

WATCH COMMITTEE PAPER		WATCH/2007/5	
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WATCH COMMITTEE

Metal Working Fluids, a potential 'new and emerging issue'

Issue

1. In the "new and emerging issues" session at the November 2006 WATCH meeting, one of five topics considered a priority for further consideration was 'Occupational exposure standards, limits or guidance for respiratory exposure to metalworking fluids' (topic 21 as described in WATCH/2006/9 Annex 1). This paper presents a substantial body of current information and asks some questions of WATCH.

Timing Considerations

2. No particular timing issues.

Recommendation

3. WATCH is invited to consider the issues noted in this cover paper and to respond to the actions in paragraph 14.

Background

4. In its "new and emerging issues" session at the November 2006 meeting, WATCH (expanded with additional Community of Practice and Interest [COPI] members) identified this topic as a priority. However, it was recognised that more information was required to enable WATCH to identify the action needed to address the concern and facilitate decisions on how best to take this action forward.

Argument

5. In recent times, due to economic, technical and health reasons, there has been a steady trend by metal working plants towards increased use of water-mix lubricant fluids. The UK Lubricants Association estimates that current UK annual usage is approximately 240,000 tonnes of water-mix fluids. From 2004 to 2006, HSE investigated several outbreaks of respiratory disease linked to the use of water mix metalworking fluids (MWF). In the largest incident, more than 100 workers were diagnosed with respiratory disease. The public report (Annex 1), press report (Annex 2), incident investigation (Annex 3), and a published paper (Annex 4) are attached. Another published paper citing index cases is of historical interest but is not readily obtainable (Robertson A, et al. An outbreak of extrinsic alveolitis at a car engine plant: Occup Med (Lond). (2006); 56(8): 559-65). These documents describe the clinical, hygiene, microbiological and immunology investigations. **The information reported was collected during a retrospective incident investigation.**

6. Inhalation of mists generated from metal working machines and wash machines was considered an import factor. Another factor was deficient management of MWFs resulting in heavy contamination by bacteria, endotoxin, and allergens derived from dead organisms. The investigation looked at the sensitising and irritancy properties of contaminated MWF, machined component wash fluids, and the biocides used to control growth of microorganisms in these fluids. HSE carried out analytical tests of the MWF and wash fluids and information about the constituents and any anticipated health effects were summarised (Annex 5). **This list is specific to the type of MWF used at the Powertrain plant and does not necessarily represent constituents found in other MWF products.**

7. Another outcome has been that HSE withdrew its guidance (HSG 231; October 2002) document and replaced this with new web-based “Metalworking Fluids Topic Pages” (Annex 6) on the HSE Web Site.

8. There have been several large investigations of the respiratory disease in the US and the background to these investigations is summarised in the US CDC Criteria report (Annex 7: only the reference to the NIOSH website is provided, the ~230-page document is not provided within this package of information).

9. Another aspect to this issue is the introduction of bio-concept metal working fluids (Annex 8) designed to permit the growth of large numbers (up to 10^8 bacteria/ ml⁻¹) e.g., of *Pseudomonas pseudoalcaligenes* and *Pseudomonas alcaligenes*. The manufacturers of bio-concept fluids do not recommend using biocides to manage the fluids arguing that pathogenic bacterial growth is restricted by formation of a stable *Pseudomonas* biofilm.

10. It is estimated that in the UK there are ~50,000 workers exposed to metalworking fluids and over 75% of metal workshops use MWF as an integral part of metal machining. During 2006 – 2007, HSE, the UK Lubricants Association (UKLA), and AMICUS, are working together to introduce new information, about health risks from MWF and how to control them effectively. A series of regional workshops on the management of respiratory and skin risks was held for companies using MWF (from June to October 2006), with speakers from HSE, UKLA, and AMICUS.

Link to HSC Strategy

11. The requirement to identify “new and emerging issues” is an example of a key “activity which delivers other Government objectives” within the HSC/E Strategy.

Consultation

12. No wider consultation on the content of this cover paper beyond HSE has been undertaken at this stage.

European Context

13. There are no specific links to EU procedures or activities.

Action

14. WATCH is asked to consider the issues described in this paper and :

- a) Given the complex mixture of chemical and biological hazards that may exist in used MWF does WATCH consider that further investigation into the causative factors for respiratory disease is warranted, and if so which areas should be researched?
- b) Should further investigation of the management of MWF be the preferred option addressing issues such as the prevention of biological contamination and the controls of fluid mists?
- c) Which individuals / organisations can contribute to taking this action forward?

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References / Attachments

Annex 1 Outbreak of respiratory disease at Powertrain Ltd, Longbridge, Birmingham: Emerging lessons. Health and Safety Executive: Public Report. April 2006

Annex 2 Outbreak of lung disease at Powertrain: Investigation and emerging lessons: Health and Safety Executive: Press summary. April 2006

Annex 3 Powertrain Occupational Respiratory Disease Outbreak: Report of Immunological Investigation: S Naylor, et al: HSL Report MU/06/01 March 2007

Annex 4 Robertson, W et al: Clinical investigation of an outbreak of alveolitis and asthma in a car engine manufacturing plant: Thorax Published Online First: 15 May 2007

Annex 5 The role of fluid constituents and contaminants in causing respiratory disease at Powertrain Limited: How respiratory health may be affected by exposure. Summary document prepared for HSE investigation team.

Annex 6 Working safely with metalworking fluids: A guide for employees: INDG365 (rev1) 03/06: Published by the Health and Safety Executive
(<http://www.hse.gov.uk/metalworking/index.htm>)

Annex 7 Criteria For A Recommended Standard Occupational Exposure to Metalworking Fluids: US Department of Health & Human Services, Public Health Services, Centre for Disease Control and Prevention. NIOSH (January, 1998)
(<http://www.cdc.gov/niosh/98-102.html>)

Annex 8 Dilger S, Fluri A, Sonntag HG. Bacterial contamination of preserved and non-preserved metal working fluids: Int J Hyg Environ Health: (2005) 208 (6): 467-476