



Contamination Control-Filter Systems



HYDAC

Contamination Control - Filter Systems

Why do Hydraulic and Lubrication Fluids Need to be Clean?

Influence of Particulate Contamination

70-90% of wear and failure in hydraulic system is related to contamination. Only 10 to 30% can be traced back to misuse, defects or age. Contamination cannot be stopped, only slowed down!

System efficiency can drop by up to 20% before an operator even detects a problem, such as cylinder drift, jerky steering, erratic operation or slower performance. Overall, unmitigated contamination results in shorter service intervals, higher operating costs and lost productivity.

Hydraulic component clearances are critical and require strategic filtration designs to remove damaging particles. Critical clearances for individual hydraulic components are shown in the table below:

Components	Typical Critical Clearance (μm)
Gear Pump	0.5-5
Vane Pump (tip of vane)	0.5-1
Piston Pump (valve plate to cylinder)	0.5-5
Control Valve (spool to sleeve)	1-23
Servo Valve (spool to sleeve)	1-4

Particulate contaminants circulating in fluid power systems cause surface degradation through general mechanical wear (abrasion, erosion, and surface fatigue). General mechanical wear causes a chain reaction of exponential wear if the resultant contamination is not properly mitigated. Subsequently, clearances and fluid leakage increases while operating efficiency decreases.

Product Application Examples



OFS-AM Filter Systems Field Application

Problem:

Refuse truck fleet experienced shortened hydraulic fluid life due to a high rate of solid contamination.

Solution:

The OFS-AM filtered precisely to the required fluid cleanliness, automatically shutting off once the ISO cleanliness was met, while recording the fluid cleanliness data - for each truckn - into its on-board computer system. By incorporating the OFS-AM solution into the company's fluid maintenance program, the customer was able to realize a gross return on investment of over 100% in its first year of use.



OFS Filter Systems for Roll-Off Cleanliness

Problem:

A lawn tractor manufacturer faced equipment warranty claims due to hydraulic fluid cleanliness. Evaluation resulted in particles greater than 100 micron in the new hydraulic systems.

Solution:

The OFS was incorporated into the customer's roll-off cleanliness program. With the OFS, the customer was able to filter the new hydraulic fluid precisely to the required cleanliness, and generate corresponding cleanliness records. Not only did the OFS minimize the frequency of fluid-cleanliness related equipment warranty claims, the customer has a verifiable record that the hydraulic fluid condition of each new unit of equipment meets the cleanliness requirements.

Product Application Examples



OFCD Filter Cart for Roll-Off-Cleanliness

Problem:

An aluminum extrusion manufacturer was having issues maintaining fluid cleanliness in their extrusion press reservoir.

Solution:

The OFCD filter cart was employed to help resolve the customer's cleanliness deficiencies. At an optimal flow rate of 14 gallons per minute (gpm), the OFCD was able to quickly clean the customer's 1000 gallon extrusion press reservoir. By incorporating the OFCD, the customer invested in the preservation of the hydraulic fluid and the extrusion press.

**Condition monitoring package available as an option*



OF5HD Kidney Loop System for Lube Oil Treatment (Power Generation)

Problem:

Customer was experiencing problems with external ingress of coal dust getting into the 255 gallon lube oil reservoirs on their coal pulverizers causing degradation wear on the bearings and bull gears, which lead to premature aging of the system components.

Solution:

The installation of OF5HD filtration skid cleaned up the system fluid from coal dust particulates and other contamination. As a result, the internal wear on system components as well as unscheduled downtime due to contamination was reduced dramatically.

**Condition monitoring package available as an option*



OFX-Skid Kidney Loop System for In-Plant Fluid Treatment

Problem:

High contamination levels in new hydraulic fluids, beyond the standard set for use in construction machinery. Customer uses four different types of fluids, each in 500 gallon tanks, that need to be treated individually.

Solution:

We reduced the particle counts down to an ISO 16/14/11 or better, by using 37 gpm duo pass high capacity filter housings housings with an interfaced Allen Bradley 1100, programmable touch pad screen, integrated CSM (CS12xx particle sensor with pump and flow control system) and AS Water Sensor.

After the OFX-Skids are turned on, following a new fluid delivery, they can bring the differing fluids into compliance in less than 4 hours. This type of installation is a vital component in fluid conditioning to increase equipment and/or machinery component life and reduce down time and maintenance cost.

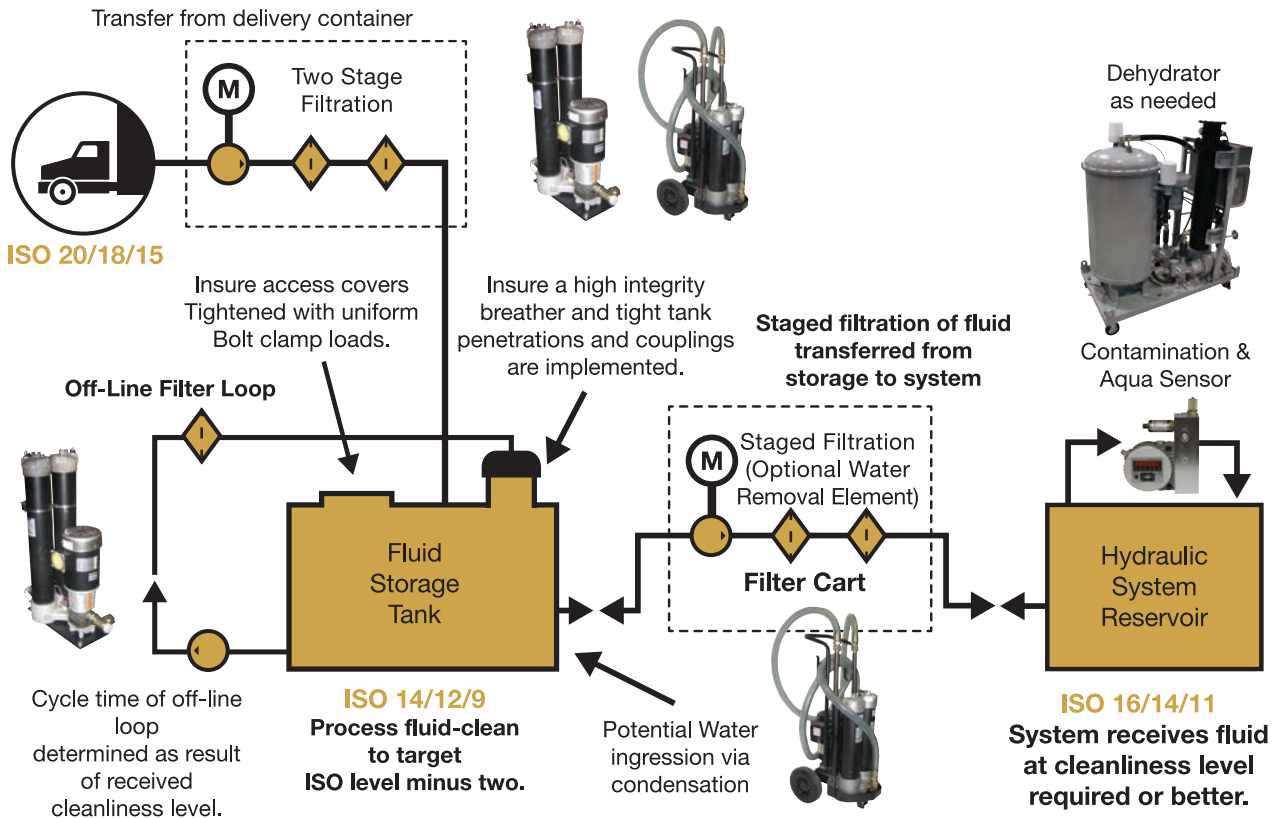
**Condition monitoring package available as an option*

Fluid Treatment

New fluid, delivered by your supplier, is generally not clean enough for immediate use without prior filtration and treatment. In general, modern high pressure hydraulic systems demand fluid cleanliness of ISO 16/14/11, or better. New fluid delivered in barrels could be as dirty as ISO 23/21/18.

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Handling of new fluid in a plant involves several points of contact between receiving and hydraulic reservoir (point of use). At each step in the process, the fluid should be filtered either by permanently installed filters, or by filter carts using high efficiency filter elements.



A kidney loop system, e.g. placed on a fluid storage tank, is continuously working with constant flow and is not influenced by pressure and flow variations that are present in a typically hydraulic system. Therefore, the kidney loop filter works more efficiently in removing particles than a system filter (pressure or return filters).

