LEV LOCAL EXHAUST VENTILATION 2024

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Hosted by

BOHS British Occupational Hygiene Society

When and why do we need to use Local Exhaust Ventilation

Adrian Parris (Senior Occupational Hygienist - Sellafield, BOHS President-Elect)

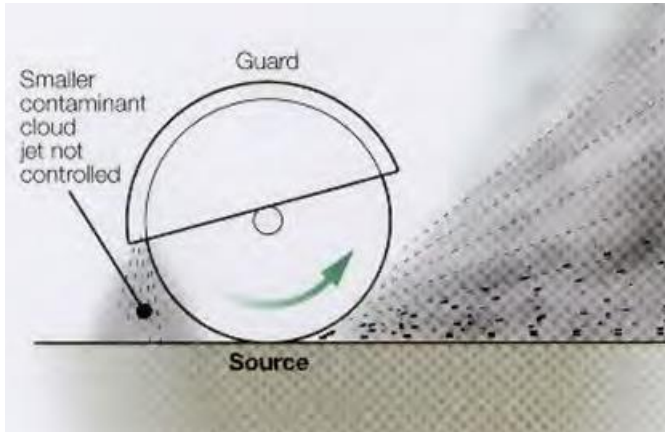
When and why do we need to use Local Exhaust Ventilation

Adrian Parris, BOHS President-Elect,
Occupational Hygiene & Chemical Safety Manager, Sellafield Ltd

What is Local Exhaust Ventilation (LEV)

- Ventilation - The process of supplying air to, or removing air from, any space by natural or mechanical means.
- Two broad forms of ventilation
  - General Ventilation (Pathway control)
    - Passive
    - Forced
  - Local Exhaust (Source Control)

Source



Pathway

Receiver

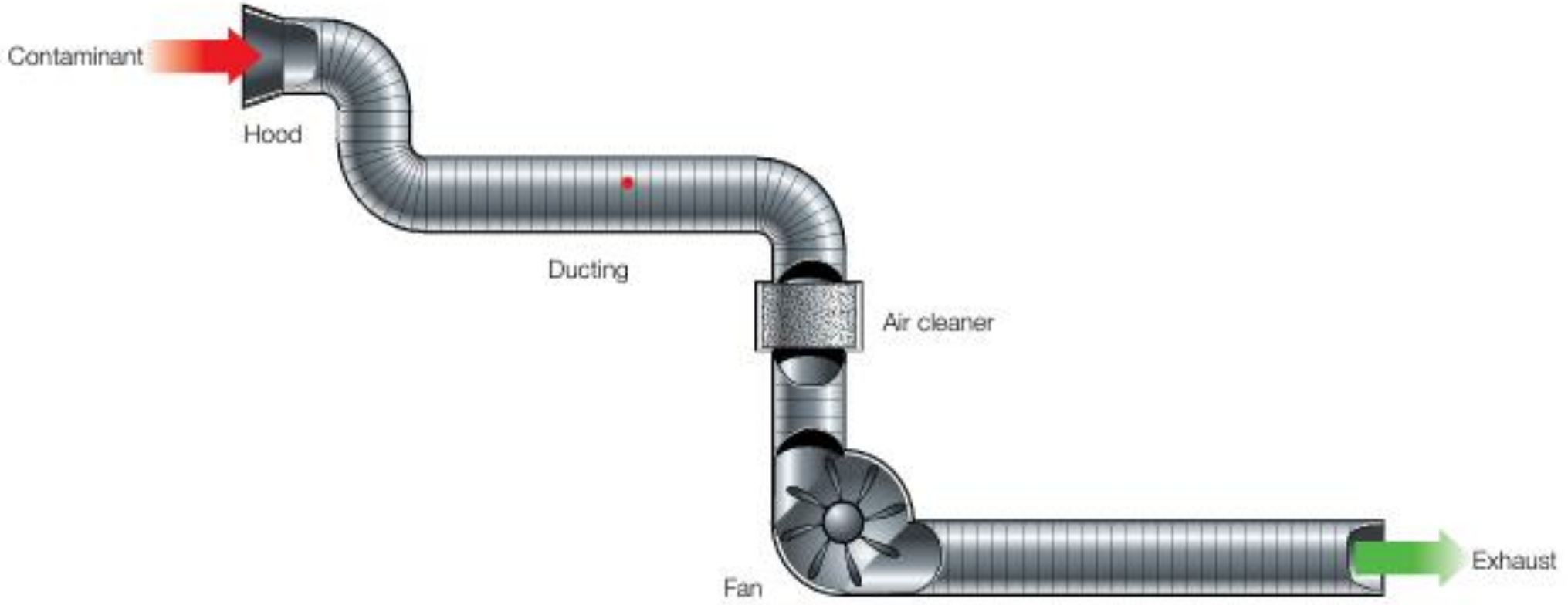
General Ventilation v Local Exhaust Ventilation (LEV)

	General Ventilation		Local Exhaust Ventilation
☑	Low toxicity substances below WEL.	☑	Used to control at source can prevent exposure.
☑	Multiple sources.	☑	Applied to substances with a range of toxicities.
☑	Emissions continuous.	☑	Emissions from defined points of exposure.
☑	Workplace/task is such it can be diluted before inhalation.	☑	Cost effective removes smaller volumes of air, lower energy costs.
☑	Improving general air quality, odorous substances, temperature etc.	☑	Protects others in the workplace and secondary exposure.
✗	Large group potentially exposed.	✗	LEV systems require careful design, installation and maintenance.
✗	Will not prevent exposure occurring.	✗	Need to be positioned close to or contain the emission source to be effective.
✗	Moving large volumes of air, operational costs.	✗	Requires high capital outlay and maintenance costs.

- Reality you would have a combination of both.
  - Requirement for makeup air for LEV
- The balance between which depends on task, substance and effectiveness of LEV.

What Is LEV, Why Is It Required

- A system typically consists.



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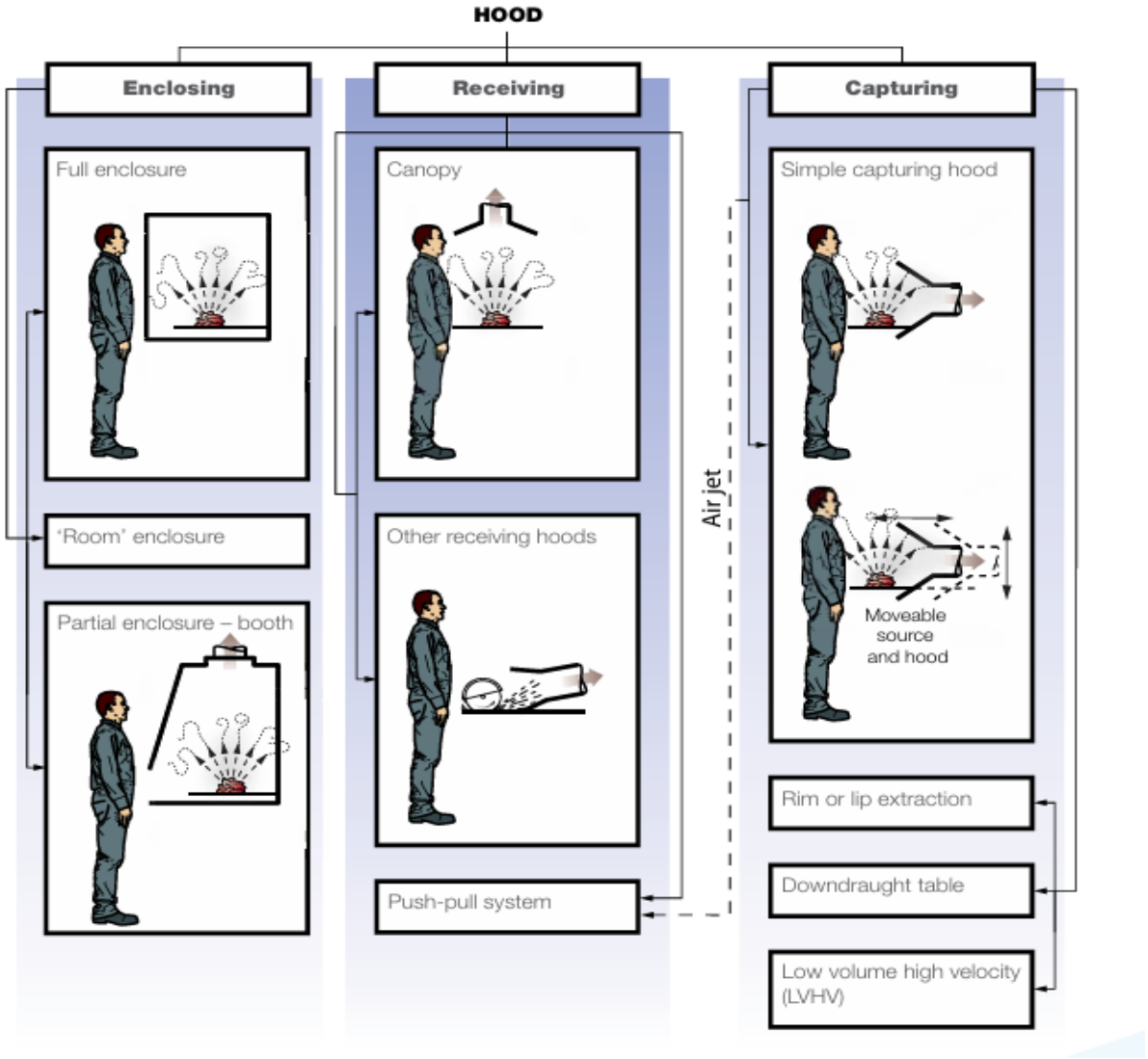
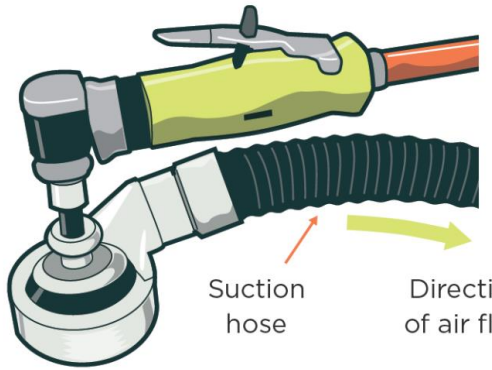
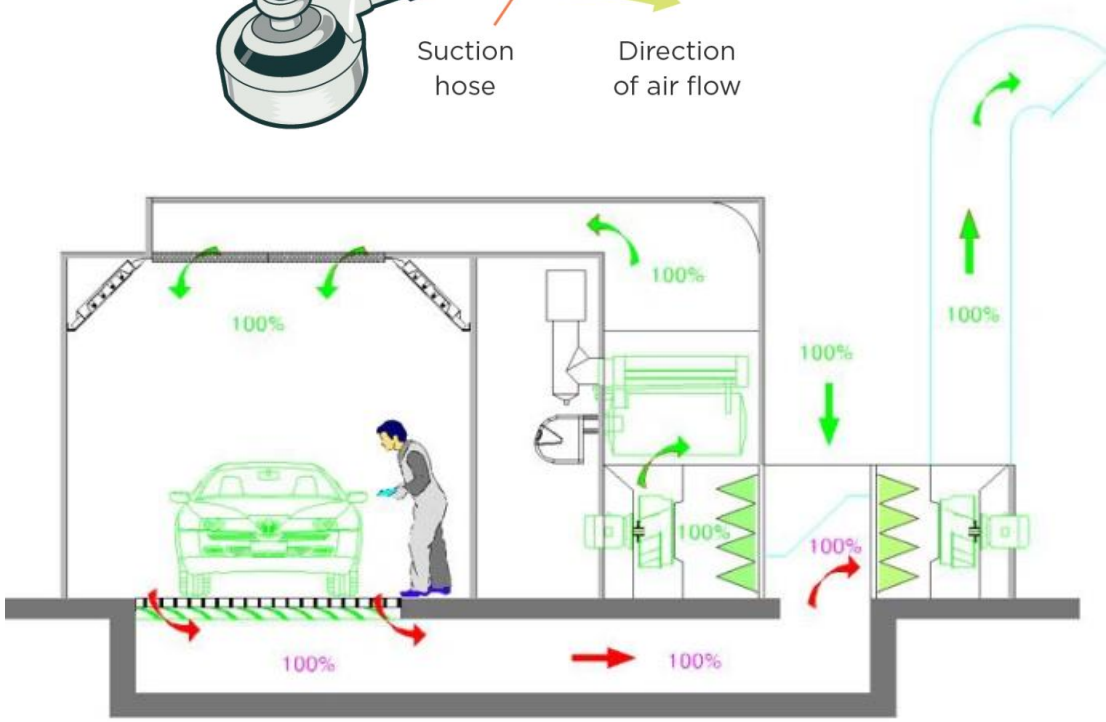






What Is LEV, Why Is It Required/Chosen

- Effective measure to manage health risks in the workplace, maintain healthy workforce.
- One of the main ways of controlling airborne chemical and biological hazards.
- Concepts have been around a long time, but often poorly understood.
- Can be very effective if designed correctly.
- Can control dust, fumes, aerosols, mists, vapours, ga
- Comes in all shapes and sizes to match the process.
- Applied across multiple industry process.

What Is LEV, Why Is It Required

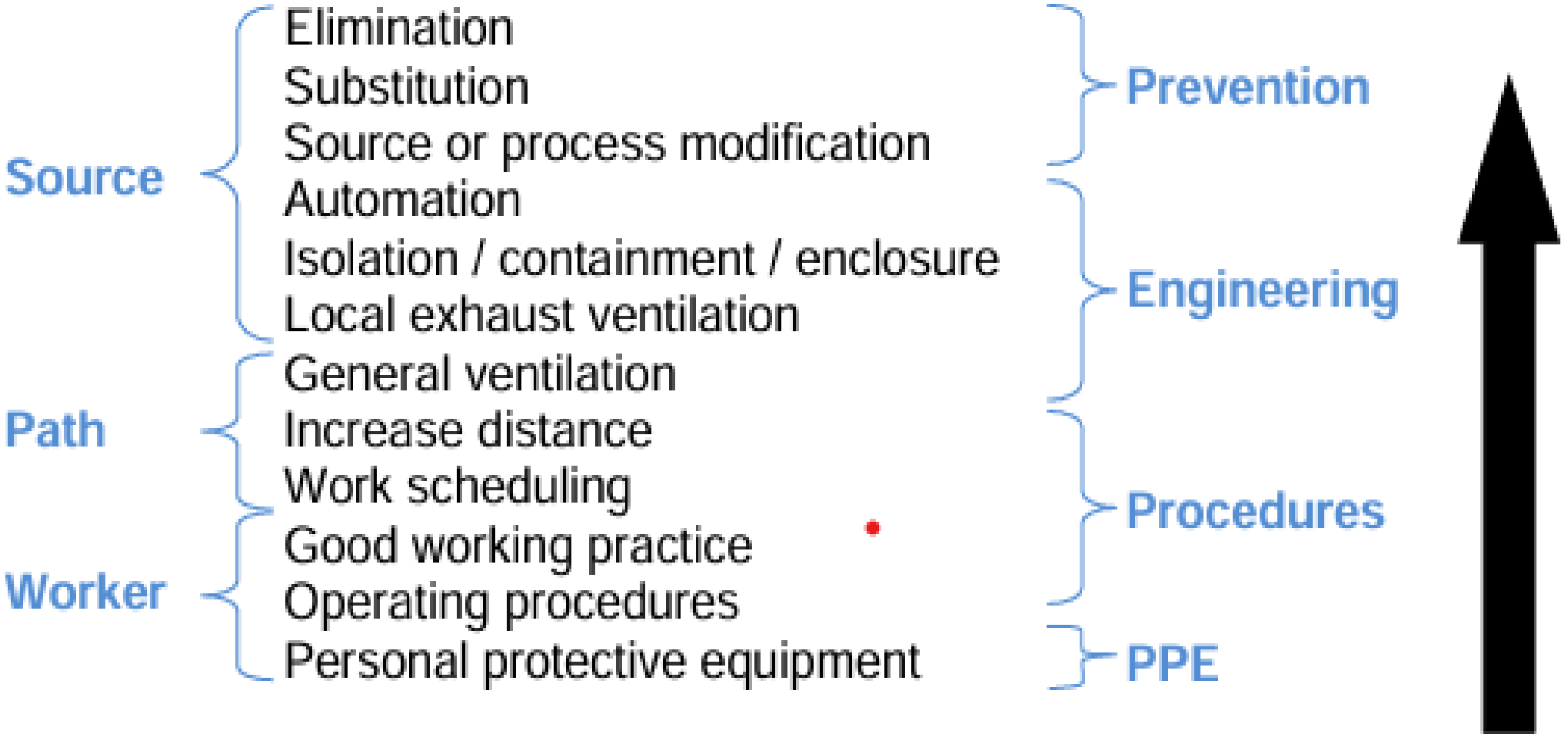
- Universal in application multiple industry sectors / process.

What Is LEV, Legally Why Is It Required/Chosen

- Legislation requires us to control substances hazardous to health (COSHH).
- LEV has a part to play in meeting those requirement's
- Prevention of exposure fundamental requirement of COSHH
- Adequate Control
  - Compliance with Workplace Exposure Limits.
  - Applying the Principles of Good Practice.
  - Reducing Exposures to As Low As Reasonably Practicable.

When You Need Local Exhaust Ventilation

What is Local Exhaust Ventilation



Welding Fume : Applying the Hierarchy of Control

- **Potential Range of Toxins Present**
  - Iron, Nickel, Chromium VI, Manganese, Ozone, Nitrogen Dioxide from base metal, consumables and process byproducts.
  - Others toxic substances present due to coatings, lead, greases & oils etc.

- **Health Effects**

- Range of potential health effects depending on process and material being welded, metal fume fever, chronic obstructive pulmonary disease (COPD), bronchitis and emphysema, asthma

- **International Agency for Research on Cancer (IARC)**
  - Reclassified all welding fume as a Category 1 ‘Known Human Carcinogen’ for lung cancer

- **Manganese**
  - WEL tightened from 0.50 mg/m3 to 0.20 mg/m3 (inhalable) and 0.05 mg/m3 (respirable)

Welding Fume : Applying the Hierarchy of Control

- **Scenario**
  - Manual Metal Arc Welding
  - Steel Pipe Fabrication
  - Joining onto existing structures
- **Looking at Options to Control Exposure to Welding Fume**

Welding Fume : Applying the Hierarchy of Control

Hierarchy	Options
Elimination	- Use robotic welding. - Buy in prepared material.
Substitution	- Alternative welding technique. - Use less hazardous materials.
Engineering Controls	- Deploy local exhaust ventilation. - Good general ventilation. - Welding jigs, optimum positioning.
Administrative	- Welders positioning. - Access control. - Optimum setting on welder unit. - Cleaning activities. - Maintenance and testing of controls. - Information, instruction and training. - Health surveillance
PPE	- Powered air purifying respirator.

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BREATHE FREELY

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Breathe Freely, Welding Fume Control Selector Tool

- To help duty holders select and specify the correct extraction system for a welding activity, a working group of experts has developed the Welding Fume Control Selector Tool. We have designed it to be simple and easy to use – and it's also free: https://www.breathefreely.org.uk/WST/