Donaldson
HY-PRO™

Mining Industry

CONTAMINATION SOLUTIONS

Mining Industry Contamination

How Lubrication Keeps Mining Running Smoothly

Mining both surface and deep or underground are harsh environments for lubrication and contaminate laden. Dirt is a major factor but so can oxidation by-products and you cannot forget diesel filtration and water removal. It is critically important to have a proactive approach to your lubrication cleanliness.

Lubrication filtration is crucial in mining applications for several reasons:

Equipment Longevity: Mining equipment operates under harsh conditions, and contaminants like dust, dirt, and metal particles can cause significant wear and tear. Effective filtration removes these contaminants, extending the life of machinery.

Improved Efficiency: Clean lubricants ensure that machinery runs smoothly and efficiently. This reduces friction and wear, leading to better performance and lower energy consumption

Reduced Downtime: By preventing contamination-related failures, filtration minimizes unexpected breakdowns and maintenance needs. This keeps mining operations running continuously, which is vital for meeting production targets

Cost Savings: Regular filtration reduces the frequency of oil changes and repairs, leading to significant cost savings over time. It also helps avoid the high costs associated with equipment failure and downtime

Environmental Protection: Proper filtration helps in managing waste and reducing the environmental impact of mining operations. It ensures that lubricants are clean and can be reused, minimizing waste disposal issues

Safety: Clean lubricants reduce the risk of equipment malfunctioning, which can lead to accidents. Ensuring machinery operates reliably is essential for maintaining a safe working environment

Overall, lubrication filtration is a key component in maintaining the reliability, efficiency, and safety of mining operations.

Scan to Learn More

Solutions in Action

Donaldson Hy-Pro Element Upgrade Outperforms OE in Copper Mine

This case study describes how our high performance filter element upgrade helped a high-production copper mine improve its reliability and save money.

The Problem: A high-production copper mine relied on a lubrication system for their Nordberg® MP Series™ crusher*. This system used a duplex filter assembly with eight elements manufactured by a competitor.

The Solution: Donaldson Hy-Pro, in collaboration with its distributor, presented a cost-saving filtration solution to a mining company by upgrading their filter element to enhance efficiency and durability, addressing common issues with the existing element.

The Results: The Donaldson Hy-Pro high performance filter element upgrade surpassed the alternative in every respect. Our solution provided superior filtration performance, reduced operating costs, and extended the life of critical system components.

Scan to Download Case Study

Let's Work Together

Our experienced team can analyze your specific needs and recommend the perfect filtration solutions for your vessel. Contact Donaldson Hy-Pro today and let's work together to keep your assets running smoothly!

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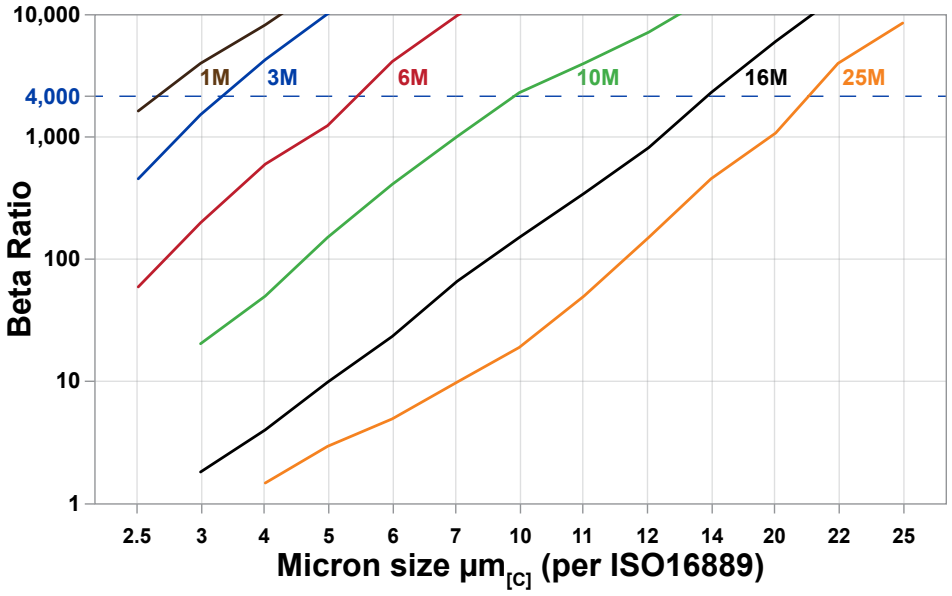
Donaldson HY-PRO™

How clean is my oil?

Highest single pass capture and retention efficiency.

Donaldson Hy-Pro DFE rated filter element upgrades deliver industry's lowest in-service ISO codes before and after the filter. Rated to $\beta X_{[C]} \geq 4000$, Donaldson Hy-Pro elements ensure your fluids are always clean and always in spec.

Glass Media Filtration Efficiency (Beta Ratio) vs Micron Size

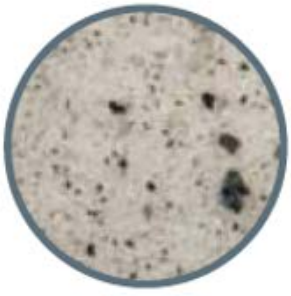


It's all about ISO Codes.

What really matters in critical hydraulic, lube and fuel applications is actual in-service oil cleanliness (ISO codes).
Proven in both the lab and real world applications, Donaldson Hy-Pro filter elements deliver the highest single pass efficiency, translating to remarkably lower in-service ISO Codes than competitors.

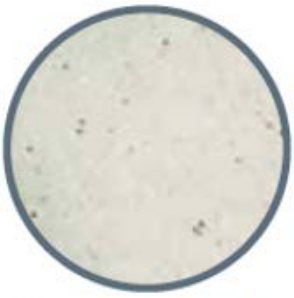
Recommended Cleanliness Levels

ISO 22/21/18



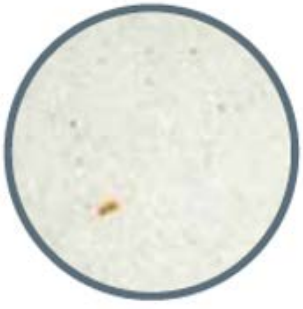
Typical cleanliness of delivered fluids

ISO 18/16/13



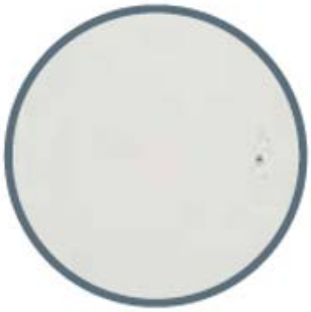
Target rating for heavy gear/ engine oils

ISO 16/14/11



Target rating for hydraulic/ transmission oils

ISO 14/13/11

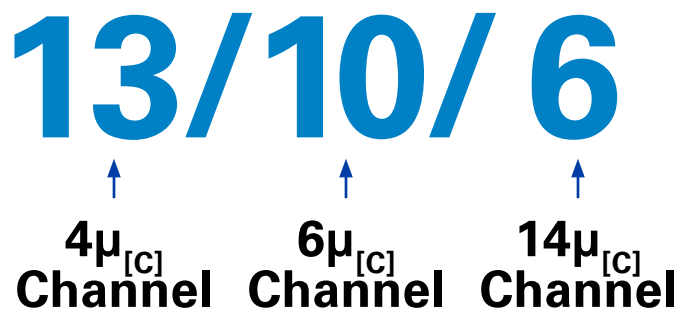


Target rating for diesel fuel

The ISO Cleanliness Code (per ISO4406-1999) is used to quantify particulate contamination levels per milliliter of fluid at 3 sizes - $4\mu_{[C]}$, $6\mu_{[C]}$, and $14\mu_{[C]}$. It is expressed in 3 numbers (example 19/17/14) where each number represents a contaminant level code for the correlating particle size. The code includes all particles of the specified size and larger.

It is important to note that each time a code increases, the quantity range of particles is doubling. Inversely, as a code decreases by one the contaminant level is cut in half.

ISO Code Example:



Fluid Cleanliness Code Comparisons

ISO/DIS 4406 BS 5540/4 Codes	NAS 1638	SAE 749	Defence Standard 05/42	
			Table A	Table B
25/23/17			100,000	
24/22/15			21,000	
23/21/18	12			
23/21/14			15,000	
22/20/17	11			
22/20/13			6,300	
21/19/16	10			
21/19/13			4,400	6,300F
20/18/15	9	6		
20/18/13				4400F
20/18/12			2,000	
19/17/14	8	5		
19/17/11			1,300	2,000F
18/16/13	7			
18/16/11				1,300F
18/16/10			800	
17/15/12	6	3		
17/15/10				800F
17/15/09			400	
16/14/11	5	2		
16/14/09				400F
15/13/10	4	1		
14/12/09	3	0		
13/11/08	2			

High Performance Filter Elements

The world's largest selection of critical filter elements.

With over 500,000 filter element crosses, Donaldson Hy-Pro's Interchange offers the most extensive and comprehensive selection of critical hydraulic and lube oil filter elements anywhere. And it's only growing larger. Each year, we catalog thousands of filter elements in our efforts to provide our customers with the best contamination solutions, service and support possible.

Element Upgrades for:

Pall
Schroeder
General Electric
Indufil
Stauff
CC Jensen
Filtration Group
MP Filtri
Hydac
Argo Hytos
Des Case
Hilco
PTI
Eaton
Rexroth
Filtroil
RRR
Parker
Internormen
Eppensteiner
Kaydon
Taisei Kogyo
Harvard
Mahle
Isopur
Yamashin
And More...

Industrial Grade - Outperform the original.

DFE Rated Glass Media

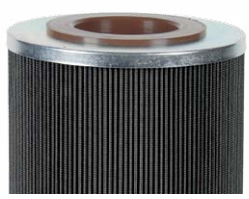
$\beta X_{[C]} \geq 4000$ rated, high efficiency capture and retention synthetic media.

Water Removal

Glass media with special layers to adsorb and retain water.

Wire Mesh

Coarse media for high viscosity fluids.



NSD Non-Spark Discharge

Glass media optimized to prevent element sparking.

Coalesce

Used to separate water from turbine oils and diesel fuels.

VTM

High efficiency particulate, insoluble oxidation by-product and water removal media.

ICB Resin

Specialty media for removing oxidation by-products from certain fluids.

Dynafuzz

Stainless fiber media for fire resistant and highly corrosive fluids.

VTM

Particulate, Water, and Oxidation By-product Removal Media

VTM media configuration is a combination of technologies that mechanically removes insoluble (suspended) oxidation by-products that form varnish deposits in additized AW hydraulic oils and EP gear lubricants. VTM adsorbs water and some polar molecules while removing particulate contamination to $\beta 0.9_{[C]} > 4000$. Ideal for high heat hydraulic and gearbox lube applications such as plastic injection molding, wind turbine, or coal mill applications. VTM is available in FSW, FSL, and FCL dedicated and portable off-line systems and is used in tandem with ICB media on FSTO, FSA, FSJL, and SVR solutions.

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.

Water Removal

G8 Dualglass Media with Water Removal

Media code "A" specifies G8 Dualglass media co-pleated with water removal scrim to produce a filter that can remove water while maintaining $\beta x_{[C]} \geq 4000$ efficiency down to $3\mu_{[C]}$. Available for all Spin-On and cartridge style filter elements.

Off-line Filter Systems

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.

CFU

Compact Filter Unit

Bigger isn't always better. The Compact Filter Unit provides you with the best filtration at a size you can take anywhere. Tried and true, the CFU is the ultimate filtration system in power and mobility. And with easy to change cartridge style MF90s, you can rest easy knowing your filtration will always exceed your expectations.

FPL

Dedicated Off-line Filter Panel

A dedicated contamination solution for bulk oil handling, fluid transfer and reservoir or gearbox conditioning.

Enhance cleanliness by adding the FPL to an existing hydraulic system and extend the life of in-line filters.

FSLD

High Viscosity Dual Filter Skids

A dedicated contamination solution for off-line conditioning and bulk oil handling. Dual housings allow flexibility in using staged element ratings to achieve remarkably clean fluids and hit target ISO Codes in fewer passes, all while extending filter element and oil life.

Ideal for conditioning reclaimed fluids or fluids with high dirt load.

FC

Filter Cart

A fully self-contained mobile solution for bulk oil handling, fluid transfer and reservoir or gearbox conditioning.

Ideal for lower viscosity hydraulic oil, lube oil and diesel fuel.

FCL

High Viscosity Filter Cart

A self contained solution for high viscosity bulk oil handling, fluid transfer and reservoir or gearbox conditioning.

Ideal for higher viscosity lube oil and highly contaminated fuel and hydraulic oil.

Water Removal Equipment

VUD

Vac-U-Dry Vacuum Dehydrators

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, the VUD is the ultimate oil purifier.

Keeping fluids clean and dry extends component and bearing life, increases productivity, minimizes downtime and extends useful fluid life. The VUD is ideal for removal of all forms of water, including free, emulsified and dissolved water and gas from hydraulic and lubricating oils.

V1

Compact VUD Vacuum Dehydrator

A compact and mobile dehydration and high efficiency filtration solution, the V1 prevent acidity and loss of lubrication properties caused by inefficient dehydration and high ingression.

Ideal for rapidly removing all forms of water including free, emulsified, and dissolved water and gas from hydraulic and lube oils.

COT

Turbine Oil Conditioning Skids

Remove harmful particulate and water contamination and achieve target ISO Codes faster with the COT.

Ideal for preventing unplanned downtime and premature component failures in turbine lube systems.

T.R.A.P.™ THERMALLY REACTIVE ADVANCED PROTECTION

BT Breathers

with T.R.A.P.™ Technology

Self-Regenerating Moisture and Particulate Breathers

Protect your uptime, critical hydraulic & lube assets and fluid life. 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.

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Varnish & Acid Scavenging Systems

LF(M)

High Viscosity Filter Assemblies

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

Diesel Filter Housings & Systems

COD

Diesel Conditioning Systems

Remove water and particulate to extend fuel injector life and increase combustion engine fuel efficiency.

Ideal for large mining and construction fueling depots, diesel fueled turbines, backup generators, and smaller day tank dispensing or on-board fueling truck applications. With options for adding non-powered units to existing fuel dispensing lines, there's a perfect COD for all of your diesel applications.

CSD

Diesel Coalesce Non-Powered Filtration System

Remove water to extend fuel injector life and increase combustion fuel efficiency. The CSD is designed for direct integration into fuel delivery systems with pump flow and pressure already in place for easy, streamlined water removal through your existing system. Using high efficiency coalesce and separating media, the CSD will keep diesel free from water contamination down to 50 ppm in a single pass.

Ideal for construction fueling depots, tank farms and common fuel rail applications.

Test Kits & Equipment

PFM75

Portable Fluid Monitor

Designed as a mobile on-line laboratory to measure particulate, water, and overall oil health, the PFM75 is an easy and cost effective way to track oil condition and optimize the efficiency of your hydraulic and lube assets. Take control of your oil analysis with the PFM75 to eliminate bottle sampling error and to get your results in real time without having to wait for the lab.

PM-1

On-Line ISO Code Particle Monitor

Get fast and accurate ISO cleanliness code readings from your hydraulic and lube oils in real time with the PM-1 Particle Monitor.

PTK1

Oil Analysis Patch Test Kit

With PTK1, oil cleanliness can be visually analyzed in the field without waiting for lab results and losing control of the analysis process. The PTK1 kit provides the opportunity to see the type, concentration, and actual size of particulate contamination inside the system.

VTK

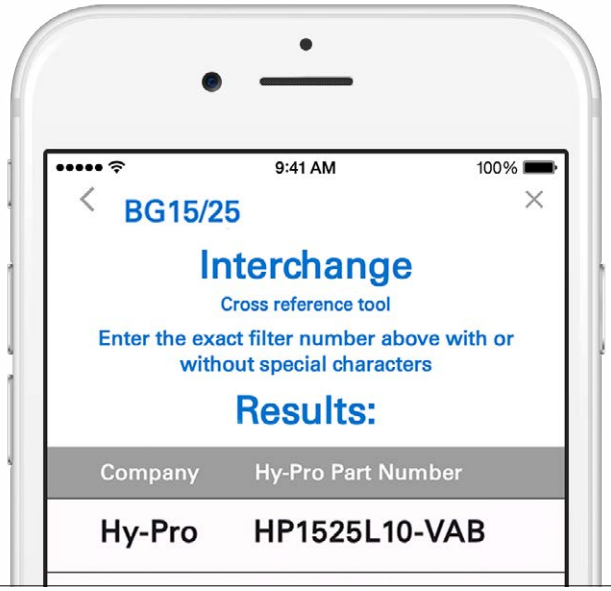
On-Site Varnish Test Kits

Condition monitoring is critical in staying ahead of lube oil degradation issues. Varnish Test Kits from Hy-Pro provide on-site access to laboratory grade Membrane Patch Colorimetric (MPC) testing as a key piece in predicting potential varnish problems before unit trip or fail-to-start conditions occur, all according to the world recognized ASTM D7843-12 standard for the measurement of insoluble oxidation by-products.

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

Download on the App Store

GET IT ON 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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