

HAVWEAR FAQ

This HAVwear FAQ is not advice to duty holders on how they should discharge their legal duties. Duty holders may instead obtain such advice from HSE or their own legal advisors.

What are the elements of The Control of Vibration at Work Regulations 2005 that the HAVwear can support?

The Control of Vibration at Work Regulations 2005 and associated guidance requires the following all of which the HAVwear is a valuable tool to assist in delivering

- Elimination or control of vibration exposure risk to **as low as reasonably practical (ALARP)**
- An assessment of the risks to employees from exposure to vibration, including assessment of employees' daily exposure to vibration
- Information, instruction and training to tool users and their managers

Specifically:

- Regulation 5(1) of the Control of Vibration at Work Regulations 2005 states: An employer who carries out work which is liable to expose **any** of his employees to risk from vibration shall make a **suitable and sufficient assessment** of the risk created by that work to the health and safety of those employees and the risk assessment shall identify the measures that need to be taken to meet the requirements of these Regulations.

What other legislation should I be aware of?

Section 2(1) of the Health and Safety at Work Act 1974 requires an employer to ensure, so far as is reasonably practicable, the health, safety and welfare of all its employees.

European legislation Directive 2002/44/EC led to the release of The Control of Vibration at Work regulations 2005 and has resulted in similar regulations throughout Europe.

How do I carry out a HAV risk assessment?

Detailed guidance provided by the HSE on how to carry out a risk assessment in respect of the Control of Vibration at Work Regulations 2005, is available at:

<http://www.hse.gov.uk/vibration/hav/advicetoemployers/assessrisks.htm>

Carrying out a HAV risk assessment requires detailed knowledge of all possible processes which could yield a HAV risk and for each process developing an understanding of the **time spent** on a tool and the "**probable magnitude of the vibration** corresponding to the equipment used in the particular working conditions"

Guidance is not definitive on how to determine what is a suitable and sufficient assessment and allows a number of possible data sources for determining the magnitude of vibration of a tool.

A suitable and sufficient risk assessment may not require a vibration measurement and so, may not **need** to have regard to ISO5349 with respect to how to carry out a measurement of vibration. Guidance is also not definitive on when a measurement is needed or how often it should be repeated.

Does HAVwear comply with ISO5349?

HAVwear does not comply with all aspects of ISO5349.

The ISO5349 standard defines how to calculate the HAV risk from a single process by taking a vibration measurement of that process. It also includes the means by which the risk from several processes can be combined in one day.

ISO5349 defines how to measure the vibration emitted from a tool, which would create a risk of HAVs, by mounting a device on the tool. HAVwear does not measure the vibration on the tool and therefore does not follow this aspect of ISO5349. HAVwear senses the level of vibration on a tool user's wrist using the key mathematics of both ISO5349 and ISO8041. It does not follow the requirements exactly, as the vibration detected on the tool user is affected by the body's resonance structure and therefore differs from the emitted tool vibration. Reactec uses patented algorithms to ensure the HAVwear data is comparable with the vibrations emitted by the tool which are harmful to a tool user.

HAVwear calculates HAVs risk from vibration magnitude data, in compliance with ISO5349, to determine what is defined in ISO5349 as daily vibration exposure - $a_{hv(eq,8h)}$ also referred to as A(8) or, as referred to by the HSE, as daily exposure points. HAVwear combines the risk of multiple processes in one day in compliance with ISO5349.

In using any digital monitor for HAV risk assessment, there is a need to determine that the vibration magnitude data used to calculate HAV exposure risk is suitable for the process which is being risk assessed. Digital monitors, unlike HAVwear, typically have a single source of static vibration magnitude data to which trigger time is then applied. However any digital monitor, including HAVwear, will be in accordance with ISO5349 if the correct mathematics to translate time and vibration magnitude to exposure points are applied (as stated above) AND the vibration magnitude used in the calculation can be shown to be representative of the vibration faced during the risk assessment.

Am I required to continuously monitor?

To comply with The Control of Vibration at Work Regulations 2005, it is not necessary to undertake continuous monitoring. However risk assessments must be suitable and sufficient and this may include the need for periodic monitoring. Evidencing that assessments have been sufficient can result in onerous paper records. Digital monitors provide an efficient means of capturing such data.

Why would I continuously monitor?

Continuous monitoring is used by a number of leading organisations because;

- It ensures that risk reduction controls are data driven and can be readily assessed for effectiveness
- Guidance on “sufficient risk assessment” is vague, whereas continuous monitoring is holistic
- It may provide relevant evidence in civil claims or criminal prosecutions
- It supports tool operator behavioural change - in the same way that average speed cameras on our roads, more effectively control driving speed relative to random speed checks

Do I need to measure the vibration level of my tools?

The Control of Vibration at Work Regulations 2005 require an employer to carry out a suitable and sufficient assessment of the risk to health and safety of employees arising from exposure to vibration at work. Where an exposure action value is likely to be exceeded, the employer must reduce that exposure to the lowest reasonably practicable level. Such a risk assessment **may not require** the measurement of vibration if an appropriate and relevant source of vibration data is available.

Sources of vibration data that may be used in a risk assessment process may include manufacturer’s data, OPERC, HSE guidelines. The responsibility lies with the duty holder (the employer) to determine that the vibration data used in a risk assessment is suitable i.e. that it reflects the probable magnitude of the vibration corresponding to the equipment used in the particular working conditions.

Any source of vibration data needs to be evaluated by the duty holder on this basis. As an example, the HSE do accept the use of manufacturer’s data provided the employer can show that the data declared by the manufacturer is applicable to the employer’s tool use situation, such as age of the tool and process the tool is used for.

As part of good practice, the HAVwear’s sensed vibration can be used to alert an organisation to tools, processes or tool users which are behaving differently to expectations and require further investigation such as tool measurement to ISO5349, process controls or operator training.

HAVwear has been developed to simplify and automate the gathering of data for use as part of a HAV risk management plan. The level of automation makes possible continuous dynamic risk assessment to assess the effectiveness of HAVs risk controls and therefore seek to reduce HAV risk ALARP.

How do I measure the vibration level of my tools?

A number of standards exist to ensure that anyone measuring the vibration from a tool for the purpose of a risk assessment measures the tool in a consistent way. Of particular importance are HSE Approved Code of Practice (ACoP) L140, ISO5349(1) and (2) and ISO8041.

Measuring vibration in accordance with the standards is complex and generally requires a skilled technician. To measure in accordance to the standards a skilled technician will provide a range of test results for a single tool, used for the same process being carried out by the same tool operator to develop an average value for the tool. This is essential due to the random nature of vibration. The test method is intrusive and cannot readily be applied during normal tool use. It should be noted

that organisations offering services to measure tools are not currently regulated to ensure compliance to ISO5349.

However if a duty holder is concerned as to whether a source of vibration data is suitable for risk assessments, the HSE recommends the use of a measurement to ISO5349 during typical tool use. It would not be necessary to do this on a continuous basis rather that it be done on a regular basis to establish the validity of the source of data.

What are the Tool Exposure Points (TEP) and Sensed Exposure Points (SEP) reported by the HAVwear?

HAVwear has the capability of providing layered HAV risk exposure data of both TEP and SEP

- **Tool Exposure Points (TEP)** are calculated using the HSE risk assessment Exposure Points system, combining the length of time a tool is in use (trigger time) with the vibration level value that is programmed on the HAVwear Tool Tag. The vibration level programmed in the HAVwear tag is a responsibility of the employer to be “representative of the tool use by their operators”. It is therefore a fixed static value which should be typical of the tool’s use over all operators and conditions, if you like the expected tool vibration level.
TEP uses a pre-defined tool vibration level.
- **Sensed Exposure Points (SEP)** are calculated by the same HSE risk assessment methodology combining the length of time a tool is in use (trigger time) but using the sensed vibration level at the wrist. The vibration level is sensed in real-time by the HAVwear.
SEP uses a real-time sensed vibration level.

HAVwear monitors exposure risk using both TEP and SEP in parallel. The employer always has access to both TEP and SEP data which are stored online. However, to avoid confusion to the tool user, the employer chooses TEP or SEP to be displayed on the monitor. This choice is based on their assessment of which vibration is most probably faced during tool use: the static tool data for TEP or the sensed vibration on the wrist for SEP.

By comparing SEP data with TEP data employers will readily be able to identify tools producing vibrations different to what is expected; or differences between tool operators using the same tools for reasons such as inadequate training, differing technique or inappropriate tool selection.

If considering using SEP data to manage HAVs risk in order to simplify deployment or capture secondary vibration exposure from “material handling”, Reactec recommends an exercise of comparative concurrent testing with an instrument compliant to ISO5349 on typical tools and processes. See “Can SEP be used to determine risk”.

Can SEP be used for risk assessment?

Duty holders, such as an employer, must undertake a suitable and sufficient HAV risk assessment. The precise nature and extent of that assessment will vary according to their circumstances. SEP data may inform the risk assessment process.

To assess the suitability of SEP an employer should determine if the sensed HAVwear vibration delivers a **probable** magnitude of vibration experienced by the tool user. This can be done through the measurement of the actual tools used in the field carried out by a trained technician with an instrument to ISO5349, against which there is HAVwear sensed vibration data to compare. (Reactec are building a data set of HAVwear vibration data taken simultaneously with measurements of tool vibration magnitude to ISO Standard 5349, but as with any other data set, the employer should consider the relevance to their equipment and working conditions). If from this comparison an employer is satisfied the HAVwear sensed vibration provides a meaningful and representative estimate of the risk faced by their employees, a duty holder can use SEP data to help assess and manage HAV risk.

In summary Sensed Exposure Points are available for employers to determine if the sensed vibration is a more realistic representation of the risk experienced by the tool user when compared to the static tool vibration magnitude data programmed into HAVwear Tool Tags. Tool Exposure Points, calculated from the static tool data, is available and recorded for all activity monitored by HAVwear. Tool Exposure Points is in keeping with established practises and HSE guidelines, whether it be paper based or using any other digital monitor, to determine a HAV risk assessment of personal daily exposure based on trigger time and a fixed level of expected tool vibration.