Rustlick™

THE 6 STEPS TO COOLANT SUCCESS

1. Concentration • The concentration of the coolant mix in the sump can change over time, therefore it is important to monitor the coolant mixture to maintain the correct concentration. This can easily be accomplished by using a Rustlick Refractometer (part no. 78095). To measure the current concentration in the sump pour a little used coolant into a Styrofoam or paper cup and let it sit for 10 minutes. After the coolant has separated poke a hole in the side of the cup and use the coolant that streams out to take your reading. This will insure that the refractometer reading is accurate.

2. Remove Tramp Oil • When tramp oils fall from the machine and into the sump they form a floating seal that prevents air from reaching the coolant underneath. This creates an ideal setting for anaerobic bacteria that thrive in areas devoid of oxygen, it is the growth of these organisms leads to rancidity and coolant spoilage. To prevent rancidity and coolant separation remove damaging tramp oil with a Rustlick Wheel Skimmer. Remember that wheel skimmers can only be run when the coolant is not in use.

3. Aerate your coolant • Many types of bacteria and fungus flourish in environments without oxygen; therefore it is important to aerate the coolant regularly. By simply running the machine a few hours a day you will prolong the life of the coolant. If it is not possible to run the machine every day then consider installing a pump like those used in fish tanks to aerate the sump when it is not in use.

4. Mix your coolant properly • A properly made coolant mixture is much more effective than an improperly mixed one so when mixing water and coolant concentrate always remember the word OIL (Oil in Last). This will remind you that water should never be added to concentrated coolant; instead always start with water and then add the coolant concentrate to the water. It is best to mix the water and coolant concentrate before adding it to the sump. If the coolant is being dispensed from a 55-gallon drum consider the use of Rustlick Drum Mixer (part no. 78096). This tool makes it easy to make the right coolant mixture every time.

5. Add make-up coolant carefully • When you are adding make-up coolant to the sump never add straight water or coolant concentrate to the sump. Doing this will throw off the concentration of the coolant mixture. If the coolant mix in the sump is too concentrated then add a make-up coolant mix that is less concentrated and if the coolant mix in the sump is not concentrated enough then add a make-up coolant mix that is more concentrated. A good rule of thumb is the 15 principle: if you initially charge with a 20:1 mix and the coolant in the sump is now too concentrated then add a 35:1 mix. After adding makeup run the sump for a few minutes before taking another refractometer reading. Keep repeating these steps until you have reached the initial 20:1 concentration.

6. Clean the sump regularly • Chips and debris take up space in the sump and reduce the amount of coolant that it can hold, this reduces the coolant's beneficial qualities such as lubricity and rust protection. These contaminants also provide breeding grounds for bacteria and fungus so it is important to regularly clean the chips and debris out of the sump.

ITW ROCOL® North America

3624 West Lake Avenue • Glenview, Illinois 60026 • Tel (800) 452-5823 or (847) 657-5278 • Fax (800) 952-5823 or (847) 657-4897
www.rocolnorthamerica.com

COOLANTS AND COOLANT MANAGEMENT

Managing the use and care of your metalworking fluid can significantly reduce cost as well as provide a safe, clean working environment.

Metalworking fluid management can produce a competitive advantage in today's marketplace. Industry estimates that metalworking fluids make as much as 10 percent of the cost of a finished part. It includes the initial cost, housekeeping, cleaning and disposal. At the same time, tooling only makes up about 6 percent of the cost of a finished part. The goals of metalworking fluids management are to reduce costs by increasing the life of the metalworking fluids and to decrease the amount of disposal. Other benefits include providing a safer and cleaner work environment for the operators.

COOLANT SELECTION

Proper metalworking fluid selection is essential in coolant management. For example, some lubricants and corrosion inhibitors are targeted specifically to work with certain metals, so choosing a metalworking fluid designed for aluminum might give poor performance if it is used strictly for ferrous metals. Also, metals that corrode easily will require an oil-based product. Finally, some hard-water situations call for specific metalworking fluids. Choosing the wrong metalworking fluid can be a costly mistake on many fronts, so start off right by choosing the appropriate metalworking fluid for the job. Most manufacturers have a team dedicated to helping companies in their product selection process.

There are three major classes of metalworking fluids, and they each carry their own inherent advantages and disadvantages. All metalworking fluids will lubricate, cool the metal, carry off chips and provide rust protection for the work piece and the machine. However, the huge number of available ingredients makes it possible to create an infinite number of variations.

WATER-SOLUBLE OILS

Water-soluble oils are the workhorses of the metalworking industry. They are most commonly used for CNC machining of ferrous metals, but can be used in a wide variety of applications. They leave behind an oily layer on the parts and machines, which acts as a rust preventative. When the coolant is used properly, it is very uncommon to have rust problems. The disadvantage of the water-soluble oils is that they will emulsify tramp oil, so that the tramp oil (hydraulic oil, spindle oil, etc.) now becomes part of the coolant. In effect, this weakens the emulsion stability of the metalworking fluids and can eventually split the emulsion.

SYNTHETIC METALWORKING FLUIDS

Synthetic metalworking fluids lend themselves well to grinding and light-duty machining. Synthetics work great for grinding because they allow for swift settling of the small fines created during grinding. Grinding fluids should be cleaner than machining fluids because they cover a larger work area and can splash more than a machining operation. Whereas water-soluble oils will absorb tramp oils, synthetics typically will reject the oils — allowing them to be skimmed from the surface of the metalworking fluid. In some applications, this feature allows synthetics greater longevity in the sump. Many synthetics work well for machining all metals and some of the newer and more expensive synthetics can approach the tool life of water-soluble oils. The disadvantage of synthetics is that some components such as lubricants and rust preventives can be used up before the rest of the metalworking fluid.

SEMI-SYNTHETIC METALWORKING FLUIDS

Semi-synthetic fluids are a good compromise between the water-soluble oils and synthetics — they are hybrid products of both water-soluble oils and synthetics. Therefore, they carry both the advantages and disadvantages of both groups. Semi-synthetics are less likely to cause rust than synthetics, will still provide rust protection because of their oil content and will emulsify tramp oils. Semi-synthetics are suited ideally for machining and grinding of cast iron.

Manufacturers will formulate different grades of products, so that there are products available for all types of machining operations. Each category of coolant can have low- to high-grade products. Typically, the higher the price of the product, the

better performance it will give. Just because a metalworking fluid is lower in price does not mean that the customer will save money in the long run, because tool life can be affected greatly by metalworking fluids.

To get the most out of your metalworking fluid, select the right metalworking fluid to begin with, then adhere to a good sump maintenance program.

DRAIN, CLEAN AND RECHARGE

Proper metalworking fluid management starts with the draining, cleaning and recharging of the machine. This is the most important step in breaking the cycle of rancidity and metalworking fluid failure. An effective biocide/fungicide intended for the use in metalworking fluids should be added 24 hours before the machine is drained, cleaned and recharged. The coolant should be circulated and the machine can continue to make parts during this process. This will eliminate the bacteria and fungi in the sump, pumps, filters and coolant lines. Do not use bleach as a biocide. Bleach will only shorten the life of the metalworking fluid. Drain and properly dispose of the old metalworking fluids. Clean the chip and swarf from the machine.

Fill the system with just enough fresh water and alkaline cleaner that the pumps can circulate the solution. Circulate the cleaning solution for 15 to 20 minutes — this will clean the grease and sludge from the sump and coolant circulation system. Pump out the cleaning solution and circulate clean water through the system.

The machine tool is vulnerable to rusting after the cleaning process. Use a spray bottle with a mixture of 50 percent new concentrate and 50 percent water to spray all of the surfaces on the machine to prevent rusting. Make sure that you spray under all of the machine fixtures, and clean or change all of the filters on the machine tool.

Refill the system with fresh metalworking fluid and circulate. Remember always to use the OIL (oil in Last) method when mixing soluble oil or semi synthetic. This will produce stronger emulsions increasing the life of the fluid. In the worst cases a biocide/fungicide treatment should be considered two or three days after the drain, clean and recharge.

MAINTENANCE

Ongoing maintenance of a metalworking fluid sump is divided between concentration and contamination management. Today's metalworking fluids are designed to function properly in concentration ratios of 3 percent to 10 percent. Just as diluted paint will not be very effective, the same holds true with coolants. The easiest (and most important aspect) of metalworking fluid management is to keep the concentration within the recommended range for the application. This will help prevent a host of future problems. Concentration can most effectively be checked with a refractometer. The use of pH to check concentration will not work, because metalworking fluids can have the same pH over a wide range of concentrations.

Over time, even the best coolants can lose components. The most common reason for the selective depletion of metalworking fluids components is adding water to the sump to reduce the concentration due to evaporation. Always add some concentrate to the sump even in low concentration to make up for the components that are being consumed in the process.

Foreign material in the sump can reduce the effectiveness of the metalworking fluids. The two main contaminants are: 1) tramp oils (way lube, hydraulic oil, spindle oil, etc.) and 2) fines created during the machining process. As previously discussed, tramp oils can emulsify with semi-synthetics or water-soluble oils, causing the emulsion to split. These tramp oils also can create a favorable environment in which bacteria can grow. Any fines that are not removed from the sump can rob the metalworking fluids of rust protection prematurely.

The simplest and most cost-effective method of removing tramp oil is a wheel skimmer. The skimmer is engineered with an injection molded frame that will accept both twelve- and eighteen-inch wheels. A new skimmer has a smaller footprint than conventional wheel skimmers, making it easier to fit on most sumps. Exclusive bidirectional tramp oil drains make it possible to remove oil from either side of the unit. Tramp oil skimmers are most effective when the sump is not in use. Coupling the skimmer with an automatic timer from a hardware store will allow it to operate during the off hours. Typically, a wheel skimmer only needs to operate one or two hours to completely remove tramp oils from the surface of a sump.

Proper maintenance of metalworking fluids is not complicated or time-consuming when compared to the advantage of longer coolant life.

For more information contact ITW ROCOL North America at 800-452- 5823 or on the web at www.rocolnorthamerica.com.

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Semi-Synthetic Coolants
PRODUCT SELECTION GUIDE

Rustlick™

Product	ULTRACUT® 380R	ULTRACUT® 375R	ULTRACUT® 370R	SS-150	SS-405L
Cast Iron	●	●	●	●	●
Carbon & Tool Steel	●	●	●	●	●
Stainless Steel	●	●	●	●	●
Titanium & Nickel	●	●	●	●	●
Aluminum	●	●	●	●	●
Brass, Bronze & Copper	●	●	●	●	●
Magnesium	●	●	●	●	●
Hard Water Stability	H	M	H	H	M
Defoaming Ability	H	H	H	H	M
Rust Protection	H	H	H	H	H
Biostability	H	M	M	H	M
EP Additives	✓	✓			✓
Chlorine		4.0%			
pH at 10%	9.9	9.8	9.8	9.9	9.8
Concentrate Color	Translucent blue	Amber	Amber	Translucent blue	Amber
Diluted Color	Translucent light blue	Translucent	Translucent	Translucent light blue	Translucent
Recommended Concentrations*	3-10%	3-10%	3-10%	3-10%	3-10%

● Best
● Better
● Limited Use
● Not Recommended

H = High
M = Medium
L = Low

* Dilution ratios are accepted industry standards. Individual applications will vary.

For additional information please visit www.itwrocolna.com.

Synthetic Coolants
PRODUCT SELECTION GUIDE

Rustlick™

Product	PowerChip 2000	SN-100A	Vytron-N	PowerSaw
Cast Iron	🔵	🟢	🟢	🟢
Carbon & Tool Steel	🔵	🟢	🟢	🟢
Stainless Steel	🔵	🟢	🟡	🟢
Titanium & Nickel	🔵	🟡	🟢	🟡
Aluminum	🔴	🔴	🔴	🔴
Brass, Bronze & Copper	🔴	🔴	🔴	🔴
Magnesium	🔴	🔴	🔴	🔴
Hard Water Stability	H	H	H	H
Defoaming Ability	H	H	H	H
Rust Protection	H	M	M	H
Biostability	H	H	H	H
EP Additives	✓			✓
Chlorine				
pH at 10%	9.8	9.0	9.8	9.0
Concentrate Color	Dark blue	Clear blue	Clear blue	Dark blue
Diluted Color	Bright blue	Clear blue	Clear blue	Bright blue
Recommended Concentrations*	3-10%	3-10%	3-10%	3-10%

🔵 Best
🟢 Better
🟡 Limited Use
🔴 Not Recommended

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Water-Soluble Oils
PRODUCT SELECTION GUIDE

Rustlick™

Product	ULTRACUT® Aero	ULTRACUT® Pro	ULTRACUT® Pro CF	ULTRACUT® Green	ULTRACUT® Green CF	ULTRACUT® 255R	ULTRACUT® 250R	WS-5050	WS-1000	WS-1000 CF	WS-500A	WS-11
Cast Iron	●	●	●	●	●	●	●	●	●	●	●	●
Carbon & Tool Steel	●	●	●	●	●	●	●	●	●	●	●	●
Stainless Steel	●	●	●	●	●	●	●	●	●	●	●	●
Titanium & Nickel	●	●	●	●	●	●	●	●	●	●	●	●
Aluminum	●	●	●	●	●	●	●	●	●	●	●	●
Brass, Bronze & Copper	●	●	●	●	●	●	●	●	●	●	●	●
Magnesium	●	●	●	●	●	●	●	●	●	●	●	●
Hard Water Stability	H	H	H	H	H	H	H	M	H	H	M	M
Defoaming Ability	H	H	H	H	H	H	H	M	H	H	M	L
Lubricity	H	H	H	H	H	H	H	H	H	H	M	M
Rust Protection	H	H	H	H	H	H	H	H	H	H	H	M
Biostability	H	H	H	H	H	H-M	H-M	M	M	M	M	M
EP Additives	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Chlorine		4.7%		3.0%		5.0%		5.0%	4.1%			
pH at 10%	9.3	9.9	9.7	9.7	9.7	9.5	9.5	9.5	9.4	9.4	9.2	9.0
Concentrate Color	Light brown	Light brown	Light brown	Light brown	Light brown	Light brown	Light brown	Blue	Light brown	Light brown	Dark brown	Dark brown
Diluted Color	Milky white	Milky white	Milky white	Milky white	Milky white	Milky white	Milky white	Milky blue	Milky white	Milky white	Milky white	Milky white
Recommended Concentrations*	3-10%	3-10%	3-10%	3-10%	3-10%	3-10%	3-10%	3-10%	3-10%	3-10%	3-10%	3-10%

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