

# **Local Exhaust Ventilation (LEV) Systems**

## **Guidance for Heads of School/ Service**

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## Introduction

This guidance is for Heads of School/ Service within whose remit there are Local Exhaust Ventilation (LEV) systems. The University has a wide variety of LEVs which are used to control the risks from hazardous airborne substances; these range from simple bench-mounted devices through to building-wide and more complex LEV systems. Responsibility for managing the many elements of each LEV system can belong to different roles and teams, from its initial selection, design and installation, through its use, formal examination, checking, maintenance and repair, and onto its eventual decommissioning.

## Definitions

### 'Local Exhaust Ventilation (LEVs) system'

An LEV system 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 worker's breathing zone before they can be inhaled. 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 un-ducted LEV systems (also known as recirculating LEV systems – e.g. unducted fume cupboards, recirculating microbiological safety cabinets, solder workstations).

This protocol **does not** include: general building ventilation, dilution ventilation (see the separate definition document attached to this protocol 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.

## Suggested roles and actions

The health and safety responsibilities of employees, students and visiting personnel are set out in the University Health and Safety Policy which you can view at the University health and safety website.

Of these, a responsibility which is particularly relevant to this protocol, falls under the 'All employees' section of the Health and Safety Policy. This states that 'employees must not undertake activities or bring in plant or equipment that may affect the fabric or services of the building or the estate in any way, without prior agreement from Facilities Directorate (FD).'

### Heads of School or Service

- Identify key roles and check to see that systems are in place to manage LEVs in their areas (see the Standard attached to this protocol for more information on what is required and discuss it with your Health and Safety Manager).

### Secretariat or school/ services (when appointing formal examiners)

- Check competency of formal examiners
- Gain agreement that the formal examiner:
  - places a "do not use" sign (or similar) on LEV that has failed the formal examination,
  - makes records available,
  - communicates with relevant people to organise formal examinations.
  - communicates with relevant people where LEV has failed (e.g. Lead Person, FD Estates, etc.).

### Lead Person(s)

- Assist with maintaining an inventory of LEVs in their area.
- Where relevant, manage and record induction, supervision and training as well as checking competency for either users and/or University employed maintainers.
- For microbiological safety cabinets, lead or assist with the appointment of competent formal examiners.
- Check competency of external people or companies involved with selection, design, installation, commissioning, maintenance, or repair of LEV/LEV.
- Report defective LEV to the LEV maintainer (e.g. FD Estates for fume cupboards).
- Help to develop emergency procedures (if identified as required by the risk assessment).

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- Where required (identified in local procedures) place a “do not use” sign on defective LEV.
- Help in the selection or design process for LEVs (to help identify the most appropriate LEV for the task), and ensure that relevant other people are included in the process (e.g. users, maintainers, specialists).

### LEV users

- Undertake induction and training before using LEVs, and receive supervision until they are identified as competent.
- Select the correct LEV for the airborne hazard they are seeking to control.
- Carry out pre-use visual check.
- Report defective LEVs to the person in charge (lead person) of LEVs in their area (e.g. laboratory manager, facilities manager, location manager etc.). If appropriate (i.e. part of local procedures) to place a “do not use” sign on defective LEV.
- Assist where required in the selection / design process (to help identify the most appropriate LEV for the task).

### LEV maintainer (who is a University employee)

- Undertake induction and training before using LEVs, and receive supervision until they are identified as competent.
- When required, place a “do not use” sign on defective LEV, or LEV that is undergoing maintenance or repair.
- Communicate as required with lead persons, users, formal examiners, contractor maintainers, to share information about LEVs that are defective / taken out of use or repaired / put back in use.
- Follow any programmes of maintenance
- Assist where required in the selection / design process (to help identify the most appropriate LEV).

## Guidance

### • Risk assessments

Risk assessments (e.g. hazardous substances, activity risk assessment, etc.) are used to identify the need to control airborne hazardous substances so they are not inhaled. By following the hierarchy of controls (see Risk Assessment protocol for more details) LEV is often identified as a control measure (e.g. fume cupboard, microbiological safety cabinet etc.) and, in the majority of cases, suitable LEVs are already in place. Where no LEV is in place then risk assessments help to determine the most suitable type of LEV to be selected or designed prior to putting it in place (installation, see point 20).

### • Table of responsibility

The University sets out health and safety responsibilities of each role through the Health and Safety Policy, and each individual health and safety protocol also suggests roles and actions which help to fulfil these. In the case of LEV, setting out the specific responsibilities for actions is critical and is the basis for the entire protocol, these responsibilities are set out in the **Table**, attached to this protocol. Included are responsibilities for: selection and design, installation and commissioning, arranging maintenance and repairs, record keeping, selection and training of maintainers, carrying out maintainer checks and formal examinations, induction and training of users and pre-use visual checks, etc.

Table 1 (attached to this protocol) helps you to determine who has responsibility for an LEV system, depending on the type of LEV system in use and how contaminated air is removed from the work area (i.e. removed by ductwork to the outside or just re-circulated through filters back into the room). LEV systems will fall into one of the groupings identified in the Table attached to this protocol. For each group responsibility is managed differently.

However, in a small number of instances responsibilities for an LEV system will not match the information in the Table 1, if this is the case then contact your Health and Safety Manager for further advice.

### • Inventory

The University has identified four types of LEV (ducted fume cupboard, ducted microbiological safety cabinet, ducted other LEV and unducted LEV); ductwork itself is considered separately.

As Head of School/ Service you should check that an inventory is kept for your school/ service which lists as a minimum, the type of LEV and/or its intended use (e.g. filtering of aerosols containing biological material, collection of wood dust, extraction of corrosive fume or vehicle exhaust extract systems, etc.). You may want to include more details such as: location, model/ manufacturer, the lead person etc. In many cases these inventories already exist to some degree. You can decide at what level the inventory should be collated (e.g. faculty / service group/ school/ service or department level) in conjunction with other colleagues.

The annual update of your inventory aims to give you assurance that the list is correct, and any new or obsolete LEVs have been identified and recorded. This supports you to check that they are being managed and that annual examinations and other checks are being carried out.

Also check that all new LEVs **except** microbiological safety cabinets (and their location) are reported to the [University Insurance Officer](#), who will arrange for their formal examination.

Please note that you as Head of School/ Service will need to appoint your own formal examiner for microbiological safety cabinets, as the University-appointed formal examiner does not offer this service (formal examination) for this type of LEV.

- **Identify the lead person(s)**

As Head of School/ Service you need to identify a lead person for each area where LEVs are used; they will take the lead role in managing the LEV. For example they would be the key contact for people to report defects to, organise repairs and/or maintenance, arrange induction and training, support the selection and design process etc. For small areas (e.g. individual workshop) this may be the LEV operator themselves, for larger areas (e.g. a suite of laboratories where there are a number of LEVs) this could be a laboratory manager (or equivalent post).

- **Sharing LEVs**

In some locations an LEV may be shared between different groups, departments or even organisations. If this is the case, the local arrangements detailed in point 12 below need to be agreed in writing between the parties involved, so there is clarity on responsibility.

- **Induction**

Because LEV is a safety-critical piece of protective equipment, users must be shown how to use it correctly and receive adequate supervision to check that they are using it properly. So, before first use of an LEV new to the user, they must be given an induction, the details of which are appropriate to the complexity of the LEV system, but which should include as a minimum:

- **how to use the LEV correctly** - (e.g. substances that can and cannot be used, how to turn the LEV on or off, position of work or substances in relation to the LEV so it works effectively, etc.).
- **how to carry out a pre-use visual check** - (e.g. does the indicator show the LEV is working properly? Is it taking away the harmful - possibly invisible - dust, mist, fumes and gas? Has it got a formal examination label which is within date?)
- **possible effects of and dealing with failure of the LEV** (how to identify failures, what to do if failure occurs, emergency arrangements (where identified by the risk assessment), who to tell if something may be wrong, what to look for – e.g. alarms, unusual noise, vibrations, smells, etc.).

- **Taking LEVs out of use**

Any LEV that fails the formal examination or has gone past its formal examination date or is not functioning as intended must be taken out of use (e.g. isolated from electrical supply by turning off the mains switch) and a “do not use” sign attached to the LEV. Ideally this will be done by the person who discovers the defect; however, it may be the lead person when it is reported to them.

Alternatively it may be the formal examiner, person carrying out maintenance etc. As Head of School/ Service you need to be sure that people working in your area know to do this.

Sometimes there are other reasons to take LEVs out of use, for example if FD Estates carry out work (e.g. electrical work) that switches off LEVs. If this happens LEVs that are affected should be signed as “do not use” until they receive a pre-use visual check. If FD Estates carry out work on the ductwork the LEV may also need a formal re-examination before being used.

- **Emergency processes**

Emergency arrangements should be considered if, as a consequence of the effective functioning of an LEV being compromised, (e.g. power cut) people are put at significant risk i.e. they face significant exposure to an airborne hazardous substance. The risk assessment should identify any need for emergency arrangements, (e.g. spills, fire, need for back up power, evacuation etc.); and these should be put in place.

- **Supervision and training**

Supervision and training is required both for people using LEVs and for University employees who maintain or repair them. A Training Matrix is attached to this protocol which sets out the minimum requirements for training from a University perspective. In addition, local arrangements for each area will set out any extra training needed. It is critically important that the training matches the type of LEV; if the type of LEV is new to that person, they should have training for it. All training needs to be recorded and where people are currently being trained they should be supervised until their competency has been signed off. As Head of School/ Service you should check that these requirements are fulfilled.

- **Competence of Formal Examiners, Maintainers, Service / Repair Engineers**

The formal examination can only be done by someone who is competent (e.g. to UKAS standard, or other industry standard such as BS EN 14175 or BS EN 12469:2000). For anything other than microbiological safety cabinets the formal examiner is appointed and competence is checked by Secretariat on behalf of the University.

For microbiological safety cabinets you as Head of School or Service will need to make sure that formal examiners are appointed locally and that their competence is checked.

Those appointing service or maintenance engineers (either internal or external) must also check to make sure that they have the necessary competence to undertake the task. Please see the contractor protocol or contact your Health and Safety Manager if you require any help.

- **Variation to the Standard and Table**

On occasion you as Head of School / Service may consider that a variation to this Standard or Table is required. This can be addressed on a one-to-one basis by formally agreeing the variation in writing with the Head of Health and Safety and relevant stakeholders (e.g. Head of FD Estates). Discuss this with your Health and Safety Manager if there is a situation requiring a variation.

## Use of LEV

- **Managing the use of LEV locally**

As Head of School/ Service you should check that the lead person has in place local arrangements to manage the use of their LEVs. This could include processes for induction, pre-use visual checks, training, risk assessment, signing and reporting defective LEVs, house-keeping, etc. Speak to your Health and Safety Manager if you or your lead person needs help with the scope of these.

- **Correct use of LEV**

There are many different types of LEV which work in a number of different ways and protect LEV users from harm in various ways. The incorrect selection and/or operation of LEV can lead to harm (e.g. using a corrosive fuming substance such as Hydrofluoric acid (HF) in a fume cupboard which is not corrosion resistant leading to failure of duct work and exposure to people in the surrounding area to HF). People using LEVs must have sufficient knowledge/training to be able to select the LEV that is appropriate to their work.

- **Pre-use visual checks**

Each time before an LEV is used the user must carry out a pre-use visual check. The extent of the visual check will depend on the complexity of the LEV, but in general includes: indicators showing the LEV is working, any visible signs of damage, formal examination labels are in date etc. If the LEV fails the pre-use visual check (or fails during use) then local procedures for reporting, recording and any emergency procedures (if identified) must be followed.

## Formal Examination

- **Frequency of formal examination**

In the vast majority of cases LEV must be formally examined every 12 months. However, in some cases (depending on the nature of the work) more frequent formal examination is required (**see Table 2** attached to this protocol). You as Head of School / Service should check to see that there are systems in place so that all LEVs in your area are examined at relevant intervals.

Where LEV, for operational reasons, is taken out of use for an extended period (e.g. mothballed), then this must be made clear to prevent use (e.g. disconnect from electrical supply and a “do not use” sign put in place on the LEV). Formal examinations do not need to be carried out in this instance; however, if the LEV is brought back into use then a formal examination is completed before first use.

- **LEV labelling by the formal examiner**

To enable users to identify which LEV are operational the formal examiner is required to place a label on the LEV stating that it has either **passed** its formal examination (along with relevant dates) or that it has **failed** and is not to be used.

- **Record retention periods for formal examination**

For most LEVs, the University has access to formal examination records, which are kept for 5 years by the formal examiner. If you arrange your own formal examination then keep these records for at least 5 years (and in such a way that they are easily accessible to others e.g. engineers, maintainers).

## Selection, Design, installation and commissioning of new LEV

- **Identifying the lead person for selection and design**

You as Head of School /Service need to identify the lead person in your locations where LEVs are selected, designed, installed or commissioned. The person may be already identified or if the LEV or the method of controlling a hazard is complex then this lead person may be a competent specialist University employee or contractor.

- **Risk Assessment for Selection and Design**

Make sure the risk assessment process is used to identify the requirement for new LEV (or any significant alteration to an existing system). This process includes as a minimum:

- Input from a user representative and the local Health and Safety Manager/ Specialist
- Likely type of hazards
- Relevant European standard to be met (if there is no European standard, competent advice needs to be obtained)
- Any need for make-up-air is considered and factored in

If more comprehensive guidance is needed to address this, then talk to your Health and Safety Manager.

- **LEV is installed by a competent person**

You, as Head of School/ Service, need to make sure that where LEV is being installed then this is by a competent person in accordance with the European standards (e.g. BS EN 14175, see the Appendix attached to the Table in this protocol). Where there is no European standard then make sure that competent advice is obtained (e.g. from the LEV supplier, specialist installation company, etc.) and a record of who provided the advice and details of the recommendation are kept (e.g. email, design brief).

- **Commissioning of LEV**

You must make sure that for LEVs, before their very first use following installation, and/ or after any significant modification or repair, they are commissioned and that a commissioning report is provided (usually done by the installer or a competent nominee). The commissioning report confirms that the LEV system is performing as designed and that, in the commissioner's competent opinion, the system delivers adequate control of exposure (i.e. it is a record which shows that the LEV has been

installed or repaired properly and that it controls exposure to airborne hazardous material). If you are unsure what constitutes a significant modification or repair talk to your Health and Safety Manager. The report also serves as a reference against which to compare regular checks, maintenance, and formal examinations. The report should be kept for the lifetime of the LEV or until a new report is made.

- **Obtaining relevant documents**

You, as Head of School /Service, need to make sure that user manuals and log books are obtained from the LEV supplier (or installer on the supplier's behalf) and that copies are kept with the LEV so that they can be used to determine any checks, maintenance programmes etc. (this can range from a wallet on the actual LEV to it being in the same location to an office of a lead person – they must be available).

## **Maintenance/ repair/ maintainer checks**

- **Documented programme of maintenance**

You, as Head of School/ Service, need to make sure that a documented programme of maintenance is scheduled and carried out. The user manual and/or log book can be used as a guide to determine a suitable schedule of maintenance checks and maintenance. Any defects identified during maintainer checks or maintenance which compromise the effective functioning of the LEV system need to be recorded, and reported to users and will require the LEV to be taken out of use (see Table 1 attached to this protocol for details of maintenance responsibilities).

- **Competence of LEV maintainer**

You must check that the LEV maintainer is competent (this depends on the complexity of the system, and the maintenance required). The person undertaking maintenance (who may be a University employee or an external contractor) must have sufficient knowledge, experience, and training so that they are competent for the LEV they are maintaining.

- **Formal re-examination following a repair**

During formal examinations of LEVs the Formal Examiner will identify defects and the repairs that are needed in order to correct those defects. If defects are such that the effective functioning of the LEV is compromised, and the repairs needed are to ensure that LEV is protecting users, then the effectiveness of those repairs need to be proved by formal examination (i.e. re-examination).

- **Record keeping**

Any maintenance or repair (e.g. replacing a belt on a motor, changing a filter) must be recorded by the person carrying out the maintenance or repair and kept in line with the Table 1 attached to this protocol for at least 5 years.

If you need any further advice or guidance please speak to your Health and Safety Manager.