RBM OIL CORPORATION

(An ISO 9001:2015 Certified Company)

Sr. No. 42 Rasikwadi, Jambe Road, Pune, MH India -411033

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RBM CUTTING OIL LOADING AND MAINTENANCE SOP

Introduction

Cutting fluids have been used in metal-cutting applications for centuries. From animal fat to specially designed cutting fluids with additives and inhibitors - cutting fluids have evolved to keep up with the changing industrial requirements. However, vigilant soluble cutting fluid management is key to its efficacy and performance. On that note, let us look at ten key tips for cutting fluid management.

Dedicated cutting fluid management personnel

Have a dedicated individual who is responsible for cutting fluid management.

They can cover the entire workshop or have teamwork under them for effective division of duties and to offer attention to every sump.

The cutting fluid manager should be trained to:

- · Check the concentration, pH, tramp oil, and contamination of the soluble cutting fluid.
- · Maintain a record of the above information.
- · Initiate corrective actions to maintain soluble cutting fluid health and performance aligned with the desired properties.
- · Remove tramp oil (leaked hydraulic oil) from the sump to prevent bacterial growth.

Assigning accountability for this task ensures that nothing is forgotten and all systems function optimally.

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1. Machine labelling and recordkeeping

All machines must be **labele**d with **cutting fluid-related information**, such as the soluble cutting fluid in use, ideal concentration, ideal pH, and typical appearance. Labeling the machines with this information will allow the appropriate cutting fluids to be added to the machine while preventing the mixing of products or topping up fluids with the wrong product. It also serves as a record of the activities carried out so far. Maintaining a record is the first step towards taking control of health.

2. Check the fluid concentration

Typically, the fluid concentration must be tested daily. However, you can space it **out to 2-3 times in a week**, depending on the target range of the system. Employ a **refractometer** to capture accurate measurements. Alternatively, you can also use titration. Practice care to apply the corresponding factor to get the actual measure of the concentration. Higher than necessary concentrations can create a mess, increase soluble cutting fluid consumption, and increase the risk of skin problems. On the other hand, lower-concentration fluids are susceptible to contamination, poor lubrication, and corrosion - all of which will affect the tool's lifespan.

3. Test fluid pH

In addition to testing the concentration, you must also check the pH levels using a calibrated pH meter or an indicator stick. Ideally, the pH value of most soluble cutting fluid ranges between **8.6 to 9.6**. However, this value is subject to change depending on the product in use.

Low pH usually corresponds to low concentration.

As such, it is susceptible to issues such as contamination, bad odor, corrosion, etc.

4. Frequent top-ups in small quantities

For top-notch soluble cutting fluid management, you should top up a little but often with an emulsion that is premixed at 1-2%. It ensures that the system is at the correct fill volume by replacing any losses resulting from evaporation or drag out. In low-concentration situations, top-ups can bring the final concentration to the ideal levels. And once you achieve this value, reset the top-up concentration to maintain it.

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5. Minimize tramp oil

Tramp oil is any contaminating oil that could be corrosion preventive fluid, hydraulic oil, slide-way oil, or spindle oil. And while they are no threat to the system by themselves, the boundary they share with the emulsion serves as a thriving ground for bacteria.

As such, you should use skimmers and separators to minimize tramp oil.

6. Remove swarf periodically

Swarfs(*Fine chips or filings of stone, metal, or other material produced by a machining operation.*

"a curl of metal swarf"

are fine chips and debris residue left behind after machining.) Removing the swarf can help maintain good soluble cutting fluid conditions as it can otherwise promote the growth of bacteria and fungi. Further, they occupy space in the sump and displace metalworking soluble cutting fluid, thereby compromising its volume. This fluid displacement affects effective heat transfer and lubrication. Hence, you should remove the large particles using a conveyor and the small particles through filtration.

7. Keep system stoppages at a minimum

Stoppages in systems can result in fluid stagnation and build-up. Soluble cutting fluid can also develop bacterial and fungal growth during this period. As such, warehouses should keep downtime at a minimum. However, if there is no way to remove stoppages entirely, get rid of the tramp oil and elevate the pH and concentration levels to boost startup. Alternatively, leave the tanks empty and treat the fluid with suitable corrosion preventive or biocide additives.

8. Schedule maintenance and fluid changes

Regular and scheduled maintenance can bolster cleaning operations and align the performance with the production requirement. Apart from **planned maintenance**, also outline a schedule for routine preventive maintenance to mitigate unplanned downtime and fluid changes that will cause disruptions and may prove to be costly.

9. Use a system cleaner while changing fluid

System cleaners are water-soluble detergents and dispersants targeted at emulsions and solutions. They can kill bacterial or fungal growth and dislodge sludge and microbiological films.

While they are not a major component of soluble cutting fluid management, using a system cleaner while changing soluble cutting fluid ensures that the system is sterile and ready for top-up with a fresh fill of fluid.

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10. Recommended grade. By **RBM OIL CORPORATION**

Refer table no. 1

Table no. 1

SN	Grade (By RBM)	Nonferrous R.I. Value (%)	Ferrous R.I. Value (%)
1.	ROBUST CUTTING OIL 2000	3	5
2.	ROBUST CUTTING OIL 3000	3	5
3.	ROBUST CUTTING OIL 4000 SS	3	5
4.	ROBUST CUTTING OIL 5000 SS	2.5	5
5.	ROBUST CUTTING OIL 6000 SS	2.5	4
6.	ROBUST CUTTING OIL 7000 SS	2.5	4
7.	ROBUST CUTTING OIL 9000 SS	2.5	4

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