

Audit Tool for Assessment and Control of MWF Exposure

This tool aims to provide a framework for assessing the risk of exposure by inhalation, or skin contact, with MWF to inform a suitable and sufficient risk assessment. The list considers process risk factors, routes of exposure and existing control systems. It does not address the maintenance of fluid quality, which is covered by the Audit Tool for MWF Quality Management.

Section A1: Risk Factors – Inhalation	
Type of Operations	High Risk: High-speed CNC machining and grinding processes.
Fluid quantity	High Risk: Continuous high-pressure delivery of the MWF at the cutting head.
Machining temperature	High Risk: Elevated MWF temperature (>30°C) which increases the evaporation of volatile constituents in MWF and promotes microbial growth.
Cleaning methods	High Risk: Using compressed air at pressures >2.1 bar (30 psi) and/or compressed air outside of the enclosure without an additional source of air extraction to control mist. These risks can be reduced by using alternatives to compressed air or by reducing the pressure of compressed air (<2.1 bar (30psi)) and using LEV.
Section A2: Controls Review – Inhalation	
Level of enclosure	High Risk: Partial, or no, enclosure of the machine tool, particularly for high-speed machining and grinding operations.
LEV provision	High Risk: LEV is not fitted to CNC machines where it is practical to do so. Note there are machines (e.g. large gantry systems) to which LEV may not be practical to install. Poor placement of the LEV extraction point within enclosures (i.e. too far from the enclosure door and operator, poor mixing of air within enclosure) can increase the inhalation risks.
LEV TExT completed	High Risk: Not addressing significant issues identified at previous TExT.
Clearance times/door interlocks	High Risk: Opening the enclosure door before the emissions have been sufficiently cleared by the LEV system. Manually overriding the door interlocks too quickly may result in inhalation of MWF mist and cause accidents.
Filtration/discharge arrangement	High Risk: Using recirculating mist extraction units without three-stage filtration (i.e. not fitted with a high-efficiency filter before returning the air into the workshop).
Filter monitoring	High Risk: Failing to monitor the efficiency of the filters in mist extraction units. To avoid this risk, pressure gauges should be fitted to monitor the pressure changes across the filter units. Sensors can also be fitted to monitor vibration and the motor temperature in mist extraction units.
Maintenance regime	High Risk: Failing to check the performance of engineering controls such as LEV and having inconsistent maintenance regimes in place.
Training	High Risk: Having no formal training in place for machinists and managers regarding exposure and health risks from MWF, and the use of control processes to manage and reduce the emission and exposure to MWF hazards.
Fluid management	High Risk: Having no programme of regular fluid quality checks for the MWF and not providing machinists and managers with training to understand the importance of these fluid quality checks to minimise the accumulation of hazards in MWF.

	This risk can be addressed by following the UKLA and HSE guidance (UKLA, 2023 and HSE COSHH MW5, 2021).
Health surveillance	<p>High Risk: Failing to put in place respiratory health surveillance for employees exposed to MWF.</p> <p>This health surveillance needs to be undertaken by a competent occupational health provider and will involve regular lung function tests (HSE COSHH G402, 2022).</p>
Section A3: Exposure Assessment - Inhalation	
Number of operating machines in the area	High Risk: Crowded workspaces with machines placed closely together, and in workshop buildings with low ceiling height and poor general ventilation.
Machine run time duration	High Risk: When machines have to be run at high speed for long periods this will increase emissions, particularly when machines are not fully enclosed or enclosed but LEV not fitted.
Interaction frequency	<p>High Risk: Intermittent stop/starting of the machine tools requiring the enclosure door to be opened is more likely to expose machinists to MWF mist and fume.</p> <p>These risks are reduced by automating the changing cutting tools and parts unloading.</p>
Qualitative assessment	<p>High Risk: Not undertaking visual inspections to check for emissions from machine tools could result in employees becoming exposed.</p> <p>The use of backlighting with dust lamp (see Section 4.2.1) or DRAM (see Section 4.2.3) to regularly monitor for emissions can help mitigate these risks.</p>
Section B1: Risk Factors – Skin Contact	
Cleaning methods	<p>High Risk: Holding closely a compressed air gun for cleaning components and machine tools resulting in splash back.</p> <p>This risk can be reduced by replacing compressed air guns with automated component cleaning systems, only using compressed air guns under an LEV extraction source, lowering the operating pressure of the compressed air gun to <2.1 bar (30 psi), and using a compressed air gun fitted on a longer lance and splash guards. Vacuum suction devices can be used for removing waste MWF and swarf and reduce the risk of generating MWF mist and metal particulates.</p>
Handling of machined parts and metal waste	<p>High Risk: Holding and touching components and tools covered in MWF or when removing metal swarf, without wearing protective gloves.</p> <p>The risk of skin contact and injury can be reduced by automating tool changes, introducing tongs or clamps for loading and unloading, and providing swarf hooks or alternative magnetic removal methods. If handling of wet workpieces is required, single-use disposable gloves meeting EN374-2 may be used but only where these do not add to other risks from machinery, such as entanglement.</p>

Section B2: Controls Review – Skin

disease and wearing	<p>High Risk: When employees are unaware of the skin disease risks from regular contact with MWF or how to prevent this.</p> <p>These risks can be reduced by training and raising awareness about these health risks and recognising early signs of skin disease, correct use of PPE, storage and laundering provisions.</p>
Fluid management	<p>High Risk: Allowing the quality of the MWF to deteriorate with use including contamination with tramp oil, metal waste and bacteria and fungi.</p> <p>This risk can be reduced by following the advice in Section 3 and by referring to the following UKLA and HSE guidance (UKLA, 2023 and HSE COSHH MW5, 2021).</p>
Skin hygiene provision	<p>High Risk: Employees have their skin constantly soaked in MWF and are not taking care of their skin.</p> <p>This risk can be reduced by employers providing suitable hygiene facilities and by employees following the advice in Section 5.6.3.</p>
Health surveillance	<p>High Risk: Employees develop skin conditions such as dermatitis because they are unaware of the risks and no health checks are in place.</p> <p>This can be avoided by using a competent occupational health provider to undertake regular checks for dermatitis (HSE COSHHe G403, 2022).</p>

Section B3: Exposure Assessment – Skin

Tasks that expose skin to MWF	<p>High Risk: Undertaking tasks which result in MWF droplets falling onto the machinists, or which require direct handling of MWF, without wearing protective PPE.</p>
Interaction frequency	<p>High Risk: The risk for dermatitis is increased when the skin is constantly wet with MWF, when the skin is not washed to remove the MWF residue, and when the skin is not dried after washing the hands.</p>

Audit Tool for Assessment and Control of MWF Exposure – Template

Section A1: Risk Factors – Inhalation	
Type of operation	
Machining temperature	
Cleaning methods	
Overall Rating	
Section A2: Controls Review – Inhalation	
Level of enclosure	
LEV provisions	
LEV TEXT completed	
Clearance times/door interlocks	
Filtration/discharge arrangement	
Filter monitoring	
Maintenance regime	
Training	
Fluid management	
Health surveillance	
Overall Rating	
Section A3: Exposure Assessment – Inhalation	
Number of operating machines in the area	
Machine run time duration	
Interaction frequency	
Qualitative assessment	
Overall Rating	

Section B1: Risk Factors – Skin Contact	
Cleaning methods	
Handling of machined parts	
Overall Rating	
Section B2: Controls Review – Skin	
Skin disease and wearing PPE	
Training	
Fluid management	
Skin hygiene provisions	
Health surveillance	
Overall Rating	
Section B3: Exposure Assessment – Skin	
Tasks that expose skin to MWF	
Interaction frequency	
Overall Rating	