Varnish Removal Systems (VRS)

Varnish in lube oil systems is a serious maintenance concern for operators of rotating equipment, particularly gas turbines, compressors, and paper machines.

A Varnish Removal System (VRS) will enable you to effectively remove both soluble and suspended varnish from your lube oil, improving overall equipment reliability and saving you money.

Utilizing the two leading technologies for varnish mitigation (granular adsorbent media and depth media filters), the VRS provides versatility and performance unmatched by any other system on the market today.

OIL FILTRATION SYSTEMS®

A Clark-Reliance Company

Remove Soluble & Suspended

Remove soluble varnish from warm oil and suspended varnish from cool oil. Varnish (also known as lacquer, sludge, or tar) is a detrimental by-product of oxidation, additive drop-out, and thermal degradation of lube oil. Certain system designs and operational conditions (such as high oil temperature, electrostatic spark discharge, high oil flow rates, etc.) contribute to the rapid formation of varnish in oil. In severe cases, varnish tends to "plate out" on the metal surfaces within a lube oil system, and if left unchecked, the build-up of varnish deposits on servo valves and other critical components can lead to "stiction," inefficient operation of rotating equipment, higher operating temperatures, and premature failure.

A single VRS can remove soluble or suspended varnish depending on which media is employed in a common housing.

Applications

- Turbine Lube Oil
- Hydraulic Oil
- Fyrquel® EHC Fluid
- Paper Machine Oil
- Compressor Oil

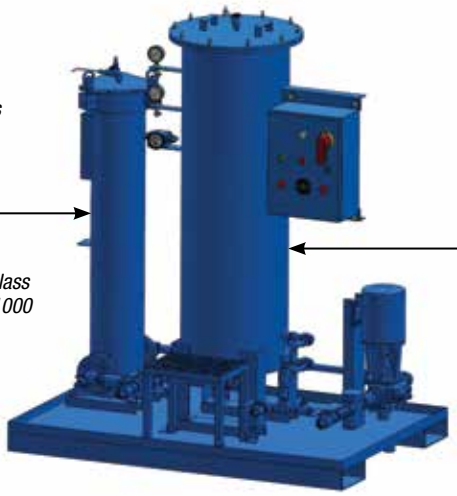
Available Sizes

- 10 gpm (sized for large 6200-gallon gas turbine lube oil reservoirs)
- 5 gpm (sized for medium 3000-gallon gas turbine lube oil reservoirs)
- 1 gpm (sized for smaller hydraulic and lube oil reservoirs)

Varnish from Your Lube Oil System

Ideal for use on GE frame 7FA, 7EA, and other gas turbines experiencing varnish problems in their lube oil systems.

High efficiency pleated microglass filter elements rated Beta(c)>1000 per ISO 16889 will remove all particulate contamination to achieve ISO cleanliness levels as low as 14/12/11.



Custom Designed Housing Accepts Depth Media **OR** Granular Adsorbent Media

Depth media filter elements effectively remove varnish from oil at lower temperatures.

Special formulation of granular adsorbent media will effectively lower varnish potential rating (MPC & QSA) from "alarm" or "critical" levels to "normal" or "acceptable," typically within 2-4 weeks of continuous circulation. For normal operating temperatures; 100°F and higher.

Varnish exists in lube oil in two different forms, suspended and dissolved. At operating temperatures (typically 100°F and higher), varnish is dissolved in the oil. At cooler temperatures (typically 70° and lower), varnish is in suspension.

The Varnish Removal System (VRS) by Oil Filtration Systems, utilizes a combination of the two leading technologies for varnish mitigation (granular adsorbent media and depth media filter elements) to quickly and reliably remove varnish from a wide variety of turbine and lube oils. With a VRS, you can easily swap elements to suit hot or cold applications, as the housing accepts both types of media.

- When loaded with **granular adsorbent media cartridges**, the VRS will effectively remove soluble varnish from oil at normal operating temperatures (100°F and higher)
- When loaded with **depth media filter elements**, the VRS will effectively remove suspended varnish from oil at cool temperatures during outages or when off-line

Continuous "kidney-loop" filtration and circulation of the oil in the reservoir with a VRS will enable you to effectively maintain very low varnish content in your oil, as measured by MPC (Membrane Patch Colorimetry).

Granular Adsorbent Media Cartridges for Soluble Varnish

Within the cartridge is a bed of specially formulated granular media with maximum surface area to effectively "adsorb" soluble varnish. This process is essentially adhesion of contaminants (ions, atoms, and molecules) onto the surface of the adsorption media. Special chemical properties of the granular media ensure that the additive package dissolved in the oil is not adversely affected or removed from the oil.

Depth Media Filter Elements for Suspended Varnish

Tightly wound layers of cellulose media create a large amount of surface area and a torturous path for the flow of oil, effectively removing suspended solids, soft contaminants, and varnish.

Varnish Potential Rating
(Before & After)

Before Filtration
ISO 22/21/19
MPC[1] Value = 38

After Filtration
ISO 15/13/10
MPC Value = 8

[1]Membrane Patch Colorimetry

As soluble varnish is removed from the oil, it allows hard varnish deposits on the metal surfaces of the lube oil system to fall back into solution. In this way, continuous use of a Varnish Removal System (VRS) will not only improve the oil quality, but it will also result in the decrease of hard varnish deposits on servo valves and other critical components within the lube oil system itself.

Standard Features

- Adapters which allow housing to accept either granular adsorbent media cartridges or depth media filter elements
- Reusable stainless steel cartridges – replace only the granular adsorbent media pack
- Lifting mechanism to help change out heavy elements saturated with oil
- NEMA 4 electric control panel with main power disconnect, illuminated "on-off" switch, and "plugged filter" indicator lights

Rental Fleet

We have a large fleet of well-maintained rental units that are available for immediate shipment anywhere in the world on an emergency basis.

Many customers take advantage of our rental equipment during scheduled outages, when routine maintenance and oil purification can be performed.

Rental costs can be applied towards the purchase price of a new unit, if desired.

Same day / next day response!
We are the "911" of oil and fuel filtration!

Field Services

We have crews of experienced and qualified field service technicians that can accompany the equipment to your jobsite and help with start-up, commissioning, and training.

In severe cases of varnish contamination in a system, we can perform "varnish flushing" services, utilizing a series of cleaning agents under strict and proven procedures to remove all varnish deposits from the lube oil piping and reservoir.

Ask us about another oil purification system built by Oil Filtration Systems that can incorporate varnish removal technology:

Vacuum Dehydration Oil Purification System (VDOPS) – *to remove water, particulate, and varnish contamination*

135 Enterprise Parkway Drive
Boerne, Texas 78006
Toll Free (800) 449-0262
(830) 816-3332
Fax: (830) 816-3331
www.oilfiltrationsystems.com

OIL FILTRATION SYSTEMS®
A CLARK-RELIANCE COMPANY

REPRESENTED BY: YATES & COMPANY, INC.
1 Hollywood Ave, Unit 22 HoHoKus, NJ 07423
Tel: 201-345-3101
Email: info@yatesco.net

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