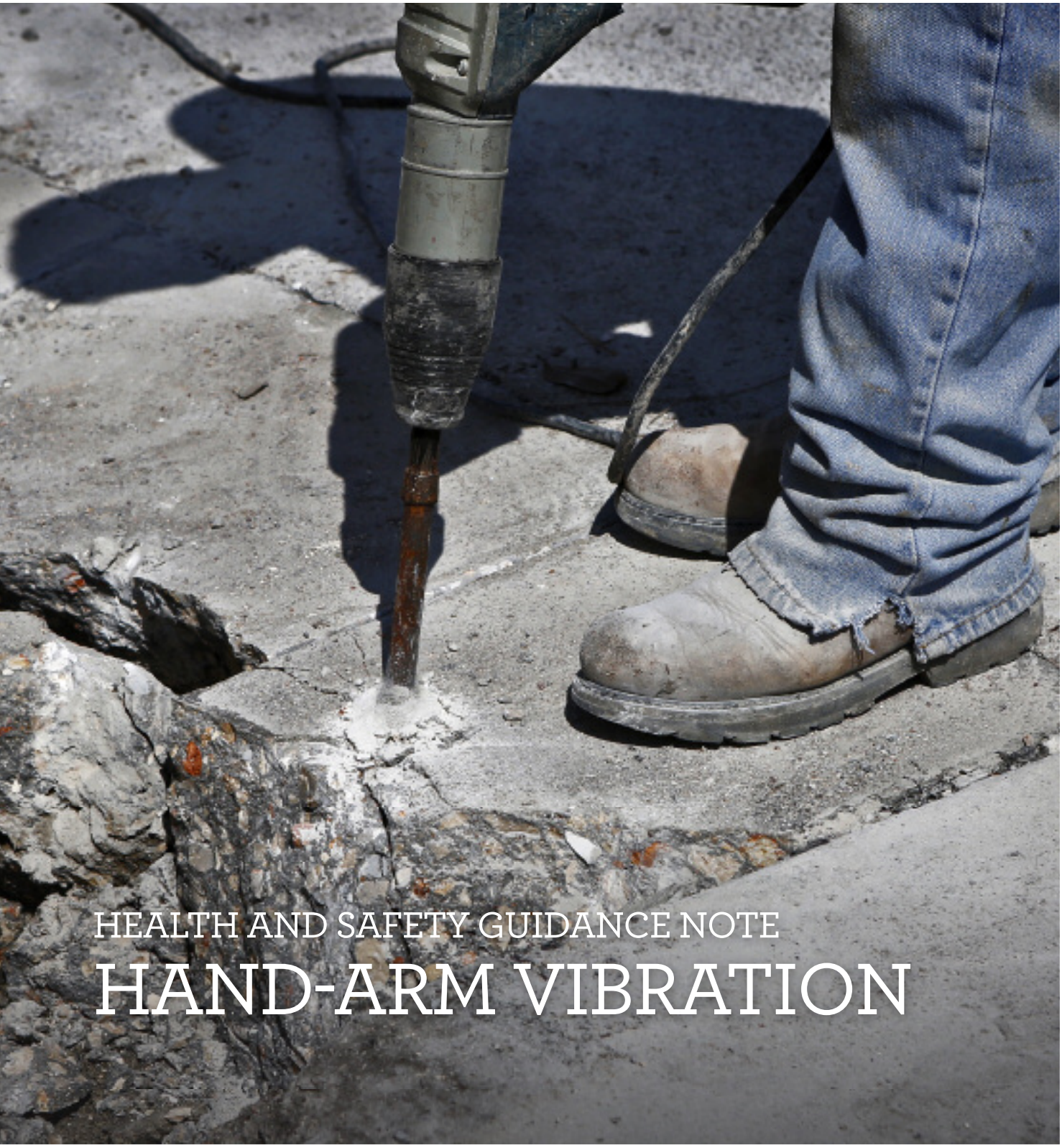

RISK MANAGEMENT SERVICES

HEALTH AND SAFETY GUIDANCE NOTE

HAND-ARM VIBRATION

NFU Mutual
Risk Management Services

INTRODUCTION

Exposure to high levels of vibration can cause long-term painful damage to your hands and fingers. The Control of Vibration at Work Regulations 2005 [The Control of Vibration at Work Regulations (Northern Ireland) 2005] requires employers to reduce the risk to employees from hand-arm vibration.

WHAT IS HAND-ARM VIBRATION?

Hand-arm vibration is vibration that is transmitted from equipment or material that is held / gripped by the operator, into their hands and arms. Hand-arm vibration can cause a range of conditions collectively known as Hand-Arm Vibration Syndrome (HAVS), as well as specific diseases such as carpal tunnel syndrome, a nerve disorder of the hand.

HAVS is the effect vibratory equipment has on the hands and arms. It is caused by:

- The operation of equipment such as hand-held power tools - e.g. rotary or oscillating equipment such as portable grinders, chainsaws, needle guns, impact wrenches etc. Hammer action tools produce some of the highest levels of vibration;
- Hand-guided equipment - e.g. lawn mowers; or
- Materials that are held by the user whilst it is being processed by vibrating machinery - e.g. bench or pedestal grinders.

Frequent and long-term exposure to vibration can lead to permanent damage to the structure and tissue of the hands and arms. Various symptoms can occur in HAVS such as:

- Painful finger blanching (whitening) especially in cold and wet conditions;
- Reduced sense to touch and temperature;
- Numbness and tingling;
- Stiff and painful joints;
- Reduced grip strength, which may affect the ability to do work safely;
- Reduced manual dexterity (e.g. difficulty fastening buttons).

All symptoms may be mild in the early stages and improvement may occur when the employee gives up activities associated with vibration. However in advanced stages of the disease, the employee may be severely debilitated by the symptoms, which will have an impact on work, social activities and ability to sleep of the affected person.

WHAT ARE MY LEGAL DUTIES?

The Control of Vibration at Work Regulations requires you to prevent or reduce risks to health and safety from exposure to vibration at work. As an employer you have to:

- Carry out a risk assessment of the risk from vibration to your employees;
- Take action to reduce vibration exposure;
- Decide if employees are likely to be exposed above the Daily Exposure Action Value (EAV) (see below) and if they are introduce a programme of controls to eliminate risk, or reduce exposure to as low a level as is reasonably practicable;
- Decide if employees are likely to be exposed above the Daily Exposure Limit Value (ELV) (see below) and if they are take immediate action to reduce their exposure below the limit value;
- Make sure the legal limits on vibration exposure are not exceeded;
- Provide information, instruction and training to employees;
- Carry out health surveillance where a risk assessment indicates that there may be a risk to an employee's health;
- Consult your trade union safety representative or employee representative on your proposals to control risk and to provide health surveillance.

You must also keep a record of your risk assessment and control actions and keep health records for employees under health surveillance.

WHAT ARE EXPOSURE ACTION VALUE (EAV) AND EXPOSURE LIMIT VALUE (ELV)

As an employer, you are required to take action to control risks when the daily vibration exposure exceeds the Exposure Action Value (EAV). The greater the level of exposure, the greater the risk and the more action you will need to take to reduce the risk.

The Exposure Limit Value (ELV) is the amount of daily vibration exposure that must not be exceeded. It represents a high risk above which employees should not be exposed.

The EAV and ELV values for hand-arm vibration you need to be aware of are as follows:

Hand-arm vibration values	Exposure Action Value (EAV)	Exposure Limit Value (ELV)*
Vibration magnitude level over an eight hour period	2.5m/s2 A(8)	5.0m/ s2 A(8)

(* The Exposure Limit Value MUST NOT be exceeded).

Both EAV and ELV are quoted for an exposure period over an eight hour working day using the designation A(8).

HOW DO I KNOW IF THERE IS A HAND-ARM VIBRATION PROBLEM IN MY WORKPLACE?

Whether you have a vibration problem in your workplace will depend on whether your employees regularly and frequently work with vibrating tools and equipment and / or handle vibrating materials. It will also depend on how long your employees are exposed to vibration and at what level.

It's likely that you have a vibration issue in your workplace if:

- Your employees complain of tingling and numbness in their hands or fingers after using vibrating tools;
- Your employees hold work pieces, which vibrate while being processed by powered machinery such as bench or pedestal grinders;
- Your employees regularly use hand-held or hand guided power tools and machines such as: concrete breakers, sanders, grinders, disc cutters, hammer drills; chainsaws, brush cutters, hedge trimmers, powered mowers, needle guns etc.;
- Your employees regularly operate hammer action tools for more than about 15 minutes per day, or some rotary and other action tools for more than about one hour per day;
- You work in an industry where exposures to vibration are particularly high, such as construction, foundries, or heavy steel fabrication / shipyards.

HOW CAN I ASSESS THE RISKS?

If any of the situations mentioned apply, you will need to assess the risks to decide whether any further action is needed, and plan how you will do it. You should involve your employees and safety representatives and keep the assessment available as the enforcing authorities may ask to see it.

You can make a simple assessment based on general vibration levels for types of equipment. Manufacturers or trade associations may be able to assist in providing this information. However some measurement data may not be based on realistic conditions and, therefore, further measurements may be required in order to gain accurate vibration levels from tools in use in real conditions. There is no need to buy expensive measuring equipment unless you have equipment with unknown vibration levels.

The severity of risk can be affected by: grip, push and other forces applied by the hand; length and frequency of work; lack of planned rest periods; area of hand exposed to vibration; temperature; smoking and individual susceptibility. Exposure to hand transmitted vibration is quantified in terms of the acceleration of the surface in contact with the hand.

The vibration exposure or 'dose' of a worker, over a working day depends upon the duration of exposure as well as the vibration magnitude at the gripped surface(s) of the tool(s) used. Exposure is adjusted to a standard reference period of 8 hours to allow different exposure patterns to be compared and for the assessment of risk.

Typical Levels of vibration output from equipment include:

- Mitre Saw – 2.5m/s2
- Power Washer – 2.5m/s2
- Portable Steel Saw – 3.9m/s2
- Angle Grinder - 6.5m/s2
- Petrol Hedge Trimmer – 7m/s2
- Hammer Driller - 16m/s2 4"

To calculate the actual exposure you must consider the vibration magnitude levels of the tools and equipment used, against the exposure time. Once you have an idea of the vibration level you then need an estimate of the time the equipment is in actual use (the trigger time). The daily HAVS exposure can then be estimated. The HSE has developed a 'ready reckoner' tool that can be used to determine whether the above values are reached or exceeded for your work activities (see 'Further Guidance').

You could do the risk assessment yourself or appoint a competent person to do it for you. The person who does the risk assessment should understand the risk assessment process, have a good knowledge of the work processes used in your business and be able to collect and understand relevant information. They should also be able to develop a plan of action based on their findings and ensure it is introduced and effective.

The findings of your risk assessment must be recorded, along with any action you have taken, or intend to take, to comply with the law.

You should review your risk assessment if circumstances change or if it is no longer valid (e.g. if your equipment or work practices have changed). An annual review is recommended, but you should not leave it for more than about two years without checking whether a review is needed.

HOW CAN I CONTROL EXPOSURE TO HAND ARM VIBRATION IN MY WORKPLACE?

You can reduce vibration exposure by reducing one or both of:

- The vibration transmitted to the hand; and
- The time spent holding vibrating equipment or work-pieces.

The following sections lists control measures that should be considered for implementation to control the risk of hand-arm vibration. Make sure that you regularly check that your control measures have the desired effect of reducing hand-arm vibration.

Look at changing the way that work is done
Your first goal should be to try and engineer out the risk through design and planning, e.g. use a breaker attachment on an excavating machine to break concrete rather than using a hand-held breaker.

Look for alternative work methods which eliminate or reduce exposure to vibration. Your trade association, other industry contacts, equipment suppliers and trade journals may help you identify good practice in your industry.

Selecting your equipment
You must make sure that your employees use equipment that is suitable for the task. 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.

- Always select the lowest vibration tool that is suitable and can do the work efficiently.
- Limit the use of high-vibration tools wherever possible.

When you are looking for new or replacement equipment or tools, you should choose, so far as is reasonably practicable, those that are suitable for the work, efficient and of lower vibration.

When choosing work equipment that presents a HAVS risk, ask yourself the following questions:

- Is the equipment suitable for the task and likely to get the work done faster?
- Is the equipment vibration emission among the lowest in class?
- Is the tool lighter and more comfortable to use?
- Are the consumables used correct for the task and the lowest vibration emitting available?

The tool / equipment manufacturer should be able to advise on some of these issues, but older tools may require testing to determine vibration levels. Bear in mind that some old equipment may have vibration levels far in excess of new tools.

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

Workstation design
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, e.g. where a heavy grinder is used at a permanent workstation to do repetitive work, suspend it from a counterbalance system to reduce the load on the operator's arms and the tightness of grip needed.

Maintaining your equipment
Introduce appropriate maintenance programmes for your equipment to prevent avoidable increases in vibration (following the manufacturer's recommendations where appropriate).

Do not use blunt or damaged concrete breaker and chipping hammer chisels and replace consumable items such as grinding wheels, so that equipment is efficient and keeps employee exposure as short as possible.

Adjusting work schedules
Limit the time that your 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.

Keeping warm and dry
Help employees maintain good blood circulation, for example, by providing clothing to help them keep warm and dry when necessary. Gloves can be used to keep hands warm, but should not be relied upon to provide protection from vibration.

INFORMATION, INSTRUCTION, TRAINING AND SUPERVISION

Where employees are likely to be exposed to the risks of hand-arm vibration, you need to provide them with training so that they understand the risks they may be exposed to, and their duties and responsibilities.

The information, instruction and training should at least include the following:

- The health effects of hand-arm vibration;
- Sources of hand-arm vibration;
- Whether they are at risk, and if so whether the risk is high (above the ELV), medium (above the EAV) or low;
- The risk factors (e.g. the levels of vibration, daily exposure duration, regularity of exposure over weeks, months and years);
- How to recognise and report symptoms;
- The need for and their own responsibility to co-operate with any requests to attend health surveillance;
- Ways to minimise risk including:
  - Changes to working practices to reduce vibration exposure;
  - Correct selection, use and maintenance of equipment;
  - Correct techniques for equipment use, how to reduce grip force etc;
  - Maintenance of good blood circulation at work by keeping warm, massaging fingers and, if possible, cutting down on smoking.

It is important that workers are appropriately supervised. Effective supervision can help you monitor the effectiveness of the training that people have received, and whether employees have the necessary competence to do the job.

FURTHER GUIDANCE

- HSE website 'Vibration at Work' www.hse.gov.uk/vibration/index.htm
- INDG 175 Hand-arm vibration at work: A brief guide http://www.hse.gov.uk/pubns/indg175.pdf
- INDG296 Hand-arm vibration: A guide for employees www.hse.gov.uk/pubns/indg296.pdf
- The HSE's hand-arm 'ready reckoner' and vibration calculator can be downloaded at: www.hse.gov.uk/vibration/hav/vibrationcalc.htm
- HSG170 Vibration solutions - Practical ways to reduce the risk of hand-arm vibration injury www.hse.gov.uk/pubns/books/hsg170.htm

These documents are available to download free of charge from www.hse.gov.uk/pubns/books

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