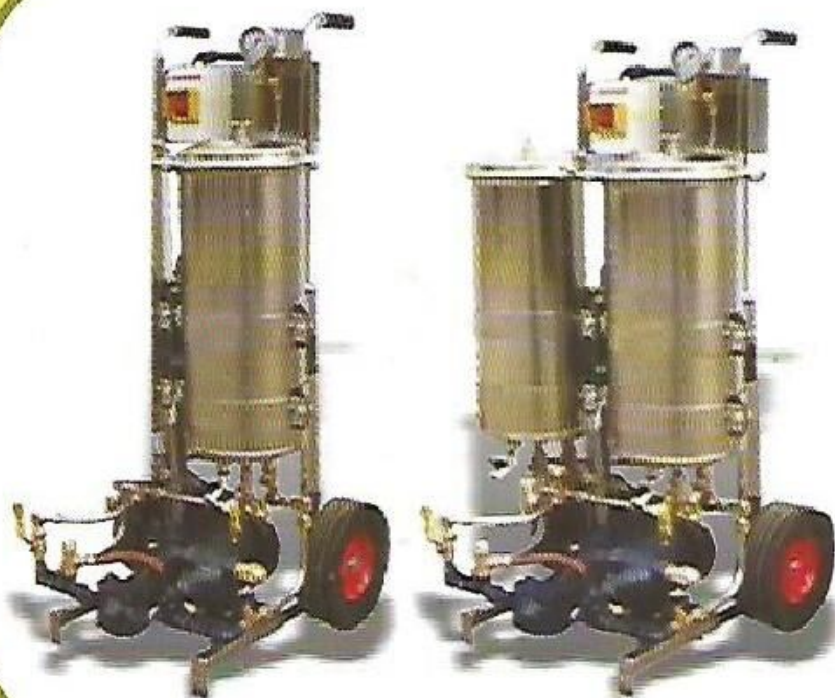


UNIVERSAL OIL COMPANY



THE SUPER-CLEAN WAY TO CONSERVE
OIL, ENERGY & ENVIRONMENT

SUPER CLEAN RECYCLING SYSTEM



ASSET MANAGEMENT DUE TO SUPER
CLEANING OF INDUSTRIAL OILS

Revised Facts

Contrary to popular belief, under normal engine conditions, oil technically **DOES NOT BREAK DOWN, IT ONLY BECOMES CONTAMINATED.**

Certainly, as with any other natural process, oil experiences a slow process of degradation due to oxidation and thermal breakdown. However, in modern oils this process is very, very slow. It has been proven that **OIL CAN MAINTAIN ALL ITS PROPERTIES UP TO 10 TIMES LONGER** than the currently recommended oil change intervals, if contamination is efficiently removed.

Technologic Paper No. 88 of the US National Bureau of Standards states: "It has been found that oils do not wear out mechanically and may be used over and over again. [...] A mineral oil is usually just as good after use as before, apart from the impurities, which are removed by filtering."

PRODUCT

HYDRAULIC OIL FILTRATION & TRANSFER UNIT



Model No. UOC 100

FEATURES

- UOC Filters are specially designed to reduce the friction in the by filtering out all the contaminants from the oil.
- UOC 100 Series Filter is made of special paper capable of filtering 15000 liters & contaminants of size 1 micron and up.
- UOC filters along with bringing down the NAS level of the oil also remove silt which is as dangerous to the system as are particles of size 5 microns and above.
- UOC Filters are a comprehensive solution for decreasing over all system wear and tear, maintain the oil in the system at a level better than new oil and multiply the life of the machinery many times.

CONTENTS

- An Iron trolley
- Four hosepipes - one for one for connecting pump motor with filter cylinder, two others for inlet and outlet and another for connecting both the cylinders.
- One Steel cylinder tightened with a clamp
- One pressure gauge on the top of the steel cylinder with filter.
- One 1 HP single phase AC Motor
- One UOC 100 series filters.



Model No. UOC 1000

FEATURES

- UOC Filters are specially designed to reduce the friction in the by filtering out all the contaminants from the oil.
- UOC 1000 Series Filter is made of special paper capable of filtering 40,000 liters & contaminants of size 1 micron and up.
- UOC filters along with bringing down the NAS level of the oil also remove silt which is as dangerous to the system as are particles of size 5 microns and above.
- UOC Filters are a comprehensive solution for decreasing over all system wear and tear, maintain the oil in the system at a level better than new oil and multiply the life of the machinery many times.

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- One pressure gauge on the top of the steel cylinder with filter.
- One 1 HP single phase AC Motor
- One UOC Bag filter
- One UOC 1000 series filters.

SUITABLE FOR
STEEL , TEXTILES, PAPER ,POWER TURBINES, CEMENT,
CHEMICAL PROCESSING , & HYDRAULIC EQUIPMENT INDUSTRIES

This project is based upon conservation of energy, especially oil, by Recycling to Super-Clean levels and Management of System. Oil is the bloodline of all systems and equipment, and has to be kept very clean. Oil is being depleted from the earth, and after 10 to 15 generations, very little oil will be left.

Conservation of oil has the following major benefits: To leave precious resources to future generations, using expertise and advanced technology relevant to the environment and ecology, and to preserve the natural environment and realize the creation of new combination of social and living environments.

Oil used for an indefinite period:

1. Recycling of oil by filtration removes contamination and makes it as good as new oil at half the price. The oil may be darker than new oil, but its properties are similar to new oil, you may find an improvement in flash point, i.e., the point at which the oil will ignite.
2. By not throwing oil on the ground and in rivers, pollution of air water and ground is controlled.
3. Make any country self-sufficient in oil for its own national security; any country can become self-sufficient in a short period by recycling oil in all major systems and equipment that are used in that country (i.e., a vast quantity of oil)

INTRODUCTION

Equipment of any kind are assets of a company. By pro-Longing their life, the company is managing its assets properly. oil is an asset also.

New oil, (i.e., fresh oil from a drum) is highly contaminated with particles that are not visible to the naked eye. The reason the systems wear out is due to these contaminants. In the manufacturing process oil, sand i.e., silicagets into the oil. These particles cannot be seen by the naked eye. Large contaminants are filtered at the blending plants, but fine particles go through the filters and blend with the oil.

PROBLEMS: Modern Hydraulic systems are highly sophisticated. Failures of these hydraulic systems can affect machine performance and productivity adversely

Hydraulic systems need super-clean oil. Super-clean oil has <32,000 particles per 100 ml of 5-15 microns and above - this level of cleanliness is NAS "7". The oil should be maintained between NAS "4" - "5" to maximize equipment life i.e., between 4,000 to 8,000 particles per 100ml of 5-15 microns and above.

Turbine oil systems are vulnerable to contamination for 3 fundamental reasons :

1. The Turbine Oil System can be, and most often is, a source of contamination. A considerable amount of contamination can be generated within the system over a period of time.
2. The size of the system and the number of openings into the system for maintenance purposes provide the opportunity for contamination to enter from outside the system.
3. Most turbine oil systems operate under a slight vacuum, which draws air (typically laden with coal fines, fly ash and moisture) into the system.

Over the years, operating experience has indicated a variety of problems that can be directly attributed to contaminated oil. Dirty oil can cause bearing ang journal scoring and considerably reduce the expected life of oil system components. Turbine/ Generators that use rotor lift pumps for turning gear operations may find additional benefits due to super-clean oil. Proper oil cleanliness can reduce the erosion and scoring damage to bearings and bearing system components that can result from high lift pump processor.

Recommended oil cleanliness level is NAS "5", i.e., under 8,000 particles of 5-15 microns and per 100 ml. The most serious effect that contamination can have on a System is in the lubricating ability of the fluid.

UNIVERSAL OIL COMPANY - FINDINGS

When the particles are about the same size as the clearance, they will pass through and rub against the moving parts, break down the film of lubricant and cause the most wear and damage to the component surfaces. Wear generates more contaminants, increases leakage, lowers efficiency, and generates heat. the higher pressure, the greater this problem.

SOURCES OF CONTAMINATION

The sources of contamination in Turbine and Hydraulic system can be divided into 3 general categories.

1. Built-in contamination
2. Ingressed contamination
3. Self-generated contamination

MANAGEMENT OF SYSTEMS TO SUPER CLEAN LEVELS HAS THE FOLLOWING BENEFITS

Oil could last indefinitely if the contaminants are removed, as oil does not lose its inherent lubricating properties. New oil itself is NAS "12" i.e., over 1,000,000 Particles of 5-15 Microns Per 100ml.

System life is increased - at least doubling - saving large capital investment. Less maintenance cost drastically reduce build-in filter replacement. Better production due to less downtime. Less oil imported thus saving foreign exchange for the country. Cut down tremendously on pollution, this is a direct result of lesser oil changes and thus less dumping of used oil.

SILT - 0.5 TO 5 MICRONS

Particles of 0.5 to 2microns are not considered in NAS Level or for ISO determination. However, they are most dangerous for wearing out system components. UOC filtration removes large numbers of 0.5 to 2 micron particles, known as silt which cause considerable wear to close tolerance parts & cause internal leakage, thereby lowering system efficiency. The oil in the system travels at very high pressure and speed and the silt causes considerable wear to the valves and seals. These silt particles act like bullets.

RETURN ON INVESTMENT

Mr. GRP Singh, Head, Maintenance Technology and Planning, Cold Rolling Mill, Tata Steel concurs that besides keeping the oil at NAS 5 level, silt control can increase the life of components from 6 months to indefinite years of service depending upon the equipment condition.

To check in the validity of UOC's Asset Management by Super Cleaning of Oil in Systems at the Cold Rolling Mill at Tata Steel, a directional control valve... was taken out from the system where silt control is being done. It was compared with an identical directional control valve from the system which was not under silt control. Microscopic examination of the valve spool showed that the valve under silt control, had no wear at all compared many scoring mark. This examination and comparison showed that UOC silt control was very effective in the system: thus saving a large amount of money by increasing system life, at least double or more.

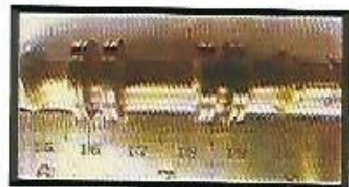
CONCLUSION

Almost 85% of contaminants are in the range of 0.5 to 2microns, whereas NAS value are undetective of contaminants above 5 microns only.

In conclusion- all lubricating system, whether they are considered critical or non-critical or whether the manufacturer suggest NAS level for a system or not, all systems should be brought down to NAS "5" level minimum. The Universal Oil Company has been very successful in keeping systems to NAS "5" or lower and in controlling silt.



Conventional System of Cleaning Oil without Silt Control — Scoring Marks



UOC System of Super-Cleaning Oil with Silt Control — No Wear

THE IDEAL CONSERVATION SOLUTION FOR POWER TURBINES & HYDRAULIC SYSTEMS

Universal Oil corporation
P.O. Box 7163 Northridge, CA 91326

ISO Code	National Aerospace Standards (NAS)	Values based per 100 ml										
		Size Range (Micron)	250	500	2000	4000	8000	32000	1024000	13/10	14/11	16/13
		0	1	3	4	5	7	12				
5-15		250	500	2000	4000	8000	32000	1024000				
15-25		22	88	356	712	1425	5700	182400				
25-50		5	16	63	126	253	1012	33400				
50-100		1	3	11	22	45	180	5760				
Over-100		0	1	2	2	8	32	1024				

Universal Oil Company, Subsidiary of
Universal Oil Corporation USA
G5 South Extension Part -2 New Delhi-49

Contact: [PRAVEEN K. TRIPATHI, CONSULTANT](mailto:praveen.k.tripathi@tecmate.com)
Mob: 09350020420.
E-MAIL: praveen@tecmate.com
tecmate@yahoo.com



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