

The Importance of MWF's

Water-based Metalworking Fluids (MWF's) are essential for machining a wide range of materials and components throughout the engineering industry. They are required to perform optimally over a variety of arduous operations and environments.

Unfortunately MWF's tend to be the component which is most overlooked in the machining process, with companies generally paying little regard to its purchase, management, and disposal. This can unknowingly increase the health & safety risk to the workforce, whilst simultaneously increasing operating costs through lost production and high MWF consumption/disposal.

Simply developing a greater understanding of the function of MWF, in conjunction with the implementation or improvement of fluid management and control practices, can effectively reduce the health & safety risk and potentially make savings throughout the operation.

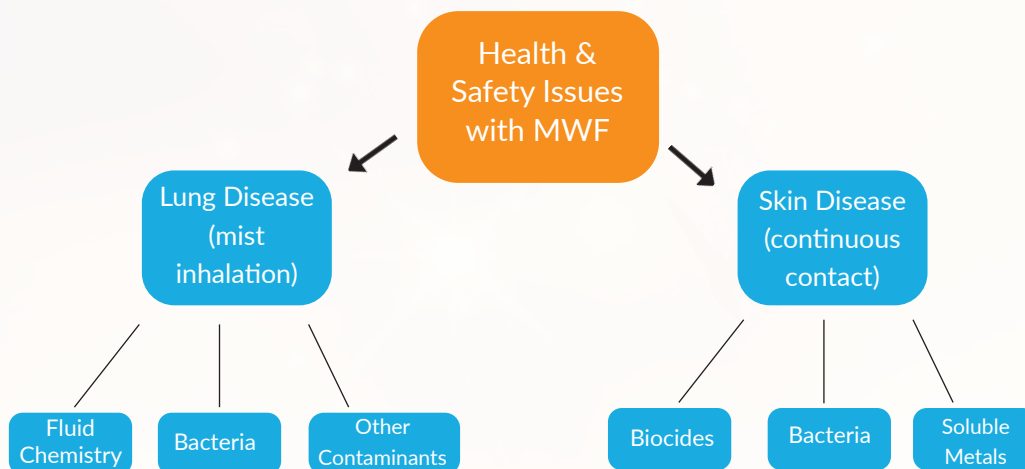
The Main Functions of a MWF	
Lubrication (improving surface finish)	Metal fines (swarf) removal from the work piece
Cooling (equipment & machined components)	Prolonging the life of the cutting tool
Surface Corrosion Protection	Reducing Power Consumption

Looking at the many areas in which a MWF is utilised it may be advantageous to reframe its description by thinking of it as a:

'Multi-Functional tool vital to the machining process.'



Despite their vital role within the machining process, MWF's can create environmental and health problems, with the risk to health increasing in parallel to the increasing deterioration and contamination of the fluid.



Did you know? - The HSE are carrying out a programme of unannounced site visits through 2018/19 focusing on lung disease from exposure to MWF's.

Did you know? - Control of MWF's are covered under COSHH, with the law requiring that risk assessments are carried out to minimise exposure.

Did you know? - An engineering company in the South of England was recently prosecuted and fined £800,000 after three workers developed debilitating lung conditions due to the inhalation of MWF.

Looking at the Bottom Line!

It is easy to think of a MWF as a low cost necessity; however MWF's have a greater impact on the machining process than the purchase price alone:

Problems associated with poor MWF control	
Increasing work piece rejection (corrosion/poor cutting quality)	Increased energy consumption
Increasing tool wear/breakages	Increased fluid use
Health & Safety issues	Increased fluid disposal
Increased machine maintenance	

Did you know? - It has been estimated that 16% of total manufacturing costs in the engineering industry are due to MWF's and lubricants.

Did you know? - Companies with poor fluid management could achieve savings of up to 40-60% by implementing fluid control strategies'

Did you know? - research has shown that a 20% improvement in MWF performance can result in a financial benefit more than 5 times larger than the purchase cost of the MWF in some cases.

Many companies are not getting the best out of their MWF's and could reduce their operating costs significantly by implementing and improving fluid management and control practices.



Applying COSHH principles of good control practice in the form of maintaining and monitoring the quality of your MWF is a legal requirement, and is an important area of exposure control that can be easily and quickly implemented. In addition to minimising the risks associated with skin contact and inhalation, fluid optimisation can also achieve financial benefits across the machining process.

Factors affecting H&S & Quality	Associated Problems
MWF Concentration	Too high, risk of misting, too low risk of microbial contamination and corrosion
MWF pH	Too high, risk of skin irritation, too low, risk of microbial contamination and corrosion
Tramp Oil	Concentrations above 2% risk of dermatitis, microbial contamination, misting, smoking
Metal Contamination	Promotes microbial growth of biofilms, skin abrasion, risk of dermatitis
Microbial Contamination	Heavy microbial contamination increases risk of inhalation, skin contact, accelerates degradation of fluid

Did you know? - The problems that increase the H&S risk also affect the fluid performance, which can increase your operating costs! The same monitoring programme can help to control both issues

Did you know? - By implementing and improving fluid management and control practices you can achieve the following:

- Raise your health & safety profile
- Minimise problems associated with product quality
- Save money on fluid purchase & disposal costs
- Improve your working environment and environmental performance
- Reduce machine downtime due to fluid related problems
- Reduce your energy consumption

Did you know? - The HSE in conjunction with the UKLA have published, 'The Good Practice Guide for Safe Handling & Disposal of MWF' which is a comprehensive manual describing all aspects of MWF management.

It is free to download via the following link:
www.dn-micro.net/links
 and click on MWF Good Practice Guide.

For further information regarding the control of MWF's

visit DN-Micro at www.dn-micro.net or contact us at info@dn-micro.net