

MW2

COSHH essentials for machining with metalworking fluids

The Control of Substances Hazardous to Health Regulations 2002 (COSHH) require employers to ensure that exposure is prevented or, where this is not reasonably practicable, adequately controlled. This guidance gives practical advice on how this can be achieved by applying the principles of good practice for the control of exposure to substances hazardous to health, as required by COSHH.

It is aimed at people whose responsibilities include the management of substances hazardous to health at work (eg occupational health specialists, anyone undertaking COSHH assessments and supervisors). It is also useful for trade union and employee safety representatives. It will help you carry out COSHH assessments, review existing assessments, deliver training and supervise activities involving substances hazardous to health.

This guidance is issued by the Health and Safety Executive. Following the guidance is not compulsory, unless specifically stated, and you are free to take other action. But if you do follow the guidance you will normally be doing enough to comply with the law. Health and safety inspectors seek to secure compliance with the law and may refer to this guidance.

See Essential information near the end of the sheet.

Control of skin risks during machining

Control approach S Harm via skin or eye contact

What this sheet covers

This sheet describes good control practice to reduce skin exposure to metalworking fluid (MWF). For guidance on inhalation risks during CNC machining see MW1 *CNC machining*.

It is important to follow all the points, or use equally effective measures.

Hazards

- ✓ MWF can cause skin diseases such as dermatitis (contact and allergic), particularly on the hands, arms, face and torso, through contact with:
 - substances in MWF concentrate, neat oils and other chemicals eg biocides and additives;
 - contaminants present in the fluid, eg metal fines, dissolved metals, tramp oil.
- ✓ Prolonged or frequent contact with water-mix fluids, called 'wet work', can cause dermatitis.

Access to work area

- ✓ Allow access to authorised and appropriately trained people only.

Equipment and procedures

Fluid management

- ✓ Consider your MWF selection. There may be a fluid with less hazardous components. Take advice from your fluid supplier.
- ✓ Minimise leaks of tramp oil (hydraulic, lubricating or gearbox oil) into the sump. Remove tramp oil by mechanical skimmers, mobile oil coalescers or vacuum systems.
- ✓ Remove fines using centrifuges, filtration systems or magnetic separators (for ferrous materials).
- ✓ Mix fresh water-mix fluids to the supplier's recommended concentration. In use, water-mix fluids evaporate and become more concentrated. Therefore top up only with fluid below recommended concentration.
- ✓ Do not add biocide until all good practice measures to maintain the fluid have been followed. If you need to add biocides, add the right amount directly to the sump.
- ✓ Higher than recommended fluid or biocide concentration increases the risk of skin disease.

Limiting skin contact

- ✓ If possible, prevent skin contact. If you cannot prevent skin contact, can you limit it?
- ✓ Use automatic mixing devices instead of manual mixing.
- ✓ Enclose machines as much as possible.

- ✓ If not fully enclosed, reduce splash risks; provide properly designed splash-guards. Don't use rags or plastic sheeting.
- ✓ Use suitable tools, eg brushes, magnetic wands and swarf hooks to remove swarf/chips from machine surfaces and components.

Caution: Don't remove swarf and fines from the sump by hand. Use suitable tools, eg brushes and shovels, and wear suitable cut-resistant protective gloves to prevent injury.

MWF delivery

- ✓ Apply MWF at the lowest possible pressure and flow volume consistent with adequate lubrication, cooling and swarf removal.
- ✓ Apply MWF at the point where the tool and workpiece make contact to minimise mist generation from contact with other rotating parts.
- ✓ Stop MWF delivery when not machining. You will still need to maintain fluid circulation to prevent stagnation (see MW5 *Managing fluid quality*).

Compressed air guns and alternatives

- ✓ You should consider using alternative methods to clean away excess fluid and swarf/chips from machined parts during machining, eg vacuum guns, absorbent materials, low-pressure coolant guns, spindle-mounted fans or automatic compressed air hoses (operated with CNC enclosure doors shut).
- ✓ Where there is no practical alternative:
 - Reduce the exit pressure of the compressed air to as low a level as practicable (as a guide 30psi/2.1bar is effective at cleaning).
 - Different nozzle designs allow guns to be operated at a lower pressure. This will reduce risks from MWF, ejected swarf and noise.
 - Blow down components inside the CNC machine with the LEV operating.
 - Consider using compressed air guns with longer lances (eg 30 cm).
- ✓ Finished components can be cleaned in industrial washing/degreasing machines (see www.hse.gov.uk/metalworking/water.htm).
- ✓ Suitable swarf vacuums should be used to remove wet swarf/chips from machine surfaces.

Caution: Never allow the use of compressed air for cleaning skin and clothing.

Personal protective equipment (PPE)

- ✓ Ask your PPE supplier to advise on suitable protective equipment for work with MWFs.
- ✓ Provide gloves that are suitable for controlling skin exposure to MWFs and safety risks (easily tearable if they become entangled). Single use 0.4mm nitrile gloves are typically acceptable.
- ✓ Provide thicker gloves for cleaning and maintenance tasks (see sheets MW3 *Sump cleaning: water-mix fluids* and MW4 *Sump cleaning: neat oils*) but only when machinery is switched off.
- ✓ Make suitable arrangements for maintenance, storage and replacement of PPE.
- ✓ Workers should replace gloves at recommended intervals, and discard damaged gloves immediately.
- ✓ Provide eye protection - goggles or glasses.

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- ✓ Provide overalls and make sure forearms are covered.
 - ✓ Ensure contaminated overalls are laundered before re-use.
 - ✓ Use a contract laundry or a suitable equivalent to wash work clothing.

Personal decontamination and skin care

- ✓ Remove clothing contaminated with MWF immediately to reduce skin contact.
- ✓ Wash hands after contact with MWF. Provide warm water, mild skin cleansers, and soft paper or fabric towels for drying. Avoid abrasive cleansers.
- ✓ Provide pre-work creams which will make it easier to wash dirt from the skin.
- ✓ Provide after-work creams to restore the natural moisture content of the skin.

Caution: Pre-work or 'barrier' creams are not 'liquid gloves' and do not provide a full barrier.

Maintenance, examination and testing

- ✓ Monitor fluid quality and maintain the fluid appropriately (see MW5 *Managing fluid quality*).

Cleaning and housekeeping

- ✓ Keep surfaces clean to minimise contact with MWF.
- ✓ Deal with spills immediately. Ensure leaks can be contained. Use a vacuum system and soak up residues with suitable absorbent materials. Take advice from your fluid supplier.
- ✓ Dispose of spilt MWF safely. Returning it to the machine contaminates the system and reduces the operational life of the fluid.
- ✓ Provide clean facilities for washing and taking refreshment, away from all machining activities.
- ✓ For cleaning water-mix sumps see MW3 *Sump cleaning: water-mix fluids*.
- ✓ For cleaning neat oil sumps see MW4 *Sump cleaning: neat oils*.

Health surveillance

- ✓ Provide health surveillance for dermatitis where there is a reasonable likelihood that dermatitis may occur in your workplace (see sheet G403 *Health surveillance for occupational dermatitis*, for further advice).

Training and supervision

- ✓ Tell workers about the hazards associated with their work and how to recognise the early signs of dermatitis.
- ✓ Provide workers with training on:
 - working safely with hazardous substances;
 - when and how to use controls, including how to put on and take off gloves correctly;
 - how to check controls are working; and
 - what to do if something goes wrong.
- ✓ Provide supervision – ensure that safe work procedures are followed.
- ✓ Training records are helpful to demonstrate training has taken place.
- ✓ Involve managers and supervisors in health and safety training.

Essential information

MW0	<i>Advice for managers</i>
MW1	<i>CNC machining</i>
MW3	<i>Sump cleaning: water-mix fluids</i>
MW4	<i>Sump cleaning: neat oils</i>
MW5	<i>Managing fluid quality</i>
G403	<i>Health surveillance for occupational dermatitis.</i>

Further information

Good practice guide for safe handling and disposal of metalworking fluids UKLA 2018 www.ukla.org.uk/wp-content/uploads/UKLA-HSE-Good-Practice-Guide-for-Safe-Handling-and-Disposal-of-Metalworking-Fluids.pdf

Working safely with metalworking fluids: A guide for employees INDG365 HSE 2011 www.hse.gov.uk/pubns/indg365.pdf

See www.hse.gov.uk/metalworking/index.htm

Managing skin exposure risks at work HSG262 HSE 2015 www.hse.gov.uk/pubns/books/hsg262.htm

How to put on and take off *Single-use, splash-resistant gloves* www.hse.gov.uk/skin/posters/singleusegloves.pdf

See www.hse.gov.uk/health-surveillance/index.htm

You can find the full COSHH essentials series at www.hse.gov.uk/coshh/essentials/

British Occupational Hygiene Society (BOHS) www.bohs.org/find-expertise/find-an-occupational-hygienist/

Occupational Safety and Health Consultants Register www.oshcr.org/

For information about health and safety visit <https://books.hse.gov.uk> or <http://www.hse.gov.uk>.

You can view HSE guidance online and order priced publications from the website. HSE priced publications are also available from bookshops.

To report inconsistencies or inaccuracies in this guidance email: commissioning@wlt.com.

Employee checklist

- Do you understand the health hazards associated with your work?
- Always follow the standard operating procedure.
- Use, maintain and store your PPE in accordance with instructions.
- Remember that gloves increase the risk of entanglement at moving machinery.
- Use skin creams provided as instructed.
- Make sure you know what to do if there is a fluid spill.
- If you find any problems tell your supervisor. Don't just carry on working.
- Check your skin regularly for dryness or soreness – tell your supervisor if these symptoms appear.
- Co-operate with health surveillance.
- Wash your hands before eating, drinking, smoking or using the toilet.