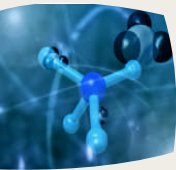




▶ PROVIDING SOLUTIONS FOR VARNISH BUILD UP AND FLUID CONTAMINATION FOR INDUSTRIAL CIRCULATING SYSTEMS..... 1



▶ THE TRUTH ABOUT WHAT HAPPENS TO ANTI-OXIDATION ADDITIVES WHEN YOUR OIL HAS ADDITIVE DEPLETION AND VARNISH ..... 2



▶ HUGE COST SAVING BY REMOVING VARNISH AND ELIMINATING COSTLY DOWNTIME ..... 2

# OILKLEEN *focus*

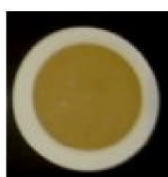
ADDRESSING THE NEEDS FOR TOTAL LUBRICATION CLEANLINESS AND INCREASED PRODUCTIVITY.

*The OILKLEEN "GREEN MACHEEN" electrostatic oil cleaner becomes the first ever 18 electrostatic fields with horizontal electrodes inside the durability of stainless steel filter housings....*

## The solution to varnish has arrived....

Electrostatics is the branch of physics that deals with a phenomena arising due to the existence of electric charges. The OILKLEEN electrostatic filtration technology forces the used oil through an oil chiller and then through 18 electrostatic fields. When the oil is chilled from it's normal operating temperature of either 120-150 degrees F to around 75-80 degrees F, the soluble free radical oxidation molecules will turn insoluble and then can be removed through the OILKLEEN electrostatic filter.

The OILKLEEN GREEN MACHEEN is the first ever stacked horizontal electrode filter inside a stainless steel tank. This has never been done before in the world, until OILKLEEN. This gives you the outstanding performance of 18 fields and the durability of stainless steel filter tanks. Each GREEN MACHEEN is powder coated and NEMA 4 certified, so it can handle the harsh outdoor environment. The electrostatic collection cartridge can be easily changed and requires no tools. The computer has built in instructions to make filter changes easy.



Sample A run at 140 degrees F

Same sample A chilled to 75 degrees F

Colorimetric analysis will show the insoluble foreign contamination that electrostatic filters will remove.

## TECHNOLOGY WATCH

OILKLEEN is the world leader in research and development for the electrostatic oil cleaning technology. We are the first electrostatic oil cleaner manufacture to patent the oil chilling process and include this technology on every GREEN MACHEEN. Notice the two colorimetric patch test results to the left. Both are from the same sample of oil, one was run through the patch at 140 degree oil temp, and the other when the oil was cooled to 75 degrees F. Notice the cooler one is darker and represents more insoluble contamination being removed. This means our filters will remove more contamination at 75 degrees F.

# “Varnish free” is more complicated than just adding an EOC...

*Electrostatic oil cleaners (EOC) have the ability to clean oil to the molecule level which makes them able to remove oxidation and varnish. However, they are only part of the solution and for a total varnish free system you need to look at the complete package...*

So you have identified a varnish problem, or you are being preventative and don't want one. Now you're looking to develop a program that will allow your equipment to run “Varnish Free”.

*Perfect!*

OILKLEEN has the solutions for you. However, you need to be aware that just adding an electrostatic oil cleaner is only part of the solution. Varnish is more complicated to remove and you must look at three factors. **FIRST**; you must look at the current condition of the oil. This means is the oil worth saving? EOC's can do amazing things, but the technology cannot

fix a bad chemistry problem. If your additive are too depleted then you can still experience varnish related troubles even with a EOC installed. **SECOND**; you must have a varnish and oxidation sampling program that monitors the condition of the oil on a monthly basis. Group II based oils out perform Group I based oils, but when they fail they fail fast. Much like a synthetic oil does. This means that your varnish and oxidation troubles could be normal one quarter and abnormal the next. Also, varnish and oxidation do not increase linear,

but rather they increase exponentially. The increasing curve looks more like a half pipe wall than a ramp. Make sure you use either the OILKLEEN V/O colorimetric analysis program or the QSA from Analysts, Inc. to make sure your system is operating normal. **THIRD**; tight tolerance mechanical filters can cause spark discharge, which are sparks in the oil over 10,000F. This is much like the spark you get when you walk on carpet and touch something. Same thing can happen in oil. The solution is add an EOC and don't use mechanical filters with 5 micron or less ratings. The EOC can get the small stuff. \*\*

## Proof of performance analysis report

*This section will show you before and after pictures of projects were OILKLEEN electrostatic oil cleaners were used to solve the fluid contamination issues.*

### BEFORE



### AFTER

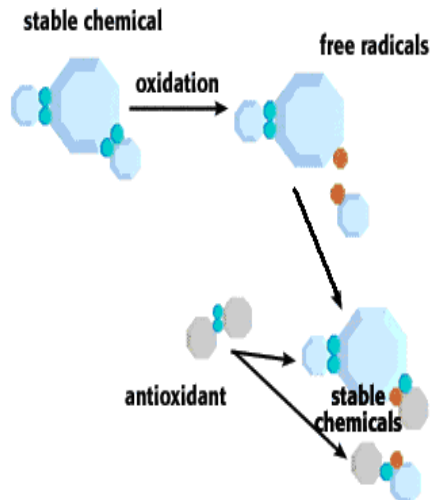


### OILKLEEN INTERNATIONAL, INC.

16585 North 92nd Street  
Suite #105  
Scottsdale, Arizona 85260  
Phone 480.556.1520  
Fax 480.556.1604  
Cell 480.650.8711  
WWW.OILKLEEN.COM

## ASK DR. VOLTAGE?

Topic is ...



*“Dr. Voltage, my question is what happens to my anti-oxidation additives if my oil is experiencing additive depletion or auto degradation issues....?”*

Notice the above illustration and the STABLE chemical, this would refer to your oil when it is new. Oxidation is a natural occurrence, and it's what happens to oil when the oil is used as a lubricant to reduce friction. Air, water, heat, particle contamination, and chemical breakdown can cause oil oxidation to be dramatically increased. Notice that OXIDATION causes the molecule to break the weak part of the compound and form a FREE RADICAL molecule. Once the FREE RADICAL is formed then the anti-oxidation additive will bond in its place and form a STABLE chemical once again. However, this cost you an anti-oxidation molecule. Once they are gone then you will have serious varnish problems. Installing an OILKLEEN electrostatic filter will remove FREE RADICALS, and help extend the life of your oil.

— Dr. Voltage