We are FUCHS Lubricants

At FUCHS Lubricants, we see ourselves as a long-term business partner to our customers. We are problem solvers with knowledge of our customer’s operations, processes and the increasing commercial demands that are placed in a rapidly changing world.

Together with our customers, we identify new opportunities to streamline production and handling, which leads to increased profitability. In close collaboration, we combine our respective areas of expertise to achieve optimum results, which in some cases may call for bespoke solutions.

The right cutting fluid – equally important as the right tool

Choosing the right cutting fluid product for metalworking is an excellent example of how a minor detail can make a major difference. The right cutting fluid reduces the number of unplanned stoppages and increases the life of both the tool and the cutting fluid. It increases capacity utilisation, thereby reducing the cost per produced unit. With the right cutting fluid, the right checks and the right handling, you can keep production at a consistently high level – both in terms of quality and efficiency. In certain cases you can even reduce one or more stages in the production process, which leads to further savings of both time and money.

Products that measure up in every respect

A cutting fluid has to perform well in all kinds of areas. It should affect the environment as little as possible throughout its life cycle, from product development to use and disposal. We focus on each link in the entire chain, to make products that measure up in every respect.

Our product programme contains the latest technology and is continuously being developed as customer requirements and legislation change. CoolWay EAL is an example of a customised product for extremely tough machining which also allows an optimal working environment. Cutting processing is one of our highest priority product areas, and we offer products for both soft and hard water. We are also committed to new boron-free and mineral oil-free products, CoolWay Bio 15 being one of our top products.

Our Application Guide gives you an overview of suitable combinations of cutting fluids, machining methods and materials.

Tips and advice

1. Appoint someone in charge of emulsion:
   • This person will check that there is the right concentration in the systems.
   • They will also keep a logbook of concentration and pH values.
   • Take corrective action to maintain the fluid’s optimum properties.

2. Label the machines.
   If you use different cutting fluids for different kinds of machining, label each machine with the type of cutting fluid used in that machine. This will avoid mixing fluids, which may compromise the performance of the cutting fluid.

3. Try to maintain the operation of cool systems, when the cutting fluid is stable.

4. Check that the concentration is correct.

5. Even topping up of concentrate/educates.

6. Check that the pH is correct. If applicable use a pH booster/preservation – refer Figure 1 below.

7. Keep the fluid as clean as possible.

8. Minimise leaked oil using skimmers and separators.

9. Continuous renewal of water.

10. Minimise plugging the recirculator. When changing coolant check the inlet and outlet of the recirculator. If there is a large amount of slurry in the recirculator, the balance of the system will be affected. Consider the following equations, or for the order of magnitude use 2/3 of the slurry volume for recirculation.

11. Planned fluid changes.
   Keeping a good eye on your systems helps you avoid costly unplanned fluid changes.

12. Always use a system cleaner when changing the fluid.

13. To ensure a reliable operation, the concentration should always be added into the machines colder than the other way around.

14. Always store cutting fluids between the temperature range of 4°C to 30°C also during transportation.

Figure 1. Support dosage

Product performance

Change of system

Change of system

Traditional process

Approved result

System with support dosage

Tips and advice
Application guide for water-miscible cutting fluids

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Symbols: +++ Typical developed for ++ Not recommended + Works – Not recommended

How to choose the right cutting fluid?

One can generally base one’s choice of lubricant on norms, specifications and quality labels from machine manufacturers. However, norms and quality labels very rarely appear on cutting fluids. The choice of cutting fluid depends on the material being machined and the types of machine being used. Most machines work fine with both water-miscible cutting fluids and cutting oils, while others are more adapted to a type of product.

To choose the right cutting fluid, you must consider:

- The types of material being machined
- The type of machining
- The premises, environmental and health & safety aspects

Material

- Cast iron and copper alloys are the easiest materials to machine. Cast iron contains graphite and copper which lubricate well by themselves, so very little extra lubrication is needed. Compare this to high alloy steel and aluminium alloys, which are harder to machine and need more advanced high lubricating products.

The material's effect on the fluid

- Titanium alloys
- Ni alloys (Inconel, Hastelloy etc.)
- Stainless steel
- Alloys
- Cast iron
- Copper alloys (yellow metals)
- Free-cutting steel
- Low alloy steel
- High alloy steel
- Copper alloys
- Aluminium alloys
- Titanium alloys
- Stainless steel

Easy to machine

- Cast iron
- Copper alloys
- Free-cutting steel

Low impact

- Stainless steel
- Low alloy steel
- Copper alloys
- High alloy steel

High impact

- Aluminium alloys
- Titanium alloys
- Free-cutting steel

The materials effect on the fluid

- Low impact
- High impact

Common materials

- Cast iron
- Copper alloys
- Free-cutting steel
- Stainless steel
- Low alloy steel
- High alloy steel
- Aluminium alloys
- Titanium alloys
- Copper alloys
- Low alloy steel
- Free-cutting steel
- Stainless steel
- Titanium alloys
- Cast iron