Are You Throwing Away The Expensive

Metal Working Coolants...

Green Machines.

Bangalore.

KleenCOOL

Emulsion Coolant Recycling Systems

Recycle Resources. Reduce Costs.

- ***What is in it for you?***
- *Coolants are a major expense, for any metal working industry like yours.*
- *Coolants are becoming expensive by the day. Replacing them is a messy and time- consuming job.*
- *Disposing them is an equally expensive affair in the face of today's tough environmental regulations.*

What's more...

- *Dirty Coolants with tramp oil and solid particles contribute to increased tool wear, poor surface finish and not-so-clean components.*
- *Also dirty coolant encourages bacterial growth giving rise to foul smell and skin irritation.*

What It Means To You..

- *It is prudent, therefore to take steps to maintain your coolant clean.*
- *And with KleenCOOL Recycling Systems it is an easy task.*
- *What's more, you can recycle your coolant*

  2 to 3 times before disposing and recover as much as 80% every time you recycle.
- *That's a huge saving on your coolant oil budget!*

EMULSION COOLANT– AN OVERVIEW

**Ideally, plain water is the best coolant available but it promotes rusting and lacks in lubricating ability.*

* Hence, soluble oil is added to water. But oil and water do not mix at atmospheric pressure.*

Hence, an emulsifying agent is added to hold water and oil particles together.

Thus an emulsion is formed.

Oil is organic while emulsifying agent is inorganic.

TYPES OF EMULSION COOLANT

Mineral oil based.

It contains 30 to 85 percent severely refined petroleum oils, as well as emulsifiers to disperse the oil in water.

Semi-synthetic oil based.

It contains 5 to 30 percent severely refined petroleum oils, 30 to 50 percent water and a number of additives.

Synthetic oil based.

It does not contain petroleum oils. Instead, it contains detergent-like components and other additives to help "wet" the work piece.

The life and the cost of emulsion increase in the order they are classified above.

Composition

Although each class will vary greatly in composition, each may contain additives such as –

- sulphurized or chlorinated compounds,
- corrosion inhibitors.
- extreme pressure additives.
- anti-mist agents.
- emulsifiers.
- alkanolamines,
- biocides.
- stabilizers,
- dispersants,
- defoamer,
- colorants,
- dyes,
- odorants, and
- fragrances.

Characteristics of a good coolant

- *ability for rapid heat dissipation from cutting zone.*
- *ability to lubricate the cutting edge of tool, preventing tool wear and built up edge.*
- *not promote rusting of components and machine parts.*
- *not promote bacterial growth.*
- *not break into water and oil, easily.*

Bacterial Contamination

- *Bacteria exists as both aerobic and anaerobic.*
- *While aerobic bacteria survives in air, anaerobic bacteria thrives in water, in the absence of oxygen.*
- *They consume the oil and secrete acid giving rise to bad odor and skin irritation.*
- *Floating oil prevents entry of oxygen helping bacteria to multiply every 20 minutes.*
- *Ultimately the emulsion breaks.*

WATER QUALITY

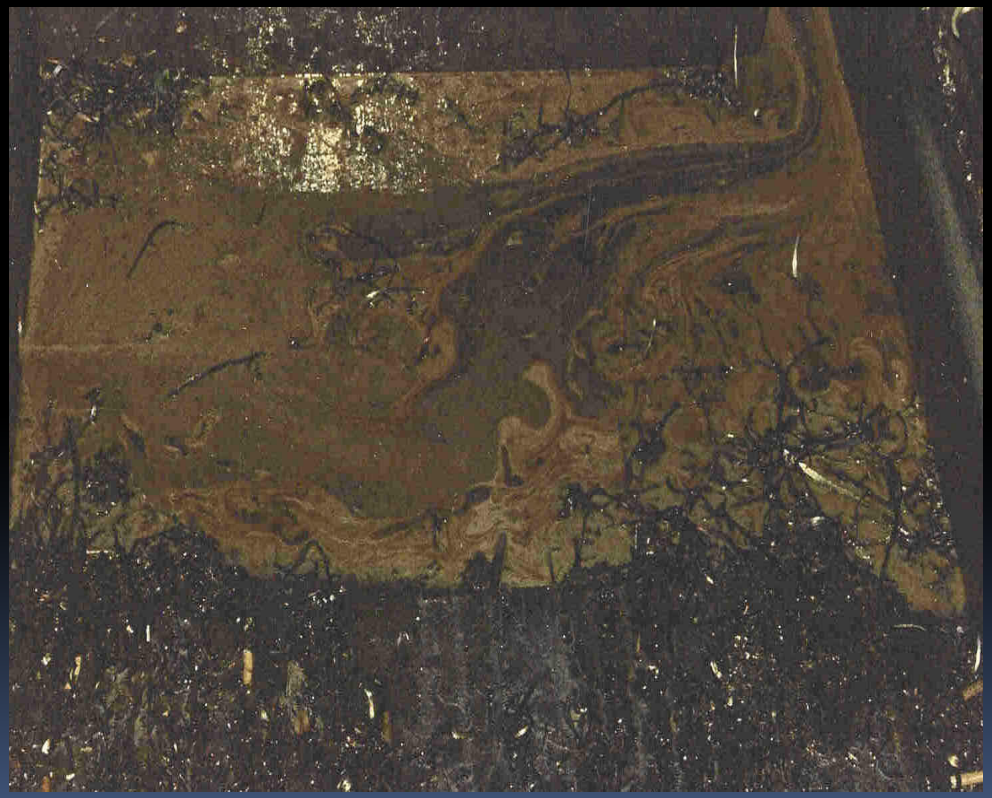
- *Water used has a direct effect on the coolant quality.*
- *Hard water reduces the rate of heat dissipation.*
- *Evaporation leads to increased salt concentration, promoting faster tool edge wear and poor surface finish.*
- *The upper limit of TDS in coolant is about 1300 ppm.*

Bacteria Multiplies Fast

The following table shows the approximate population that would result.

- *1 Hour..... 8*
- *3 Hours..... 512*
- *6 Hours.....262,000 or 2.62X105*
- *9 Hours.....134,000,000 or 1.34X108*
- *10 Hours.....268,000,000 or 2.68X108*
- *11 Hours.....516,000,000 or 5.16X108*
- *12 Hours.....1,032,000,000 or 1.03X109*

Dirty Coolant Sump.



KleenCOOL Emulsion Coolant Recycling Systems.

- *Emulsion coolant should ideally last for a long duration.*
- *But it gets contaminated, becomes unfit for use and is disposed prematurely.*
- *Recycling makes it fit for reuse many times.*

The Types of Contaminants

- *Tramp oil - formed by hydraulic and lube oil mixing with coolant.*
- *Solid particles – burrs, chips and rust particles.*
- *Bacteria.*
- *Bad odor and skin irritation due to bacteria.*

How does *KleenCOOL* purify?

- *By removing all the above contaminants through a well designed physical filtration process.*
- *It does not involve any chemical treatment.*
- *It does not change the properties of coolant.*

Large chips separation from coolant.

Complete Coolant Recycling System.

Tramp Oil separation from coolant.

A fluid with three or more of the properties listed below should be considered close to its end of working life.

- Microbial activity (as indicated by dip slide tests):
  Aerobic bacteria 1x106 CFU/ml
  Fungi/yeasts /moulds - Present
- Corrosivity (IP287 test method) above 15% fluid concentration
- Build-up of metals (as advised by your fluid supplier or independent lubricant test house)
- Excessive foaming ,uncharacteristic frothing, e.g. over the edge of the machine tool sump.
- Tramp oil above 3.0%
- pH less than 8.0 or more than10.0.
- Appearance/ color - Dark/hazy (compared to original appearance)
- Odor : Smell of ammonia or hydrogen sulphide (bad eggs)
- Stability : Creaming/separation.
- Particulate loading: More than 1300 ppm.

Benefits.

- Contaminated waste coolant is made usable again and again.
- Approx.80% of coolant recoverable, balance being losses due to evaporation and in handling.
- Improved surface finish on components.
- Increased tool life.
- Better operator health.
- Better machine up keep and shop environment.
- Extremely attractive payback and quick Return On Investment.

Thank You