

How to Test and Treat Metalworking Fluids

Metal Working fluids are one of the most dangerous killers in the metalworking industry.

The danger of MWF lies in its ability to release harmful lung-infecting organisms without being noticed. A welder, grinder or plasma cutter will exhume visible fumes, sparks, and vapours, but not metal working fluids. They stay happily swirling around in a sump, looking like a mixture of cream and weak coffee, do an essential job without complaining, don't burn the fingers when handled, and offer up that old-fashioned odour, the tell-tale identity of a skilled hardworking engineer, even outside of the black country.

Fluid systems that contain water or water-mixes can become highly contaminated with harmful bacteria. The bacterial contamination of fluids and associated machinery and pipework should be monitored and controlled.

So how can metalworking fluids so seriously affect us?

- Irritation of the skin or dermatitis.
- Lung diseases, such as occupational asthma, occupational hypersensitivity pneumonitis, bronchitis, irritation of the upper respiratory tract and other breathing difficulties.

How is this harm potentially caused?

- Inhalation of mist or splash particles.
- Skin contact during the preparation or draining of fluids, handling of workpieces, especially through cuts and abrasions or other broken skin.
- Through the mouth if we do not wash our hands before eating.

Unfortunately, what follows, possibly even when an employee has already moved to other duties or left, is an illness or life changing injury. That pursued can culminate in an enquiry under the [PUWER \(Provision and use of work equipment Regulations 1998\)](#), and prosecution.

That is why the Health and Safety Executive, the HSE, has not only devoted a raft of guidance notices specifically on that subject, but why their factory inspectors regularly home in on what to the average worker seems unimportant. HSE inspectors are currently visiting businesses across Great Britain, checking that all risk assessments and mitigations are in place.

So, what is the method of dealing with this killer? It is not a one-off fix, it is a *process of management* of just **FIVE steps** which follows the path below:



1 – Conduct a Risk Assessment

An employer must consider the likelihood of a hazardous event occurring, and the consequence. Documented, it indicates that action is being taken to control the risk, which will be to monitor the fluid condition.

If using a specialist, they can supply the initial test kit

2 – Purchase monitoring equipment

Monitoring is a constant process of management and needs to be delegated to a responsible person, either in H and S, or the machine operator.

The **test kit** includes record sheets which can be copied for multiple machines

3 – Take samples from each machine

These tests can be recorded instantly:

- Temperature
- Visual / Refractometer
- pH
- Tramp

Nutrient needs **24-48 hours** to incubate.

Yeasts need up to **120 hours** to incubate.

4 – Grow the samples in the incubator

These tests must be grown in the incubator

- cfu/cm² Nutrients
- cfu/cm² Yeast
- Moulds

5 – Record the results

No

MWF Condition under control?

Yes

Treat with biocide or clean out with a suitable system cleaner and refill

Repeat steps 3 – 5

If using an external specialist, it is good practice to request an annual check visit under PUWER.

Enter a frequency of repeat on the Risk Assessment

There is no specified frequency.

Base it on your usage, extend it if clean conditions prevail, shorten it if poor results repeat.

Best practice and solutions from Selmach.

As part of our GoldCut range, Selmach offers three chemical products to assist with bacterial contamination control.

GoldCut 310 Cutting Fluid – A modern biostable semi-synthetic metalworking fluid suitable for all general machining operations on ferrous materials and high carbon steels. Mixed 1 – 8, this fluid helps keep blades cool during sawing, prolonging the life of the blade, and keeps bacterial contamination to a minimum.

GoldCut BC Biocure – This high performance Biocure is for use in any aqueous solutions and emulsions, such as waterbed Plasmas, and coolant sumps for saws and drills. Extremely potent, it just needs to be added at a concentration of 0.1% to keep bacteria at bay.

GoldCut SC System Cleaner – A professional system cleaner which can be used to flush out your current contaminated coolant sump mixture ready for new coolant.

