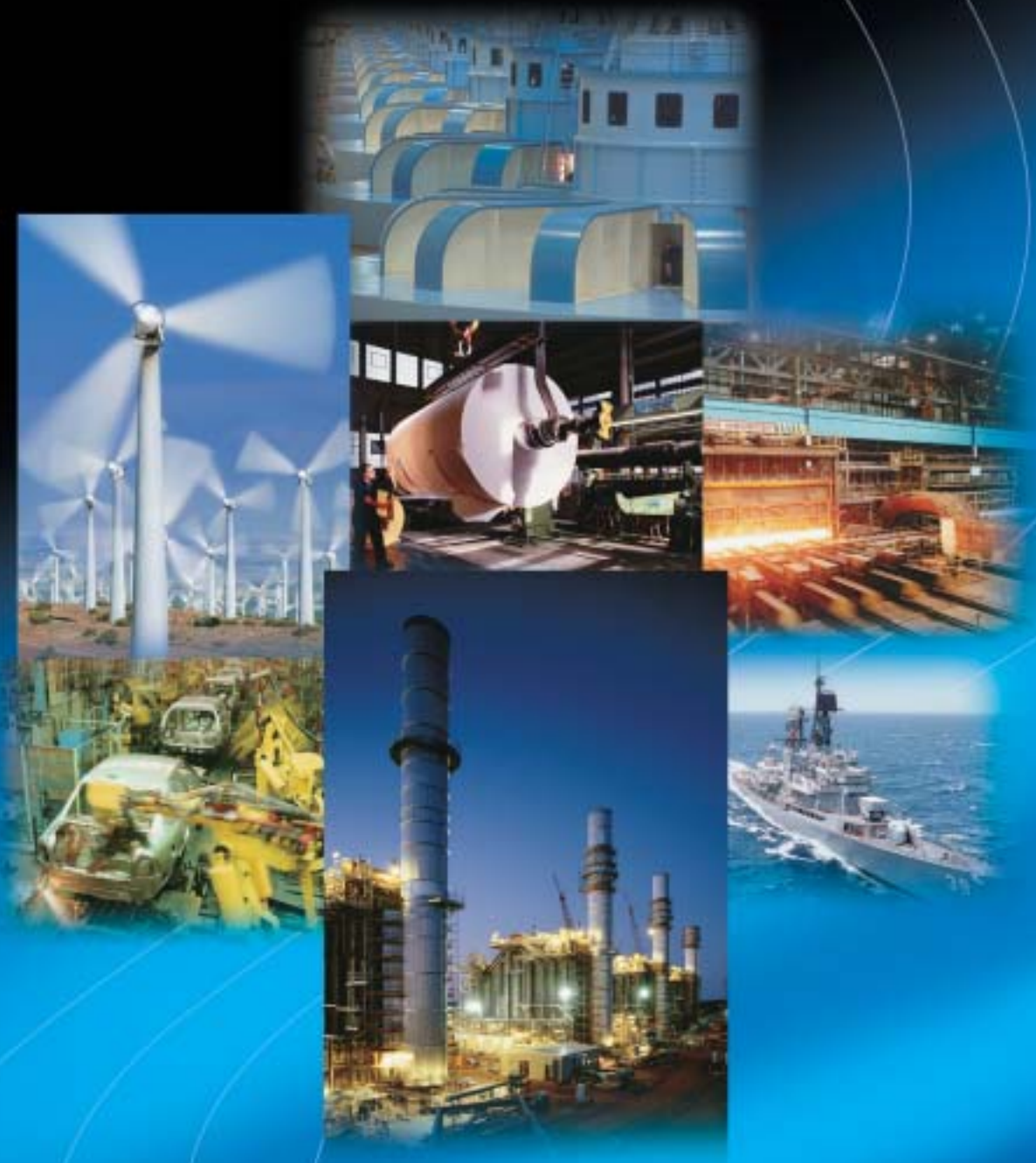




KLEENTEK®

N/R Series



ELECTROSTATIC OIL CLEANERS

A VARNISH REMOVAL solution for your ENTIRE SYSTEM ENSURING OPTIMAL machine performance

VARNISH: DETERIORATES MACHINE PERFORMANCE

As your machine runs, a chemical process called oxidation occurs — forming tar, varnish and sludge. Varnish acts as a catalyst to shorten the life of the lubricant. In addition, the tacky nature of varnish attracts other contaminants, converting smooth metal surfaces to sandpaper.

Products of oil oxidation coat the hydraulic servo, proportional and cartridge valves which forces the friction in these valves to increase. Unfortunately, the change in friction in these highly sensitive, close

tolerance components can cause unwanted effects, including:

- Loss of control stability
- Constant valve adjustment
- Reduced machine performance
- Erratic cycle times
- Increased downtime
- Slow start-ups

SOLVING VARNISH PROBLEMS

Unlike traditional oil filtration, Kleentek's patented electrostatic technology removes all insoluble contaminants, including degradation by-products that are responsible for varnish. Kleentek electrostatic oil cleaners actually clean the internals of the system. The technology allows the lubricants to act as a system cleaner, stripping varnish away one molecular layer at a time.

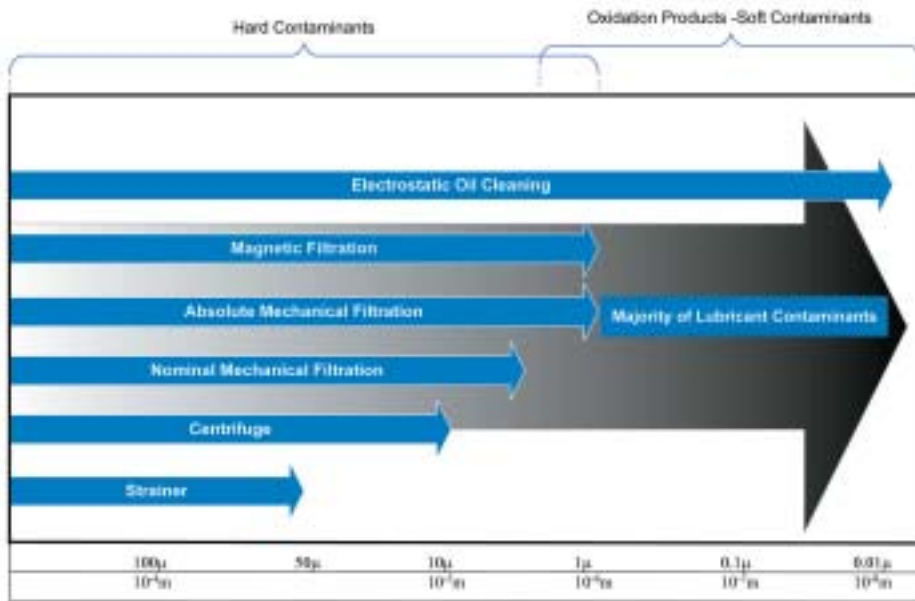


Oxidation in oil reservoir –
curable with Kleentek

THE END OF CONTAMINANTS AND SYSTEM DOWNTIME

Kleentek systems have the unique ability to draw contaminants of all sizes out of the oil, trapping them on the surface of a collector. This removal of all insoluble contaminants, including tars and varnishes, allows you to achieve ultimate machine performance.

Traditional mechanical filters remove only large particles, while Kleentek electrostatic systems are particle size independent, allowing submicronic particles as well as large contaminants to be removed from any nonconductive liquid. This means that only insoluble oil contaminants are extracted. *Soluble additives present in the oil are not affected.* In addition, because the Kleentek system is so effective at maintaining oil cleanliness, it significantly reduces the need for repeated oil changes.



THE BENEFITS OF KLEENTEK

Kleentek Electrostatic Oil Cleaners provide significant benefits and return on investment.

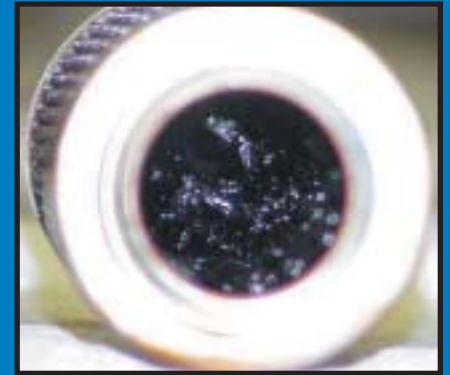
Some of the benefits include:

- Varnish-free lube and hydraulic oil circuits
- Extended oil life
- Avoidance of unplanned outages
- Improved heat exchanger performance
- Energy savings by lowering the coefficient of friction in mechanical equipment
- Extended seal and o-ring life
- Elimination of costly system flushes



Model N100

TYPICAL VARNISH-RELATED PROBLEMS



Plugged filter from static discharge



Varnished load gear

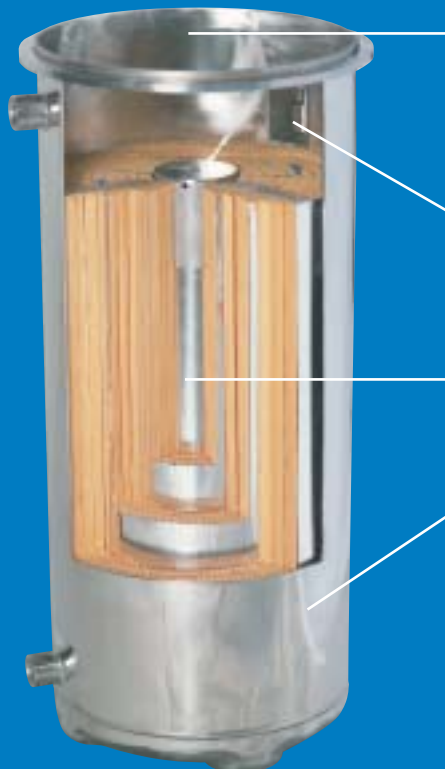


Varnished bearing surface

Kleentek solutions become a key element of your reliability program and an essential partner in profitable operations and maintenance. Kleentek systems often pay for themselves many times over in the first year of operation.

TREATABLE FLUIDS

- Hydraulic Oil
- Lubricating Oil
- Gear Oil
- Transformer Oil
- Compressor Oil
- Phosphate Esters
- Many Other Non-Conductive Fluids



THE KLEENTEK SYSTEM

Collector

High capacity collector utilizes multiple cleaning fields for optimal varnish removal.

Fluid Switch

Effectively monitors oil level to activate controls.

High Voltage Electrode

Provides high voltage charge.

Stainless Steel Tank

Stainless steel oil reservoir provides superior corrosion resistance.

Outlet

Clean oil discharged from system and return to system reservoir.

Motor

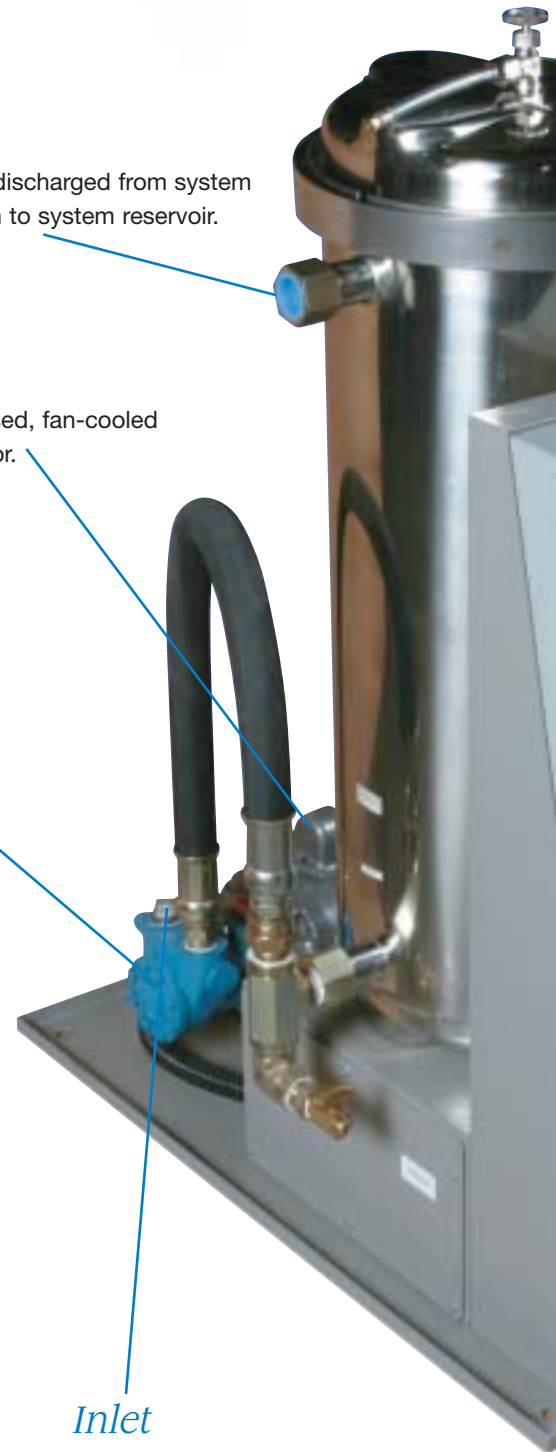
Fully-enclosed, fan-cooled 1/4 hp motor.

Pump

Positive displacement gear pump regulates flow of oil.

Inlet

Easily attaches to oil reservoir utilizing NPT fittings.



A MULTITUDE OF INDUSTRIES SERVED

Pulp and Paper

Eliminates servo valves sticking on calendering stacks and hydraulic press sections.

Injection Molding

Improves accuracy and reduces friction on highly sensitive, close tolerance components.

Automotive / Assembly

Eliminates transfer line hydraulic system failures.

Power Generation

Eliminates servo valve failures on turbines.

Steel Processing

Eliminates servo valve failures on temper mill hydraulic systems.

Refining / Chemicals

Eliminates varnish problems on turbo compressors.

Marine

Eliminates servo valve failures on controlled pitch propeller systems.

Virtually any other hydraulic oil application.

On/Off
Power switch.



Control Panel

Digital module monitors system performance.*



*High Performance programmable control (PLC) available on N100 models.

NEMA 4 Enclosure

Protects critical components from extreme environmental conditions.

Powder Coated Finish

Helps prevent fading and chalking in outdoor applications.

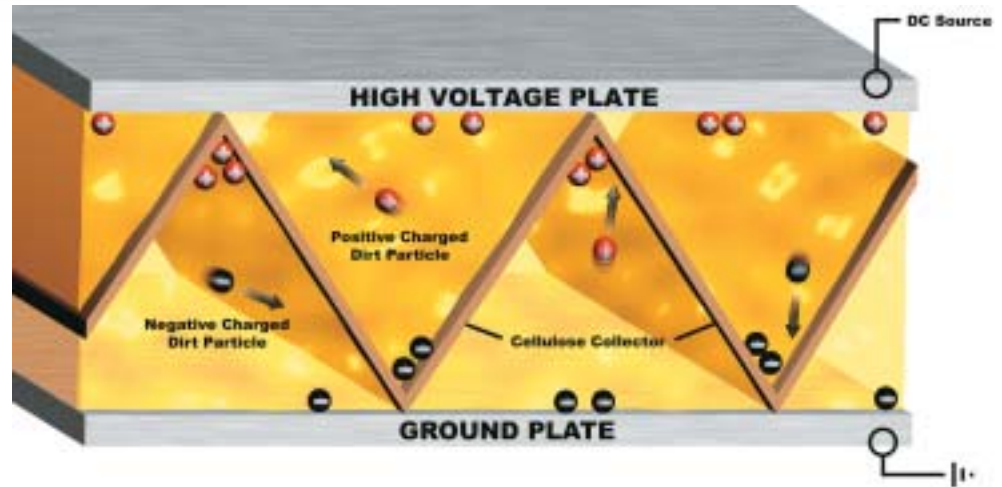


ADVANCED TECHNOLOGY. UNPARALLELED PERFORMANCE.

Kleentek utilizes a kidney-loop process that draws oil from a main reservoir and circulates it at very low velocity. The result: continual removal of contaminants from hydraulic fluids and lubricating oils.

Using the principles of electrostatics to collect fluid contaminants, Kleentek's unique design utilizes gradient force, allowing it to take advantage of the natural charge that each contaminant contains. Contaminants with a positive charge are drawn toward a negative electrode within the system, while those with an inherent negative charge are drawn toward a grounded plate.

As the fluid flows freely through the system, Kleentek removes contaminants, submicronic particles, dust, dirt and products of oil oxidation, including tars and varnishes. These contaminants are trapped in the collector for easy disposal.



HIGH-CAPACITY CONTAMINANT COLLECTION

Kleentek's collector is housed within a stainless steel chamber. Featuring high-capacity contaminant collection, all pleated collectors can be changed easily and, depending on the application, can provide continual operation from 2,000 to 10,000 hours of use.

Kleentek eliminates the need for costly system flushes.

DESIGNED FOR INDUSTRIAL APPLICATIONS

Kleentek offers four models to meet the needs of virtually any hydraulic or oil lubricating application and performance requirement.

Kleentek units are specifically designed to accommodate individual hydraulic and hydrostatic systems. These units are designed to be installed as dedicated systems.





KLEENTEST

Kleentest goes beyond traditional testing because we check products of oil oxidation at the molecular level, as well as checking for particulates.

By performing a Colorimetric test — the analysis of insoluble oil contamination of hydraulic and lubricating oils — Kleentek can effectively identify varnish potential. This procedure involves drawing oil and soluble additives through a .08 micron filter patch, leaving only the insoluble portion (real contaminants) behind. The insoluble portion is identified by the color and shade of stain.

A Spectrophotometer analyzes the light reflectance of this color and shade of stain, then compares it to a clean, unused patch giving a total color difference. This total color difference is charted by colorimetric value and cleanliness level to give a definitive answer to the question, “How’s your oil?”.

SPECIFICATIONS

UNIT SPECIFICATIONS	Model	Cleaning Chamber Capacity		Flow Rate		Width		Length		Height		Weight	
		Gal	Liters	GPM	LPM	Inches	cm	Inches	cm	Inches	cm	lb	KG
	DOC-R10	3.3	12.5	0.5	1.9	12.75	32.4	17.75	45.1	21.5	54.6	37	16.8
	DOC-N25	5.1	19.3	1.5	5.7	12.75	32.4	17.75	45.1	29.5	75	60	27.2
	DOC-N50	9.3	35.2	2.8	11.4	15.75	40	27.91	70.9	33.75	85.73	150	68
	DOC-N100	18.6	70.4	5.5	20.8	20.75	52.7	43.25	109.8	33.25	104.8	270	122.5

System voltage 115/1/60.

OIL REQUIREMENTS	Oil Viscosity										
	Method	cSt	SUS	cSt	SUS	cSt	SUS	cSt	SUS	SUS	
	Temperature	40 C	110 F	40 C	110 F	40 C	110 F	40 C	110 F	40 C	110 F
	Grade	32	150	46	210	68	300	100	460		
	Model	Gallons of Oil									
DOC-R10	1,050		700		475		250				
DOC-N25	2,550		1,675		1,200		650				
DOC-N50	5,050		3,350		2,400		1,300				
DOC-N100	10,100		6,700		4,800		2,600				

NOTES:

1. Unit capacity may vary depending upon application.
2. Performance specification based upon units with pump options and oil at 140° F (60° C) or less.
3. Oil viscosity guidelines: contact an authorized dealer for specific application requirements.