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 customers' 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.

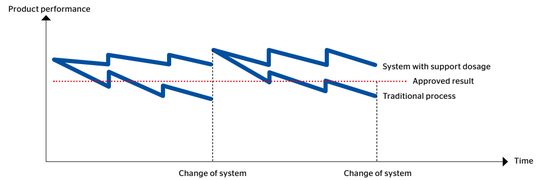
Our product programme contains the latest technology and is continuously being developed as customer requirements and legislation change. CoolWay EAL is an example of a customised product for extremely tough machining which also allows an optimal working environment. Cutting processing is one of our 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 to be 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 properties in the cutting fluid.
3. **Try to minimise the number of 'dead' spaces in the system, where the cutting fluid stands still.**
4. **Check that the concentration is correct.**
5. **Even topping up of concentrate/water.**
6. **Check that the pH is correct.** If applicable use a pH booster, preservative – see Figure 1 below.
7. **Keep the fluid as clean as possible.**
8. **Minimise leaked oil using skimmers and separators.**
9. **Continuous removal of swarf.**
10. **Minimise stoppages in the systems.** When stoppages occur, raise the pH by 0.2–0.3 units. If there is a longer period of down time, such as during the summer shutdown, a bactericide may also be needed. Circulate the system regularly, or air the system. A small aquarium pump is adequate for small systems.
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 stable emulsion, the concentrate must always be added into the water, rather than the other way around.**
14. **Always store cutting fluids indoors in the temperature range +5°C to +30°C, also during transportation.**

Figure 1. Support dosage *(which we refer to in the above text, point 6)*



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Application guide for water-miscible cutting fluids

Application guide for water-miscible cutting fluids

	TeTechnical characteristics						Type of machining						Materials						
Product	Technical level	Recommended conc	RI-factor	Oil content	Boron	Biocide	Turning	Grinding	Tapping	Reaming	Drilling	Cutting	Cast Iron	Steel	Stainless steel	Hard metal alloy	Aluminum	Copper & Brass	Titanium
Coolway G 18	2	4-8%	2,0	18%	Yes	Yes	+++	+++	-	-	++	+	+++	++	+	-	+	-	-
ECOCOOL GRINDSTAR VBF	2	6-10%	1,6	12%	No	No	+++	+++	+	-	++	+	+++	++	+	-	+	-	-
CoolWay G 25 NV	2	4-8%	1,6	25%	Yes	Yes	+++	+++	-	-	+	+++	+++	++	-	-	-	+	-
CoolWay X 25	2	4-8%	1,6	25%	Yes	Yes	+++	+++	+	-	+	+++	+++	++	-	-	-	+	-
CoolWay BF 25	2	4-10%	1,8	25% synthetic	No	Yes	+++	+++	-	-	+	+++	+++	++	-	-	-	+	-
CoolWay BFF 25	2	5-10%	1,3	25%	No	No	+++	+++	-	-	+	+++	+++	++	-	-	-	+	-
CoolWay E 32	3	4-10%	1,0	84%	No	No	++	+	+	-	++	+++	++	++	++	-	++	++	-
CoolWay GM	3	4-10%	1,0	76%	No	Yes	++	+	+	-	++	+++	++	++	++	-	++	++	-
CoolWay CB	3	5-8%	0,9	49%	No	No	+++	+	+	+	++	++	-	++	+	-	+++	+++	-
CoolWay BIO 15	3	4-10%	2,4	15% ester	No	Yes	+++	+++	+	-	++	+++	++	+++	+	-	++	+	-
ECOCOOL FERROSTAR MBF	4	6-12%	1,3	25%	No	No	+++	+++	++	++	+++	++	+++	+++	+++	-	++	+	+
CoolWay HD 25	4	5-12%	1,5	25%	Yes	Yes	+++	+++	++	+	++	+++	++	+++	++	-	++	+	-
CoolWay HD 25 BF	4	5-12%	1,6	25% synthetic	No	Yes	+++	+++	++	+	++	+++	++	+++	++	-	++	+	-
ECOCOOL GLOBAL 10	4	6-10%	1,3	34%	No	No	++	++	++	++	+++	+++	+	+++	++	+	++	+	++
CoolWay G 40	4	4-10%	1,0	36%	Yes	Yes	+++	++	++	+	++	+++	++	++	++	-	++	++	-
CoolWay BFF 40	4	4-10%	2,0	36%	No	No	+++	++	++	+	++	+++	++	++	++	-	++	++	-
CoolWay EAL EP	5	5-12%	1,0	24% synthetic	No	Yes	+++	++	+++	+++	+++	+++	+	+++	+++	+++	++	+	+
CoolWay EAL	5	5-12%	1,0	28% synthetic	Yes	Yes	+++	++	+++	+++	+++	+++	+	+++	+++	+++	+++	+	++
CoolWay EAL BFF	5	5-12%	1,0	28% synthetic	No	No	+++	++	+++	+++	+++	+++	+	+++	+++	+++	+++	+	++
CoolWay S2	1	4-8%	4,2	0%	No	No	-	+++	-	-	-	-	++	++	+	-	-	-	-
CoolWay S Co	1	4-6%	2,5	0%	No	No	-	+++	-	-	-	-	++	++	+	+++	-	++	-
CoolWay S	1	3-8%	3,3	0%	Yes	Yes	-	+++	-	-	-	-	+++	++	+	-	-	-	-
ECOCOOL S-FC	4	5-10%	2,2	0%	No	No	+++	+++	++	++	+++	++	+++	+++	++	-	+	-	++
CoolWay S 20	4	4-12%	1,7	0%	No	No	+++	+++	++	-	+++	+++	++	++	++	+	+++	++	+
CoolWay S33	5				No	No													

Symbols +++ Special developed for ++ 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

However, when we look at the material's effect on the cutting fluid, cast iron and copper alloys form small metal particles during machining which can easily get stuck in nooks and crannies and make the machine dirty. There are therefore higher demands on the fluid's cleaning properties when machining these materials.