

Local Exhaust Ventilation (LEV) Systems

Definitions

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Definitions

Hazardous airborne substances - contaminants carried by the air such as dust, mist, fume, vapour, gas or aerosols, often there is a workplace exposure limit, or for dusts (as well as potential exposure limits) there is an absolute limit of 10mg/m³ inhalable dust or 4mg/m³ respirable dust. Local Exhaust Ventilation is used to control airborne hazardous substances (i.e. contaminated air) by capturing the airborne contaminants as soon as they are generated and removing them from a person's breathing zone before they can be inhaled causing harm. The contaminated air is then drawn away and may be discharged into the air at a distant point (such as the rooftop) where the dilution effect of the atmosphere reduces the concentration to acceptable levels, or it may be cleaned up (e.g. by particulate filtration) and discharged back into the workplace, or elsewhere. Where an LEV system is needed to protect anything other than people (e.g. the environment, animals, etc), then talk to your Health and Safety Manager.

This protocol covers four types of LEV as identified by the University: ducted fume cupboard, ducted microbiological safety cabinet, ducted other LEV (e.g. woodworking dust extractor, down-flow table, snorkel) and unducted LEV (also known as recirculating LEV – e.g. unducted fume cupboards, recirculating microbiological safety cabinets, solder workstations).

This protocol does NOT include: general building ventilation, dilution ventilation (see definitions for more information) or respiratory protection equipment (RPE – e.g. filter mask). If you are unsure what type of ventilation/LEV is installed in your area talk to your Health and Safety Manager.

Dilution ventilation; another method to reduce or prevent exposure to airborne hazardous substances, this provides a flow of air into and out of the working area, but does not give any control at the source of the contamination, workers will inhale contaminated air, however, contaminants are diluted below workplace exposure limits (this type of ventilation is not within the scope of this protocol).

Respiratory Protective Equipment (RPE), another method to reduce or prevent exposure to airborne hazardous substances, works by directly protecting the worker most commonly by use of a filter mask (RPE is not within the scope of this protocol).

Ducted fume cupboards: By far these are the most common type of LEV at the University, they are usually found in laboratories, are typically enclosed on five sides of the work area, with contaminated air being drawn away from the user via the front (open) side of the cupboard and expelled, by a system of ducting, to the outside of the building. There are many elements to this type of system, with responsibility being allotted to different people. Fume cupboards have their own set of European standards (BS EN 14175) which covers almost all aspects of their life cycle from construction through to installation, use, and testing (but not decommissioning).

Ducted microbiological safety cabinets - These ventilated enclosures provide protection for the user and the environment from the aerosols arising from handling potentially hazardous and hazardous micro-organisms. Exhaust air is HEPA-(High-Efficiency Particulate Air)-filtered as it exits the cabinet, removing hazardous material (e.g. bacteria, viruses, etc) and the filtered exhaust air is removed from the area by a system of ductwork (additional HEPA filters may be installed in the ducting). Microbiological safety cabinets have their own set of European standards (i.e. BS EN 12469:2000 and BS 5726:2005) which is why, for the purposes of this protocol, they are separated from fume cupboards and other types of ducted LEV systems.

Any other ducted systems such as down-flow benches and wood dust extraction systems: There is a range of remaining *other* ducted LEV systems (such as down-flow benches, wood-dust extraction systems, in-building vehicle exhaust extractors etc.) that don't fit into either the fume cupboard or microbiological safety cabinet categories. These may (or may not) have European standards (e.g. BS EN 12779 – *safety of woodworking machines. Chip and dust extraction systems with fixed installation*), where possible these standards are used to provide detailed information for the management of these types of LEV systems.

LEV not covered by above: Any LEV system that does not connect to ductwork belongs to this category – in general this type of LEV is often easily movable, and ranges in size from small desk top units (e.g. for removing fumes from soldering) to large cupboards such as recirculating microbiological safety cabinets, and un-ducted fume cupboards. Schools or Services are entirely responsible for these types of LEV as there is no associated ductwork system (fans, motor, stacks etc.).

Defect: This is a fault with an LEV system that results in it no longer providing protection to users (this does not include minor faults).

Make-up-air: This is the volume of air that needs to enter a work-area to replace air removed e.g. by ducted LEV systems.

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