



Essential guide

for machine workshop

airborne hazards



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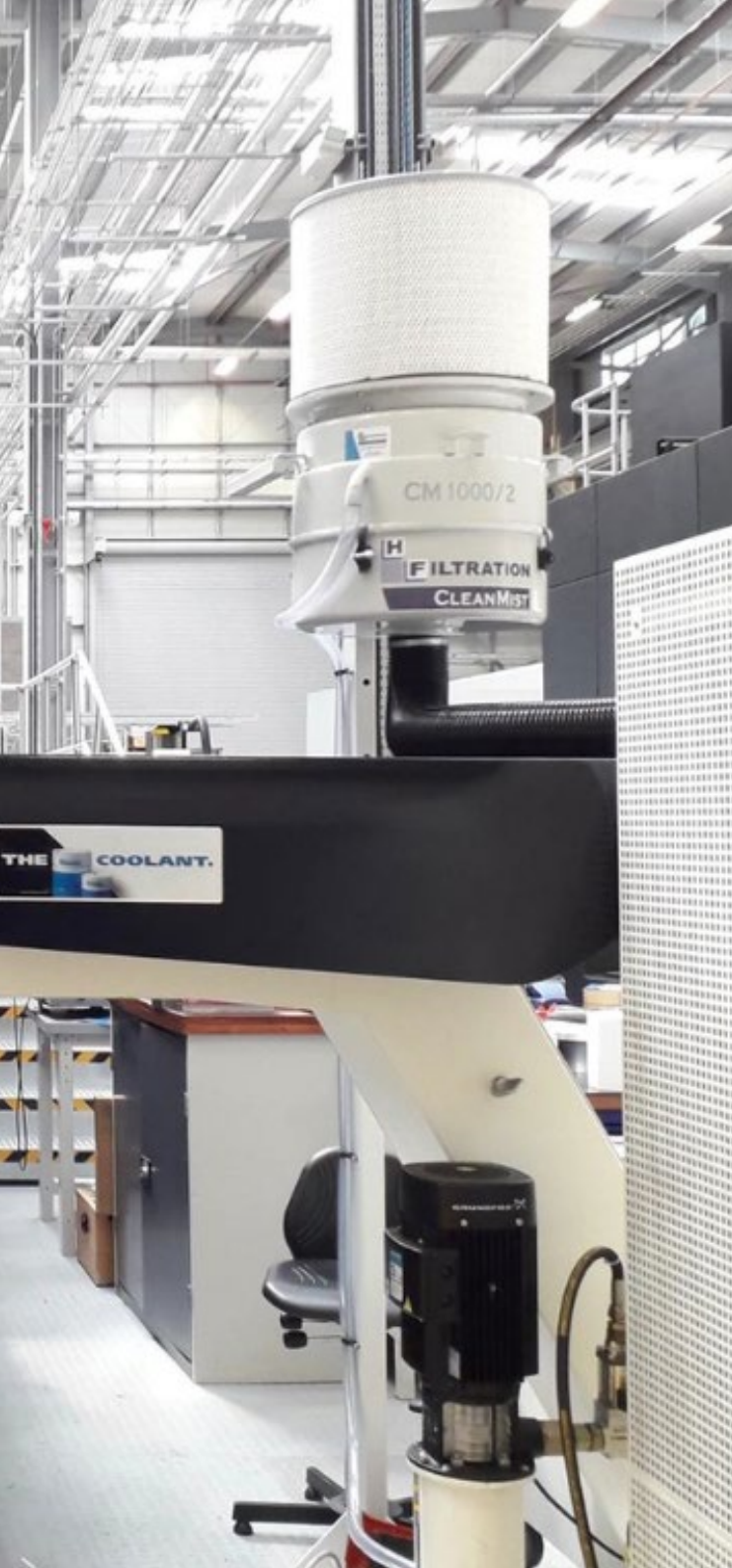
“Our aim is to create a safer and more efficient workplace environment, helping to reduce downtime and improve production and ultimately, profitability.”

Stewart Coull
MANAGING DIRECTOR

The air you work in: why airborne hazards matter

Machining processes generate aerosols, vapours and particulates from metalworking fluids (MWFs), coolants, oils, and the cutting action itself. These contaminants can affect lungs, skin, eyes, machine reliability, housekeeping, lighting and even slip/fire risks.

Because droplets and particles are often invisible, the risks are easy to underestimate – until production quality, operator health or inspections are impacted.



Part 1

Common airborne hazards in machining workshops

Oil mist (neat oils)



Source

High-speed turning, milling, drilling and grinding with neat (straight) oils; heat and shear generate fine droplets.



Hazard

Inhalation and skin contact risks; can aggravate asthma and respiratory issues; settles on floors and equipment causing slips, poor visibility and housekeeping burdens; potential ignition risks in poorly controlled environments.



Control measures

Capture at source via suitable LEV (mist extraction), closed doors/guards, correct enclosure negative pressure, good maintenance and appropriate filtration media.

Coolant mist (water-mix / emulsions)



Source

Emulsified MWFs atomised at the tool-work interface; through-spindle coolant and high-pressure systems.



Hazard

Respiratory irritation, occupational asthma/hypersensitivity pneumonitis risks; dermatitis from skin contact; can carry bioburden (bacteria/fungi) if fluids are poorly controlled.



Control measures

Effective capture and filtration; fluid management (concentration, pH, tramp oil control); enclosures shut; avoid visible misting; maintain LEV to keep exposure 'as low as reasonably practicable'.

Part 1

Common airborne hazards in machining workshops

Smoke / condensable fumes



Source

Thermal processes (hard turning, grinding, EDM) and hot chips generating sub-micron smoke that can bypass basic separation.



Hazard

Fine particulates penetrate deep into lungs; challenging to capture without the correct filter stages.



Control measures

Use systems rated for smoke (high-efficiency coalescent and final/HEPA stages); verify capture velocities and seal integrity.

Dust and dry smoke (auxiliary ops)



Source

Dry machining, deburring, polishing, additive manufacturing support removal, some composite/plastic machining.



Hazard

Inhalable/respirable dust risks; may be combustible depending on material.



Control measures

Application-matched extraction (mist vs dust are different), housekeeping, explosion protection where applicable.

VOCs and odours



Source

Additives/cleaners, degraded MWFs, solvents.



Hazard

Eye/airway irritation, comfort/productivity impacts.



Control measures

Fluid care, suitable filtration stages (e.g. activated carbon where appropriate), substitution and process optimisation.



Part 2

UK legislation and what it means for you

Core duties you should plan for:

COSHH (Control of Substances Hazardous to Health):

Requires you to assess risks, prevent or adequately control exposure, maintain control measures, provide information/training, and arrange appropriate health surveillance where indicated.

LEV (Local Exhaust Ventilation):

If you use extraction as a control, it must be properly designed, commissioned, and maintained.

1

Risk assessment and hierarchy of control

Eliminate, substitute, engineer (LEV), administrative measures, then PPE/RPE as a last line.

2

Commissioning of LEV

New or modified systems must be commissioned to prove they achieve adequate control in your process.

3

Thorough Examination and Test (TEXT)

Most LEV systems require a thorough examination and test at least every 14 months (some processes more frequently).
Keep records.

4

Operate and maintain

Keep systems in 'efficient working order'; ensure operators know how to use and check them.

5

Health surveillance where appropriate

E.g. for risks of dermatitis or asthma when working with MWFs.

6

About exposure limits

There is no current UK WEL (Workplace Exposure Limit) for oil mist or water-mix MWF mist. Practically, this means you must reduce exposures as low as reasonably practicable (ALARP) and demonstrate effective control.

Part 3

Why effective mist extraction matters



✓ Protects health

Reduce respiratory/skin risks from mists, smoke and aerosols; support a cleaner, brighter working environment.

✓ Demonstrates compliance

A commissioned, well-maintained LEV system with records puts you on the front foot for inspections.

✓ Improves reliability and quality

Keep optics, sensors and electrics cleaner; stabilise process conditions; reduce rework linked to contamination.

✓ Cuts housekeeping and slip/fire risks

Less residue on floors, fixtures and lights; reclaim oil where appropriate.

✓ Supports morale and retention

Cleaner air is a visible investment in operator wellbeing.



Part 4



Jemtech partners with Hfiltration to provide application-matched solutions for mist, smoke and dust. The core ranges cover single machines through to centralised systems and harsher smoke applications.

Jemtech mist extraction ranges

CleanMist® – centrifugal and electrostatic oil mist filters

Best for

Individual CNCs producing oil/coolant mist at typical speeds/pressures.

How it works

Polluted air is drawn into a centrifugal filter (mesh-protected intake prevents swarf entry). Droplets are thrown out by centrifugal force; optional stages address finer fractions. Electrostatic options are available for certain duties.

Key benefits

Compact machine-mount options; proven, energy-efficient removal of oil mist; helps maintain enclosure negative pressure; reduces visible mist, odour and residue.

Typical outcomes

Clearer air around the machine; fewer mist alarms/door plumes; improved housekeeping.

Efficiency

300m³/h to 2300m³/h



Part 5



A coalescent effect filter for the abatement of emulsified oil mists, composed of pleated glass fiber cartridges with H13 efficiency and an external polypropylene membrane.

The structure of MIST COMPACT® is equipped with a large inspection panel to facilitate all assembly and maintenance operations.

Mist Compact® high-efficiency coalescent cartridges

(incl. centralised systems)

Best for

Higher-duty and multi-machine installations; emulsified oil mists; where verified high capture efficiency and easy service access are priorities.

How it works

Pleated glass-fibre cartridges with high-grade efficiency (up to H13 with options); large inspection panels; configurable extras (final filters, silencers, differential pressure monitoring).

Key benefits

Suited to centralised systems; robust performance for demanding coolant-mist applications; scalable airflow and static pressure for longer duct runs.

Typical outcomes

Consistent plant-wide air quality; simplified maintenance; strong compliance evidence via DP checks and inspection access.

Efficiency

1500m³/h to 14000m³/h



Part 6



Ideally suited to CNC Machine Tools, Lathes, Boring, Drilling, Milling, Broaching, Printers, Grinding and super-finishing, Threading & tapping, Cutting with sawing machines, Nebulization of whole oil, Emulsion nebulization, Applications with oil presence and Mechanical machining in general.

MCOS coalescent filter

for oil mist and smoke in harsher conditions

Best for

Processes generating finer smoke/condensable fumes (e.g., hard turning/grinding, thermal effects) and difficult aerosols.

How it works

Multilayer glass-fibre media promotes true coalescence; micro-particles agglomerate while passing through progressively denser layers, forming drainable droplets. Integrated-fan variants are available to simplify installation.

Key benefits

High removal efficiency on sub-micron particles; handles harsher conditions than basic mist units; options to mount within or close to the machine to save space and reduce noise.

Typical outcomes

Noticeably clearer cabins/aisles even on challenging smoke-prone operations; easier compliance demonstration for fine-particle duties.

Efficiency

2000m³/h to 8000m³/h – 99.99% filtration of particles



Part 7

Installation, service and support with Jemtech

- ✓ **End-to-end support:** Application survey, selection, and sizing; electrical/mechanical installation by qualified technicians.
- ✓ **LEV commissioning and records:** We commission systems to verify technical performance and control effectiveness for your specific processes, providing the baseline for future TEXT.
- ✓ **Planned maintenance:** Filter changes, integrity checks, DP monitoring, fan/duct inspections to keep capture performance consistent and energy-efficient.
- ✓ **TEXT and air monitoring:** Support with 14-month thorough examination and test cycles (or as required) and air monitoring where appropriate.
- ✓ **Minimise downtime and cost:** Proactive service prevents failures, extends equipment life and maintains compliance.
- ✓ **Jemtech offers a no-obligation survey:** to review your current extraction, risks and compliance posture, and to recommend practical improvements.

Part 8

Practical steps for Workshop Managers

1

Walk the shop

Identify visible mist, 'foggy' enclosures, odours, slippery residues, stained lights, and areas where doors are frequently opened mid-cycle.

2

Check enclosures

Doors/guards should stay shut; confirm seals and negative pressure (no mist plume when doors open).

3

Verify LEV basics

Capture points correctly positioned; ducting intact; filters in service date; DP readings recorded; drains clear.

4

Keep fluid healthy

Maintain concentration/pH, remove tramp oil, clean sumps, and control bacteria (diplslides, routine checks).

5

Train and brief

Operators should recognise mist controls, pre-use checks, and reporting routes.

6

Plan TE_XT and maintenance

Put the 14-month cycle on the calendar; keep commissioning and service records accessible for inspections. We also recommend the internal filters of the units to be changed every six months.

7

Escalate issues early

Rising DP, visible haze, or odours usually mean filters or capture set-up need attention.

Frequently Asked Questions

What are the hazards associated with CNC machines?

CNC machining can generate airborne oil mist, coolant mist, smoke and fine dust depending on the process and cutting fluid. These hazards can cause respiratory irritation, occupational asthma, dermatitis, poor visibility, slip hazards and potential fire risks if not controlled.

What are the hazards associated with workshop machinery in general?

Beyond airborne contaminants, hazards include moving parts (entanglement/crush), flying chips, noise, vibration, electrical risks, and poor ergonomics. Good machine guarding, regular maintenance, and appropriate extraction all reduce these risks.

Do CNC machines need ventilation or extraction?

Yes. Under UK COSHH regulations, employers must control exposure to mist, fumes and dust. Well-designed Local Exhaust Ventilation (LEV) or mist extraction systems are the most effective way to keep exposures as low as reasonably practicable and maintain compliance.

What safety precautions should be observed during a CNC process?

- Keep machine doors and guards closed during operation.
- Ensure mist extraction or LEV is running and functioning correctly.
- Wear appropriate PPE if required by risk assessment.
- Check coolant levels and concentration to reduce misting and bacterial growth.
- Conduct pre-use checks: look for leaks, broken seals, damaged ducts or filters.
- Train operators to recognise mist problems (visible haze, odours, alarms) and report them promptly.

How often should mist extraction systems be checked?

LEV systems must undergo a thorough examination and test at least every 14 months (sometimes more often depending on process), with routine visual inspections and filter maintenance and replacement in between to ensure consistent performance.

What happens if mist extraction is inadequate?

Poor control can lead to health issues, HSE enforcement action, housekeeping problems, machine downtime, and reduced part quality. It also makes inspections and compliance evidence difficult.

Your trusted machine shop partner

Jemtech has been a specialist in UK machining workshop products and services for decades, specialising in metalworking fluid management and air quality solutions.

By combining expertise in both coolants and mist extraction, Jemtech provides an integrated approach to controlling airborne hazards and keeping processes stable.



Specialist knowledge

Deep understanding of machining processes and how mist generation links to coolant type, pressure, and machine design.



Full-service provider

From site survey and system design to installation, commissioning, and ongoing maintenance.



Compliance assurance

Detailed commissioning records, LEV documentation, and planned service schedules give clear evidence for inspectors.



Focus on people and productivity

Cleaner air supports operator health, morale, and retention, while protecting equipment and ensuring consistent component quality.



Proven partnerships

Jemtech supplies industry-leading HEPA filtration products, selected to suit applications ranging from single-machine installations to centralised plant systems.

Whether you're tackling visible mist, addressing inspection findings, or planning a new facility, Jemtech offers practical solutions and the guidance to stay ahead of compliance requirements.

**Book your
FREE LEV
requirement
survey**





Product range



Fluid management

The intelligent and automated fluid management systems designed for your cutting fluid of choice



Mist extraction

Air purification filters from CNC to full factory solutions



Cutting fluids

Reduce costs, increase efficiency and provide quality where it counts.



Industrial vacuums

Coolant / neat oil industrial vacuum units.

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