

VENTILATION

(See also: [Legionellosis\(44\)](#); [COSHH\(19\)](#); [Soldering\(79\)](#); [Sick Building Syndrome\(74\)](#); [Welding and Flame Cutting\(88\)](#))

INTRODUCTION

Ventilation in workplaces can include both general (fresh air) ventilation and ventilation used to control airborne contamination of the workplace. Both will be covered in this element.

General ventilation of a building is needed to satisfy the respiratory needs of its occupants and to remove any body odours and tobacco smoke, should smoking be permitted. Regulation 6 of the **Workplace (Health, Safety and Welfare) Regulations 1992** requires that effective and suitable provision be made to ensure that every enclosed workplace is ventilated by a sufficient quantity of fresh or purified air.

Ventilation used to control airborne contamination can be either dilution ventilation or local exhaust ventilation (LEV). The latter has an important position in the hierarchy of control measures that may be required to comply with the **Control of Substances Hazardous to Health Regulations (COSHH) 1999**.

GENERAL VENTILATION

Enclosed workplaces should be sufficiently well ventilated so that stale air, and air which is hot or humid because of the processes or equipment in the workplace, is replaced at a reasonable rate. The air that is introduced should, as far as possible, be free from any impurity that might cause ill-health or be offensive. Air inlets should be sited away from possible contaminated air and, where necessary, filtered to remove particulates.

In many cases windows and doors will suffice. Where necessary, mechanical ventilation systems should be provided as appropriate. However, workers should not be exposed to draughts.

Re-circulating air systems should use adequate filtration to remove impurities and have some fresh air added to them before being recirculated.

Mechanical ventilation systems should be regularly and properly cleaned, tested and maintained. Where necessary for reasons of health and safety, plant failure warning devices must be provided.

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The fresh air supply rate should not normally fall below 5-8 litres per second, per occupant. Factors to be considered should include the floor area per person, the processes and equipment involved and whether the work is strenuous.

DILUTION AND LOCAL EXHAUST VENTILATION

Dilution ventilation provides a flow of air into and out of the working area and does not give any control at the source of the contaminant. The background concentration is reduced by the addition of fresh air but there is little, if any, reduction in direct exposure at the process.

LEV intercepts the contaminant as soon as it is generated and directs it into a system of ducting connected to an extract fan. To achieve the same degree of control, far less air is extracted using a LEV system than with an equivalent dilution system, with considerable cost savings. For a LEV system to be effective, each of the following components must do its job properly:

- (i) a hood, enclosure or other inlet to collect and contain the contaminant close to the source of its generation.
- (ii) ductwork, to convey the contaminant away from the source.
- (iii) a filter or other air-cleaning device to remove the contaminant from the extracted airstream.
- (iv) a fan or other air-moving device to provide the necessary air flow.
- (v) further ductwork to discharge the cleaned air to the outside atmosphere at a suitable point.

The booklet HS(G)37 - An Introduction to Local Exhaust Ventilation provides guidance on the following:- general features of an LEV system; generation of airborne contamination; assessing the hazard; inlets; partial enclosures; hoods; ductwork; airflow distribution and balancing; air cleaners; fans and air movers; discharge to atmosphere; commissioning and maintenance; examination and testing.

Booklet HS(G)54 - Maintenance, examination and testing of LEV contains guidance and advice in the following areas:-

- What a local exhaust ventilation system is
- The legal requirements
- Procedures - initial appraisal/maintenance
 - thorough examination and testing
 - making a judgement
- Instruments and techniques
- Records, reporting and action

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DUST

Guidance Note EH44 'Dust: General principles of protection' gives details of the risks to health which may arise from exposure to dust and advice on approaches to preventing harm. In outline it comprises:-

- where dust is likely to occur
- how dust can affect health
- application of COSHH
- assessment/prevention and control of exposure
- maintenance, examination and testing of control measures
- monitoring and health surveillance
- information, instruction and training

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CHECKLIST - VENTILATION

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|----|---|-----|----|
| 1. | Is your workplace sufficiently ventilated? | YES | NO |
| 2. | If mechanical ventilation systems are used, are they regularly and properly cleaned, tested and maintained? | YES | NO |
| 3. | If LEV is used, is it maintained in an efficient state, in efficient working order and in good repair (as required under COSHH 1999)? | YES | NO |
| 4. | Is LEV subject to formal examination and testing at least every 14 months (as required under COSHH 1999)? | YES | NO |

(NB This interval is reduced for certain, more hazardous processes)

REFERENCE/FURTHER DETAILS

- *1. Book L24 Approved Code of Practice - Workplace (Health, Safety and Welfare) Regulations 1992 (HSE). ISBN 0 7176 0413 6.
- *2. Guidance Note EH44 - Dust: General Principles of Protection (HSE). ISBN 0 7176 1435 2.
- *3. Booklet HS(G)54: The Maintenance, Examination and Testing of Local Exhaust Ventilation (HSE). 0-7176-1485-9
- *4. Booklet L5 COSHH ACoP, Carcinogens ACoP and Biological Agents ACoP. ISBN 0 7176 1670 3.
- *5. Booklet HS(G)37 - An Introduction to Local Exhaust Ventilation (HSE). ISBN 0 7176 1001 2.
- *6. HSG 202 General Ventilation in the workplace. Guidance for employers (HSE). ISBN 0 7176 1793 9
- *7. Booklet HSG187: Control of Diesel Engine Exhaust Emissions in the Workplace. (HSE)(ISBN 0-7176 1662 2)(£6.95)

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- * Available to view by prior arrangement at Nuneaton and Bedworth Borough Council, Environmental Health Services, Council House, Coton Road, Nuneaton. CV11 5AA
 - ** Free copy available from Nuneaton and Bedworth Borough Council at the above address

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