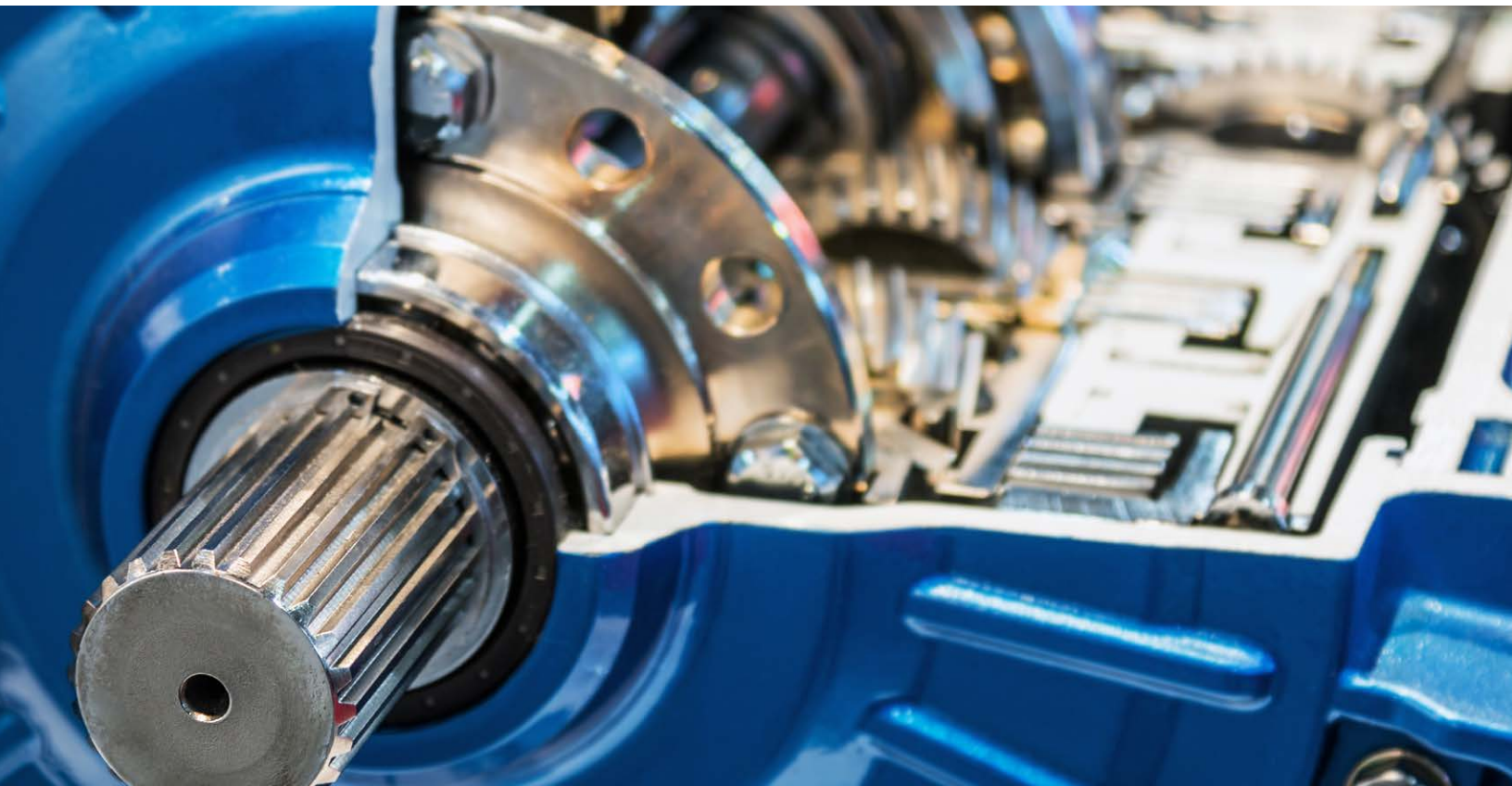




Gearbox

CONTAMINATION SOLUTIONS

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Gearbox Contamination

Sources of Contamination

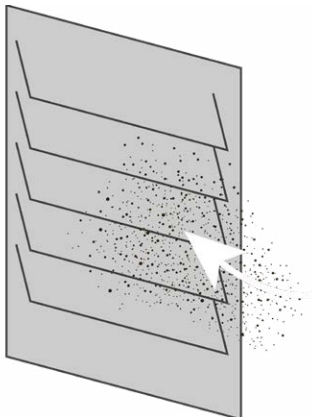
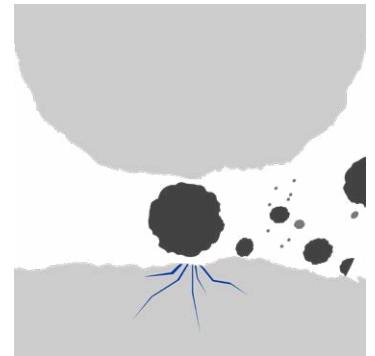


New Oil

New oil is one of the most often overlooked ways for contamination to enter a system. While it may have been “clean” leaving the manufacturer, particulate and water contaminants can be ingressed through any number of steps during transfer to your reservoir. Dirty hoses, unmonitored storage units, even exposure to atmosphere all provide opportunities for dirt to enter the oil and then your system. For these reasons, all oil should be passed directly through a high efficiency filter before being added to any system.

Internally Generated

Once contamination enters your system, it begins an autocatalytic cycle of wearing down components, fittings and bearing to create more particles which pass through and wreak havoc on your equipment. By minimizing ingress and filtering system fluids, you can prevent this chain reaction of wear to prolong component life and prevent costly downtime. No system, regardless of the size or oil characteristics, is immune to contaminants generated from within.



Airborne

Another often overlooked source of contaminant ingress is through atmospheric exposure. Reservoirs not sealed from atmosphere provide unbridled access to airborne particulate and moisture which degrade oils and strain system filters beyond their designed capabilities to protect your system. The **only** way to prevent airborne ingress is by sealing reservoir vents and incorporating breathers into the reservoir to allow for the fluid level fluctuations to inhale and exhale clean, dry air through the breather.

Maintenance

Every time your system is opened for maintenance, it is exposed to multiple sources of additional contamination. Airborne contaminants, dirty hoses, dirty hands or oil interacting with components, even dust sitting on pipes or overhead ducts can enter your system and dramatically increase ISO Codes. Proper practices alone aren't enough to prevent ingress. By filtering fluids prior to adding, recirculating fluids through kidney loops and eliminating points of ingress, you can minimize service intervals to prolong component (and oil) life to maximize your system's efficiency.



Types, Uses & Contamination Prevention

Implementing off-line filtration is the best way to ensure your hydraulic and lube oils are clean and your systems are operating efficiently. Whereas applications that consume fluids (diesel, etc) must filter fluids in a single pass, off-line filter systems for hydraulic and lube oils allow for recirculating the reservoir to remove more dirt with every pass. A dedicated off-line system has the added benefit of being used as a 3-way valve to top off the reservoir, turning your filter system into a fluid transfer solution that removes any dirt from oil that is added and prevents contamination from ever entering your system.



Dedicated

A properly sized off-line filtration system can turn over the entire volume of a reservoir several times a day, maintaining ISO fluid cleanliness codes well below the upper limit. Whether you're using low viscosity hydraulic or high viscosity lube oil, implementing dedicated off-line filtration will yield longer bearing and hydraulic component life and longer useful fluid life. When dealing with high viscosity gearbox and rolling mill lubricants, it's most effective to filter off-line so that the flow rate and filter can be sized for optimal pressure drop and element life without sacrificing efficiency. That means you can pump thick fluid through an oversized filter at a low flow rate and get it super clean, even when it's cold outside. And when the filter element has removed kilograms of dirt, you don't have to stop your operation to change it; just turn off the kidney loop, change elements, and get right back to filtering your fluids. With a dedicated system, you know that your fluids are always clean and your system is always protected.

Mobile

Portable filtration systems are a valuable tool in the battle against contamination and are ideal for fluid transfer and in field service work. The Donaldson Hy-Pro range of portable filtration systems includes compact units for small gearboxes, filter carts optimized for hydraulic applications and units with generously sized filters for high viscosity or highly contaminated fluids commonly found in fluid reclamation. Staged filtration, two filters in series, allows for combined water removal and particulate filtration in one pass to get you on to the next job more quickly. Donaldson Hy-Pro mobile filtration systems are designed for industrial, outdoor use with high quality components including cast iron gear pumps and non-shredding wheels that get your filtration exactly where you need it.



High Performance Filter Elements

Fluid Contamination Under Control with Donaldson Hy-Pro's Total System Cleanliness Approach

Our industry leading DFE filter elements remove more contaminants and last longer, saving you time and money in the long run.

We offer a variety of filtration solutions that can help protect your gearboxes from unplanned downtime and expensive wear.

DFE

Dynamic Filter Efficiency

The Dynamic Filter Efficiency Test (DFE) is the evolution of standard hydraulic and lube filter performance testing. DFE goes further than current industry standards to quantify capture and retention efficiency in real time by inducing dynamic duty cycles, measuring real-time performance during dynamic changes and the filters ability to retain particles.



Cellulose: $\beta_{10\mu_{[C]}} = 2$

Dirt in

50,000 particles $10\mu_{[C]}$ or larger

= 50,000 Particles In

25,000 Particles Out

Dirt out

25,000 particles $10\mu_{[C]}$ or larger

**50%
efficiency**

Glass: $\beta_{10\mu_{[C]}} = 4000$

Dirt in

50,000 particles $10\mu_{[C]}$ or larger

= 50,000 Particles In

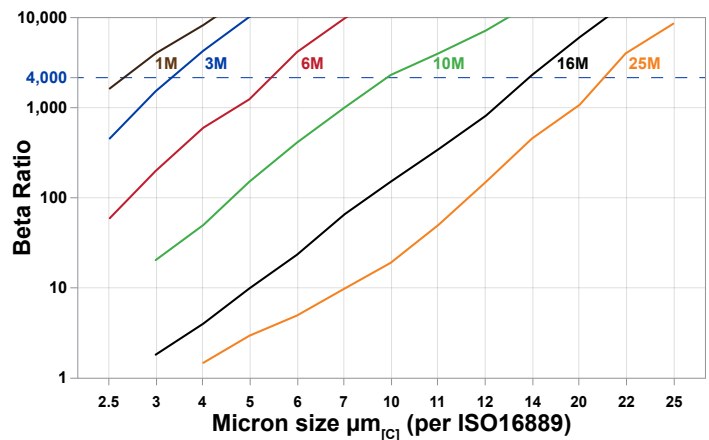
12.5 Particles Out

Dirt out

12.5 particles $10\mu_{[C]}$ or larger

**99.97%
efficiency**

Glass Media Filtration Efficiency (Beta Ratio) vs Micron Size



& Fluid Contamination Equipment

LF(M)

High Viscosity Filter Assemblies

Low pressure filter assemblies optimized for high flow hydraulic, high viscosity lube and heavily contaminated fuel applications.

Max Operating Pressure: 150 psi (10 bar)

Available options up to 450 psi (31 bar)



BT Breathers with T.R.A.P.™ Technology

Self-Regenerating Moisture and Particulate Breathers

Protect your uptime, critical hydraulic & lube assets and fluid life. Donaldson Hy-Pro Thermally Reactive Advanced Protection (T.R.A.P.) breathers are critical in Donaldson Hy-Pro's Total System Cleanliness approach as a barrier preventing airborne particles and water from entering reservoirs and gearboxes. Unlike traditional dessicant breathers, T.R.A.P. breathers can self-regenerate their water-holding capacity, extending the life of the breather and lowering the total cost of ownership.



**THERMALLY REACTIVE
ADVANCED PROTECTION**

hyprofiltration.com/

Donaldson.
HY-PRO™



Off-line Filter Systems

FSL

High Viscosity Filtration Systems

A dedicated contamination solution for bulk oil handling and fluid transfer. Designed to excel in filtering particulate from heavily contaminated oil, the FSL keeps gearbox lubricant clean and equipment running efficiently.

Ideal for high viscosity gearbox or lube applications and highly contaminated fuel applications.



FSW

Wall Mounted Filtration Systems

A compact, dedicated off-line contamination solution ideal for small reservoirs, gearboxes and diesel engine crankcase conditioning. Element media options for every application including particulate removal, water absorption, varnish and acid removal.

Compact and compatible, the FSW is the perfect off-line filtration system for removing contamination from your systems and making sure they remain in peak operating condition.





VUD

Vac-U-Dry Vacuum Dehydrator

The optimized balance between heat, vacuum, process design and an easy, user friendly operating system for removal of water and particulate from hydraulic and high viscosity lubricating oils. Equipped with generously sized high efficiency filtration, it's the ultimate oil purifier.

COF

Compact Offline Filter

Our smallest unit yet, the Compact Offline Filter is able to fit where no other filtration equipment can. Ideal for smaller systems, or where a larger offline system wouldn't fit, can be permanently installed or portable.

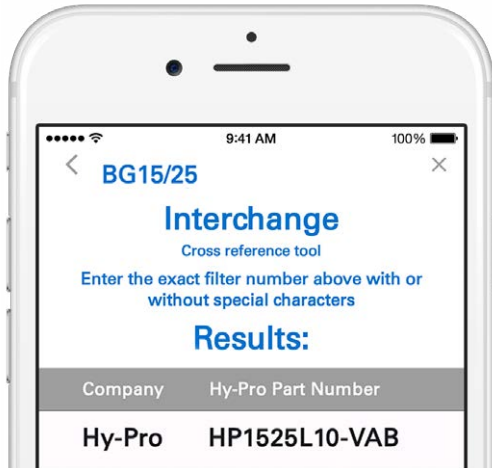
Typical applications include gear boxes, plastic injection molding machines, and vacuum pumps, to name a few. Choose between a variety of motors, wands, hoses, and portable cart options. Paired with our unique VTM elements, this unit can remove particulate, water, and varnish all with one filter.



Filter Element Interchange

The world's largest online selection of critical filter elements.

With over 500,000 filter element cross references, Donaldson Hy-Pro's Interchange offers an extensive and comprehensive selection of critical hydraulic and lube oil filter elements. Discover all Donaldson Hy-Pro cross references via our app, Donaldson Hy-Pro Solutions and our distributor website.



Download Donaldson Hy-Pro Solutions



Calculate the amount of contamination that passes through your hydraulic components and bearings and access to Donaldson cross reference with our app.

Available on
the App Store & Google Play



Donaldson Hy-Pro Total Solutions

Your Premier Partner for
Comprehensive Industrial Filtration Solutions and Services.

At Donaldson Hy-Pro, we are known for our expertise in industrial hydraulics; Donaldson also offers comprehensive filtration solutions. We can help with all your filter and service needs. If it needs a filter or service, we can help. Reach out today and we will connect you with the team that can help with your filtration needs.



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