

WHAT YOU'LL LEARN

- HOW THE LEVEL OF DAILY EXPOSURE TO VIBRATION IS CALCULATED
- WHAT STEPS SHOULD BE TAKEN TO MANAGE EXPOSURE
- HOW TO PREPARE A METHOD STATEMENT

GETTING TO GRIPS WITH HAND ARM VIBRATION SYNDROME

Contractors can play their part in helping workers reduce the risk of developing HAVS, says **Dr Tom Gunston**

Hand arm vibration syndrome (HAVS) is a serious condition caused by over-exposure to vibration from held machinery. The Health and Safety Executive reports that around 2m workers are at risk. HAVS has become a more prominent issue since the introduction of the Control of Vibration at Work Regulations in 2005, the UK version of the EU Physical Agents (Vibration) Directive. Since its introduction, contractors that fail to properly manage employee vibration exposures could face substantial compensation claims.

Vibration white finger (VWF) is the most common HAVS disorder. This is characterised by a whitening of the fingers due to a loss of blood flow, causing numbness, tingling and chronic pain in the fingers, which can lead to a permanent and irreversible condition.

Less visible, but often considered more disabling, is damage to the nervous system, joints and bones. These disorders are painful, mostly irreversible, and can disrupt lives.

The construction industry is improving the way it manages HAVS and an increasing number of contractors and subcontractors have vibration control policies in place. But contractors still face challenges translating the general requirements of the Control of Vibration at Work Regulations into efficient and robust systems that work in practice. Construction sites are constantly changing with different

subcontractors carrying out different tasks with different machines, which makes vibration exposure much harder to assess and control than in a factory or workshop.

Contractors can take various measures to minimise the risk of workers developing HAVS and communication is critical. Personnel with responsibility for managing vibration should ensure that machine users fully understand what HAVS is, recognise the symptoms and are aware of how conditions can develop.

Alternative methods

The most effective management strategy is to identify alternative working methods that eliminate the HAVS risk completely: using a vehicle-mounted pick instead of a hand-held breaker, for example. Once alternatives have been considered, residual vibration exposure must then be managed.

The 2005 Regulations set two levels for the daily exposure to vibration, an exposure action value (EAV) and exposure limit value (ELV). These are defined in metres per second squared averaged over an eight-hour working day, or A(8). The EAV for hand arm vibration is $2.5 \text{ m/s}^2 \text{ A}(8)$ and the ELV is $5 \text{ m/s}^2 \text{ A}(8)$.

If exposure is likely to exceed the EAV then steps must be taken to minimise it. No worker must ever exceed the ELV.

In practice, it is more common for



MEASURING UP: This pneumatic breaker is fitted with a HAVI vibration indicator.

AUTHOR'S NOTE

V J Technology manufactures and distributes fixing systems, fastenings, power tools and accessories to the construction and civil engineering industries. Its customers include main contractors and specialist sub-contractors.

Products are developed through exhaustive testing and incorporate

many technical features and time-saving benefits. Thanks to in-house technical expertise, V J Technology is able to help engineers, architects and tradesmen select the most practical and cost-effective solution for their specific applications.

V J Technology also set up the Noise and Vibration Control Group, which includes a purpose-built

testing facility, to provide practical information and guidance to sites and safety managers. The company aims to make it easier for customers to manage the risks from vibration and other related occupational hazards such as noise and dust.

V J Technology works with contractors in the UK to assist with vibration control management. This

typically involves providing exposure information, incorporating a vibration control management programme into the in-house health and safety policies and procedures, plus a training programme.

→ vibration exposures to be measured in terms of 'trigger times', 'productivity', or 'HSE points'. Trigger time is the period a worker spends using a machine, and productivity is the amount of work they can be expected to carry out before the EAV and ELV are reached.

Where a worker is carrying out a series of different tasks, measuring the overall exposure becomes more complicated. The Health and Safety Executive therefore introduced a points system where the EAV is 100 points and the ELV is 400 points. The points can simply be added together to arrive at a total exposure figure.

Power tool suppliers are required to provide guidance on the risks associated with use of the machine (see example below). As a minimum, the tool's vibration emission values should be included in the user handbook. This value is determined using a standardised test allowing one tool to be compared with another.

THE TOOL'S VIBRATION EMISSION VALUES SHOULD BE INCLUDED IN THE USER HANDBOOK

In general, contractors should use declared values to select the lowest-vibration tool. However, a low-vibration tool may not be an improvement if it takes longer to do the job, so it is important that the performance of the tool is considered as well as the vibration levels.

When undertaking a risk assessment, it remains the employer's responsibility to decide what vibration value to use. The recommended approach is to consult the supplier to ensure that any information provided is useful and relevant.

If a task is considered to have an unavoidable HAVS risk and reliable information is not available, it may be necessary to take measurements to assess the scale of the risk and the effectiveness of controls.

Methods for taking measurements on site are described in the standard BS EN ISO 5349. These tests should be performed by trained, experienced personnel who have a clear understanding of the limitations of the methods and equipment involved. Real-use and customer-specific testing can be provided by VJ Technology.

Finally, it is important to note that the Construction Design and Management Regulations can play an important role in reducing exposure to vibration. Use of off-site techniques, for example, will minimise the work needed on site by hand-held machines.

Monitoring problems and systems

An effective HAVS management system will generally require vibration emission information from suppliers, training for risk assessors,

task planners and machine operators, plus monitoring by a suitably qualified occupational health practitioner. The system must eliminate exposure where possible, minimise any remaining risk and spot the symptoms of HAVS at an early stage.

A practical means of testing the robustness of the system is to begin with a worker and move upwards, considering risk assessment and occupational health issues separately. For example, from the risk assessment perspective, is it possible to say that from the moment a worker picks up a new breaker tip they are not likely to be exposed beyond the EAV (or ELV)? If so, how was this worked out, where did the information come from, is that information appropriate to the job in hand, and was it necessary to use a hand-held breaker in the first place?

From an occupational health perspective, if a worker comes off the breaker on a cold afternoon with early signs of VWF in a fingertip, are they aware that this is likely to be the start of something more serious and must report it? Who do they speak to? How are they referred to occupational health specialists?

It shouldn't be necessary to compile detailed exposure logs for every worker carrying out every task. Too much emphasis on recording exposures after the event takes attention away from minimising exposure in the first place.

Reporting and referral

The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 place a duty on an employer to report any cases of HAVS arising from certain work activities or of



understand their roles and responsibilities.

A typical tiered approach to health surveillance might work as follows:

Tier 1 A short questionnaire to gauge an employee's understanding of HAVS.

Tier 2 A short questionnaire issued once a year to employees exposed to vibration, checking whether they need to be referred to an occupational health nurse.

Tier 3 A HAVS health assessment by a qualified person such as an occupational health nurse.

Tier 4 If the assessment shows that the



VIBRATION VALUES FOR A MAKITA HR4011C POWERDRILL

| Weight (kg) | Vibration (m/s ²) | Trigger Time to EAV | Trigger Time to ELV | Never exceed | HSE points /15min |
|-------------|-------------------------------|---------------------|---------------------|--------------|-------------------|
| 6.4 | 8.1 ⁽¹⁾ | 45 min | 3h 0m | 3h 0m | 33 |

carpal tunnel syndrome associated with exposure to vibration.

A health surveillance programme is not legally required unless workers are likely to be exposed over the EAV. But given the varied tasks carried out by construction workers, many contractors have sensibly put all regular power tool users under a health surveillance programme.

Employers considering a health surveillance programme must explain to employees and safety or employee representatives what is being proposed and give them the opportunity to comment on the proposals. Employees must be given information on the reasons for carrying out health surveillance and

employee has HAVS, a formal diagnosis should be carried out by a doctor qualified in occupational health. They will advise on the employee's fitness for work.

Tier 5 This is optional and involves referring the employee for various HAVS tests, the results of which may help the doctor assess fitness for work.

Preparing a method statement

The following questions should be asked when developing a method statement for HAVS:

- Can a task be carried out in a different way to eliminate the vibration completely? This must be considered with the efficiency of the project in mind, but some alternative working



PUT TO THE TEST:
*monitoring tools will
reveal accurate EAV
and ELV information*

practices are faster and produce less noise than a vibration-intensive alternative.

- Is the vibration exposure likely to be over the EAV? If so, can it be reduced and are the workers under health surveillance?
- Have the workers been given information about HAVS, including the symptoms and simple ways to reduce the risk?
- Are the tool and consumables the most appropriate for the task?
- Can the work be split between more than one worker to reduce individual exposures?
- If the exposure from this task is significant then steps should be taken to ensure that workers do not move on to another high vibration task.

Managing HAVS is an issue for sites of all sizes, but the major challenge faced on large construction sites is ensuring that HAVS assessment and management is taken up by smaller contractors and sub-contractors. At the moment, VJ Technology is working with some of the industry's larger players, providing management advice and training. As major contractors improve and refine their vibration control practices, these will filter down to smaller companies and sub-contractors.

Vibration exposure is complex and remains an active area of research at leading institutions in many countries. As knowledge of the causes improves, best practices for high-risk industries, such as construction, will evolve. Anyone who uses a power tool is at risk from HAVS, but this risk can, and legally must, be responsibly managed. **cm**

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