



FILTER VAC

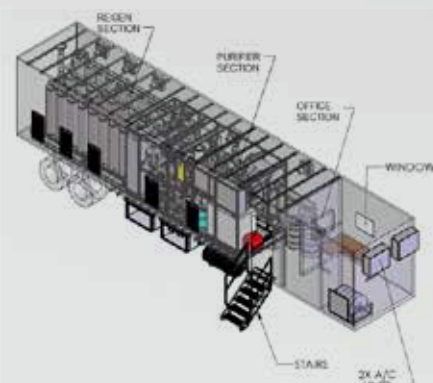
INTERNATIONAL INC.



GLOBAL LEADERS IN OIL CONDITIONING SYSTEMS

ECOIL TRANSFORMER OIL REGENERATION SYSTEMS

The ECOIL Mobile (Model RS-M) and Stationary (Model SRS) Transformer Oil Regeneration system are used to regenerate insulating mineral oil in Energized or non-energized transformers as well as on a tank to tank basis. The ECOIL systems use a special blend of Fuller's Earth that is permanently installed in a set of columns. With the use of these precisely packed Fuller's Earth columns, the ECOIL system is able to completely regenerate oil with high acidity levels, rectify colour and also provide optional transformer de-sludging abilities. Incorporated into the ECOIL system is a degasifier and a set of particulate removing filters that allow for an operator to also degasify and dehydrate the oil. The ECOIL system is able to regenerate transformer oil to a specification that surpasses all ASTM and IEEE specifications and standards.



What makes the ECOIL process so unique is its ability to reactivate the same Fuller's Earth up to 300 times before it has to be inexpensively disposed of as a non-hazardous and oil free substance. When the fuller's Earth is no longer efficient in adsorption of contaminants it is simply reactivated within the columns. In order to ensure a high degree of control and reliability, the ECOIL Regeneration system is controlled by a process logic controller and monitored/interfaced by a computerized supervisory system which monitors and records all vital operation parameters.

TRANSFORMER OIL DEGASIFIERS/PURIFICATION SYSTEMS

Stationary, Portable and Mobile VPH Systems

Filtervac's High Vacuum Transformer Oil Purification systems (Model VPH) is used for dehydration and degasification of electrical insulating liquids such as transformer oils and silicone fluids. The VPH Process is able to increase and maintain the oil's dielectric strength and includes the removal of free and soluble water, free and dissolved air and gases and particulate matter. The standard VPH System is designed for processing oils in workshops, in storage tanks or directly in transformers (de-energized and energized transformers).

Filtervac offers a variety of flow rates and options to suit every customer's needs.

Optional features offered are conventional Fuller's Earth filter(s) or column(s) for acidity and colour rectification.

In addition, Filtervac offers High Vacuum Degasification/Purification systems to treat cable oils (Model VPH-C) as well as for many other applications outside of the electrical industry, such as for electronic and radar equipment, vacuum pump sealing oils, brake fluids and refrigeration oils.



MOBILE & PORTABLE INSULATING OIL FILTERCARTS



Mobile Filter Carts

Filtervac Filter Carts are used to clean insulating oils found in switch gear/circuit breaker applications. These mobile and roadworthy filtration systems come with processing rates ranging from 10-40 GPM and come equipped with one (1) or more particulate removing filter cartridges. A variety of filters are available with micron ratings down to 0.5 micron as well as water adsorptive cartridges. Typical system features include on-board dirty and clean oil tanks, hose reels and power cables. Each system is designed to ensure operator friendliness and maintenance ease.

Portable Filter Carts

FV-P-UF Portable Filter Carts are used for oil circuit recloser, voltage regulator and tap changer applications where they are ideal for removing carbon and water contamination from insulating oils. The portable Filter Carts utilize Disc-Pak Filter Cartridges that provide a combination of high filtration efficiency and high dirt holding capacity.

Filtervac also offers an On-Line Tap Changer Filtration System for the continuous removal of particulate and water contamination.



FULLER'S EARTH FILTRATION

Fuller's Earth Filtration Systems utilize Fuller's Earth Clay as a filtering medium to remove contaminants such as acids, waxes, gums, resins, asphatees, sludges, carbon residue, surfactants and traces of free water from various oils and liquids. In addition, these systems are able to rectify the colour of various liquids as well as being able to remove odour from the liquids. Many applications exist such as:

- Insulating Oil
- Seal Oil
- Quenching Oil
- Lubricating & Hydraulic Oil
- Aviation & Diesel Fuels
- White Oils
- Cooking Oils
- Oil Refinery & Recovery Process Application



Conventional Fuller's Earth Filtration Systems

Conventional Fuller's Earth Clay Systems are defined as systems that require the clay to be disposed of and the vessel or column must be replenished with new Fuller's Earth Clay each time after the clay has maximized its adsorptive capacity.

Filtervac offers two (2) broad ranges of Conventional Fuller's Systems that are comprised of either a vessel that is designed to accept replaceable Fuller's Earth Cartridges or a tower/column that is filled with loosely packed Fuller's Earth Clay.



Ecoil Reactivable Fuller's Earth Filtration System

Filtervac offers the Ecoil Fuller's Earth Filtration System for applications that require extended processing cycles and demand reduction in clay disposal and use. The Ecoil's unique process allows for up to 300+ reactivations of the same clay before it has to be inexpensively disposed of as a non-hazardous substance. The environmentally friendly Ecoil System provides for a higher filtering efficiency when compared to Conventional Fuller's Earth System and provides for a high rate of return on investment. The Ecoil System is offered as a Stationary or Mobile System that is housed in either an aluminum enclosure or a 20/40ft Customized Sea Freight Container.

A variety of flow rates and configurations are available to suit the application. Filtervac is able to provide a system to replace existing Conventional Fuller's Earth Filtration System and integrate it within the existing process/system.



TAP CHANGER FILTER SYSTEM

Tap Changer Filter System Model TCF-3

Filtervac offers an On-Line Tap Changer Filtration System for the continuous removal of carbon, water and metallic particles in Tap Changers. These contaminants are present in Tap Changers due to arcing contacts during the transfer of loads from tap-to-tap in the tap changer compartments. The Filtervac System is designed to improve the overall reliability of the Load Tap Changer and the Distribution Transformer itself and is also designed to reduce operation and maintenance costs. A variety of options are available to meet specific customer's requirements and budgets.

OFF LINE OIL CONDITIONERS/FILTER CARTS:



Skid Mounted Off-line Oil Conditioner:

The Skid Mounted Extender System is designed for continuous or portable use and come available in single or dual stage filtration configurations to provide for both particulate and optional water contamination removal from the oil. Oil reservoirs are continuously kept clean and dry and ensure that oil specifications that are outlined by Original Equipment Manufacturers (O.E.M.) are met or surpassed. Flow rates of Extender Systems range from as small as 5 USGPM and to as large as 150 USGPM and come available with several options to suit all applications. The Extender Oil Conditioner can effectively remove particulate & water in the following applications:

- Gas Turbines
- Forced Draft Fans
- Small Boiler Feed Pump Turbines
- Transformers
- Paper Machines
- Compressor & Seal Oil Systems
- Fluid Drives
- Coal Pulverizers & Gear Boxes
- Turbine Speed Control Systems
- Induced Draft Fans
- Gas & Diesel Engines
- Tap Changers

Portable Filter Carts (MODEL FDP):

Filtervac designs a sturdy and compact portable two(2) wheel vertically standing filter cart that allows for convenient removal of particulate and water removal from oil contained in reservoirs/drums. Standard Features Include:

- One or two Filter Vessel that is/are constructed of carbon steel. Filter Vessels includes an internal by-pass valve and differential pressure gauge.
- Flow rates: 3, 5 & 10 USGPM with use of gear pump/TEFC Motor
- Accepts either 6"x18" or 6"x36" particulate and water removal pleated filter elements.
- Operating Voltage: 115V/1PH/60HZ or 220V/1PH/60HZ

Options

- Filter Vessels available in Stainless Steel, Light Weight Aluminum and special T-Top Vessel that does not require tools for filter removal.
- Cart is available with use of air diaphragm pump or no pump at all.



OIL HEATER & FLUSHING SKIDS



Oil Heater

Filtervac designs and manufactures low watt density Heater Skids/Systems for elevating and accurately maintaining temperatures of various kinds of oils and fuels.

The Filtervac Oil Heater System design utilizes CE/CSA/UL listed heating elements with a watt density rating of 12 watts per square inch. The heating elements are mounted inside steel tubes thus being completely insulated from the oil. This design ensures the elimination of hot spots, prevents any burning of oil, and permits service removal of individual heating elements without disrupting the oil heating process.

The Filtervac Heating Skids are available with pumps or as stand alone systems that can be integrated into existing oil circulating systems. Each system has a control panel to ensure safe and reliable operation with a variety of extra options available.

Skid Mounted Off-line Oil Conditioner:

The Skid Mounted Extender System is designed for continuous or portable use and come available in single or dual stage filtration configurations to provide for both particulate and optional water contamination removal from the oil. Oil reservoirs are continuously kept clean and dry ensure oil specifications that are outlined by Original Equipment Manufacturers (O.E.M.) are met or surpassed. Flow rates of Extender Systems range from 5 USGPM to 800 USGPM and come available with several options to suit all applications. The Extender Oil Conditioner can effectively remove particulate & water in the following applications:

- Gas Turbines
- Forced Draft Fans
- Small Boiler Feed Pump Turbines
- Transformers
- Paper Machines
- Compressor & Seal Oil Systems
- Fluid Drives
- Coal Pulverizers & Gear Boxes
- Turbine Speed Control Systems
- Induced Fan Drafts
- Gas & Diesel Engines
- Tap Changers



OIL DEHYDRATION EQUIPMENT



Water and particle contamination is one of the primary reasons for reduction in oil life and for machinery component degradation.

The Filtrvac Low Vacuum Dehydrator, which uses a vacuum distillation process combined with a low watt density heater and a particulate removal filter is able to remove water, light hydrocarbons and particulate contamination from most kinds of synthetic and mineral based oils. The Filtrvac VPL System is able to remove water from 10,000 ppm to 70-100 ppm in a single pass and is able to provide ISO particle counts down to ISO 14/12 or less, thus ensuring life extension of the oil and the related piece of machinery. The VPL Systems are offered in a variety of flow rates (60, 120, 200, 400, 600, 900, 1200 & 1600 USGPH) and several options are provided to suit customer's requirements. The VPL has proved to be a very efficient and cost effective solution for the following applications:

- Lubricating and Paper Machine Oils
- Phosphate Ester Oils
- Turbine Oils
- Quenching Oils
- Hydraulic Oils
- Turbine Oils
- Gear Oils
- Compressor Seals Oils

COMPLETE OIL RECLAMATION SYSTEMS

Certain applications that experience oils with frequent high levels of water (free, emulsified and dissolved) contamination and/or high levels of particulate contamination require a rugged system that can quickly and efficiently remove the contamination in a single pass. To meet the needs of such applications, Filtrvac provides both standardized and customized In-Plant Oil Reclamation Systems that combine a centrifuge, vacuum dehydrator and a series of particulate removal filters into one self-contained automated system for in-plant use that is easily the most efficient oil reclamation system on the market. Depending on the requirements, these systems can be incorporated as a re-circulating system or as a single pass batch filtration system (i.e. dirty to clean oil tank), allowing the customer to maintain oil at better than new oil specification while eliminating the need for costly oil change outs and the continuous need for on-site oil management to maintain the oil quality.



Mini Centralized Complete Oil Purification System

Filtrvac combines the use of an Alfa Laval Disc Stack Centrifuge with a Filtrvac Vacuum Dehydrator and Filtrvac particulate removing filter housing to provide for removal of all forms of water (free, emulsified and dissolved) down to less than 100 ppm as well as particulate contamination. This system is packaged as one self contained system to provide for automatic operation. In addition to the above mentioned components the standard design includes an inlet pump, electric heater (two-stage), control panel (Nema 4) and various safety interlocks. Various other options are available and Filtrvac is able to custom design the system to suit the customers' requirements.



Max Centralized Complete Oil Purification System

The Max Oil Purification System utilizes similar technology as does the Mini oil purification system but is designed with a much larger capacity and is able to provide the most efficient oil purification package available on the market. This system is packaged as one self-contained system and utilizes an Allen Bradley Panel View Screen to provide for automatic operation and advanced diagnostic capabilities. Standard design includes an inlet pump, bag filters(Qty 2), electric oil heater, centrifuge, cartridge filters(Qty 2), additional electric heater(2 Stage), Dual Stage Vacuum Dehydrator c/w Vacuum Pump, Discharge Pump, polishing filter cartridges(Qty 2) & a flow meter.

Various options are available such as a Chiller, which eliminates the need for water input(except for water used for centrifuge), reduces water discharge and enhances the efficiency of the vacuum dehydrator. Filtrvac is able to custom design the system to suit the customer's requirements.

Model VPL-CSR-1200 (1200 US Gallons / hour)

TURBINE OIL PURIFICATION SYSTEMS

Studies by Electric Power Research Institute have concluded that over half of the forced outage hours related to bearings, journals and lube oil systems were due to contaminated oil. This contamination comes in the form of free, emulsified and dissolved water and also particulate matter.

Since it is often if not impossible to prevent water from entering the lubricating system, it is extremely important to remove it from the oil before it causes permanent damage. Filtrvac offers three (3) different types of oil purifiers that remove both water and particles to provide a Total Turbine Oil Purification System.



Vacuum Turbine Oil Purification Systems (Model VPL)

Filtrvac Vacuum Oil Purifiers (Model VPL) utilize a vacuum distillation process combined with a heater to remove emulsified, dissolved and some free water (and some gases) from mineral and synthetic based turbine oil as well as utilizing a high efficiency particulate removal filter to remove fine particulate contamination from the oil. The Filtrvac VPL System is able to remove water down from 10,000 ppm down to 70-100 ppm in a single pass and is able to provide ISO particle counts down to ISO 14/12.

These systems come as either a dedicated stationary off-line oil conditioning system on specific oil reservoirs or as a Portable System that can be used for plant wide use on several oil reservoirs, ranging from light viscosity turbine oils to heavy viscosity gear oils. The VPL Systems are offered in a variety of flow rates (60, 120, 200, 400, 600, 900, 1200 & 1600 USGPH) and several options are provided to suit customer's needs. The VPL systems are self-contained, skid mounted and utilize a PLC controlled full status control panel that allows for unattended and fully automatic operation.

Coalescer/Separator Purification Systems (Model TOP):

Filtrvac also offers Coalescer/Separator Oil Purifiers that utilize a series of Coalescer and Filter Separators to quickly remove both free and emulsified water from mineral based turbine oil as well as using a High Efficiency Particulate Removal Filter to remove fine particulate contamination. The Coalescers/Separator Oil Purifiers efficiently remove free and emulsified water from turbine oils down to achieve a total water content of 150 ppm or less and are able to achieve ISO particle counts of less than ISO 16/13.

These systems typically are used as dedicated stationary off-line oil conditioning systems, but some smaller models are available as portable systems to use on several other reservoirs using low viscosity turbine oils. The TOP Systems are offered in a variety of flow rates (1, 2, 10, 30, 50, 100 USGPM) to allow for them to be used on oil reservoirs ranging from 30 US Gallons to 12,000 US Gallons. The TOP Systems are self contained, skid mounted and utilize a full status control panel that allows for unattended and fully automatic operation.



Combination Systems (Model VPL-CSR & VPL/TOP):

Model VPL-CSR: This series combines the principle of rapid free water and particulate contamination removal enjoyed by centrifuges and the polishing characteristics of our line of Vacuum Oil Purifiers to obtain maximum turbine oil system cleanliness. These systems are integrated into one self contained system and are provided with one full status control panel that allows for unattended and fully automatic operation.

Model VPL/TOP: This series combines the principles of rapid free water and particulate contamination removal enjoyed by Coalescer/Filter Separator Systems and the polishing characteristics of our line of Vacuum Oil Purifiers to obtain maximum turbine oil system cleanliness. These systems are integrated into one self contained system and are provided with one full status control panel that allows for unattended and fully automatic operation.

INDUSTRIAL LIQUID FILTRATION

Filter Housing for Liquids

Filtervac offers A.S.M.E. Code Designed Housings for a variety of liquid filtration applications. A broad range of filtration vessels are offered, such as bag filters, basket strainers, filter separators and cartridge filters for a variety of flow rates. These carbon or stainless steel vessels are available in many design configurations and styles to suit your flow rates and application requirements. specification while eliminating the need for costly oil change outs and the continuous need for on-site oil management to maintain the oil quality.



SPECIAL OPTIONS:

DUPLEX FILTRATION SYSTEMS (MODELS VDL): Many applications also require 100% continuous filtration and call for Duplex Filtration. Filtervac offers several styles of duplexing that utilize a Three-Way Transflow Valve for reliable flow transfer. The V-Top Handle system allows for quick and easy changing of filters without using any tools.

COALESCERS

Filtervac's VFL Filter Separators are all constructed of carbon steel and are internally and externally epoxy coated to provide the utmost protection against corrosion. The Separators are constructed in accordance to ASME code and are available with UM and U stamp depending on the size and requirement.

The VFL Series Filter Separators are designed to remove both particulate and water contamination from light viscosity petroleum products such as aircraft fuels and diesel fuels. Filtervac utilizes a combination of coalescer and separator that can reduce 5,000 parts per million (ppm) concentration of water down to 5ppm during a single pass.



FILTER VESSELS

(CARTRIDGE & BAG FILTER STYLE)

Filtervac designs and manufactures standard and custom designed filter housings to accept filter cartridges or bag filters. The vessels are available in carbon or stainless steel construction and are designed to meet a wide variety of applications, liquids and flow rates. Standard Vessels are ASME Code Design for 150PSI but higher pressure ratings are available.

REPLACEMENT ELEMENTS & BAGS



Filtervac has a wide variety of high performance filter elements, filter bags, Fuller's Earth Filters, Disc Pac, coalescers, separators and rolled tubes for particle and water/moisture removal from air, gas, fuels, oils and liquids in general.

Filtervac offers various micron rated, pleated filter elements with several choices of media such as microglass, polyester/fibre glass, impregnated cellulose and plain pleated paper.

LUBRICATION SYSTEMS



Choose from complete Centralized Oil Circulating and Filtering Systems or Lubricating Systems for individual mill stands or drives.

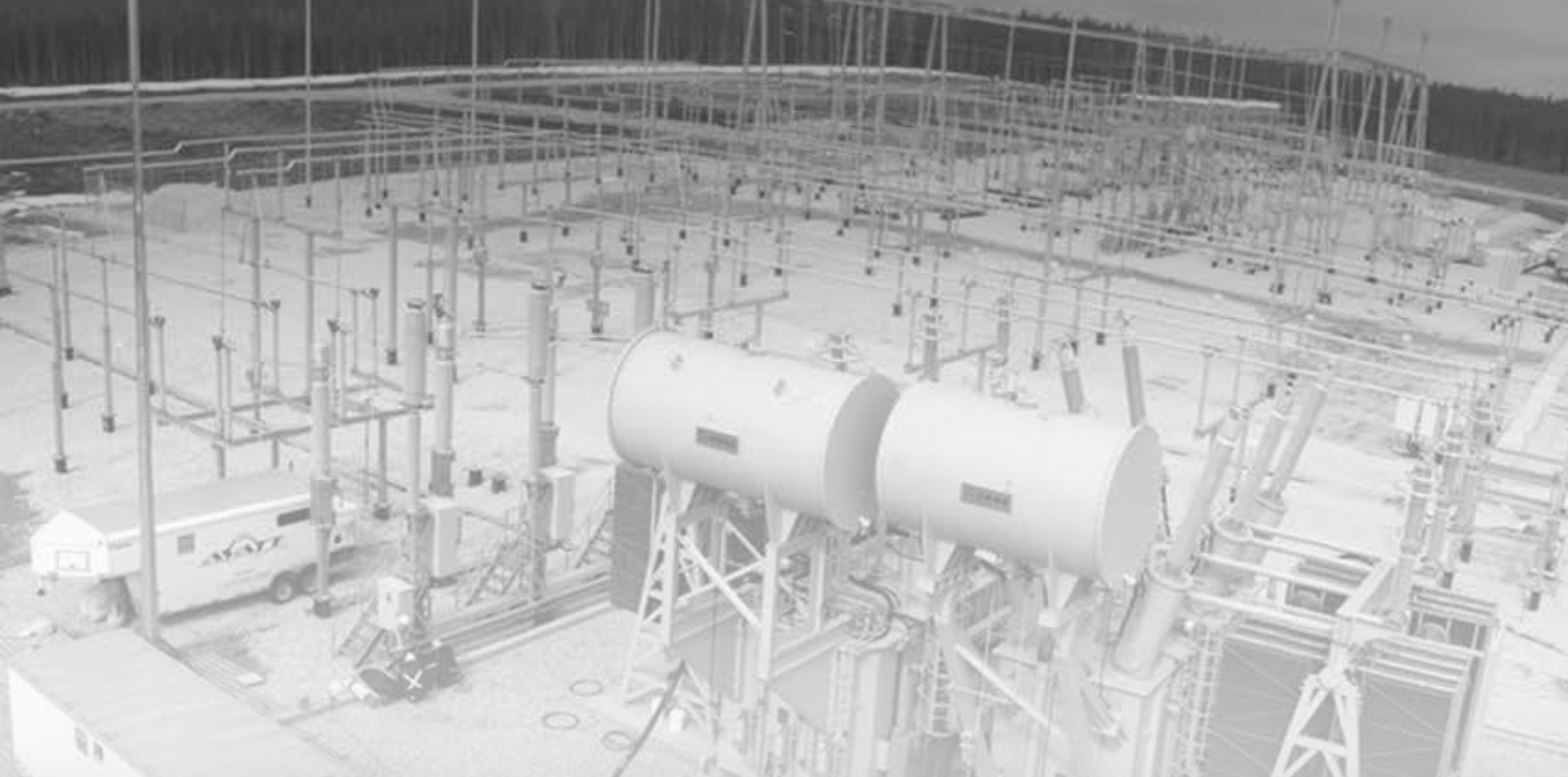
Filtervac Engineers work with their customers to ensure all specifications and requirements are established and adhered to.

These systems are extensively used in many industries such as Paper Mills, Steel Mills and Power Generation applications.

OTHER PRODUCTS

Mobile Oil Breathing Equipment - Oil Testing Equipment (Portable & Lab) - Thermal Waste Gas Flares

These systems assure reliable lubrication of vital bearings, thereby decreasing maintenance costs, reducing lost production time and providing longer machinery life.



Filtervac was first established in 1983 and was reorganized in 1993 with a much stronger focus on the global market. The founder and president of Filtervac International was the former Chief Engineer of Keene-Bowser Corp., tracing its roots back to 1885. During this period, Keene-Bowser was known as the world leader in oil dehydration equipment used for insulating oil applications in the electrical and power industry. This laid the foundation on which Filtervac improved and expanded on its line of quality filtration products.

Since 1983, Filtervac International Inc. is a leading designer and pioneer North American Manufacturer of liquid and air filtration, with special emphasis on providing quality oil purification systems for a wide variety of oils and applications. Transformer Oil Regeneration Systems, High Vacuum Transformer Oil Purifiers, Degasifiers, Oil Recovery Systems, Low Vacuum Dehydrators, Turbine Oil Conditioners, Lube Oil Recovery Systems, Lubrication Systems, Water De-Oxygenation Systems, Thermal waste gas flares, and EPC Turnkey solutions covering the entire spectrum.

"Filtervac" name quickly became synonymous in the worldwide market for quality engineered liquid filtration equipment that is on the cutting edge of technology, especially in the area of oil filtration, purification and regeneration systems. Filtervac offers a variety of systems for various industries and applications. Filtervac has the largest fleet of service and rental equipment's across the globe that any other original equipment manufacturers in the industry. Filtervac's senior executive management team has a combined expertise of over 150 years in the industry.



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