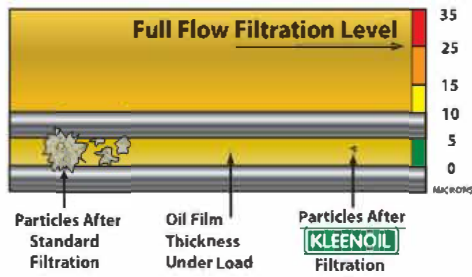


Go GREEN  
Keep it KLEEN!

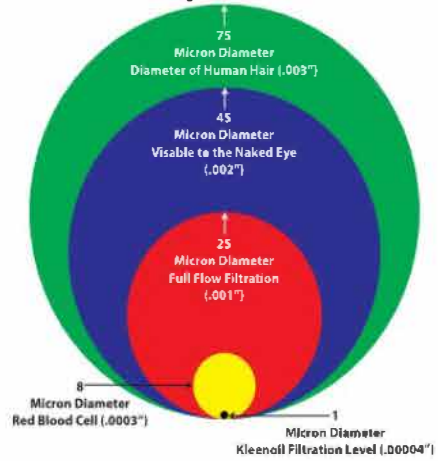
# KLEENOIL

www.perfectfiltrationperu.com

Your Engine is a Rock Crusher!



How Big is One Micron?



### Kleenoil Bypass Filter Recycling Process

The Kleenoil Bypass Filter System is constantly filtering oil from equipment in a never ending recycling process where dirty oil from the engine is cleaned down to 1-micron!



Go GREEN  
Keep it KLEEN!

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### Lifetime Warranty



Kleenoil warrants the Kleenoil filter housing and brackets to the original purchaser for life. Adaptors, hose ends, and hosing will all carry the normal warranty of the original supplier of those parts. The Kleenoil warranty exceeds the working life of the engine and can be transferred from vehicle to vehicle. Kleenoil's Lifetime Warranty does not cover losses resulting from improper installation, criminal acts, accidents, acts of negligence, intentional acts or Acts of God.

### Using Kleenoil WILL NOT Void OEM Warranties!

Original equipment warranties are unaffected by the installation of a Kleenoil Bypass Filtration System. All Kleenoil products far exceed the OEM warranty specifications and requirements; and in most cases the filtration quality provided by Kleenoil filters is over 100 times finer than standard filtration.



"The use of any product sold in the marketplace not manufactured by Cummins would not affect our warranty. However, any engine performance problem or failure caused by products or components not manufactured or sold by Cummins is not considered by Cummins as a warrantable type of failure."



"When auxiliary devices, accessories or consumables (filters, oil, additives, catalysts, fuel, etc.) made by other manufacturers are used on Caterpillar products, the Caterpillar warranty is not affected simply because of such use."



"With reference to your telephone inquiry regarding the use of Kleenoil bypass filtration systems, we would confirm that the fitting or use of this product does not, in itself, invalidate the warranty on the engine."



"Our statement relative to the use of the Kleenoil Filtration System is as follows: Use of products which we do not manufacture, sell, or recommend with Mack vehicles does not, in and of itself, void Mack warranty coverage."



"Regarding the use of your Kleenoil Bypass Filtration system on our equipment...the use of your products on our vehicles do not in and of themselves void the warranty."

A JOHN DEERE COMPANY



"The mere installation of a bypass filtration system on a John Deere engine will not automatically void the engine warranty."

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# KLEENOIL

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## Features and Benefits

### Removes Dirt and Contaminants

Dirt and wear metals will always be present in hydraulic and engine oil. The reasons that most fluid changes are done is to get rid of the dirt and contaminants. Standard full flow filtration at best, will filter oils down to approximately 35 microns in size in engines and 20 microns in hydraulic systems. Accelerated wear and damage occurs somewhere around 3 to 6 micron. Using Kleenoil Onboard Oil Recycling Systems, you will filter the fluid down to 1 micron in size, reducing the chance of wear and ultimately reducing the number of engine failures and rebuilds that would have been needed to be performed during the life of the unit.

### Eliminates Water

Water will always be present because of condensation from the heating and cooling of components in an engine. Diesel fuel used as the source of combustion contains sulfur. Small amounts of fuel will pass by the piston rings and down into the oil. The sulfur will mix with the water resulting in sulfuric acids. The Kleenoil Onboard Oil Recycling System will remove all the water down to less than 0.05%, reducing the formation of sulfuric acid that will cause accelerated wear to engine components.

### Doesn't Remove Desirable Elements

Certain components are purposely placed in lubricating oil to make it effective. Some of these additives include dispersants, detergents, oxidation and rust inhibitors, pour-point depressants, metal de-activators, and anti-foaming and galling agents. While the Kleenoil Onboard Oil Recycling System removes dirt, contaminants, wear metal particles, and water, it does not remove the oil additives needed for continued use.

### Reduces Oil Cost Up to 80%

Oil can be run longer as long as it is kept clean, free of water, and still maintains its additive package. Proper oil analysis will indicate the life of the oil, but on average oil drains can be extended 3 to 5 times what it would be without the Kleenoil Onboard Oil Recycling System.

### Reduces Time Needed for Service

Changing the Kleenoil Filter Cartridge requires less time than what is required to perform a conventional full fluid change. Simply remove the lid from the container, remove the old cartridge and install the new cartridge and seal. All this can be performed in less than five minutes and without worry of spilling oil and disposing of contaminated fluids.

### Continuous Protection Provided

The Kleenoil Onboard Oil Recycling System is installed to filter the fluid whenever there is oil pressure. Once the engine or the hydraulic pump is activated and there is fluid pressure, the fluid is continuously passing through the densely wound filter cartridge. The cartridge is wound with pure coniferous long fiber wood pulp paper. The design allows the water to be extracted from the fluid and still allows the larger oil molecules to pass through unchanged. The dirt and wear particles are trapped in the filter giving you a continuous, self-contained recycling system.

### Good for the Environment

Because the fluid is being recycled inside of its own application, longer drain intervals can be realized. Disposing of the used, contaminated oil also creates a risk to the environment for future generations. Reducing the amount of fluid that has to be discarded, reduces the impact on the already taxed environment. Whenever fluid change is required to be done, there is always a risk of spills and ground contamination. Reducing the number of full drains reduces the risk dramatically.

# KLEENOIL

Go GREEN - Keep it KLEEN!

## Run All Your Equipment on Clean Oil All The Time!



## Cut Oil Costs 80% or More! Extend Equipment Life Up to 10 Times!

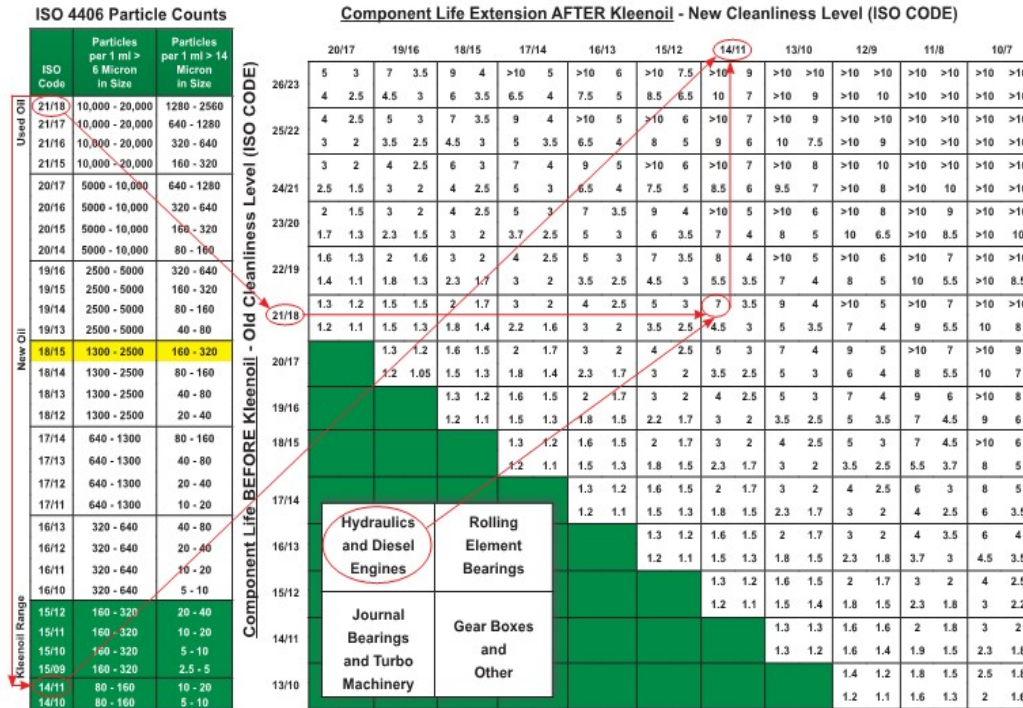
## Kleenoil Bypass Filter Systems and Cartridges



The Kleenoil Bypass Filter System is a bypass oil filtration system that passes only a small portion of the total oil flow through a very dense filter cartridge at about 2 to 3 quarts per minute. At this speed, it is possible to remove particles down to 1 micron (3 absolute), 99.95% of all water. Kleenoil can eliminate water and particle contamination, extend oil life up to 5 times and hydraulic oil up to 10 times, reduce engine wear and component wear, dramatically reduce downtime and is applicable to engines as well as hydraulic systems.

Kleenoil Part #	KU06	KU16	KU50	KU65	KU85
Engine Sump Capacity (Qts)	Up to 6	Up to 16	Up to 50	Up to 65	Up to 85
Hydraulic Capacity (Gal)	None	Up to 60	Up to 200	Up to 300	Up to 400
Water Retention <0.05%	.026 Gal (.104 Qt)	.07 Gal (.28 Qt)	.12 Gal (.48 Qt)	.20 Gal (.8 Qt)	.26 Gal (1.04 Qt)
	0.098 L	0.265 L	0.454 L	0.757 L	0.984 L
Height	6.13 in	6.25 in	6.25 in	6.5 in	6.75 in
	15.56 cm	15.88 cm	15.88 cm	16.51 cm	17.15 cm
Diameter	3.0 in	4.63 in	7.25 in	9.5 in	10.0 in
	7.62 cm	11.76 cm	18.42 cm	24.13 cm	25.4 cm
Weight/Mass	4.1 lbs	6.5 lbs	8.1 lbs	10.2 lbs	13.1 lbs
	1.86 kg	2.95 kg	3.67 kg	4.63 kg	5.94 kg
Oil Capacity	0.25 Qt	0.5 Qt	1.0 Qt	1.5 Qt	2 Qt
Flow Rate	2-3 quarts per minute, depending on oil viscosity.				
Material of Unit	Constructed of cast aluminum to BS 1490 (M). Subjected to batch and individual testing. Epoxy coated finish. Galvanized steel mounting bracket.				
Material of Cartridge	Main body: Long fiber virgin coniferous pulp cellulose wound around a central sleeve; third stage polypropylene or polyester; Cover: nylon.				
Filtering Performance	Water adsorption to 99.95% and filtering down to 1 micron (3 absolute); ISO 4406 down to a 10/7; Filter action: adsorption and absorption.				
Beta Rating	B3-22=99.6%; ISO 4572 Multi-pass method.				
Inlet Pressure	Maximum = 10 bar (150 psi), Minimum = 0.5 bar (4 psi).				
Temperature	High temperature fluids @ 302°F (150°C); Vitron seal.				
Pressure Reduction in engine	The Kleenoil Bypass Filter System takes such a small amount of oil from the engine that engine pressure does not decrease because the oil pump has adequate reserve capacity.				
Changing the filter cartridge	Recommended cartridge changes at normal oil change intervals. For example, if you did 25,000 mile oil changes, you would change cartridges at same interval. Cartridge changes take less than 5 minutes.				

## Relationship Between Oil Cleanliness and Life Extension of Equipment Components



The two charts above show the relationship between oil cleanliness and equipment life. By cleaning up oil, you can not only reduce oil drain intervals but you can extend the life of equipment components. In this example, we start off with a piece of equipment that prior to Kleenoil Bypass Filtration being installed on it had an oil analysis done on its existing oil and found it to have a 21/18 ISO 4406 cleanliness code. The highlighted yellow section is brand new oil. As you can see, new oil is not all that clean at a 18/15. By installing Kleenoil Bypass Filtration, we are able to clean this oil to a 14/11. Through the use of Kleenoil Bypass Filtration, we have cleaned the oil from a 21/18 to a 14/11. When following this on the chart on the right, we can see we have been able to extend the life of the hydraulics and diesel engine components 7 times. If this component had been a gear box, we would have increased its life 3 times. When you are dealing with a \$20,000 engine overhaul, this 7 times life extension can really impact your companies bottom line!



## Energy Drilling Saves \$56,357 in Oil Changes and Engine Rebuilds!

Energy Drilling Company, based in Natchez, MS, has a fleet of nine drilling rigs running Kleenoil Bypass Filtration Systems since day one. Energy Drilling was able to safely extend oil change intervals from 250 hours to 2000 hours on their CAT C13 engines saving them \$16,357.32 in oil change costs alone! **Puckett Machinery, a CAT dealership in Jackson, MS**, tore down one of their drilling rig engines, a CAT C13



Main Bearings	Specs Lower: +/- 0.004 mm (Test Results of 7 Bearings)						
New Specifications	1	2	3	4	5	6	7
Upper	3.950	3.940	3.940	3.930	3.930	3.930	3.940
Lower	3.946	3.930	3.930	3.930	3.920	3.920	3.930

with 23,888 hours on it to see how little the internal wear was on the engine. The main, rod and camshaft bearings were tested with a Brown & Sharpe Type 300 Red micrometer to gauge wear. Results show that there was little to no wear on any of the internal bearings after close to 24,000 hours. CAT recommends engine rebuilds on the C13 every 12,000 hours at a cost of \$20,000 per rebuild.

With virtually no internal engine wear after 23,888 hours, Energy Drilling was able to save an additional \$40,000 in engine rebuilds. Total savings on this one engine alone was \$56,357 in oil changes and engine rebuilds!

## Kleenoil Testimonials

### Construction



"There has not been any oil related engine failure on the engine that has had the Kleenoil system installed. We have just recently had to rebuild the John Deere engine and were surprised when we were told that the crankshaft did not have any wear and did not have to be turned. This engine has 19,000 hours on it." **Gerry King, Drain Brothers Excavating Limited**

### Trucking



"Prior to installing the Kleenoil filter, we used to change the main and rod bearings on our Tandem Milk Trucks at approximately 200,000 kilometers due to the effect of the liquid load shifting band forth in the tank with no baffles. With Kleenoil, we now change main and rod bearings at 1,800,000 km." **Glen MacDonald, Villeneuve Tank Lines**

### Oil Field - Drilling



"We now change our oil at 2000 hours and have extended our oil life 8 times. Based on ISO standards, our oil at 1000 hours is better than new oil. One big question is how this affects warranties? None of these practices will affect our warranty." **Pat Burns, Jr, General Manager Energy Drilling Company**

### Hydraulics



"We have decided to run this program on our entire fleet of 60 disposal and recycling trucks, including city and long haul units. We will be installing the Kleenoil System on any future equipment purchases and highly recommend the product." - **Trevor Micallef, U-Pak Maintenance Manager**

### Marine



"We've equipped our CATs, Detroit Series 60s and all generators with Kleenoil. The money savings are substantial and we have the peace of mind that the internal parts of our engines are being protected from wear." - **Bill Caldwell, Maui-Lana'i Ferry**

### City - Municipality



"As of June 2009, the entire heavy equipment fleet, in all departments of the City of Artesia, utilizes the Kleenoil System. Our engine and hydraulic servicing is now based on fluid analysis only. Our drain intervals have been reduced as well as our downtime." - **Jimmy Bustamante, Solid Waste Supervisor, City of Artesia, New Mexico**