| MRAT 033 | Metal-cutting oils | Applicable to: mineral oils; synthetic oils; soluble oils; Tellus oil | See also: 010 037 038 039 |
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| **Process(es) covered:** | | | |

## Control Measures

- Follow the suppliers'/manufacturer's instructions, particularly when diluting for use and pouring from one container to another.
- Wear eye protection (against swarf and coolant spray) at all times.
- Wash hands after work and prior to using the toilets
- Reduce the risk of harm from Legionella bacteria and other organisms by regular draining and cleaning cutting oil systems, and replacing with fresh oil.
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## Immediate Remedial Measures:

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| Coolant in the eyes | Irrigate immediately with water for at least ten minutes, holding eyelids apart. Call 111 and seek medical attention. |
| Coolant is swallowed | Accidental ingestion is unlikely. If ingestion is suspected, wash out the mouth with water and send the casualty to hospital immediately, showing the manufacturer's safety data sheet to the doctor.<br>DO NOT INDUCE VOMITING. |
| Effects on the skin | Repeated and prolonged contact with the skin may cause removal of natural greases, resulting in dryness, cracking and possible dermatitis. Wash with mild antiseptic and apply moisturising cream. |

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| **Storage** | Small amounts for immediate use can be kept by the machine(s), larger amounts should be stored as flammables. |

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| **Disposal** | Large volumes of used or generally unwanted coolant must be disposed of via an authorised waste disposal contractor. 500 ml or less can be diluted with water and flushed down the drain. |

## Risk Assessment

### Hazards:

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| Irritant<br>Harmful to health | Cutting oils are irritant to skin and eyes.<br>There is a small risk of Legionella bacteria surviving and developing in machine oils. |

### Risks:

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| Irritant | Some coolants or cutting oils can cause irritation to the eyes and/or dermatitis. The mist from products based on highly-refined mineral oils was given an OES of 10 mg/m$^3$ (15 min ref period) but this value has not been converted to a WEL. Suppliers are required to provide warnings and if these are observed, there will be minimal risks to health. |
| Harmful to health | The likelihood of growth is not substantial since temperatures are rarely consistently above the 20 °C necessary for the Legionella bacteria to grow. Other microbes however, are known to proliferate at temperatures below 20 °C. |

### Further Information:

- The use of a barrier cream may be advisable. While coolants are refined, mineral-based oil, against which creams are not an effective protection, they do assist and encourage the cleaning of skin following contact. See the supplier's guidance.
  In school workshops, cutting oils used on manually operated machines are usually applied by means of a brush or manually operated dispenser. This will reduce the risks from mists. Sometimes containers, such as those for washing up liquid or those with a trigger pump used for other cleaning products, are used as dispensers for cutting oils. Whilst these reduce the risks in applying cutting oil with a brush close to rotating work pieces or cutters, and also reduce spillage, there is the potential for pupils to use such containers to squirt each other with the cutting oil. This should not be allowed to happen. If CNC machines are used to cut metals that require the use of cutting oils applied by a pump, then there is an increased risk of mist.
- There is no published evidence of cutting oils causing cancer either by contact or inhalation but, since used lubricating oils present a risk of cancer, there is a small risk from cutting oils that have become contaminated with other lubricants.
- In order to reduce the risk of harm from Legionella bacteria and other organisms CLEAPSS advice is as follows: At least once every six months:
  - Drain down the machine coolant system.
  - Flush through with clean water.

***Then either***

  - Fill with a degreasing solution to remove any bacterial film. Washing up liquid in water will probably do but this will depend on the system and how contaminated it is.
  - Flush through with clean water.
  - Fill with 1% Virkon solution (probably available from the science department) and leave for a minimum of 20 minutes.
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***Or***

  - Fill with 1% Virkon solution to which a generous squirt of washing up liquid has been added and leave for a minimum of 20 minutes.
- Drain and flush a couple of times with clean water.
- Refill with the cooling machine oil mixture.

If cutting oils are kept in small containers of any sort and the oil is applied by hand, then the containers should be emptied and degreased every six months as outlined above and refilled with fresh oil.