

Getting laboratory extract ventilation that works

John Saunders
10th June 2010



John Saunders



- Scientist with HSL for over 20 years working in industrial and containment ventilation
- Member of the HSE LEV Project Team
- Represents HSE as a member of the BSI Technical Committee for laboratory fume cupboards
- Represents HSE as a member within the UK delegation to CEN TC332, producing the new European fume cupboard standard
- Member of the BOHS Special interest group on control

Today's HSL : Dimensions

- 400 staff
- £36m t/o
- 75% graduate
- 98 PhDs
- 70 MScs



Widest science base of any equivalent European Laboratory

Contents

- What's Local Exhaust Ventilation (LEV)?
- What's the problem with LEV?
- The HSE LEV project
- Getting effective LEV and assessing control
- Commissioning LEV and looking after it

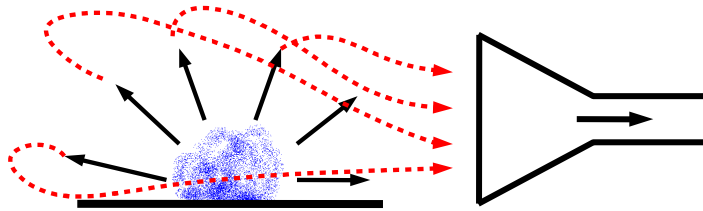


**What is Local Exhaust
Ventilation (LEV)?**

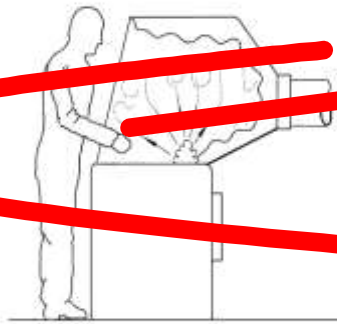
Examples of Local exhaust ventilation hoods



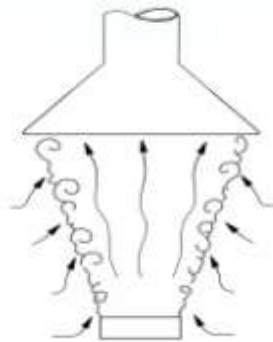
The three basic types of LEV hood



Capturing
(Capture)



Enclosing
(Contain and separate)



Receiving
(Receive, contain & empty)

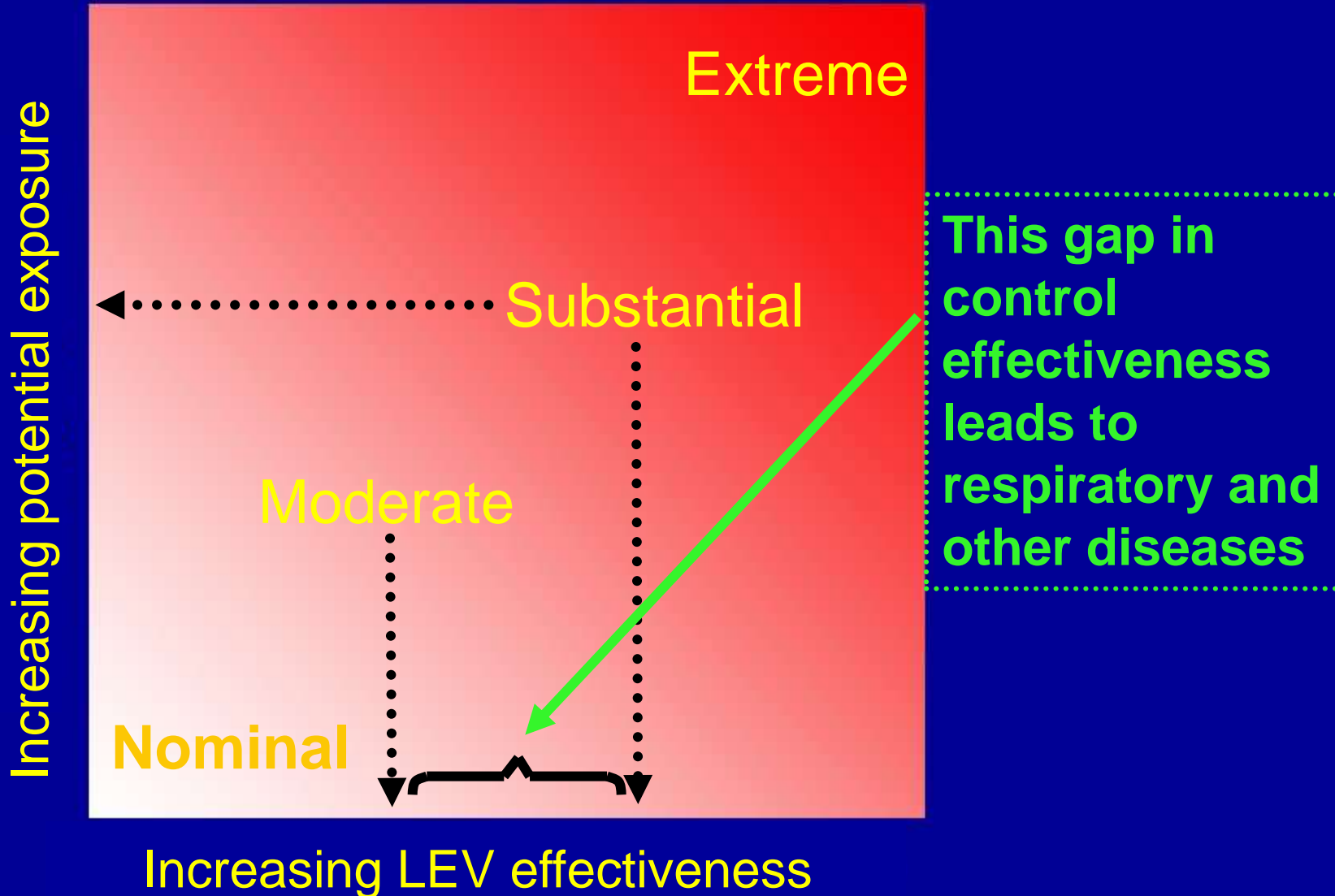
Why classify LEV hoods?

- Design principles listed in HSG 258
- Details the essential features of the different types of hoods
- Helps assessors to think more logically and look more critically at LEV hoods
- Note: some hoods may work in mixed-mode



**What's the problem with
LEV?**

Matching LEV to potential degree of over-exposure



The control problem in a nutshell

(1 of 3)

The main problems are:

- Employers frequently sold inappropriate and expensive LEV systems that don't work
- Employers often don't appreciate the extent of exposure risk from their processes
- Employers and employees, are often over-optimistic about LEV capabilities

The control problem in a nutshell

(2 of 3)

- LEV buying – There has been no guidance and employers are often misled and mis-sold
- LEV design – often the LEV hood is not matched to the process and source(s) causing exposure
- LEV commissioning – this is rarely done thoroughly, often done mechanically and control effectiveness, matched to need, is usually missed out

The control problem in a nutshell

(3 of 3)

- LEV checking and maintenance – suppliers provide little guidance and employers don't do it frequently or systematically enough
- LEV thorough examination and test – is often not done and when it is it is often incomplete and uncritical (it's not "thorough")



The HSE LEV Project

HSE LEV project aim:

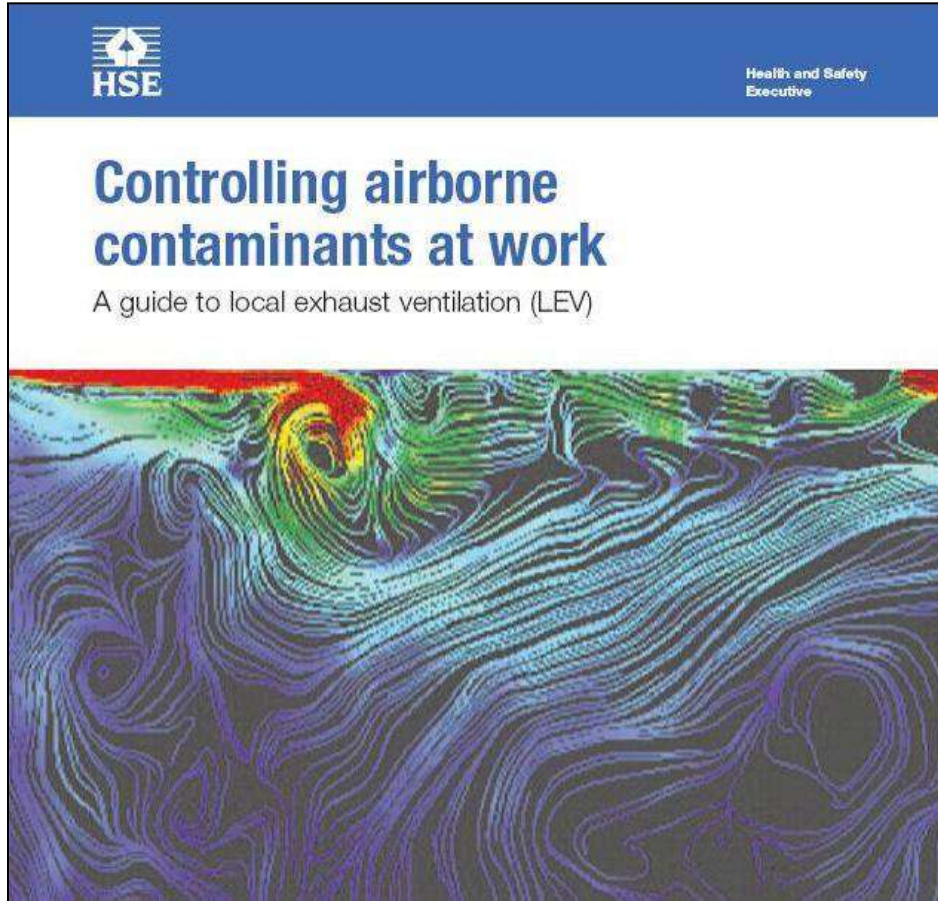
“To bring about a significant, measurable improvement in the coverage and effectiveness of engineering exposure control, particularly LEV, in the UK”



LEV guidance aimed at suppliers

HSG 258 “*Controlling airborne contaminants at work: A guide to local exhaust ventilation*”

Priced publication (£12.95) and replaces HSGs 37 and 54



Or available to download for free from the HSE site (type ‘HSG 258’ in to any search engine)

Employers and employee guidance

INDG 408 “*Clearing the air: A simple guide to buying and using local exhaust ventilation*”

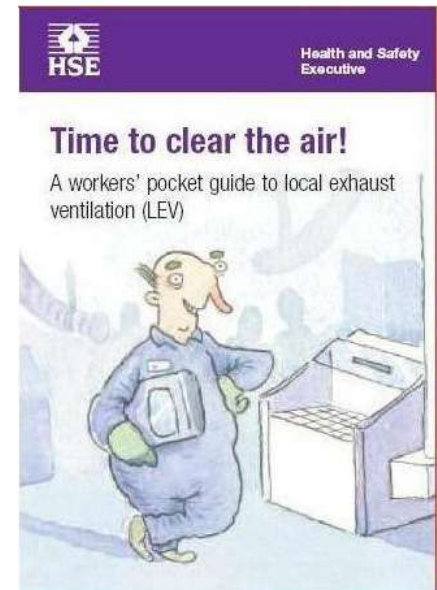
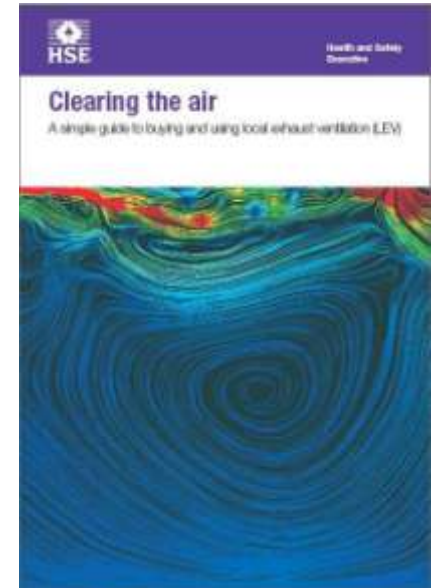
May 08 to March 09 = 42,455
Downloads = 11,999

INDG 409 “Time to clear the air! A pocket guide to local exhaust ventilation (LEV)”

Leaflet available on:

<http://www.hse.gov.uk/lev/index.htm>

May 08 to March 09 = 43,969
Downloads = 9,960



HSE LEV guidance

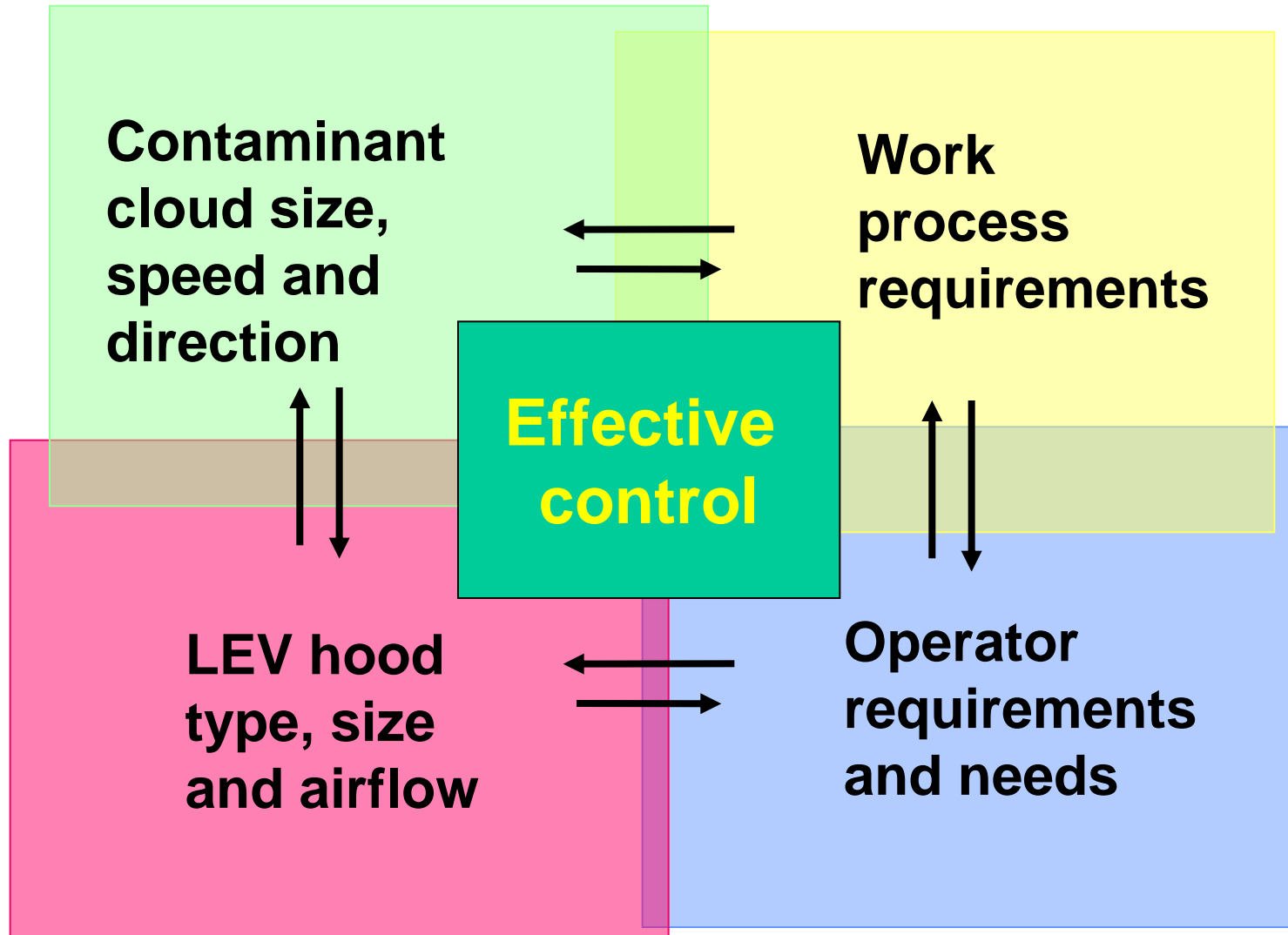
- The new HSE guidance is not specific to a particular industry/sector
- Has to be generic – from laboratories to wood working shop





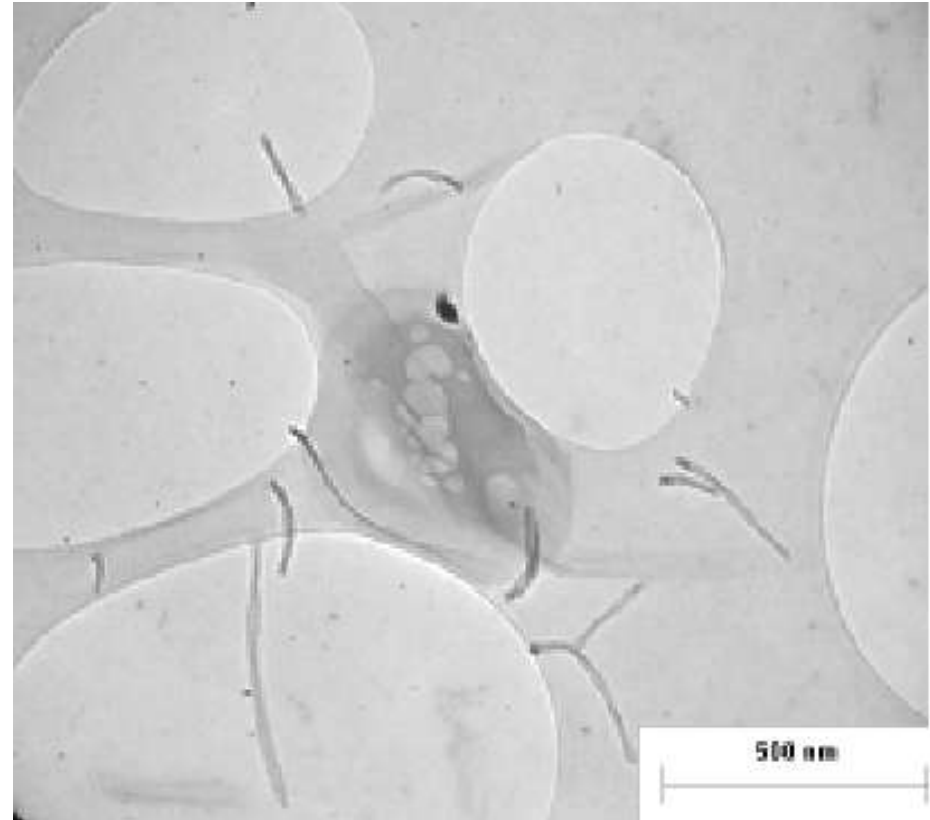
Getting effective LEV and assessing control

Effective LEV - the four overlapping elements



Control of contaminants in the laboratory setting

- A range of materials – not just vapours and gases
- Airborne particles (dusts, fumes, mists, fibres) and nanoparticles/ CNT's
- Therefore modern laboratories tend to have all types of LEV systems installed



Qualitative assessment - Smoke

Review of smoke machines:

www.hse.gov.uk

or Search fog machines on
the internet



Inexpensive equipment for assessing and checking LEV systems (2)



DRAPER

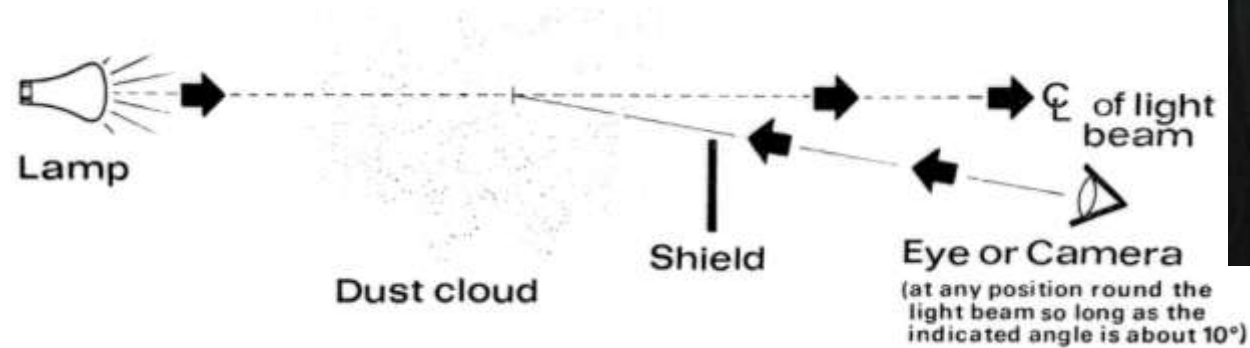
6V Rechargeable 1Million Candle Power Halogen Lamp Draper RHL120/50A

6V portable hand lamp ideal for camping, caravanning, vehicle breakdowns, security and other applications. The halogen bulb gives extra brilliant white light. On/off locking switch, hand grip. Gives up to 30 minutes continuous usage. Built-in 6V rechargeable battery, supplied complete with 230V AC mains adaptor with 3 pin plug and in-car charger unit. Display panel.

The Draper 6V Rechargeable 1Million Candle Power Halogen Lamp 78482 Draper RHL120/50A appears on page 387 of the current Draper Tools catalogue.



Example of a DIY dust lamp



<£20

Qualitative methods

- Personal sampling
- BM (where possible)
- Direct reading monitors
- Challenge tests
 - EN 14175 for fume cupboards
 - EN 12469 Microbiological Safety Cabinets Safety cabinets





**Commissioning LEV and
looking after it**

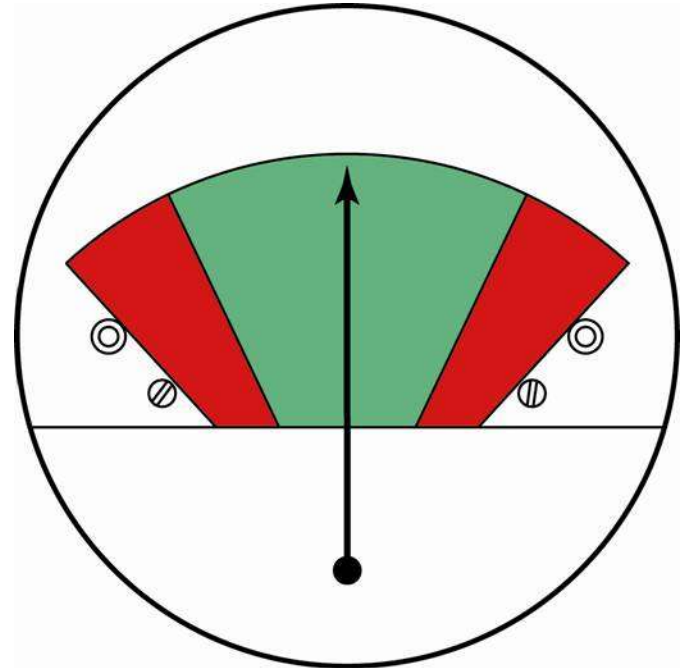
Commissioning - HSG258

Four stages

1. Installation and verify that the system was installed as designed
2. Show LEV systems meets specified technical performance
3. Control effectiveness
4. Commissioning report

Airflow indicator set-up

- Ideally all hoods should be fitted with airflow indicators
- Suitable and sufficient
- You will find they are fitted to fume cupboards and MSC – consider fitting them to other LEV hoods



User manual?

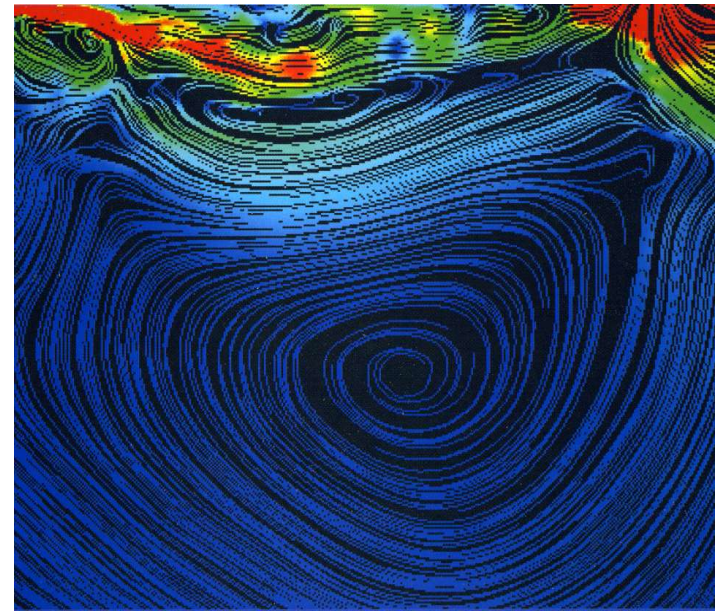


LEV thorough examination and test

HSE LEV guidance (HSG 258) defines “thorough” as follows:

“Thorough’ means careful, methodical, painstaking and complete”

Treat this ‘annual’ test as an audit of the previous years maintenance



Thank-you for listening