IN USE WORLDWIDE

37 YEARS

KLEENOIL FILTRATION INDIA PVT. LTD.

KLEENOIL®

www.kleenoilindia.com

LOW VACUUM DEHYDRATION + FILTRATION SYSTEM

Before KLEENOIL Filtration

After KLEENOIL Filtration

ISO 9001:2015

GeM Government e Marketplace

Low Vacuum Dehydration + Filtration System

Principles of operation

Contaminated oil is drawn into the Kleenoil Low Vacuum Dehydration + Filtration machine by a vacuum of 600 millibars. The oil passes through the in-line low watt density heater where the oil is heated to an optimum temperature of 66°C - 70°C (depending on oil flash point capacity).

The oil then enters the distillation column where it is exposed to the vacuum using special dispersal elements.

This increases the exposed surface area of the oil and converts the water to vapor form, which is then drawn through the condenser by the vacuum pump.

The water-free oil falls to the bottom of the column and is removed by a heavy-duty lube oil pump. This pump forces the dry oil though a final particulate removal filter. The oil passes through a series of filters to remove any solid contamination to help clean the oil.

Effects of Water Contamination

Water is one of the most common contaminants in a fluid system and one of the most damaging. When water contaminates a system, it can cause serious problems such as:

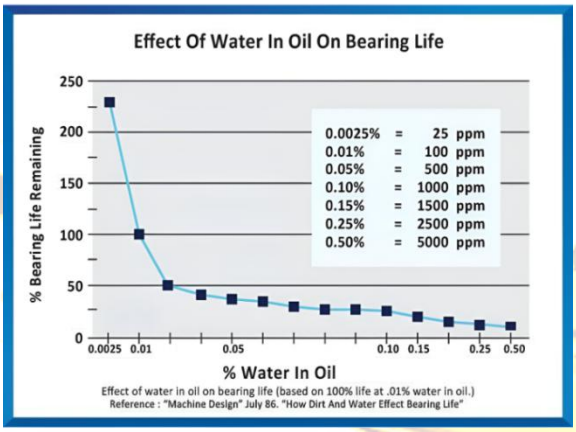
- ✓ Corrosion by etching metal
- ✓ Abrasive wear in hydraulic components
- ✓ Fluid breakdown, reduction of lubricating properties, additive precipitation, and oil oxidation

Free water occurs when oil becomes saturated and cannot hold any more water. This water is usually seen as cloudy oil or puddles of water at the bottom of an oil reservoir. Water which is absorbed into the oil is called dissolved water. At higher temperatures, oil can hold more water in the dissolved stage due to the expansion of oil molecules. As the oil cools, this ability reverses and free water will appear where not visible before. In addition to temperature, fluid type also determines the saturation point for your system (see chart above).

TYPICAL SATURATION POINTS		
Fluid Type	**PPM**	**%**
Hydraulic Fluid	300	.03
Lubrication Fluid	400	.04
Turbine Fluid	50	.005

Effect of Water in Oil on Bearing Life

- ✓ Corrosion of Metal Surfaces
- ✓ Accelerated Abrasive Water
- ✓ Accelerated Fatigue
- ✓ Additive Precipitation
- ✓ Fluid Oxidation
- ✓ Viscosity Variation
- ✓ Reduced Lubricity



The LVDH + Filtration is the only system, which can remove, water dissolved oil and solid contamination thus restoring oil to its original properties.
It removes water/moisture to below 50% of the saturation point in oil at low temperature (44°-60° C).
Remove free, emulsified, and dissolved water by vacuum distillation & mass transfer – achieve overall content as low as 20 PPM.
Remove entrained air and dissolved gases by vacuum distillation.

The Kleenoil Low Vacuum Dehydration + Filtration (LVDH+F - 1200) is recommended for use on the following applications:

- ✓ Turbine Lube Oils
- ✓ Quenching Oils
- ✓ Gearbox Oils (ISO 150 to 680)
- ✓ Transformer Oils (Mineral Based)
- ✓ Synthetic Oils
- ✓ Refrigerant Oils
- ✓ Compressor Oils
- ✓ EHC Fluids (Fyrquel)

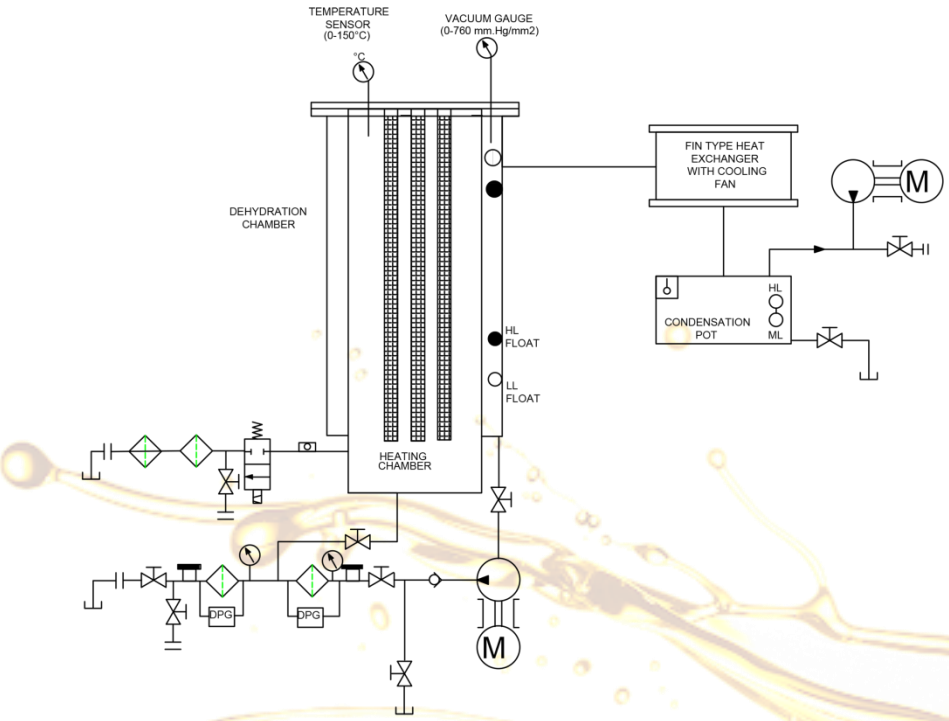
Table 1. Oxidation Life Of Mineral Oils Under Ideal Conditions

Oil Type	k_I	Max Temperature for 1,000-hour Life
Uninhibited (used in once-through systems)	-10.64	75º C
Extreme-pressure gear lubricant	-10.31	84º C
Hydraulic	-8.76	99º C
Turbine	-8.45	106º C
Heavily refined, hydrocracked	-8.05	121º C

Features:

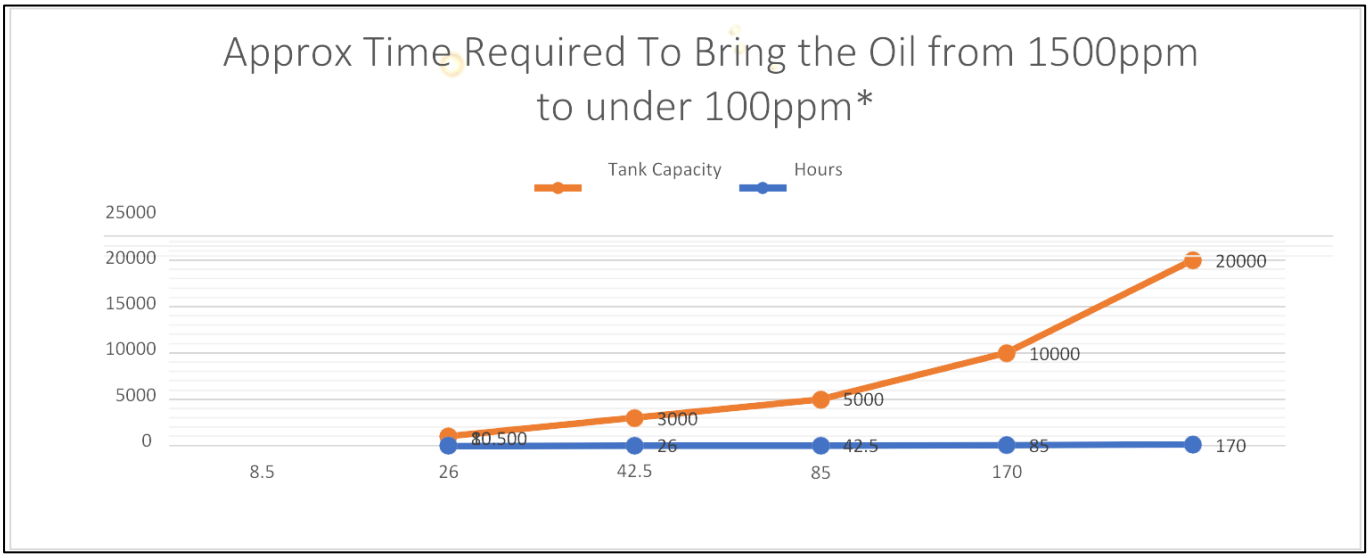
- ✓ Achieve particle counts as low as ISO standard 14/12/9 Cleanliness Level (if used with the filtration machine) Process flow rates from 20LPM
- ✓ No consumable costs other than electricity are required (no costly water consumption) and long interval of filter change (if using glass fibre)
- ✓ Easily portable and requires very little user intervention
- ✓ Requires virtually no maintenance – no vanes to wear out and no lubricating oil to become contaminated by a wet air stream

SCHEMATIC MECHANICAL CIRCUIT DIAGRAM



The Kleenoil LVDH + Filtration:

- ✓ Removes water and dissolved gases from oil Water reduction below 300 ppm
- ✓ No oil quality damaged since temperature ranges between 45 to 60 deg. Plug and Play
- ✓ Run both offline and online
- ✓ Removes solid contamination to increase the cleanliness standards.



*** Values are made depending on parameters such as viscosity, machine handling rate of ingression of water**

Typical Fluid Cleanliness Levels for Different Types of Hydraulic Systems, Defined According to ISO, NAS, and SAE Standards:

The fluid sample and the condition report indicate an actual cleanliness level of ISO 19/16, well outside the target of 16/13. With this level of contamination, achieving optimum service life for the system's components is unlikely, therefore, system cleanliness must be addressed.

Potential Contaminant	Kleenoil LVDH + Filtration Performance
Solid particulate	ISO Cleanliness Code* 14/13/10 Attainable.
Water	Removes 100% of free water, 80-90% of dissolved water.
Air	Removes 100% of free air, 90% of dissolved air.
Gases	Removes 100% of free gases, 90% of dissolved gases.

Construction:

LVDH + Filtration machine consists of five parts:

A) Heating chamber
B) Vacuum Chamber
C) Refrigerated Type Condensing Apparatus
D) Control Panel (RLC BASED)
E) Filtration Housings

Before **After**

Oil is passed through a strainer in the heating chamber where it is indirectly heated to about 50°-55º C. The oil so heated is dispersed in a thin film in the vacuum chamber. Dispersing the oil into a thin film increases the surface area exposed to vacuum. As water will boil at low temperatures in vacuum, it evaporates and is excavated through the condenser where it is condensed into water and drained out. Dehydrated oil is then pumped back into the oil reservoir. Vacuum, temperature gauges and moisture sensors are installed on the equipment.

Technical Specifications	
Electrical Supply	415V ,3 PH– 50 Hz, 4 Wire
Control Panel	RLC
Oil Inlet/Outlet	SAE R1AT 3/4″BSP hose pipes with end fittings
Discharge Pump Details	
Type Nominal Flow Rates Operating Pressure Motor Power	Drtp 20 Trochoidal Monoblock 20 Lpm 0-6 Bar (Kg/Sq.Cm.) 1Hp, 3PH ,50Hz
Vacuum Chamber Capacity	100 Liters (nominal)
Operating Vacuum	Upto 750mm Of Hg @ Msl
Heater Type	Low Watt Density Heaters
Heater Load	7.5KW – 415-VAC-50Hz
Vacuum Pump Details	
Capacity Drive Motor Power	150 Lpm Direct Driven 0.5 HP, 0.37 Kw 1440 RPM, 3PH
Filter Housing	
Coarse filter Fine Filter	10 (Micron) 3 (Micron)
Overall Dimensions	
Length Width Height Pre Suction Filter	1100mm 830mm 1630mm 149mm
Weight Of the Unit	
Empty Full	425 Kgs Approx. 530 Kgs Approx.
Provided With	Fixed castor wheel, two swivel with lock
Duty Conditions	Continuous
Color Shade	Anthracite Grey (Ral 7016)
Water Discharge	Auto-drain
Condenser	Air cooled oil cooler

Contact us:
KLEENOIL FILTRATION INDIA PVT.LTD
537, Udyog Vihar Phase 5, Gurgaon (Haryana) 122016
Helpline: +91 9899151010, Board: +91 124 4904545
Email: info@kleenoilindia.com Website: www.kleenoilindia.com