Title Tag: What are the Advantages and Disadvantages of Metal Cutting fluids?

Meta Description: Click here to learn more about the advantages and disadvantages of metal cutting fluids from Pennine Lubricants.

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What are the Advantages and Disadvantages of Metal Cutting Fluids?

At Pennine Lubricants, we've been blending metal cutting fluids for over 30 years. Offering our customers a comprehensive, yet adaptable range for even the most demanding applications. As well as the many benefits metal cutting fluids offer, there are some disadvantages if the fluids are not maintained correctly. So, what are the advantages and disadvantages of metal cutting fluids?

Advantages include:

- **Cool and lubricate machinery which can improve tolerance and efficiency.**
- **Reduces the input needed to work the machinery.**
- **They can be altered to suit different requirements.**

Disadvantages include:

- **Risk of health and safety if you come under contamination.**
- **Require maintenance to keep them in working condition.**
- **Lose effectiveness over time.**

Keep reading to find out more about the features of metal cutting fluids as well as some common examples of metal working fluids.

Advantages and Disadvantages of Metal Cutting Fluids

Metal cutting fluids offer many advantages; not only do they cool and lubricate machinery, formulations can be easily altered to suit varying application requirements. However, if not maintained correctly, metal cutting fluids can cause health problems in operatives. Read on to find out more about the advantages and disadvantages of metal cutting fluids.

Advantages	**Disadvantages**
Metalworking fluids both lubricate and cool machinery. It helps protect tooling as well as enhancing surface finish. They can also improve machine efficiency and tolerance, which reduces re-work time and scrappage rates down the line.	Metalworking Fluids (MWF) can present health and safety issues once they pick up contaminants in skin and lungs. Common health issues include lung disease and skin disease if you come into contact with them. Click here to read more about these health and safety issues.

Advantages	Disadvantages
Metalworking fluids reduce the power input/effort necessary to cut materials. This can in turn reduce the cost and strain on your resources which benefits you over time.	They do however require some effort to keep them in good working order to comply with HSE MW05 which can be time consuming.
Neat oils have an inherent stability and resist oxidation. They have a high flash point and relatively low flammability. Neat oils can act as a carrier for a large number of additives which can be blended easily.	Although they are resistant to degradation, over time neat oils will still degrade and lose effectiveness. Eventually leading to contamination, additive breakdown and depletion.
Metalworking fluid formulations can be altered easily to suit different requirements.	Another disadvantage is that there can be bacterial and fungal breakdown in soluble oils. In neat oils you can also experience oxidation and scorching.
No alternative to metalworking fluids has been found to provide the same cooling	There is also an environmental disadvantage to metal cutting fluids.

Advantages	Disadvantages
and lubricating function. It is the best solution on the market.	Due to there not being an enclosed process when using them there will naturally be impacts from spillages, smoke, drag out -swarf contaminated with oil.

To learn more about the health risks and safety precautions required when using metal cutting fluids, read our informative blog by clicking here.

What are the Features of a Metal Cutting Fluid?

There are many features of metal cutting fluids, which can benefit a wide range of applications, here are a few of them:

- Boron and formaldehyde free metal cutting fluids promote the highest level of health, safety and environmental performance.
- Metal cutting fluids can offer non-staining properties when machining aluminium.
- Low-foaming metal cutting fluids are used in soft water areas in high-pressure coolant systems.
- Resistance to bacterial contamination, which can help increase sump life.
- Low odour and light colour mean the operator has excellent workpiece visibility and makes for an improved working environment.

What are Some Examples of Common Metal Working Fluids?

There are many different types of metalworking fluids within our range. Each one was developed to combat the challenges of different materials and processes. Take a look below for more information on the types of metalworking fluids in our range, and the applications they are suitable for:

- Water-extendable metalworking fluids such as semi-synthetic microemulsions.
- Fully synthetic solutions and high oil content, fine milky solutions. These metalworking fluids have been developed and blended to suit a wide range of materials, applications and water make-up properties.
- Neat Oils, which include mineral and synthetic formulations developed for demanding machining and grinding techniques. These neat oils are suitable for applications where exceptional anti-oxidant performance is essential.
- Hand-applied cutting fluids are developed to improve tool life in tapping, reaming and drilling applications.
- Spark erosion metalworking fluids are suitable for fine & rough work in electrical discharge machines.

Click here to view our full range of cutting fluids.

What are the Hazards Associated with Metalworking Fluids?

There are several potential hazards that are associated with the use of metalworking fluids, but with the correct training, PPE, good hygiene and regular monitoring of coolant these risks can be significantly reduced.

Skin Disease:

Metalworking fluids can cause skin conditions in operatives if the correct PPE is not worn. Dermatitis can develop on the hands, arms and face. This is caused by contact with both mixed metalworking fluids and neat oils.

Metalworking fluids can cause the skin to lose its natural oils, which can lead to itching and red patches on the skin. These are symptoms of dermatitis. The skin can also become very dry and start to crack. In severe cases, it can also result in swellings, blisters and open sores.

How to Reduce the Risk of Skin Disease?

- Minimise skin contact - install a dosing pump so no manual handling of metalworking fluids is needed. Enclose machines with splash guards so that misting is reduced.
- Enclose processes with guards where possible so that the metal cutting fluid is contained.
- Wear close-fitting disposable gloves so that metalworking fluids do not touch the skin, but these must easily tear to minimise the risk of entanglement in machine parts.
- Before taking a break ensure hands, arms and other exposed skin are washed and dried well to avoid retaining moisture and soap between fingers.

Lung Disease:

Operators are at risk of inhaling metalworking fluid mist, which increases the risk of developing lung disease. The most commonly reported types of lung disease by operatives are: Occupational Hypersensitivity Pneumonitis (OHP) and Occupational Asthma (OA).

Early indications of lung disease include: unexplained coughing, recurrent chest infections, difficulty breathing and weight loss.

How to Reduce the Risk of Lung Disease?

- A suitable health surveillance programme should be put in place by employers, which should include a questionnaire looking for relevant symptoms, and a periodic lung function test. Employees should be trained to recognise the symptoms of lung disease and should report them to an appropriate supervisor, who should then arrange a referral to Occupational Health.
- Installation of an LEV system (Local Exhaust Ventilation System) will remove metal cutting fluid mist from the enclosure.

Metal Cutting Fluids at Pennine Lubricants

We have developed a wide range of metal cutting fluids for industry, but can also provide bespoke blends on a small or large scale, for applications which require a unique formulation. If you'd like help selecting the correct metal cutting fluid for your application then get in touch with our technical team today.