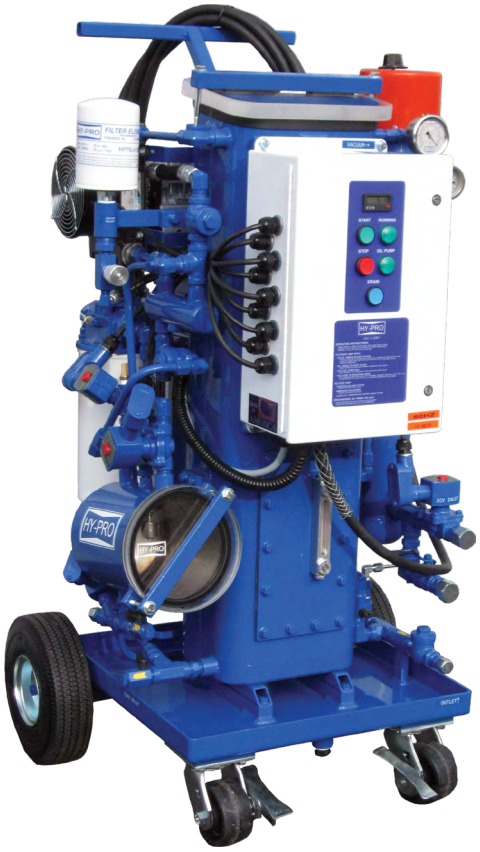


1 GPM VUD

Hy-Pro Vacuum Dehydration

Remove Free & Dissolved Water down to 20 PPM (0.002%)

Remove Free & Dissolved Gasses

Visually Monitor Fluid and Process through Clear Chamber Covers

High Water Removal Efficiency

High Efficiency Particulate Filtration

The VAC-U-DRY Purification Process

Contaminated oil is drawn into the VAC-U-DRY purifier by a high output vacuum pump. The oil passes through the low watt density heater where heated to optimum temperature for the dehydration process (150°F, 66°C). The oil enters the vacuum chamber passing through specially designed dispersal elements which create a thin film of oil that is exposed to the vacuum. The water is vaporized and then drawn into the condenser where it becomes liquid and drains into the condensate tank. The dehydrated oil flows to the bottom of the vacuum chamber and is removed by the discharge pump. The oil is pumped through the high efficiency particulate filter assembly ($\beta x_{[c]}$ >1000) and returned to the system. The recirculating line helps the VAC-U-DRY reach optimum temperature in cold start situations and can be used to throttle machine inlet and outlet flow.

75% of All Hydraulic Component Failures are Caused by Fluid Contamination

The effects of moisture in your oil systems can drastically reduce on stream plant availability. Bearing life and critical component life is greatly reduced by moisture levels above and within the saturation point. Many systems run constantly above this point due to inefficient dehydration technologies and high ingression. This develops acidity and loss of lubrication properties.

Unit Specifications	
Flow Rate	.5 ~ 1.8 GPM (1.89 ~ 6.81 LPM)
Pump Type	Dry Seal Piston Pump
Amp Draw	120 VAC - 1KW Heat (15 FLA) 220 VAC - 4.5KW Heat (23 FLA) 230 VAC - 4.5KW Heat (23 FLA)
Condenser	Air Cooled

*Flow rate is adjustable based on recirculation line flow.
The V1 is designed for reservoirs ≤ 150 gallons @ 110-125°F.

HY-PRO FILTRATION

Appearance of Water in Oil

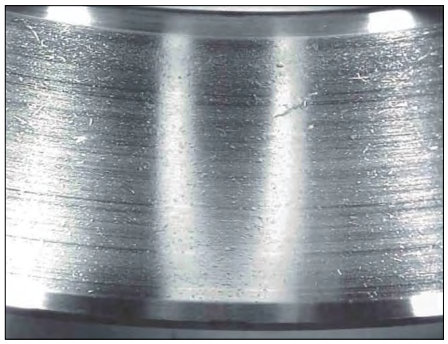
Dissolved Water- Oil appears bright and clear. Water can only be removed by vacuum dehydration.

500 ppm 1000 ppm 2500 ppm 5000 ppm 10000 ppm

Emulsified Water- Very small droplets dispersed in oil. Oil viscosity may go up and appear cloudy and milky. Tiny amounts of detergent engine oil can contaminate industrial oils.

Free Water- Large drops that readily settle out.

Harmful Effects of Water in Oil



Contamination Related Failure

Water is one of the most common and most damaging contaminants found in a lube or hydraulic system. Continuous or periodic high water levels can result in damage such as:

- Metal Etching (Corrosion)
- Abrasive Wear in Hydraulic Components
- Dielectric Strength Loss
- Fluid Breakdown
- Additive Precipitation and Oil Oxidation
- Reduction in Lubricating Properties

Component Life Extension by Removing Water

New Moisture Level PPM (%)

Current Moisture Level PPM	1000 (0.1%)		500 (0.05%)		250 (0.025%)		100 (0.01%)		50 (0.005%)	
	Rolling Element	Journal Bearing	Rolling Element	Journal Bearing	Rolling Element	Journal Bearing	Rolling Element	Journal Bearing	Rolling Element	Journal Bearing
5000	2.3	1.6	3.3	1.9	4.8	2.3	7.8	2.9	11.2	3.5
2500	1.6	1.3	2.3	1.6	3.3	1.9	5.4	2.4	7.8	2.9
1000			1.4	1.2	2	1.5	3.3	1.9	4.8	2.3
500					1.4	1.2	2.3	1.6	3.3	1.9
250							1.5	1.3	2.3	1.6
100									1.4	1.2

Component Life Extension by Removing Water*

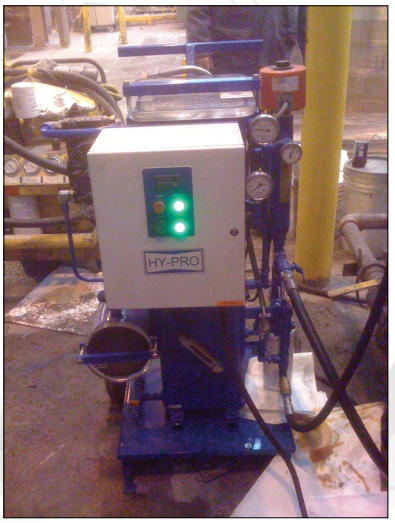
*Courtesy of Noria

HY-PRO FILTRATION

V1 Paper Mill Case Study

A paper mill was experiencing severe water ingression problems and needed to dehydrate its fluids to avoid replacement. Hy-Pro suggested rotating a 1 GPM V1 vacuum dehydrator utilizing a pleated dispersal element among the affected fluids.

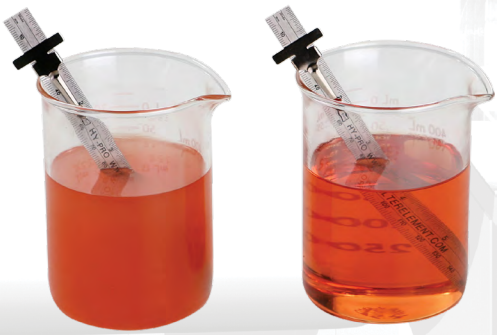
Application #1



Initially, Hy-Pro's V1 was placed on a Super Calender CC Lube Reservoir. This reservoir contained 200 gallons (757 liters) of PM220 Exxon Mobil at 110°F (43°C). The water level of this reservoir when the V1 was introduced was 1400 parts per million (ppm). After 48 hours of continuous operation the water level was reduced to less than 100 ppm.

- Initial Water Level: 1400 ppm
- Duration on Reservoir: 48 hours
- Ending Water Level: <100 ppm

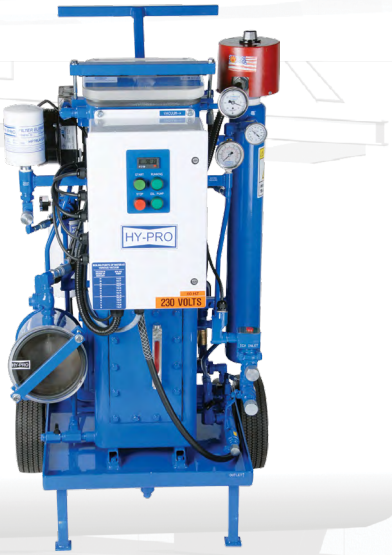
Application #2



Next, the V1 was relocated to a vacuum pump oil reservoir on the wet end of the plant. This reservoir contained 300 gallons (1135 liters) of fluid at 125°F (51°C). At the time of installation the fluid contained 20,000 ppm of water. In less than 72 hours the V1 reduced the water level to 60 ppm.

- Initial Water Level: 20,000 ppm
- Duration on Reservoir: <72 hours
- Ending Water Level: 60 ppm

Application #3



Finally, the V1 was installed on a tote containing 200 gallons (757 liters) of reclaimed AW46 oil at ambient temperature (~70-80°F, ~21-26°C). At the time of installation the oil contained 10,000 ppm of water. In less than 24 hours the water was reduced to less than 100 ppm.

- Initial Water Level: 10,000 ppm
- Duration on Reservoir: <24 hours
- Ending Water Level: <100 ppm