Factory Indoor Air Quality monitoring platform

HEXmon is the intelligent companion for Containment & Control Systems

The problem

Manufacturing processes generate emissions that can be harmful to health and the environment.

These emissions include Particulates (such as aerosol mists, dust and fumes), Volatile Organic Compounds (VOC), Noise and Temperature.

Health risks in the workplace may not be apparent, underestimated, or misunderstood. Yet, even low-level, repeated exposure to certain emissions can lead to serious long-term health issues

Inadequate or failure of engineering controls can result in uncontrolled release of emissions at source, significantly increasing both primary and secondary exposure pathways through airborne dispersion.
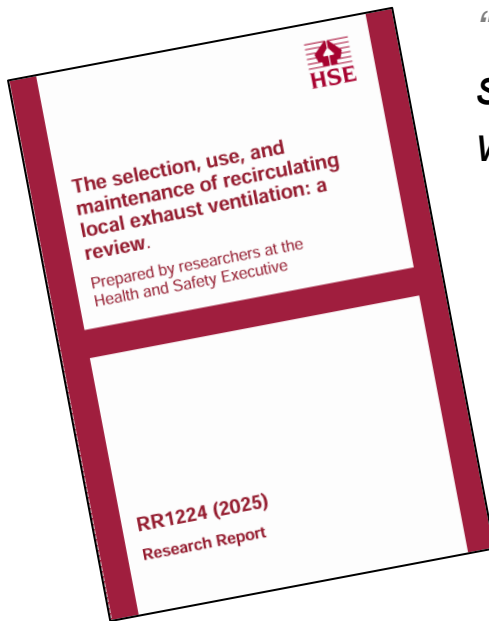
Factory indoor air quality fluctuates during production periods, driven by variations in processes, material handling and operational activities

Regulatory occupational health assessments and evaluations of control measures are required but only offer a momentary snapshot, failing to capture fluctuating risks from emissions
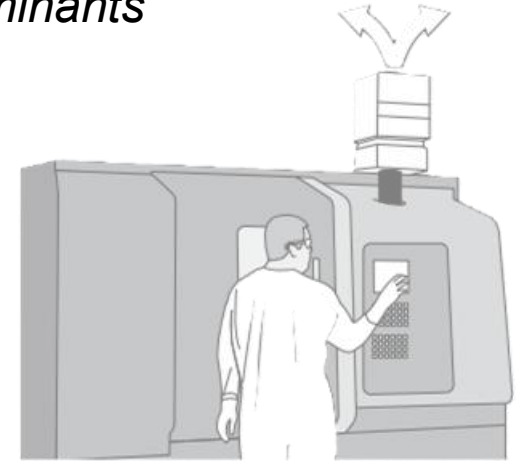
Recognising the problem

A common form of engineering control are Local Exhaust Ventilation (LEV) – extraction – Systems. Recirculating systems dominate certain industries

The UK Health & Safety Executive Research Report,
[RR1224 - The selection, use, and maintenance of recirculation local exhaust ventilation: a review](#) **published May 2025 concludes**

"there are potentially high numbers of recirculating LEV systems that are unlikely to be effectively controlling worker exposure to harmful contaminants"

"Real time aerosol monitors could play a larger role as monitors/alarms on recirculating filter systems. This is because they could indicate particle filter breakthrough, which pressure measurement is unlikely to pick up."

Consequences of not dealing with the problem

The link below is to a joint British Occupational Hygiene Society / Health & Safety Executive webinar and is a must watch for responsible persons

https://app.getcontrast.io/watch/besa-shep-2

Skip to 2:20 to hear from Kevin Bampton, a Lawyer & CEO of BOHS and how corporate risk profile is changing for those responsible.

Couple of quotes from KB, which are very relevant

"*The tools, the mechanisms you have in the workplace, to assess your health and safety need to be as up to date as your knowledge of the risk.....*"

"*...the minimum standards are not enough to meet compliance ... you need to show you are reducing exposure to as low as reasonably practicable...*"

This is ALARP

Beyond the moral and regulatory obligations to safeguard worker health, failing to do so exposes both organisations and individuals to significant legal and reputational risks.

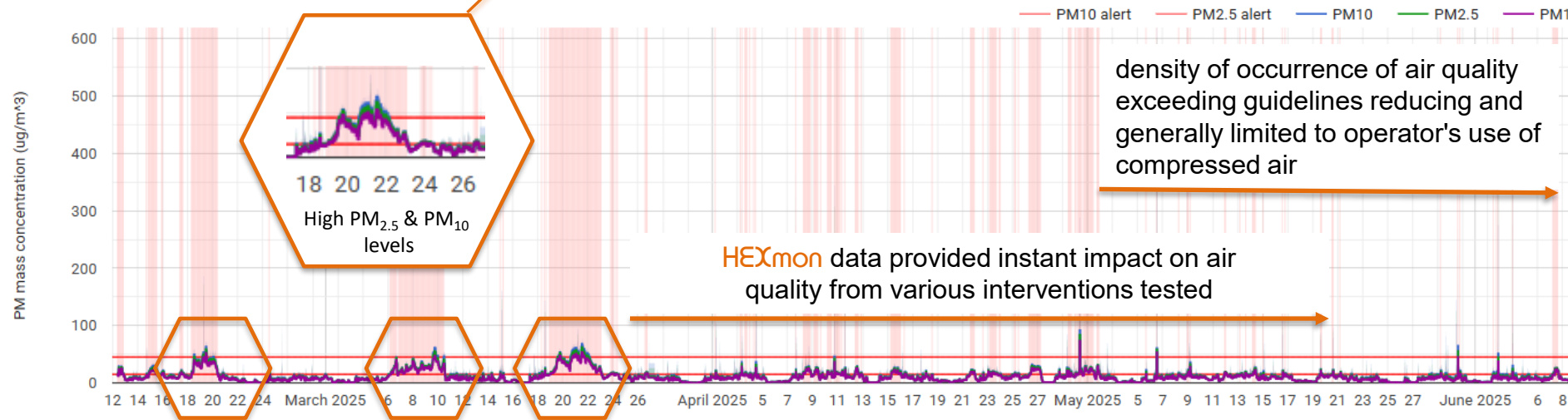# A solution to evidence progress towards achieving ALARP

Following the installation of **HEXmon** in a modern, well maintained CNC machine shop producing high-value components, initial data analysis revealed that during extended cutting cycles, the recirculating LEV system failed to effectively capture respirable particulates of coolant mist, with $PM_{2.5}$ and PM_{10} concentrations frequently exceeding WHO guidance values.

PM Mass Concentration

Averages: PM10: 12.1ug/m^3, PM2.5: 11.3ug/m^3, PM1: 10.1ug/m^3

csv

PM10 alert — PM2.5 alert — PM10 — PM2.5 — PM1

High $PM_{2.5}$ & PM_{10} levels

density of occurrence of air quality exceeding guidelines reducing and generally limited to operator's use of compressed air

HEXmon data provided instant impact on air quality from various interventions tested

HEXmon data demonstrates continual improvement towards achieving ALARP

HEXmon SENSOR monitoring, alerting, reporting platform

HEXmon monitors relative changes in common emissions from manufacturing processes.

Real-time monitoring helps assess the continued effectiveness of control measures, levels of secondary exposure, and sees the impact of actions taken to reduce emissions.

- **Reduces risk for Duty Holders, informed decision making**

- **Evidences progress toward achieving ALARP**

- **Real time insight into change impact & secondary exposure risk**

- **Continuous monitoring, alerting & reporting**
  - **Noise Levels**
  - **Particulate Matter (mist, dust, fumes)**
  - **Total Volatile Organic Compounds**
  - **Temperature, Humidity, Atmospheric Pressure**

- **More effective than LEV inline pressure or flow monitors**

- **Easy to install**

- **Secure data access via our independent Cellular Gateway**

HEXmon is the intelligent companion for Containment & Control Systems

HEXmon provides actionable insights, supporting Duty Holders, Occupational Hygienists and Safety Advisors to refine risk assessments and implement safer, more efficient work practices.

HEXmon helps reduce risk, creates a safer workplace, enhances employee well-being and efficiency, lowers costs, and reduces pollution.

HEXmon is an effective component of 'safety first' strategies, sustainability initiatives, and corporate social responsibility efforts.

HEXmon data documents the journey towards achieving ALARP and operational excellence

Get in touch to learn more

HEXmon website

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