

Safety Info Sheet:	19-01	Simple. Sensible. Safety. SITK Ltd t/a Safety is the Key Health & Safety Consultants www.safetyisthekey.co.uk	
Hand Arm Vibration (HAVs) Information Sheet			

What is hand-arm vibration?

Hand-arm vibration is vibration transmitted into workers' hands & arms from either hand-held power tools or fixed machinery i.e. grinders, road breakers, lawnmowers, forge hammers etc.



Why is hand-arm vibration an issue?

Regular exposure to hand-arm vibration can lead to: (1) hand-arm vibration syndrome (HAVS); or (2) carpal tunnel syndrome (CTS). Symptoms can include: (1) tingling and numbness in the fingers that can prevent you doing everyday tasks; (2) loss of strength in the hands and (3) the fingers going white (blanching) and becoming red and painful on recovery.

With continued exposure, symptoms may become prolonged or permanent and cause pain and sleep disturbance. This can happen between a few months or a few years of exposure.

What the law says

The Vibration Regulations require employers: (1) to make sure that risks from vibration are controlled; (2) provide information, instruction and training to employees; and (3) provide suitable health surveillance if they exceed certain levels – the EAV (exposure action value) and ELV (exposure limit values):

- A daily EAV of 2.5 m/s² A(8) represents a clear risk requiring management; and
- Daily ELV of 5 m/s² A(8) represents a high risk. Employees **must not** exceed this level.

Example 1: For hammer-action powered hand-tools, you are likely to reach the EAV after just 15 minutes (or one hour for non-hammer action tools).

Example 2: For hammer-action powered hand-tools, you are likely to reach the ELV after about one hour (or four hours for non-hammer action tools).

Is hand-arm vibration a problem in my workplace?

Some jobs and industries are known to be likely to create a vibration risk such as: Foundries; Construction; Engineering; Forestry; Motor vehicle repair; Maintenance; Utilities etc.

Which tools are most likely to create a risk?

Some tools are known to be likely to create a vibration risk such as:

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chainsaws; grinders; hand-fed equipment; impact drills; scaling hammers; sanders; polishers; pedestrian controlled equipment; powered hammers; hand-held saws etc.

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.



Assess where risks are most likely

- Find out who is exposed to hand-arm vibration in your work and what is causing it.
- Estimate the time workers spend holding the equipment or work-piece while it is vibrating.
- Very short periods may not be a problem, but the longer the equipment or work-piece is held, the higher the exposure will be.
- Ask users of equipment if they feel tingling or numbness during or after exposure to vibration. If they do, their exposure to vibration could be causing them harm.
- Use the Vibration Calculator (see Info Sheet 19-02) to work out employee exposures.

How should I use this information?

Look for ways of working that avoid or reduce the need to hold vibrating tools / equipment and consider vibration emissions when purchasing or hiring new tools or equipment.

Keep an inventory of equipment and its vibration emissions and maintain equipment in accordance with its manufacturer's instructions. Plan your work schedules to minimise vibration exposures and organise work to avoid uncomfortable postures and the need for high manual effort to grip, push or pull equipment. Finally, help employees maintain good blood circulation, for example, by providing clothing to help them keep warm and dry.

Information, instruction and training

Tell your employees (1) the health effects of hand-arm vibration; (2) the sources of hand-arm vibration and how the vibration has been minimised; (3) whether they are at risk; (4) how to recognise and report symptoms; (5) how health surveillance can help them remain at work and what your arrangements are for health surveillance; (6) the steps you have taken, or plan to take, to minimise the risk; (7) where necessary, training in how to use equipment to minimise vibration and how to reduce grip force etc.

Health surveillance

You **must** provide health surveillance when exposures are at or above the EAV and in other circumstances where there is risk, for example, after diagnosis of HAVS and exposure continues but below the EAV.

Health surveillance can involve just a short set of questions until, for example, signs or symptoms are reported; or other medical tests carried out by someone with medical qualifications and training.

Finally, if any of your employees suffers from HAVS or CTS, you must report it under RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations).

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Safety Info Sheet:	19-02	Simple. Sensible. Safety.	
Guide to using the on-line HAVS 'hand-arm vibration' exposure calculator		SITK Ltd t/a Safety is the Key Health & Safety Consultants www.safetyisthekey.co.uk	



HAND-ARM VIBRATION EXPOSURE CALCULATOR

Version 4.3 January 2014

Tool or process name	Vibration magnitude m/s ² r.m.s.	Exposure points per hour	Time to reach EAV 2.5 m/s ² A(8)		Time to reach ELV 5 m/s ² A(8)		Exposure duration		Partial exposure m/s ² A(8)	Partial exposure points
			hours	minutes	hours	minutes	hours	minutes		
Tool or process 1	10	200		30	2			15	1.8	50
Tool or process 2	6	72	1	23	5	33	0.5		1.5	36
Tool or process 3	3.5	25	4	5	16	20	1	30	1.5	37
Tool or process 4										
Tool or process 5										
Tool or process 6										

Lock Tool or process names

Instructions for use:
 Enter vibration magnitudes and exposure durations in the white areas
 To calculate, press <Enter>, or move the cursor to a different cell
 The results are displayed in the yellow areas
 To clear all cells, click on the 'Reset' button
 Tick the 'Lock tool or process name' check box to prevent 'Reset' clearing these cells
 For more information, click the 'Help' button

Daily exposure
m/s² A(8)
2.8

Total exposure points
123

WARNING: Exposure at or above 2.5m/s²A(8) EAV (100 points)

1. The calculator may be used online or you can download and save it as an Excel document.

2. Click on the white areas and type in a vibration magnitude in m/s² - see the equipment, or the supplier / manufacturers manual. Then type in exposure duration (in hours and/or minutes). You can do this for up to six different tools or processes then press ENTER.

3. The following values will then be calculated and displayed in the yellow cells on the right.

The Partial exposure is the vibration exposure (shown in both m/s²A(8) and exposure points) for each individual tool or process, and is calculated from the Vibration magnitude and the Exposure duration.

The Total exposure, also given in m/s²A(8) and exposure points, is calculated from the Partial exposures.

4. In addition to above, the calculator also gives you the following values:

Exposure points per hour. The number of exposure points for every hour of exposure time for the individual tool or process.

Time to reach EAV (exposure action value) i.e. the total exposure time required for the individual tool or process, before the exposure action value (2.5 m/s²A(8) or 100 points) is reached.

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Time to reach ELV (exposure limit value) i.e. the total exposure time required for the individual tool or process, before the exposure limit value (5 m/s²A(8) or 400 points) is reached.

5. In the example photo above, three tools are used by an operator during a working day. The vibration magnitudes are 10, 6 and 3.5 m/s² and the total exposure times are 15, 30 and 90 minutes respectively. These values have been typed into the white cells (you can use hours, minutes or a combination of the two for the exposure duration). The results (in the yellow cells) show the partial exposure values for the three tools and the total exposure which, at 2.8 m/s² A(8) or 123 points, is above the exposure action value.

Typical Question: The action and limit values are given a 8-hour equivalent values, A(8), but my employer works for more than 8 hours / works less than 8 hours per day. How do I determine their exposure?

Answer. The A(8) value is an "8-hour equivalent" value and is not directly dependent on how long someone is at work. Most workers have vibration exposures that change over the working day. The A(8) value allows us to compare average daily exposures. If someone works for just 45 minutes a day using a tool with a vibration level of 4 m/s² they will have the same daily exposure as someone who works for 12 hours a day with a tool producing 1m/s². We choose to express this as the A(8) daily exposure value which, in both of these example cases, is 1.2 m/s²A(8) (or 24 points).

6. Press the Reset button to clear the figures.

Note: When you open the spreadsheet, Excel may ask you to enable macros. If your system settings allow it, you should enable macros. If not, the Reset button will not work, but the white cells can still be cleared by manually deleting their contents.