

# VARNISH ADSORPTION SKIDS

## EQUIPMENT DATA SHEET

Varnish in oil systems can cause important components to fail, often at critical times in the equipment's operating cycle. To protect your equipment and prevent downtime, Reliable Industrial Group (RIG®) has a fleet of Varnish Adsorption Skids (VAS) available to assist with removing varnish from your oil.



Figure 1. RIG® Varnish Adsorption Skids

Our Varnish Adsorption Skids (VAS) can reduce varnish back to safe levels without shutting down oil systems/ equipment operation.

### Varnish Adsorption Skid (VAS) Features:

- Side-stream filtration units filter during normal operations
- Auto shutdown for high filter differential pressure
- Fuse protected electrical system
- Easy to use, plug-and-play equipment design
- Low maintenance

### VAS Units Can Be Used to Remove Varnish from:

- Lubrication oil systems
- Hydraulic oil systems
- Paper machine oil
- Compressor and turbine oils

### VAS EQUIPMENT OVERVIEW

- A kidney loop VAS is setup on equipment still in service to be used at normal system operating temperatures while equipment continues to run
- The VAS uses a granular adsorbent resin to remove varnish from oil and lower varnish potential rating (MPC) to normal levels, typically within 3 to 4 weeks
- A secondary filter on the skid is fitted with a high-efficiency micro-glass filter element to remove hard particulate contamination that can damage critical components
- VAS unit runs as side stream dialysis while unit is in operation
- VAS can come Nema 4 or Nema 7
- VAS runs off of 110V power for easily accessible power requirements
- VAS is outfitted with both pre and post filter sample ports for quick non-intrusive sampling
- VAS has emergency shut-off sensors for low flow and filtration dpi

### WATER REMOVAL OPTIONS

Water greater than 500 ppm in the oil can cause issues with varnish removal. In these cases, the varnish removal procedure should be combined with a Vacuum Dehydration Unit (VDU) to reduce the water content. See RIG's VDU skids for reducing moisture content at <https://therigteam.com/vdu-data-sheet>.

# VARNISH ADSORPTION SKID TECHNICAL SPECIFICATIONS

Equipment Name	Flow Rate	NEMA Rating	Weight	Height	Depth	Width	Power Requirements
VAS-5-N4	5 gpm	4	370 lbs	60"	24"	48"	120 Volts 10 Amps Single Phase
VAS-5-N7	5 gpm	7	370 lbs	60"	24"	48"	120 Volts 10 Amps Single Phase
VAS-10-N4	10 gpm	4	780 lbs	72"	36"	60"	120 Volts 14 Amps Single Phase
VAS-10-N7	10 gpm	7	780 lbs	72"	36"	60"	120 Volts 14 Amps Single Phase
VAS-15-N4	15 gpm	4	990 lbs	72"	48"	60"	120 Volts 18 Amps Single Phase
VAS-15-N7	15 gpm	7	990 lbs	72"	48"	60"	120 Volts 18 Amps Single Phase

## PREVENTING UNPLANNED OUTAGES CAUSED BY VARNISH

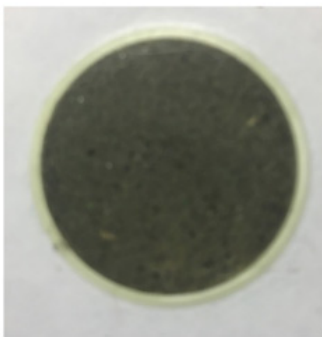
Varnish refers to a variety of insoluble contaminants that are not trapped by system filters. Many factors contribute to varnish formation in machinery oil, but all revolve around oxidation and degradation of oil additives. Excessive heat and undesired contaminants—such as water and wear metals—accelerate oil oxidation and thus varnish formation.

Varnish can appear in:

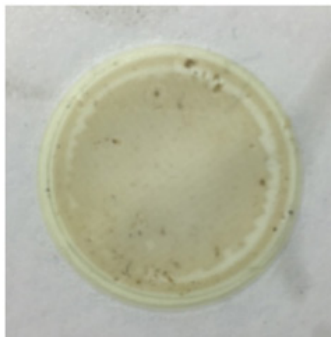
- Areas of mechanical contact where there are load zones
- High speed contacts
- Hot spots
- Hydraulic systems and especially sensitive filters, which can cause:
  - Critical controls to become in-operative
  - Servo valves to stick or fail to open, which may result in a turbine failing to start

Do not wait for critical components to become damaged! Regular monitoring and maintenance will prevent unplanned outages and damage to sensitive system components. Our Varnish Adsorption Skids (VAS) can reduce varnish back to safe levels without shutting down oil systems/equipment operation.

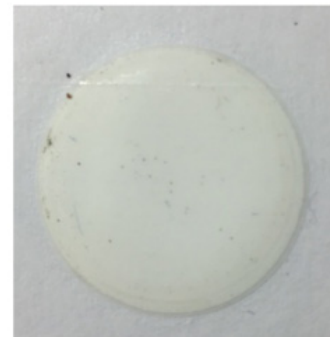
### VARNISH BEFORE, DURING AND AFTER VAS FILTRATION



Severe Varnish in Oil  
MPC > 42  
Initial Sample



High Varnish in Oil  
MPC > 25  
After 4 days of run time



Low Varnish in Oil  
MPC > 15  
After 3 weeks of run time

**Mobil Serv**<sup>SM</sup>

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RIG<sup>®</sup> works across many industrial service disciplines. These include Hydrolazing, steam/air blows, chemical cleaning, varnish mitigation and oil flushing. Contact us for more information:

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