Water Removal

Available for all spin-on and cartridge filter elements.

Media code “A” specifies G8 Dualglass media co-pleated with water removal scrim to produce a filter that can remove water while maintaining $\beta x_{[c]} = 1000$ efficiency down to 1µ / 2.5$\mu_{[c]}$.

Water Contamination

Free and dissolved water in hydraulic and lube systems leads to bearing fatigue, accelerated abrasive wear, corrosion of metal surfaces, increased electrical conductivity, viscosity variance, loss of lubricity, and fluid additive breakdown. Sources include condensation, reservoir leakage, worn actuator seals, heat exchanger leakage, new oil and more.

Filter elements with water removal media can bring high water counts down. Most water removal elements utilize low efficiency (nominally rated) media. We combine the best of both worlds by removing the water while maintaining our $\beta x_{[c]} = 1000$ particulate removal efficiency and ensuring that none of the gel particles are released back into the system. Water removal is available with any of our glass media selections from 1µ to 40µ. There is a price adder to the glass element price so please consult the price list or call Hy-Pro before quoting.

Capacity by Common Series

Hy-Pro Element	Capacity H_2O	
	Liters	Ounces
HP75L8-*AB	0.7	23
HP101L18-*AB	2.5	84
HP101L36-*AB	5.1	172
HP102L18-*AB	1.9	65
HP102L36-*AB	3.3	112
HP107L18-*AB	2.8	93
HP107L36-*AB	5.8	197
HP83L16-*AB	1.7	57
HP83L39-*AB	3.6	123
HP8314L39-*AB	5.9	200
HP8310L39-*AB	6.2	207
HPKL9-*AB	0.6	21
HP60L8-*AB	0.5	15
HP25L9-*AB	0.4	12

Water Removal Application - Bulk Oil Conditioning

Fluid volume: 250 gallons, 1000 liters
Initial ppm H_2O: 12000 ppm, Final ppm H_2O: < 50 ppm

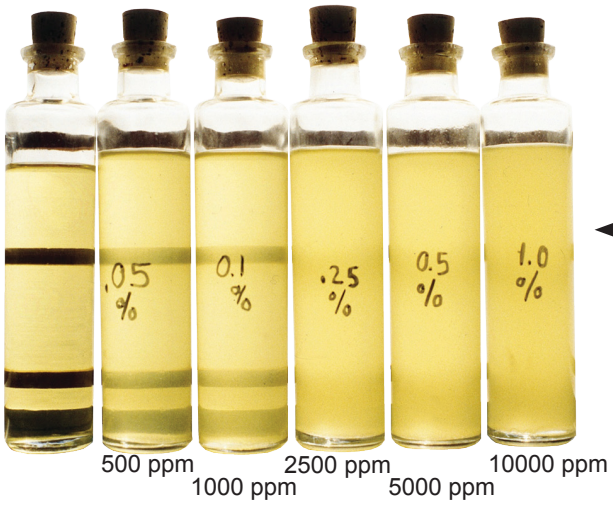
A power plant planned to use a vacuum dehydrator to remove the water from 1000 liters of hydraulic oil. Dehydrator rental was expensive and required one month minimum. As an alternative Hy-Pro element HP8314L39-6AB (A media code = G8 Dualglass + water removal) was applied. Hy-Pro estimated that 2 elements would bring the ppm levels below the target. After the second element was removed the ppm level was below 50 ppm H_2O. A third element was installed but did not reach terminal Δp before the fluid was determined to be free of water and ready for use.

Water PPM ~ Ounce conversion:
Moisture (PPM) X Fluid volume (Gallons) X .0001279 = Ounces of Water

HY-PRO FILTRATION

Appearance of Water in Oil

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



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*