



Barrie Roe MBE  
Technical Manager  
SKILLBUILD Competitions Limited  
1 Tanhouse  
Orton Malborne  
PETERBOROUGH  
Cambs PE2 5NA  
Tel/Fax 01733 234793

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J Hammer CB  
Technical Delegate  
UK Skills  
18 Park Square East  
London  
NW1 4LH

Dear Jim

I recently attended a meeting of the Stone Federation Great Britain where the problem of hand-arm vibration syndrome (white finger) was discussed and specifically in relation to the amount of time spent using air-powered tools at a competition.

I have enclosed for your information the HSE Information Sheet specific to this problem. You will see from the table on page 2 that the maximum time limit is 2 to 40 minutes, I take this to be 2 continuous minutes and a collective total of 40 minutes. The time in question is only that when the hammer is actually in contact with the stone thereby causing the greatest vibration.

SKILLBUILD will now be taking some measures to reduce the total amount of time a competitor can use air-powered tools; some work will now be done by traditional means of using a hand held mallet.

Whilst we can take measures to control the use at a national level, there seems little can be done to influence change in the International Technical Description, where many countries have lower levels of Health and Safety and possibly white finger is a problem yet to be identified.

The use of air powered tools in international competitions will far exceed the recommendations of HSE. What will be the situation if a competitors employer works within the guidelines of HSE but UK Skills as the organisation responsible for the UK team expects that competitor to work outside of the HSE Guidelines? Or are we prepared to send a competitor to the international competition to work within the HSE Guidelines in full knowledge that he/she is competing in an unequal situation? Where will responsibility be laid in the event of any claim being made?

At the next International Technical Committee in June 2000 is it possible for you to raise this issue with your international colleagues and start the process where change can be made. I feel a directive for change must come from the International Delegates, I would not have any confidence in support from the stonemasonry international technical experts for any proposal put forward by Richard Golland.



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I fully appreciate that Health and Safety requirements do vary from country to country as was so obvious in Montreal, but I do feel the issue is of sufficient importance for the International Technical Delegates to accept best working practice as being the minimum required of all countries when competing at international level.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Barrie', followed by a long horizontal flourish.

Barrie Roe MBE  
Technical Manager  
SKILLBUILD Competitions Limited

Cc

Belinda Barclay  
Peter Ellis  
Richard Golland

SKILLBUILD Project Manager  
Stone Federation Training Committee Chairman  
UK Technical Expert Stonemasonry



## Reducing the risk of hand-arm vibration injury among stonemasons

MISC112

### Introduction

This information sheet produced by the Health and Safety Executive outlines the risks to workers in the stonemasonry industry from hand-arm vibration. It is aimed at employers, employees and their representatives and deals with:

- the effects of vibration;
- symptoms to look for;
- what action to take if symptoms are suspected;
- how to assess exposure; and
- how to reduce the risks.

### What is hand-arm vibration syndrome?

Hand-arm vibration syndrome (HAVS) is a group of diseases caused by exposure of the hands to vibration. The best known of these is vibration white finger (VWF) which is caused by damage to blood circulation.

Other damage may be to the nerves and muscles of the fingers and hands, causing numbness and tingling, reduced grip strength and sensitivity. Carpal tunnel syndrome (CTS) is an example of this and is caused by compression of nerves in the wrist. Pain and stiffness in the hands and joints of the wrists, elbows and shoulders may also occur (see Further reading).

HAVS and CTS are reportable diseases under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (see Further reading).

### Symptoms

VWF is characterised by attacks of blanching (whitening) when the fingers become numb. At first only the fingertips are affected but over a period of time the whole finger may be affected. Attacks last up to half-an-hour and often end with a painful, throbbing return of blood flow as the colour of the fingers changes to bright red.

Tingling and numbness caused by nerve damage can develop independently from blanching and eventually the fine sensation in the fingertips may be permanently lost, making it difficult to undertake delicate jobs. These effects are separate from the tingling that can occur during exposure to vibration. Reduced grip strength has also been found in some exposed workers.

### Who is at risk?

HAV usually comes from finger or hand contact with either a powered tool or material being held against a moving surface, eg an abrasive wheel.

The users of rotating or percussive hand-guided tools, where the hands are exposed to high levels of vibration, are at greatest risk. The degree of risk depends on:

- the amount of tool vibration;
- the length of time for which the tool is used;
- whether tool use is intermittent or continuous;
- workplace temperature;
- individual susceptibility;
- the method of work; and
- the ergonomics of the task.

Although in many cases symptoms may take several years to develop, they can appear after only a few months in susceptible people exposed to high levels of vibration.

### HAVS among stonemasons

Many stonemasons use a range of powered hand-tools during the working day including chipping hammers, angle grinders, drills, disc sanders/cutters, air rammers and abrasive wheels. Most masons using powered hand-tools are at risk of developing hand-arm vibration syndrome.

Many cases of VWF have been found in UK stonemasons' yards but masons themselves appear reluctant to report their symptoms, often thinking that they indicate arthritis.

A regular vibration maximum exposure level of  $2.8 \text{ m.s}^{-2} \text{ A(8)}$  (ie daily average) is recommended by HSE.<sup>1</sup> This feels much like using a powered lawnmower for four hours. Above this level a programme of preventive measures and health surveillance should be introduced.

### Working practices and exposure to hand-arm vibration

Powered hand tools are used in many yards but the amount of use varies widely from a few minutes per week to almost continuously. Some masons use one type of powered hand-tool only, while others use a range of tools.



Powered hand-tools are used for tasks including cutting, carving, grinding, sanding, and polishing stone. Most tools are likely to be rotary but a few, particularly for carving, will be percussive.

There is a wide range of work and hand-tools being used at different yards. Vibration levels of up to 40 ms<sup>-2</sup> have been measured, so many masons are likely to be exposed above the HSE recommended limit.

The table below indicates regular daily usage times for some tools after which a programme of preventive measures is required. Note the way vibration-reduced tools increase the period that tools can be used.

<i>Tool type</i>	<i>Typical vibration magnitudes</i>	<i>Time limit before action recommended</i>
Chipping hammers	10-40 ms <sup>-2</sup>	2- 40 minutes
Sand rammers	25-40 ms <sup>-2</sup>	2-6 minutes
Angle grinders	2-35 ms <sup>-2</sup>	3 minutes-16 hours
Disc cutters	4-10 ms <sup>-2</sup>	40 minutes-4 hours
Disc sanders	10-15 ms <sup>-2</sup>	16-40 minutes
Rock drills	15-35 ms <sup>-2</sup>	3-16 minutes

Assessing exposure to vibration

Exposure to hand-arm vibration is a risk that should be assessed under the Management of Health and Safety at Work (MHSW) Regulations 1992. A written record of the assessment should be made where there are significant risks. Assessments can be done by staff, often an expert or consultant is not needed for this. Taking these four steps will achieve results:

- find out if there is a problem;
- decide what action to take;
- take action; and
- check what has been done.

Vibration exposure assessments should identify all groups of workers likely to be exposed above 2.8 m.s<sup>-2</sup> A(8). There should be an estimate of likely daily personal vibration exposure levels, the number of masons involved in each task and the pattern of exposure, for example daily, three days per month etc. The assessment should prioritise preventive and protective measures for reduction of the risk of vibration

injury, taking account of patterns of exposure and other factors as detailed in HSE guidance.<sup>1</sup>

Health surveillance

Health surveillance for vibration injury is required under the MHSW Regulations. This should be a programme overseen by a doctor. A suitable arrangement would be a worker questionnaire completed on-site by an informed member of staff. The completed surveys would be sent to the doctor who would diagnose and make recommendations. It is important that suitably qualified people are involved - see HSE guidance.<sup>1</sup>

Health surveillance can prevent significant handicap. It can confirm that there are weaknesses in control of the risk of vibration injury, indicate where improved control efforts should be concentrated, and occasionally indicate where people should be removed from work. Pre-employment screening followed by annual checks is good practice.

Reducing exposure to vibration

Use of high-vibration tooling should be eliminated wherever possible. Mechanisation of processes commonly performed using powered hand-tools is one way of reducing the risk, eg the use of planing machines to rough shape stone, and auto-lettering machinery.

Actions to minimise the risk of vibration injury should include:

- careful selection of reduced vibration power tools;
- using water-powered tools;
- careful selection of the cutting tool (chisel etc) for the job;
- selection of well balanced discs on sanders and grinders;
- maintenance of the power tool, eg anti-vibration mountings; and
- maintenance of the cutting tool (sharpness of chisels etc).

Selection of low-vibration tools

Tools bearing the CE mark are declared by the manufacturer to be safe when used as instructed. Vibration data is given in technical sales literature and the instruction book if the vibration level exceeds 2.5 m.s<sup>-2</sup> during standard tests.<sup>2</sup> Supplementary information on measures necessary to control risks from exposure to tool vibration should appear in the instruction book.

Manufacturers' vibration data should be used to select a group of relatively low-vibration tools appropriate for a task. This group will usually contain the tools with the lowest vibration for the task but trials may be needed to confirm the lowest vibration tool.

**Purchasers should be aware that many tools produce much higher vibration levels during normal use than those declared in the instruction book.**

Manufacturers may cover such eventualities in discussion of 'residual risks' in the instruction book.

Low-vibration tool accessories should be selected. For example, well balanced blades or discs on rotary tools substantially reduce vibration levels.

Retrospective vibration controls

There are some instances where retrospective engineering vibration control at source will be reasonably practicable in stonemasons' yards, eg redirecting air exhaust away from the operator's hands.

Poor maintenance contributes to high vibration exposures. Masons should be instructed to report defective tools for maintenance and cutting tools should be kept sharp. Vibration exposures can be reduced by job rotation.

Applying so-called anti-vibration coatings to handles may help to keep your hands warm but it is unlikely to reduce the low-vibration frequencies which are the most harmful.

Personal protection

There is no personal protective equipment that has proved to be effective against HAVS in stonemasons' yards. Anti-vibration gloves may be beneficial in keeping hands warm but they are generally not effective at reducing vibration at the low frequencies which are important in the development of VWF.

However, it is important to keep hands warm, as this increases blood flow. This can be done by wearing thermal gloves and providing localised heating and rest breaks in cold conditions for workers to exercise and keep their hands warm. Exercising hands and fingers and not smoking will also help.

References

1 *Hand-arm vibration* HSG88 HSE Books 1994 ISBN 0 7176 0743 7

2 BS EN ISO 8662-14:1997 *Hand-held portable power tools - Measurement of vibrations at the handle Part 14: Stone working tools and needle scalers* British Standards Institution

Further reading

*Vibration solutions: practical ways to reduce the risk of hand-arm vibration injury* HSG170 HSE Books 1997 ISBN 0 7176 0954 5

*Everyone's guide to RIDDOR 95* HSE31 HSE Books 1996 Single leaflets free, multiple copies in priced packs ISBN 0 7176 1077 2

*The costs of accidents at work* HSG96 HSE Books 1997 ISBN 0 7176 1343 7

The future availability and accuracy of the publications listed in this Information Sheet cannot be guaranteed.

Further information

HSE priced publications are available by mail order from HSE Books, PO Box 1999, Sudbury, Suffolk CO10 6FS Tel: 01787 881165 Fax: 01787 313995

HSE priced publications are also available from good booksellers.

For other enquiries ring HSE's InfoLine Tel: 0541 545500, or write to HSE's Information Centre, Broad Lane, Sheffield S3 7HQ.

HSE home page on the World Wide Web: <http://www.open.gov.uk/hse/hsehome.htm>

This leaflet contains notes on good practice which are not compulsory but which you may find helpful in considering what you need to do.



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