

The British Occupational Hygiene Society
Faculty of Occupational Hygiene

PROFICIENCY MODULE SYLLABUS

P701 – MANAGEMENT AND ASSESSMENT OF EXPOSURE TO HAND-ARM VIBRATION

AIM: To provide the methodology, theoretical and practical knowledge to enable the student to proficiently:

- Appreciate the nature of hand-arm vibration [HAV] hazards in the workplace
- Appreciate the need to protect employees from hand-arm vibration syndrome [HAVS]
- Advise and assist employers to meet their legal duties regarding HAV in accordance with current HSE guidance.

On successful completion of this proficiency module the student should be able to:-

- Outline the requirements of current legislation on exposure to hand-arm vibration.
- Identify situations where HAV hazards exist and assess the risk.
- Discuss basic techniques for the control of vibration exposure, and identify areas where vibration reduction is required.
- Assess the effectiveness of vibration control measures.
- Evaluate the daily vibration exposures of employees from information about measured vibration magnitudes and work patterns.
- Explain the uses and limitations of personal protective equipment.
- Explain the role and purpose of health surveillance with respect to HAVS

CONTENT

	TOPIC	TIME ALLOCATION
1.	Introduction to hand-arm vibration	15%
2.	Legal duties	10%
3.	Vibration exposure and risk assessment	25%
4.	Control	30%
5.	Practical	20%

Note: Reference is made in this syllabus to HSE guidance or other documentation. This may not be the most up-to-date relevant publications from HSE/other sources and is intended as guidance for candidates only.

1. INTRODUCTION OF HAND ARM VIBRATION (15%)

Educational Objectives

The student should be able to understand the complex nature of HAV exposures in the workplace, the nature of the health effects of HAV and the consequences of excessive exposure on the employer's business.

1.1 Basics of vibration

Introduction to vibration
Continuous vibration and shock
HAV versus Whole Body Vibration
Time averaging, rms acceleration
Units of measurement – acceleration, velocity and displacement
Frequency and frequency weighting
Calculation of daily exposure.

1.2 Health effects of HAV

Hand-arm vibration syndrome
Neurological component
Vascular component

- Vibration white finger [VWF]
- Dose-effect relationships in standards, A(8).

Musculoskeletal component
Carpal tunnel syndrome

1.3 Effects on business

Lost time
Insurance premiums
Claims
Redeployment and retraining
Productivity.

2. LEGAL DUTIES (10%)

Educational Objectives

The student should be able to understand the requirements of relevant national legislation as it applies to HAVS and should be able to apply this understanding to workplace activities in order to determine the duties of the employer and to advise accordingly.

2.1 Employer's duties

Control of Vibration at Work Regulations 2005
Assessment of risk in order to determine a control strategy

Exposure standards

- Exposure limit value
- Exposure action value

Control of exposure

- Consideration of alternative processes
- Selection of equipment

- Maintenance of equipment
Information, instruction and training for employees
Consultation with employees.

Health surveillance
Reporting occupational diseases – RIDDOR.

2.2 Duties of Machinery Manufacturers and Suppliers

Design of low vibration equipment
Supply of information on vibration emission and safe use of equipment

2.3 Relevant Regulations:

- The Control of Vibration at Work Regulations (2005)
- The Provision and Use of Work Equipment Regulations (1998)
- The Personal Protective Equipment Regulations (1992)
- The Workplace (Health Safety & Welfare) Regulations (1992)
- The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (1995)
- The Supply of Machinery (Safety) Regulations, as amended (1992)

3. VIBRATION EXPOSURE and RISK ASSESSMENT (25%)

Educational Objectives

The student should be able to demonstrate their understanding of, and ability to evaluate, exposures and to determine the associated risks.

3.1 Exposure assessment

Evaluation of exposure and assessment of risk
Dose-response relationship for HAV
Determining vibration magnitudes:

- Manufacturer's guidance and emission data and its interpretation
- Use of vibration information
- Limitations of information (accuracy and applicability)
- Measurement of vibration.

Use of the Exposure Points System
Determining exposure patterns and duration
Determining daily vibration exposure
Precision/uncertainties.

3.2 Measuring vibration magnitude

Current standards – BS EN ISO 5349-1 : 2001, BS EN ISO 5349-2 : 2001
Instrumentation

- Instruments available and standards for their specification e.g. ISO 8041.
- Transducers – mounting methods, single axis v. triaxial arrangements, effect of mass, etc.
- Sources of measurement artefact – d.c. shifts, overloads, transducer movement, etc.
- Use of mechanical filters.
- Calibration.
- Sampling of activities for measurement.

Limitations of accuracy, repeatability and applicability of measured vibration magnitudes.

Measuring vibration exposure to both hands.

Reporting of results.

4. CONTROL (30%)

Educational Objectives

The student should be able to determine from the evaluation of exposure, and assessment of risk, the need for risk reduction and be able to advise on an appropriate strategy for controlling exposures. They should be able to monitor the effectiveness of control measures.

4.1 Control of Risk

Elimination or reduction of vibration exposure

- Selection of the process (equipment, operation and workplace environment)
- Selection and maintenance of tools and equipment
- Equipment modifications
- Reduction of exposure duration

Reducing risk by other means

- Blood circulation improvement
- PPE
- Grip and push forces
- Operator training -Information, instruction and training to employees about the risks, correct use of equipment and risk control
- Abstinence from smoking

Case studies.

4.2 Monitoring the effectiveness of a control programme

Regular review of risk assessments

Regular review of management actions and control measures

Health surveillance

- Management of a tiered health surveillance programme
- Questionnaires.
- Clinical interview and medical examinations
- Management of affected workers.

5. PRACTICAL (20%)

Educational Objectives

The student should be able to understand the principles, and practicalities, of systems that give rise to HAVS

5.1 Practical Knowledge

The student should be able to carry out measurements of vibration levels and to determine the effect of control measures. They should be able to describe the limitations of the measurements and the control measures. They should be able to understand the crucial importance of ergonomic aspects of the design of equipment and its use in the workplace.

RECOMMENDED DOCUMENTATION

- i. HSE Guidance HS(G)88 Hand-Arm Vibration
- ii. HSE Guidance HS(G)170 Vibration

COURSE LENGTH

It is envisaged that the course would run over 4 days with at least 3 days for the course and 1 day for the examination and practical assessment.

COURSE EXAMINATION/ASSESSMENT

The students will be assessed as follows:

1. A 75 minute BOHS examination consisting of 35 short answer questions.
2. A practical assessment carried out by the course provider (see below)
3. Submission of two acceptable reports, etc.

PRACTICAL ASSESSMENT Measurement of hand-arm vibration levels

Candidates Individual Assessment must include:

- Undertake HAV measurements on tools.
- Understanding of HAV risk assessments.
- Evidence of Field Proficiency *A full understanding of the numbers produced by the tests (e.g. what is an acceptable vibration magnitude for the application? Recognising artefacts such as a d.c shift, and what to do about it, etc)*

Candidates are required to demonstrate that they have carried out, possibly under supervision, two hand-arm vibration assessments, which must include measurements of vibration magnitudes. A copy of each of these two relevant reports must be submitted to BOHS within six months of receiving notice of performance in the written examination and practical assessment. (Please refer to current guidance).

Successful completion of all of the above will lead to a:

‘PROFICIENCY CERTIFICATE’
in
MANAGEMENT AND ASSESSMENT OF EXPOSURE TO HAND-ARM VIBRATION