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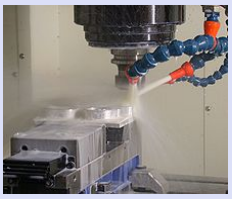
Safety Services Guidance



Biohazards and other hazards associated with metalworking fluids

Key word(s):	Metalworking fluid, biohazards, machine tools
Target audience:	Workshop staff, safety advisors, biosafety advisors,

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What are Metalworking Fluids?

1. These are fluids used to cool and lubricate during machining activities, prolong the life of a machine tool, carry away debris and protect surfaces of work pieces.

   There are two types of metalworking fluids – neat oils and water based fluids.
   Neat Oils – Contain highly refined mineral oils and additives and used neat without mixing with water.
   Water Based Fluids – These are designed to be diluted with water before use. There are three types of water based fluids.

   - Soluble oil
   - Semi-synthetics
   - Fully synthetic fluids

What are the risks associated with metalworking fluids?

2. **Skin problems** – dermatitis due to repeated or prolonged skin exposure to metalworking fluids.

3. **Respiratory Ill Health** – irritation of the respiratory tract and impairment of lung function, in some cases occupational asthma. The most serious respiratory effects relate to exposure to endotoxins released by bacteria. These cause short-term health effects, including 'flu' like symptoms and reduced lung function and in some cases may exacerbate symptoms in those with pre-existing asthma.

4. **Carcinogenicity** – the oils in their basic state do not pose a risk of cancer; however known carcinogens may be formed under certain in use conditions.

5. **Microbiological Contamination** –bacteria, moulds and viruses can grow in places where there is a supply of nutrients and water; metalworking fluids, especially mineral oil water emulsions, provide these conditions. These can cause respiratory tract irritation and lung function impairment, 'flu' like symptoms or exacerbate asthmatic symptoms, cause allergic contact dermatitis and also they may possibly be a source of legionnaire's disease (in certain very specific conditions).

Who is at risk?

6. The main groups of people are

   - Workshop machine operators

- Others working in vicinity of workshop machines

How can the risk be controlled?

7. There are four methods for controlling the risks from metalworking fluids. These are based on the operator, the sump where the metalworking fluid is stored, the fluid and the process being undertaken.

8. Methods of control

   - **The operator** – training, awareness, personal hygiene, skin care, health surveillance
   - **The sump** – contamination control, monitoring / observations, sump clean out criteria and method.
   - **The Fluid** – selection, storage, stock preparation, delivery to machine.
   - **The Process** – fluid use (point of delivery, rate of delivery), mist / vapour control, enclosures, local exhaust ventilation, splash guards.

Legal requirements

9. This activity involves substances that are potentially hazardous to health therefore a COSHH assessment is required. This should identify measures to ensure that exposure is prevented or where this is not reasonably practicable, adequately controlled.

Bibliography

HSE publications:

INDG 365 – Working Safely with Metalworking Fluids: A Guide for Employees (2011)
HSG 129 - Health and Safety in engineering workshops (2004)

Document control box	
Title	Guidance on biohazards and other hazards associated with metalworking fluids
Link to Policy or Chapter	University Health & Safety Arrangements Chapter 3 Biological Safety
Date issued:	2006 (as technical briefing note).
Issued by:	Safety Services
Implementation date:	2006
Version:	Version 1.2 (January 2017) personnel update Version 1.1 (January 2017) personnel update Technical Briefing Note issued 2006 Version 1.0 issued Jan 2015
Next review date:	Upon significant change
Owner of this document:	Head of Safety Services
Lead contact:	Safety Services