PRODUCTS

FILTER ELEMENTS

RENTAL EQUIPMENT

FLUSHING SERVICES

Bulletin No.: VDOPS-17

OIL FILTRATION SYSTEMS®

A CLARK-RELIANCE COMPANY

Fischer-Robertson, Inc.
3890 Symmes Road
Hamilton, OH 45015
ph 513-860-3445 fx 513-860-4744
www.fischer-robertson.com

Vacuum Dehydration Oil Purification System (VDOPS)

Recirculating your hydraulic and/or lube oil with a Vacuum Dehydration Oil Purification System (VDOPS) will help you maintain optimal fluid cleanliness in your system, extending the life of your rotating equipment and critical component parts, minimizing downtime and saving you money.

Samples of ISO 32 Turbine Oil

Left
Initial Sample
Water Concentration
1800 PPM

Right
Final Sample
Water Concentration
20 PPM

We Set the Standard for Oil Purification™

The harmful effects of water, entrained gases, particulate, and varnish contamination in lubrication and hydraulic oils have been well documented. By removing all water contamination and entrained gases, the VDOPS from Oil Filtration Systems® helps maintain the oil's original viscosity, ensuring its optimal performance and extending its life as a lubricant.

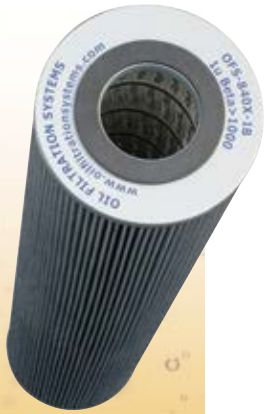
A VDOPS will:

1. **Remove Water:** through the process of vacuum distillation, our Vacuum Dehydration Oil Purification System (VDOPS) is capable of removing all water contamination from oil (free, emulsified, and dissolved), achieving very low overall water content (as low as 20 PPM).
2. **Remove Gases:** the same process of vacuum distillation effectively removes entrained air and gases from the oil (benzene, propane, methane, etc).
3. **Remove Particulate:** using high efficiency pleated microglass filter elements rated Beta(c)>1000 per ISO 16889, our VDOPS is capable of achieving very low particle counts in oil to meet or exceed an ISO 14/13/11.
4. **Remove Varnish:** when equipped with granular adsorbent media (offered as an optional accessory), our VDOPS is capable of removing soluble varnish from turbine and hydraulic oil, achieving an MPC value of 15 or lower.

5 GPM VDOPS NEMA 4

20 GPM VDOPS NEMA 7

50 GPM VDOPS NEMA 4



Employs Most Efficient Filter Elements

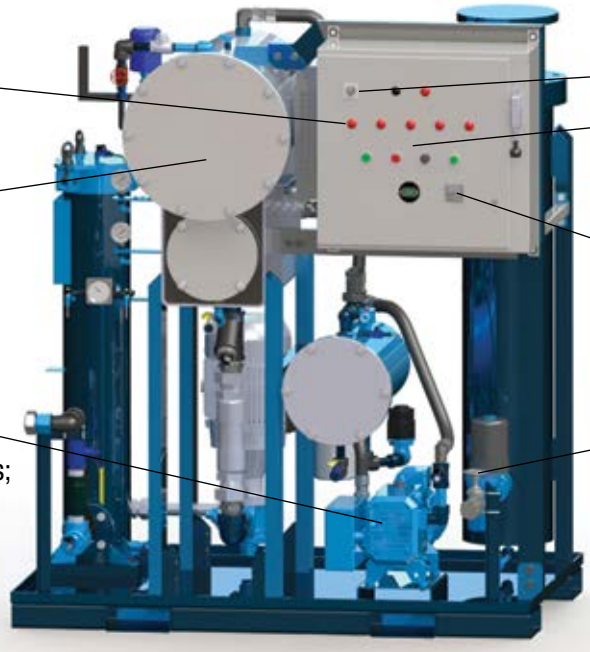
Oil Filtration Systems® manufacturers its own high-efficiency filter elements for particulate removal from all mineral-based and synthetic hydraulic, lubrication, dielectric, and fuel oils. OFS elements are constructed of the highest quality micro-fibrous glass filtration medias utilizing serial filtration technology, and the medias are layered to achieve optimal performance characteristics. OFS elements are suitable for use in the most demanding applications, and they are designed and tested to provide the highest level of efficiency with the maximum dirt holding capacity. All OFS filter elements have particulate removal efficiencies of Beta(c)>1000 (99.9% for the stated micron size), which is based on ISO 16889-1999 testing standards. They are available in a wide range of micron sizes to suite virtually any application (2.5, 5, 7, 12, and 22-Micron).

Fischer-Robertson, Inc.
3890 Symmes Road
Hamilton, OH 45015
ph 513-860-3445 fx 513-860-4744
www.fischer-robertson.com

Alarm Indicators With Automated System Shut-Down enables unattended operation for 24/7 service

Permanent Dispersion Media provides maximum surface area for high water extraction rates; eliminates need for costly coalescer element change-out

Dry Running "Claw" Style Vacuum Pump – very durable and reliable in wet oil applications; requires very little maintenance while providing long life



Phase Reversal Switch

Variable Frequency Drive gives system versatility across a wide range of applications

Digital Temperature Controller – enables operator to set optimal oil temperature

Inlet Solenoid Valve for fail-safe isolation

"Oil Filtration Systems® has been a key partner in providing oil purification equipment to the Chevron ISOCLEAN® Marketer network for many years. Their systems have provided reliable performance in the field, consistently achieving very low particle counts and water content to meet or exceed stringent cleanliness specifications. They provide excellent response time and level of support to meet the customers demanding requirements, which makes OFS a valuable partner to the Chevron ISOCLEAN® Marketer network."

Jason Gerig, Americas Marketing – ISOCLEAN®, Chevron Lubricants

Effective for Use On:

- **ISO 32 Turbine Oil**
- **Hydraulic Oil**
- **Paper Machine Oil**
- **Gear Oil (ISO VG 150 – ISO VG 680)**
- **Compressor Oil**
- **EHC Fluid (Fyrquel® and other phosphate esters)**
- **Bio-Diesel**
- **Waste Oil (used engine oil)**
- **Heavy Fuel Oil and Bunker Fuel**

Fischer-Robertson, Inc.
3890 Symmes Road
Hamilton, OH 45015
ph 513-860-3445 fx 513-860-4744
www.fischer-robertson.com

Low Watt Density Heater with outer insulation, two type J thermocouples (high limit & process), and shunt trip for redundant safety protection against over-heating

Inlet Basket Strainer for pump protection

Heavy Duty Skid Base With Spill Containment Lip, Forklift Slots (and Casters)

Elevated Vacuum Tower – provides gravity flow to oil discharge pump for reliable performance on high viscosity oils

Filter Housing – holds high efficiency pleated microglass filter element rated Beta(c) > 1000 per ISO 16889

Positive Displacement Gear Pump – with Viton® mechanical seal

Because of its unique vacuum tower design and high CFM vacuum pump, our Vacuum Dehydration Oil Purification System (VDOPS) gives the highest water extraction rates available in the industry today.

We build our VDOPS in a wide range of process flow rates for optimal performance on almost any application. A general rule of thumb to use is 1 GPM flow rate for every 100 gallons of reservoir capacity, so we build our VDOPS units in the following process flow rates:

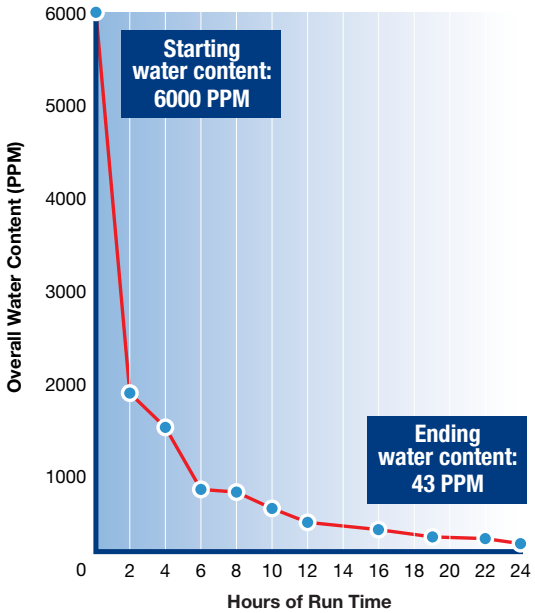
1 GPM, 3 GPM, 5 GPM, 10 GPM, 15 GPM, 20 GPM, 30 GPM, 40 GPM, 50 GPM, 100 GPM

Our experienced sales and technical support personnel will help you select the correct system for your specific application depending on all the unique conditions at your plant.

In addition, because we use only the highest quality components in the overall design, our VDOPS is the most reliable, durable, and user-friendly system available in the industry today.

Typical Water Extraction Rates

(Data Taken Using 20 GPM VDOPS on 3000-Gallon Turbine Lube Oil Reservoir / ISO 32 Turbine Oil)



- ***Very high water extraction rates***
- ***Very low maintenance required***
- ***Easy to use (turn on, adjust vacuum, walk away)***
- ***Suitable for use with turbine and hydraulic oils, as well as high viscosity gear oils (ISO VG 150 – 680)***

Rental Fleet of Systems Available for Immediate Shipment

Oil Filtration Systems® keeps a large rental fleet of VDOPS units of all sizes ready for emergency mobilization. We have the largest, newest, and best maintained fleet in the industry. We have experienced field service technicians who can accompany the system to your jobsite to help with start-up, commissioning and training.

50 GPM VDOPS rental unit at a power plant in Texas

Model Selection Key

VDOPS — 20VFD — 840X — 36kW — AWD — DMI — DPM — 480 — N4 — V — Z

VDOPS
Vacuum Dehydration Oil Purification System

20VFD
Flow Rate:
1 = 1 GPM
3 = 3 GPM
5VFD = 5 GPM Variable Flow
10VFD = 10 GPM Variable Flow
15VFD = 15 GPM Variable Flow
20VFD = 20 GPM Variable Flow
30VFD = 30 GPM Variable Flow
40VFD = 40 GPM Variable Flow
50VFD = 50 GPM Variable Flow
100VFD = 100 GPM Variable Flow

840X
Filtration:
S514D = OFS-S514D (Series) Spin-On
820X = OFS-820X (Series) Cartridge
840X = OFS-840X (Series) Cartridge
BF#2 = OFS-BF#2 (Series) Bag

36kW
Heater Rating:
3kW = 3 kilowatt
6kW = 6 kilowatt
16kW = 16 kilowatt
25kW = 25 kilowatt
36kW = 36 kilowatt
48kW = 48 kilowatt
56kW = 56 kilowatt
66kW = 66 kilowatt

AWD — DMI — DPM
***Optional Equipment:**
4PLL = 4-Point Lifting Lugs
4PLS = Cage Structure with 4-Point Lifting Lugs
AWD = Automatic Water Drain
DMI = Digital Moisture Indicator
DPM = Digital Particle Monitor
EHC = Wetted Components Compatible with Fyrquel® EHC Fluid
SS = Stainless Steel Wetted Components

480
Electrical Requirement:
120 = 120V / 1Ph / 60Hz
200 = 200V / 1Ph / 50Hz
220 = 220V / 1Ph / 50Hz
220V / 1Ph / 60Hz
220V / 3Ph / 50Hz
220V / 3Ph / 60Hz
380 = 380V / 3Ph / 50Hz
400 = 400V / 3Ph / 50Hz
415 = 415V / 3Ph / 50Hz
480 = 480V / 3Ph / 60Hz
575 = 575V / 3Ph / 50Hz

N4
Electrical Rating:
N4 = NEMA 4
N7 = NEMA 7 Explosion Proof
Class 1 Div. 1 or Class 1 Div. 2

V
Seal Material:
V = Viton®
B = Buna N

Z
Custom Options:
Z = Custom Equipment (Specified)

Fischer-Robertson, Inc.
3890 Symmes Road
Hamilton, OH 45015
ph 513-860-3445 fx 513-860-4744
www.fischer-robertson.com

Varnish Removal Options

Varnish contamination in the turbine lube oil systems of gas turbines has recently become a major concern for maintenance personnel. For this reason, Oil Filtration Systems® now offers a "varnish removal" option on all of our Vacuum Dehydration Oil Purification Systems (VDOPS). By diverting the flow of turbine oil through specially formulated granular adsorbent media, soluble varnish can be effectively removed from the oil, eventually resulting in the removal of varnish that has plated out on critical components, including servo valves in the speed control system.

Before Filtration
ISO 21/20/17
MPC* Value = 35.2

After Filtration
ISO 19/17/15
MPC* Value = 11.3

Standard VDOPS Features

1. **Claw-Style Vacuum Pump** – very durable design for applications with high moisture content (removed water cannot cause premature failure of vanes), and high CFM rating optimizes "mass transfer" effect for high water extraction rates.
2. **Permanent Dispersion Media Inside Vacuum Chamber** maximizes the spread of oil over a large surface area, optimizing water extraction rates and eliminating the need for frequent and costly coalescer element change-out. Also enables system to work effectively on high viscosity oils.
3. **Variable Frequency Drive** – greatly enhances the system's ease of use during cold start-ups, and enables it to be used effectively across a wide range of applications and oil viscosities.
4. **Inlet Solenoid Valve** – safety feature for automatic isolation of inlet.
5. **Two Type J Thermocouples** – (high limit and process) with shunt trip for redundant overheating protection.

Optional Features

1. Explosion proof components (Class 1, Division 1 or Class 1, Division 2)
2. Inline digital particle monitor
3. Inline digital moisture indicator
4. Welded steel cage structure around system with 4-point lifting lugs for offshore use
5. All stainless steel wetted parts (vacuum chamber, piping, etc)
6. Special 3-part epoxy exterior coating for extra corrosion resistance in salt environments

The Experts at Oil Filtration Systems®

We will assist in determining your system needs and improve your fluid quality.
We design and build the COMPLETE SOLUTION.
We manufacture the cartridge filters, pressure vessels, and the complete systems.
We know Oil and Fuel Purification!

Oil Filtration Systems® are designed for easy start-up and operation. Our team is highly trained and ready to assist; on-site, on-call, start-up, commissioning and training.

Oil Filtration Systems® Provides Results.

OIL FILTRATION SYSTEMS®
A CLARK-RELIANCE COMPANY

135 Enterprise Parkway
Boerne, Texas 78006
PH: (830) 816-3332
Fax: (830) 816-3331
info@oilfiltrationsystems.com
www.oilfiltrationsystems.com

USA Since 1999

Fischer-Robertson, Inc.
3890 Symmes Road
Hamilton, OH 45015
ph 513-860-3445 fx 513-860-4744
www.fischer-robertson.com