Schroeder INDUSTRIES
Advanced Fluid Conditioning Solutions®

CONTAMINATION CONTROL - DEHYDRATORS

Standardized Fluid Testing

Fluid Quality Optimization

Filtration Optimization

Why do Hydraulic and Lubrication Fluids Need to be Dry?

Influence of Water and Gaseous Contamination

Water in hydraulic systems can be caused by moisture from ambient air, leakage of cooling systems or process water, or chemical processes such as combustion and oxidation which cause seal leakage.

Design issues in the hydraulic system can contribute to air/gasses in hydraulic fluids. Incorrect motor speeds, unprimed pumps, suction lines too small or leaks, among other reasons, contribute to air contamination over time.

Water and gas contamination can drastically shorten the life of the oil and hydraulic components. In general, mineral based oils age faster when water is present. The oil additives are rapidly consumed during operation and the service life of the oil is greatly reduced leading to more frequent, costly oil changes and deterioration of foaming characteristics.

Free Water Causes

- Corrosion pits, rough surfaces and release of abrasive flakes into the fluid
- Microbial colonization / Bacteria: Odors, acids, slime, and health problems
- Loss of lubricity: Free water enters contact loading zones, allowing opposing surfaces to crash together, results in high friction, wear and seizure
- Additive depletion: Free water retains polar additives

Dissolved Water Causes

- Faster oil oxidation: Leads to oil acidity, thickening, varnishes, sludge & resins
- Reduced Fatigue life: Propagation of fatigue cracks in metals
- Demolition of Ester-based fluids and additives: Reacting with esters/ hydrolysis, results in formation of acids, gels, and loss of additives

Gas and Air Effects

- Oil oxidation: Mostly oxygen reacts with oil resulting in premature degradation (oil aging)
- Varnish formation (oil aging)
- Cavitation: Formation and collapse of gaseous oil cavities causes decrease in pump efficiency and damage to pumps
- Noise and increase of temperature: Result in dynamic operating problems and system stiffness reduction
- Micro-Diesel-Effect
- Change of viscosity

TWS-D

TestMate® Water Sensor | TWS-D

The TestMate® Water Sensor TWS-D provides early detection of water problems thus preventing faults and unnecessary interruption to operations. The TWS-D can be added to Schroeder fluid conditioning monitors such as the TCM (Testmate® Contamination Monitor) and patent-pending HY-TRAX® Fluid Sampling System, available in both manual and telematics versions.

- Saturation level/temperature
- Switching points

Product Application Examples

Triton-A

Triton-A Dehydrator for Industrial Machining Application

Problem:
Machining processes can introduce water into the oils. Manufactures often drain or replace the oil which quickly becomes expensive as disposal and replacement oil costs increase.

Solution:
One manufacturer removed the water contaminated oil into 350 gallon (1325 Liter) totes. Using the 1.5 gpm (6 L/min) Triton-A, they were able to reclaim the hydraulic fluid for continued use. By instituting a rotational schedule, they could replace the now clean and dry oil back into their lube systems, resulting in substantial savings in new oil purchases.

Triton-E

Triton-E Dehydrator for Power Generation Application

Problem:
Power Generation plants use water to help cool their turbine oil during operation. The seals used to keep the oil and water separated will wear over time causing the cooling water to mix with the turbine oil. When this happens, the water along with the heat will drastically affect the machinery.

Solution:
When a power plant experienced a seal leak, they use the 15 gpm (57 L/min) Triton-E to remove the water quickly and maintain a low water concentration until the turbine could shut down at its regular scheduled maintenance period, saving a costly unplanned shut down of their turbine and also the cost of replacing 400 gallons (1500 Liters) of fluid.

SVD

SVD Vacuum Dehydrator for Pulp and Paper Application

Problem:
The pulp and paper industry uses a great deal of water in their process. That water will inevitably end up contaminating their hydraulic fluids causing the fluid to age rapidly and reduce the life of their system components. Unscheduled shutdowns of critical systems can cost thousands of dollars an hour in lost productivity.

Solution:
By installing a 10 gpm (35 L/min) SVD vacuum dehydration system to remove water from the oil, the water content can be maintained well below the recommended level, preventing costly shut downs. Savings are also soon realized by reducing the need to replace 450 gallons (1700 Liters) of expensive hydraulic oil and machine components.

Applications

- Power Generation
- Industrial Machining
- Pulp & Paper
- Steel & Rolling Mills
- Plastic Injection Molding Industry
- Machine Tools
- Marine
- Oil & Gas

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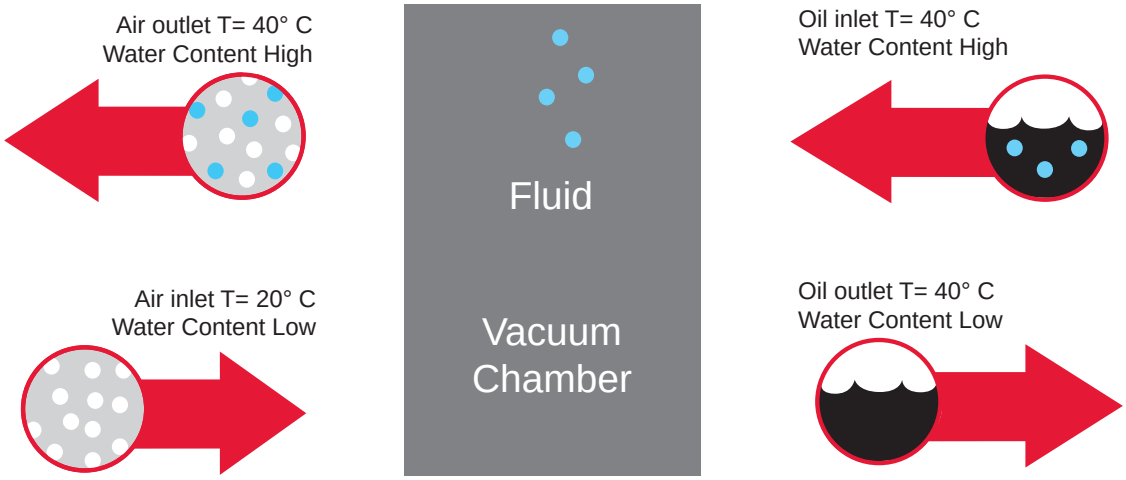
The Dewatering Process

- **Mass Transfer (The Triton system)**
  The Triton system utilizes the ability of warm air to attract and hold onto water. Simply put, warm air can hold onto more moisture. The water contaminated oil is pumped into the top of the dewatering chamber; at the same time ambient room air is heated and blown up through the chamber from the bottom. As the oil trickles down slowly the water is drawn to the warm dry air away from the oil. The moist air is then released through a breather and the now dry oil is returned to the reservoir.

- **Vacuum Dehydration and Degassing**
  The water contaminated oil is either drawn into the chamber or pumped in. At the same time the vacuum pump removes the air in the chamber, causing a drop in the pressure inside the chamber. The resulting vacuum in the chamber has the effect of reducing the boiling point of the water in the fluid. This causes the liquid water to turn into a vapor and to be released from the oil. Any trapped gases are also released. The vacuum pump then removes the water and gas, and the oil is returned to the reservoir.



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