are long enough to put them in the high risk group.

Personal protective equipment can also be used to reduce the risks from vibration. Provide employees with clothing where possible to keep them warm and dry: this will encourage good blood circulation and should help protect against vibration white finger.

Gloves can be used to keep hands warm, but they should not be relied upon to provide protection from vibration.

Health Surveillance

Health surveillance must be provided for all employees who, despite your actions to control the risk, are likely to be regularly exposed above the exposure action value or are considered to be at risk for any other reason.

The purpose of health surveillance is to:

- Identify anyone exposed or about to be exposed to vibration who may be at particular risk, for example people with blood circulatory diseases such as Raynaud's Disease.
- Identify any vibration-related diseases at an early stage in employees regularly exposed to vibration.
- Help prevent disease progression and eventual disability.
- Help people stay in work.
- Check the effectiveness of vibration control measures.

With the results of the health surveillance, you will need to:

- Keep records of the health surveillance and fitness for work advice provided for each employee. Health and safety inspectors are entitled to see the health records as part of their checks that you are complying with the regulations.
- Make employees' records available to them on request.
- Act upon any recommendations made by a doctor about an employee's continued exposure to vibration.
- Use the results to review and, if necessary, revise your risk assessment, including your plans to control risks.
- Discuss any changes to your risk assessment with your trade union safety representative or employee representative.
- When necessary, notify the relevant enforcing authority as required by RIDDOR.

Employees should also be provided with information on:

- The health effects of vibration.
- Sources of vibration.
- Whether they are at risk and, if they are, whether the risk is high (above the ELV), medium (above the EAV) or low.
- The risk factors, for example the levels of vibration, daily exposure duration and regularity of exposure over weeks, months and years.
- How to recognise and report symptoms.
- The need for health surveillance, how it can help them remain fit for work, how you plan to provide it, how you plan to use the results and the confidentiality of the results.

Exercise

Which activities should you implement vibration control measures for first?

- High risk
- Medium risk
- Low risk

Summary

In this part of the course, you've learnt about how vibration can cause ill health to employees. The most common conditions caused by vibration are hand-arm vibration syndrome (HAVS), whole-body vibration (WBV), carpal tunnel syndrome and vibration white finger.

The Control of Vibration at Work Regulations 2005 introduced exposure action values (EAV) and exposure limit values (ELV) for hand-arm vibration and whole-body vibration. These values must not be exceeded.

Employers are required to assess the risks from vibration, reduce exposure and provide health surveillance for employees where necessary. Any equipment provided for work should be designed to lower the vibration risks wherever possible.

You should also group work activities according to whether they are high, medium or low risk, and then plan actions to control the risks for the employees at greatest risk first.