THE HEALTH AND SAFETY ONLINE 2021

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SAFE USE OF METAL WORKING FLUIDS

Meet your speakers

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Metal Working Fluids - Why is there a risk?

Poorly managed Metal Working Fluids.

Exact causations are not fully understood but are likely to be from :

- Ingredients themselves,
- Microbial contaminants
- Substances deliberately added such as biocides
- Contamination in the fluids →

Sources of exposure- Inhalation Risk


Photo Source: HSE

- Mist can often be formed in the breathing zone due to how the machinery is positioned and how the compressed air lines are held
- Can cause occupational asthma and occupational hypersensitivity pneumonitis
- Harm is caused through the inhalation of mist. Higher the tool speed the greater potential for the mist

High exposures are likely :

- During CNC machining where mist is released from enclosure openings
- On opening CNC enclosure doors immediately after machinery
- Use of compressed air

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Sources of exposure - Skin

Photo Source: HSE

Skin exposure can cause irritation of the skin and dermatitis

Skin can be affected when it comes into contact with the same causal agents in the fluid.

Can cause dermatitis

- Harm is caused through direct contact with unprotected skin, particularly hands, forearms and torso.

Skin exposure can happen during:

- Handling of neat and diluted fluid
- Handling wet components and swarf
- Hands can become contaminated when not removing gloves properly.
- Use of compressed air guns
- Sump and machine cleaning.

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COSHH & ALARP

Under The Control of Substances Hazardous to Health Regulations 2002, you are required to:

- Make a suitable and sufficient assessment of the risk to employees health created by the use of a substance in relation to a work activity
- Identify control measures
- Implement control measures
- Consult with employees
- Record your findings - write them down
- Review the risk assessment at regular intervals

N.B. MWF HAS NO WORKPLACE EXPOSURE LIMIT (WEL) AND THEREFORE EXPOSURE MUST BE REDUCED AS LOW AS REASONABLY PRACTICABLE (ALARP) - SCHEDULE 2(A)

Enforcement Cases

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Engineering company fined for exposing workers to the risk of dermatitis

12th February 2020

£800k fine after CNC machine operators develop lung problems

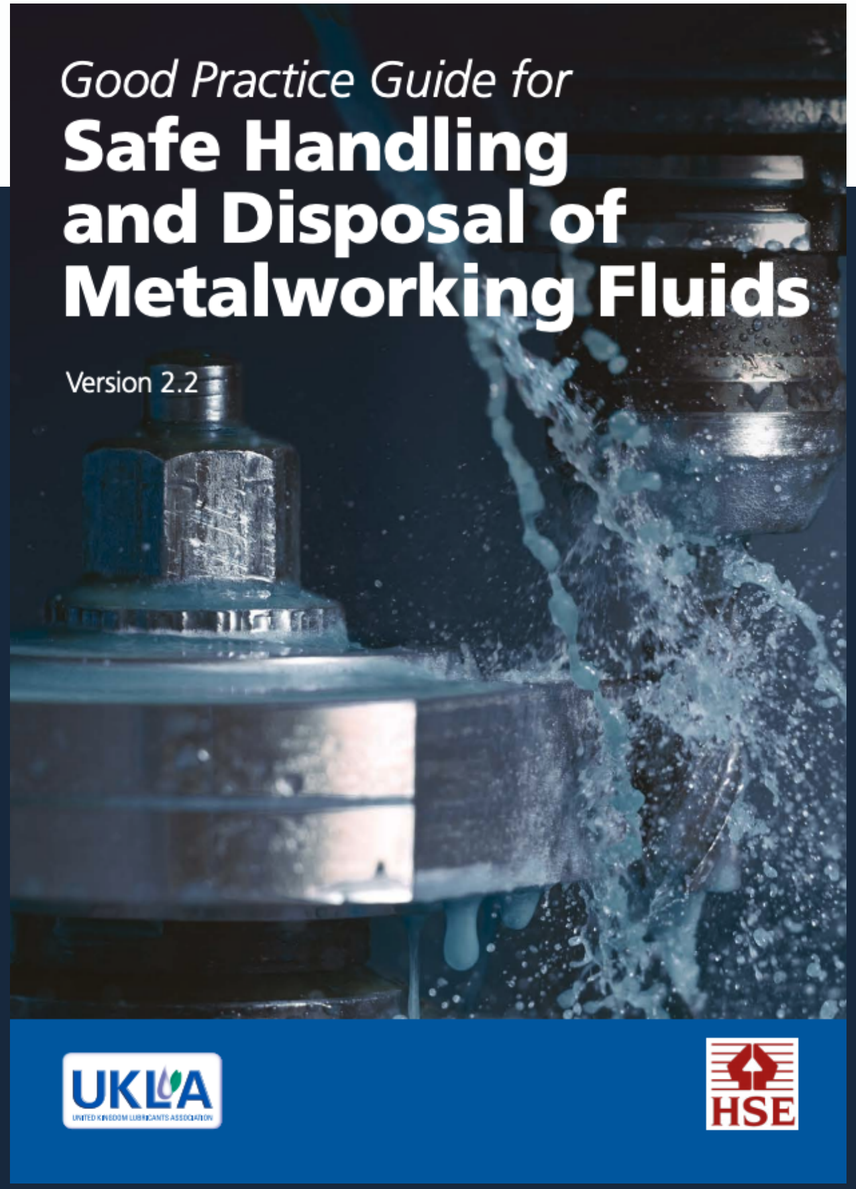
02 December 2016

An Uxbridge manufacturer of ejector seats - Martin Baker Aircraft Company - has been fined £800,000 after three workers developed debilitating lung conditions.

HSE

Guidance Update - UKLA Good Practice Guide for Safe Handling and Disposal of Metal Working Fluids

Photo Source: UKLA / HSE



Continued emphasis on:

- Understanding the importance in safe use of MWF to prevent harm
- COSHH requirement - Records must be kept for 5 years
- Focus on dermatitis (Safe glove usage/ training)
- Checking Health Surveillance - and following this up
- Machinery Controls
- LEV / Compressed Air use
- MWF testing regimes and frequency

Enclosed CNC Lathes and Millers

- CNC lathes and millers are enclosed due to their ability to machine material at high speeds.
- Metal Working Fluids (MWF) are used to cool the cutting process.
- If MWF is water based/ semi-synthetic they have they organic compound to grow bacteria
- The bacteria can be ejected into the air during the machining process, therefore potentially exposing the operator to MWF Mist with the risk of long term respiratory problems.
- There is also a skin contact issue as prolonged exposure can cause dermatitis.

Compressed air line use

Avoid compressed air use where practicable :

- Range of alternatives which can be used.
- Measure to reduce pressure to as low as possible.
- Use inside a machine enclosure fitted with LEV.
- Ensure pressure is no greater than 2 bar.
- Look at alternative nozzle heads for the guns and vacuums guns.
- Use vacuum where possible to remove MWF and excess chippings.

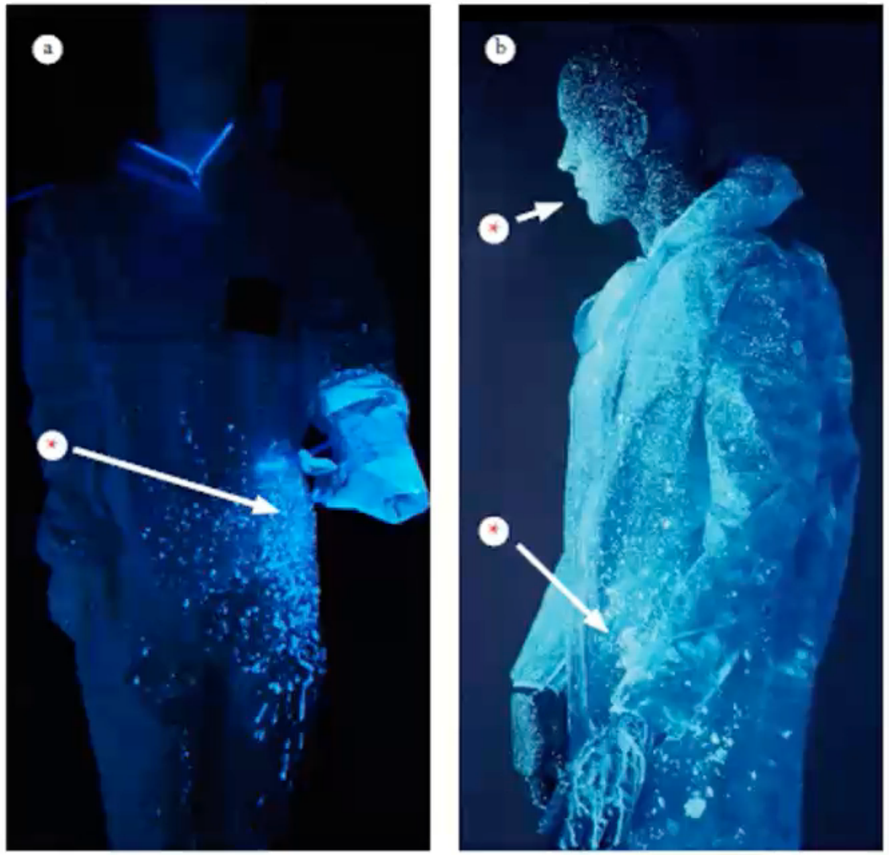


Figure 17: a and b) Photographs of MWF contamination on the torso and face (of a manikin) showing the effects of using a compressed airline and splash back onto the operator (The asterisk marks the spots / deposits on the face and arm visualised by adding a fluorescent blue dye to the MWF [C]

Photo Source: UKLA / HSE

Dip Slide Testing

- MSDS
- Dip-Slide Testing
- Dermatitis
- Respiratory Issues such as occupational asthma

! BE AWARE... !

- Dilution rates of MWF - Always follow manufacturer's guidance
- Tramp oil - if sump is saturated it indicates poor MWF control
- Visual - is there mist in the air?
- Smell - is there a foul/sulphuric smell in the air?
- If using a biocide to clean - ALWAYS follow manufacturers guidance

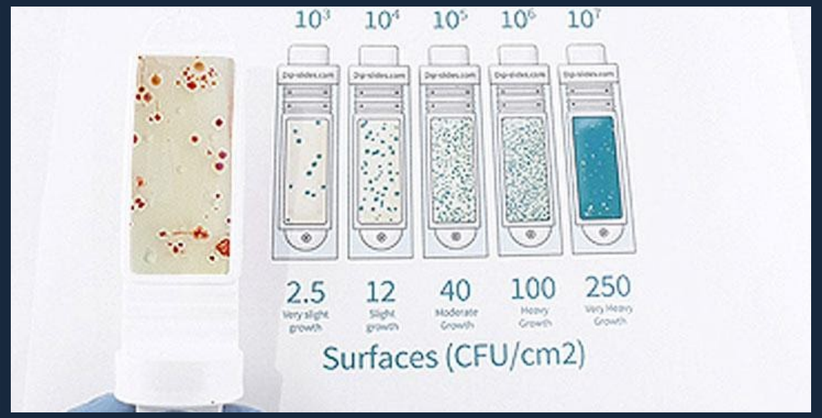


Photo Source: Dipslides UK

Air Monitoring

- In order to identify exposure, air monitoring is often required.
- A qualified Occupational Hygienist is required to undertake the process.
- Personal dose meters are attached to machine operators to determine their exposure to MWF mist
- A report will then be prepared showing the results.
- To satisfy requirements under COSHH, the readings need to be negligible or at a 'non-detectable' rate.
- If the levels are raised, it is likely LEV will be required.
- Multiple tests may be required to demonstrate and prove consistency.
- Check your existing reports are relevant to the most up to date EH40/2005 WELs.

Health Surveillance

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- Programme of regular skin inspections by a responsible person.
- Annual Health Questionnaire & Follow up. to investigate any change in controls.
- Check your own skin regularly for lasting changes.
- Don’t ignore health problems caused by metalworking fluids, as these could become disabling and permanent, sometimes requiring a change in occupation.

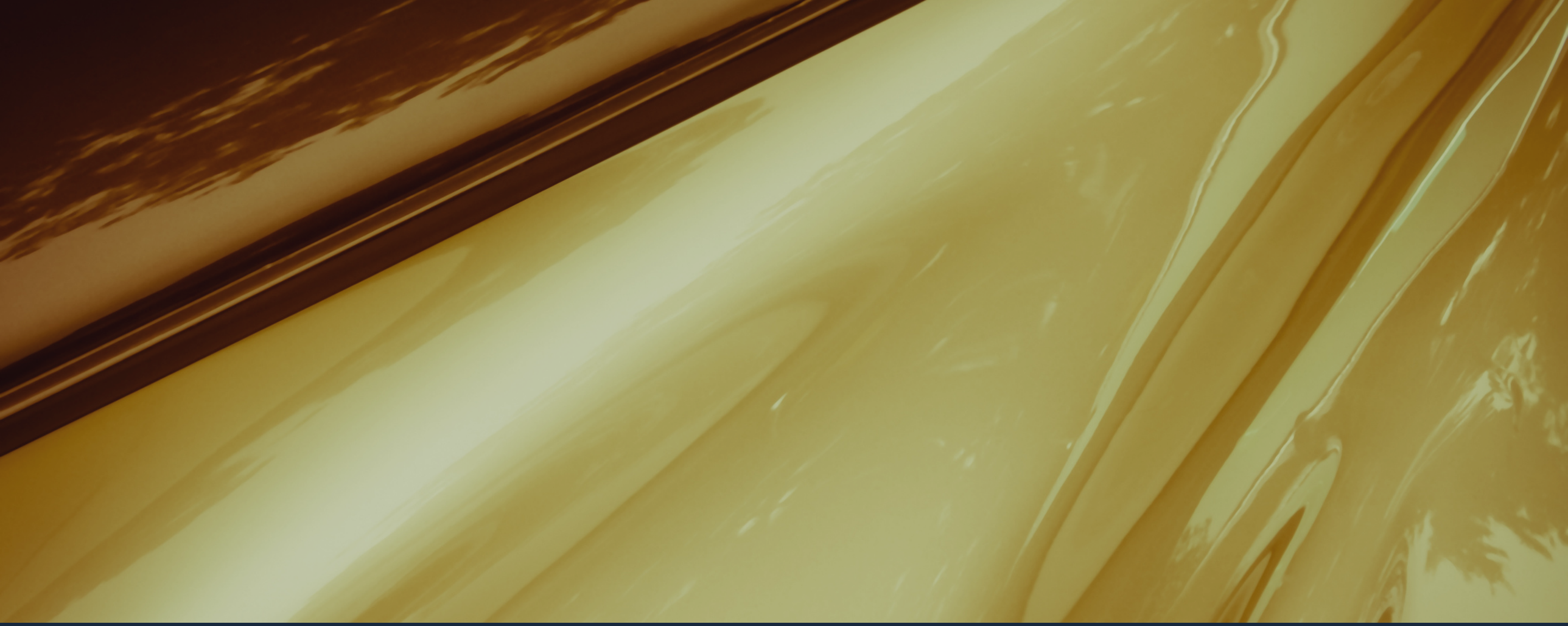
Correct use of PPE

Training for staff on the correct use of PPE as exposure can be increased where not wearing PPE or it is taken off incorrectly

Sample of HSE Resources available

Additional Controls

- Filtermist if extraction required
- High powered mist lamp to show mist in the atmosphere whilst opening enclosure (verification that there is no exposure)
- Gloves to be worn at all times whilst handling material with MWF (dermatitis)
- Health Surveillance (respiratory and dermatological)



Key points to consider

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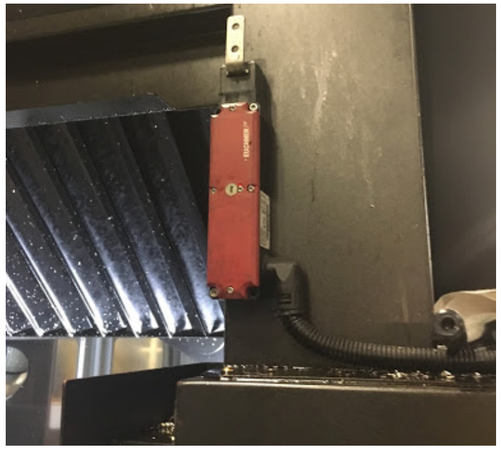
- Demonstrate tool speed less than 300 metres per second
- Tool size <5cm diameter is low risk
- Dwell time of at least 30 seconds prior to opening enclosure
- Reduce compressed air to low pressure nozzles
- Reduce AFARP the use of compressed airlines for cleaning where mist and swarf is generated.



Key Points to consider

- Commercial viability
- LEV installation & Statutory testing
- Enforcing authorities quote rpm of 1500 upwards can cause problems (MWF mist)
- <u>There is NO specific legislation which requires LEV on enclosed CNC Lathes or Millers</u>
- <u>If you use fully synthetic MWF there isO risk and therefore no breach under COSHH</u>

Other consideration - Dusts & Fumes

- Where adding LEV to the controls, ensure it is suitable and sufficient for use.
- Consider controls to Welding / Soldering in the process lines/
- Air Monitoring - Types considered - are they capturing the correct readings. (workplace / breath zone) or of the environment.
- Control of metal dusts. There are various WELs for metals so these may need to be considered as well as the MWF. tipping of dusts can create dust clouds.
  - Avoid overfilling dust / swarf containers
  - Assess the cleaning process to ensure reduced risks of inhalation.
- **Consideration for Fire and DSEAR Assessments as metals and the equipment used can be both Flammable and combustible. Insurance visits are raising LEV on metal cutting equipment as needing further controls**

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Questions?

We've dedicated health and safety consultants who love making a difference for our clients.
Talk to us today.

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