

METALWORKING FLUIDS

(See also: [Skin Diseases\(75\)](#); [COSHH\(19\)](#); [Carcinogens\(12\)](#))

INTRODUCTION

Metalworking fluids (MWF) contain mineral oils or synthetic lubricants and may be used neat or in a water-mix. They may be called 'coolant', 'suds', 'slurry', 'soap', 'water', etc. and are applied to the metal being worked to provide cooling, lubrication, swarf removal and corrosion protection. The application can be by continuous jet, spray, mist or by the hand use of a dispenser. Skin contact can occur in a variety of circumstances. Inhalable (breathable) aerosols or oil mist and fumes can also be generated during machine operations. Both of these situations create health risks. Good precautionary measures are therefore required which can, at the same time, improve the working environment, avoid deterioration in product quality or excessive wear, and minimise MWF replacement costs.

HEALTH EFFECTS

SKIN - irritation; dermatitis, oil acne; cancer

RESPIRATORY SYSTEM - irritation of throat; breathing difficulties such as bronchitis and asthma.

LEGAL REQUIREMENTS

- COSHH 1999 - assessment and prevention/control of exposure to risk from MWF.
- RIDDOR 1995 - oil acne or skin cancer are reportable diseases.
- Control of carcinogenic substances Approved Code of Practice/COSHH 1999- used engine oils, unrefined mineral oils and mildly refined distilled oils may contain substances that can cause cancer. In metalworking applications, these oils should not be used, as safer alternatives are available.

EMPLOYERS DUTIES

1. Assess risks (under COSHH 1999 and Management of Health and Safety at Work Regulations 1999).
2. Remove or reduce any identified risks.
3. Provide information, instruction and training and, where appropriate, health surveillance.
4. Maintenance of effective control measures.
5. Ensure a proper MWF management system to ensure quality and to reduce the risk from contamination etc. The free leaflet 'Management of Metalworking Fluids - a guide to good practice for minimising risks to health' (INDG 168) provides useful advice (as Do's and Don'ts) under the following headings, from which certain key points have been taken:-

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GENERAL ADVICE

- Storage of fluids**
- correct conditions, location, environment
 - prevention of spread of spills
 - protection from moisture

Maintenance of fluids and coolant systems

- trained personnel
- regular monitoring of MWF
- results to be recorded
- top up with a separately mixed emulsion
- keep machine clean and free from debris
- keep coolant tank covered
- use filters to remove swarf and fines
- consider the need for removal of 'tramp' oil (extraneous oil)
- ensure that leaks from hydraulic and gearbox systems are reported and dealt with promptly

Cleaning and filling coolant systems

- thorough cleaning of sump pipework, machine and guards before refilling with MWF
- use of a compatible cleaner
- use of drinking quality water of correct hardness
- add concentrate to the water, not vice versa
- use of a refractometer to check the mist is at the correct strength (relatively cheap hand-held ones are available)
- use of protective equipment

Operation of machines

- provide training and instruction for employees using MWF
- enclose the process where possible; maintain and use spray covers, etc.
- ensure correct coolant flow
- provide local exhaust ventilation where significant mist is unavoidably produced
- ensure speeds and feeds are compatible with cutting tools and materials being worked
- follow correct working procedures

HEALTH CHECKS

Where employees have regular skin contact with MWF or exposure to fume, mists or aerosols a **health surveillance** programme will probably be necessary.

A **responsible person** should be appointed and assigned appropriate duties. **If suitably trained for the purpose**, this person could be a first aider or supervisor. Otherwise it should

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be an occupational health physician/nurse. Duties should include ensuring regular skin inspections and related audits/checks. The former may be made at approximately monthly intervals. An effective medical referral system should be in place.

Records of a health surveillance programme need to be kept for a period of 40 years from the last entry.

PROTECTION, HYGIENE, FIRST AID

Personal protective equipment (PPE) should only be used as an additional measure where adequate control by other means is not reasonably practicable. This may include:-

- eye protection and (pocketless) overalls for splash protection. The lack of pockets should help prevent contamination of the groin area by oil-contaminated wipes/rags.
- impervious aprons.
- any use of gloves should be very carefully approached (entanglement risks)
- respiratory protective equipment - not commonly required.
- separate accommodation for clean/ordinary clothing and dirty overalls.

Personal hygiene: high standards are vitally important. Considerations include the provision and use of washing facilities and frequent laundering where necessary. Barrier creams are no substitute for good personal hygiene.

First Aid: proper and prompt first aid is essential. Eye irrigation/washing facilities need to be ensured.

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CHECKLIST - METALWORKING FLUIDS **(MWF)**

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|---|-----|----|
| 1. Have you carried out and an assessment of risks arising from the use of MWF? | YES | NO |
| 2. Have you identified and implemented 'control measures' to prevent or control any risk? | YES | NO |
| 3. Do you ensure that control measures are maintained and used properly? | YES | NO |
| 4. Have you established a MWF management system? | YES | NO |
| 5. Have you provided adequate information, instruction and training for employees regarding MWF? | YES | NO |
| 6. If a significant risk has been identified, have you introduced an appropriate health surveillance programme? | YES | NO |

REFERENCES/FURTHER DETAILS

- **1. Leaflet INDG 167 – Health risks from metalworking fluids. Aspects of good machine design (HSE).
www.hse.gov.uk/pubns/indg167.htm
- **2. Leaflet INDG 169 - Metalworking fluids and You (HSE).
www.hse.gov.uk/pubns/indg169.pdf
- **3. Leaflet INDG 168 - Management of metalworking fluids - a guide to good practice for minimising risks to health (HSE).
- **4. Leaflet INDG 165 - Health surveillance programmes for employees exposed to metalworking fluids - guidance for the responsible person (HSE)
www.hse.gov.uk/pubns/indg165.pdf
- **5. HSE Engineering Information Sheet No: 14 - Skin creams and skin protection in the engineering sector
www.hse.gov.uk/pubns/eis14.htm

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- * Available to view by prior arrangement at Nuneaton and Bedworth Borough Council, Environmental Health Services, Council House, Coton Road, Nuneaton. CV11 5AA
 - ** Free copy available from Nuneaton and Bedworth Borough Council at the above address.

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