

Entry Requirements

The Institute of Acoustics is committed to an open access policy. The main principle is to admit all who will benefit from the Certificate programmes. However students will need to be numerate and to be able to carry out scientific calculations. If the Certificate is used towards satisfying the educational requirements for Technician membership of the IOA (**TechIOA**) relevant passes at GCSE level may be necessary also.

Study Modes

Students take the Certificates at an Accredited Centre (see separate list). Attendance at the Centre is usually for four days, plus the examination day. Examinations for CCMOEHAV take place once per year. It is important to check on the local arrangements for the examination.

Assessment

To obtain a Certificate, a candidate is required to;

- 1) Pass both parts of a written examination
- 2) Produce a competent report on a case study.

The written examination papers are set by the Chief Examiner, who is responsible to the CCMOEHAV Committee. Members of the Committee review and moderate the marking of all papers at their meetings held shortly after each course.

The detailed logistical arrangements for the case study report submission are made by the Accredited Centre. However the requirements for the report are overseen by the CCMOEHAV Committee.

Aims

The aims of the course are two-fold:

- to enable course delegates to appreciate the nature of Hand-Arm Vibration (HAV) hazards in the workplace and the need to protect employees from hand-arm vibration syndrome (HAVS)
- to enable them to advise and assist employers to meet their legal duties regarding HAV, under relevant health and safety law in accordance with current guidance from the Health and Safety Executive

Objectives

After completing the course delegates should be able to:

- explain the requirements of current legislation
- identify situations where HAV hazards exist and assess the risk
- discuss basic techniques for 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

Syllabus

1. Basics of vibration

- Introduction to vibration
- Continuous vibration and shock
- Time averaging, r.m.s., peak and peak-to-peak indices
- Acceleration, velocity and displacement
- Frequency and frequency weighting
- Transmissibility and its frequency dependence, damping, and isolation (a simple, semi-quantitative treatment)

2. Health effects of HAV

- Hand-arm vibration syndrome (HAVS):
 - Neurological component
 - Vascular component:
 - vibration-induced white finger (VWF)
 - dose-effect relationship in standards, A(8)
 - Musculoskeletal component
- Carpal tunnel syndrome (CTS)
- Requirements for reporting disease (RIDDOR 95)

3. Effects on business

- Lost time
- Insurance premiums
- Claims
- Redeployment and retraining
- Productivity
- Enforcement action

4. Legal duties

- Duties of employers:
 - assessment of risk and producing an action plan
 - the exposure action and limit values
 - control of exposure/risk and the hierarchy of control
 - consideration of alternative processes
 - selection of equipment
 - maintenance of equipment
 - information, instruction and training for employees
 - consultation with employees
 - health surveillance
 - reporting occupational diseases
- Duties of machinery manufacturers and suppliers:
 - design and manufacturer for safety
 - measure and declare vibration emission in accordance with the appropriate harmonised test code
 - provide information for safe use
- Duties of employees:
 - follow instructions on safe working practices
 - report problems with equipment, such as unusually high vibration
 - cooperate with employer's programme of control measures
 - cooperate with employer's health surveillance programme

Relevant legislation

- The Control of Vibration at Work Regulations 2005
- The Provision and Use of Work Equipment Regulations 1998
- The Personal Protective Equipment at Work Regulations 1992

- The Workplace (Health, Safety and Welfare) Regulations 1992
- The Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995
- The Safety Representatives and Safety Committees Regulations 1977
- The Supply of Machinery (Safety) Regulations 1992 as amended by the Supply of Machinery (Safety) (Amendment) Regulations 1994

5. A vibration risk management programme

- Identification of hazard
- Assessment of risk
- Control of exposure and risk (to as low a level as is reasonably practicable)
- Health surveillance
- Management of affected workers
- Monitoring of effectiveness of programme
- Costs and benefits

5.1 Exposure assessment

- Determining vibration magnitudes:
 - interpretation and use of manufacturers' declared emission values:
 - harmonised vibration test codes (e.g. BS EN ISO 8662 series; BS EN 50144 series)
 - other relevant standards (BS EN ISO 20643:2005; BS EN 12096:1997)
 - other sources of vibration information
 - measurement of vibration in the workplace (see 5.2)
 - limitations of information (uncertainty and applicability)
- Evaluation of exposure:
 - determining exposure patterns and durations
 - calculation of daily vibration exposure (the A(8) value)
 - use of the HSE exposure points system
 - other assessment methods (e.g. nomogram, calculations)
 - calculation of exposure times required to reach the exposure action and limit values
 - weekly averaging of exposure (and the restrictions on its use)
- Assessment of risk:
 - tentative dose-response relationship for VWF (in BS EN ISO 5349-2:2001)
 - comparison of daily exposure with the exposure action value and exposure limit value

5.2 Measurement of vibration magnitudes

- The current standards (BS EN ISO 5349-1:2001 & BS EN ISO 5349-2:2002)
- Instrumentation:
 - instruments available and their specification (BS EN ISO 8041:2005)
 - transducer (selection, mounting methods, single and triaxial arrangements, effect of mass, etc.)
 - sources of measurement artefact: dc shifts, overloads, transducer movement, use of mechanical filters, etc.
 - calibration
 - sampling of activities for measurement
- Uncertainties: the limitations of accuracy, repeatability and applicability of measured vibration magnitudes

5.3 Control of risk

- Eliminating or reducing vibration exposure;
 - alternative work processes to eliminate vibration exposure
 - selection and maintenance of suitable tools and equipment
 - operator training for correct use of vibration-reduced equipment
 - equipment modifications

- reduction of exposure duration
- Reducing risk by other means
 - exercises to maintain blood circulation
 - gloves and other clothing to keep warm and dry
 - minimising grip and push forces
 - ergonomic tool design
 - information and instructions to employees about risks
 - training in correct tool operation and risk control
- Anti-vibration gloves:
 - limited effectiveness at reducing frequency-weighted vibration
 - BS EN ISO 10819

5.4 Monitoring the effectiveness of a control programme

- Regular review of risk assessments
- Regular review of effectiveness of management actions and control measures

6. Health surveillance

- The tiered approach to health surveillance:
 - pre-employment/screening questionnaire
 - annual screening questionnaire
 - referral to qualified person (e.g. occupational health nurse):
 - clinical questionnaire/interview/examination
 - referral to occupational health physician:
 - diagnosis and recommendations
 - the Stockholm scales
 - numerical scoring (Griffin method)
 - standardised tests
- Selection of an Occupational Health provider
- Management of health surveillance programme
- Management of affected workers

Assessment

In two parts:

1. Written examination 2.5 hours, two sections:
 - Section A, ten short compulsory questions;
 - Section B, two from three longer questions.
2. Case study: Exposure Assessment and Control Programme proposal based upon supplied information. Assessment details are given out with examination paper and the assessment proposal is to be completed within **two** weeks of the examination date.