Donaldson
FILTRATION SOLUTIONS

Hydraulic Filtration Product Guide

Spin-ons • Cartridges • In-tank • Low Pressure • Medium Pressure • High Pressure • Duplex • Accessories

Donaldson Delivers Performance Under Any Pressure!
Clean, dry oil is essential for your equipment.
Donaldson Company, a leader in filtration for over 100 years, has proven performance in thousands of applications – offering the industry's largest selection of replacement hydraulic, lube and gear oil filtration products for contamination control.

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Locate the Donaldson model closest to the intersection of the maximum operating pressure and maximum flow rate. If there is not a model at the exact intersection, select the nearest series to the right or above the intersection to ensure a filter that is adequate to handle the maximum operating pressure and flow rate has been selected.

Pressure families are color coded in the selection chart for low, medium and high model series. Filter housing styles are identified by their shape.

Sensitive hydraulic circuits are vulnerable to a variety of contaminants that result in inefficiency, downtime and excessive repair costs. It is important to remember that protecting and maintaining the most sensitive components within a circuit will result in effective contamination control.

With the broad range of housing styles and filters available from Donaldson, how do you choose the right filter to reliably protect your systems and equipment? Follow these recommended steps to identify the correct Donaldson filter and parts required for efficient contamination control.

1 Determine the system operating pressure and flow rate

Start by identifying two key factors in the hydraulic system operating environment for the most critical component being protected, such as pumps and motors.

- nominal and maximum operating pressure
- nominal and maximum flow rate

2 Select the filter housing model

Refer to the Hydraulic Filter Model Series Selection Guide to select the filter housing that meets your requirements.

- Pressure families are color coded for low, medium and high models.
- Housing styles are identified by their shape code: spin-on, in-tank and in-line
- Porting type options – see page 3 for model series details.

3 Consider application factors when selecting the filter

After the appropriate housing is identified, other application factors must be considered when selecting the appropriate filter. Use the filter choice tables to determine a specific part number.

- components being protected
- ISO Code desired
- fluid type and material compatibility
- oil viscosity (SUS/cSt) and temperature
- vibration/cyclic flow surges
- media type
- flow rate (GPM/LPM)
- maximum allowable pressure drop
- efficiency / beta rating
- seal options
- standard vs. high-performance filters
- servicing and installation convenience

4 Choose the appropriate line and reservoir accessories

Items such as breathers, suction strainers, and gauges are important parts of an overall hydraulic system.

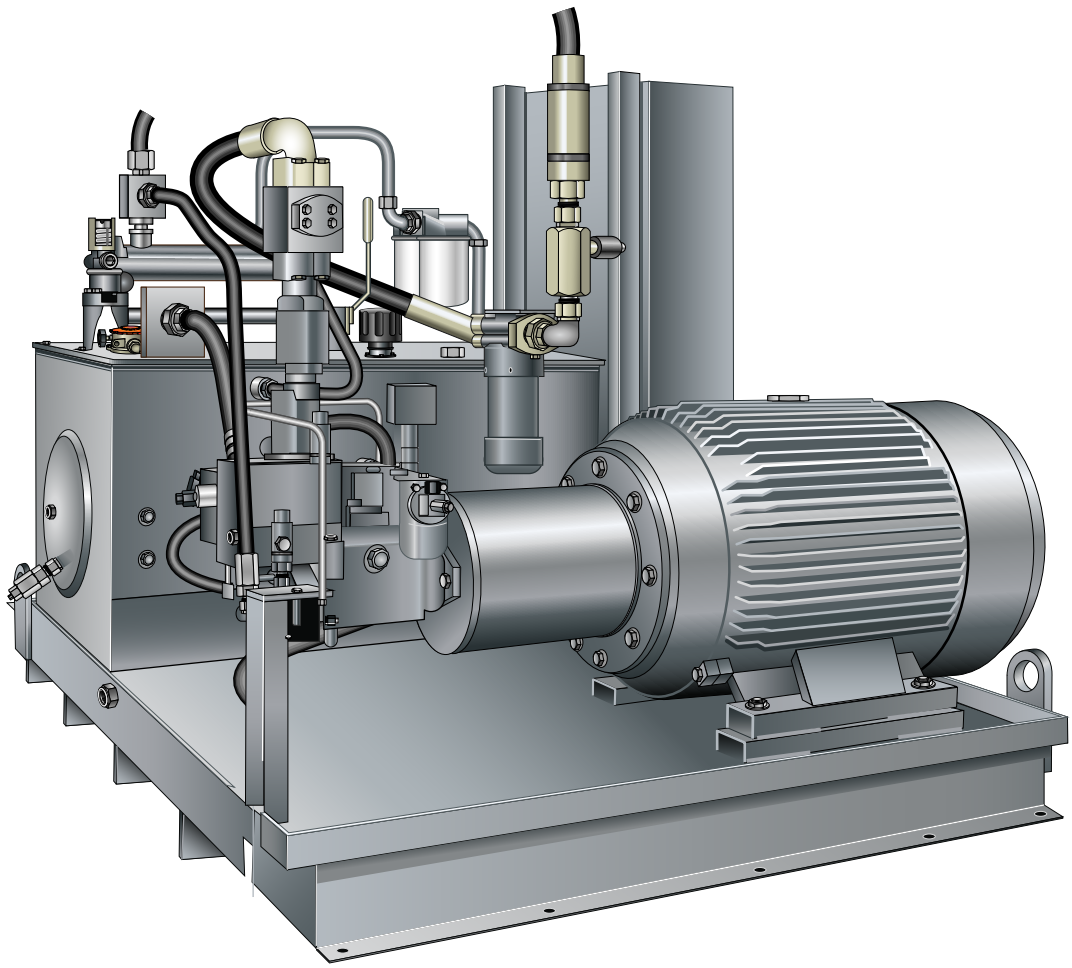
Refer to the Accessories Section for more information.

5 On-going contamination control practices

To optimize system performance and lengthen component life, new oil should be filtered before being transferred into a reservoir or gearbox. Monitor the condition of fluids and identify wear and contamination with regular fluid analysis.

Refer to the Off-Line Filtration and Fluid Analysis Sections for more information.

This publication contains a wide selection of standard and custom hydraulic filtration assemblies for equipment manufacturers – and replacement filters for both Donaldson housings and those produced by other manufacturers. Donaldson assemblies and filters can be used in both mobile and stationary equipment applications. For custom hydraulic filtration systems, please contact your Donaldson supplier.



Today's hydraulic systems are intolerant of corrosion, require higher cleanliness standards, and demand higher filtration performance. Hydraulic-powered vehicles and equipment owners desire solutions providing lower cost of operation and ownership. Donaldson works to develop new technologies that meet your engineering specifications and add customer value.

Low Pressure Filtration

Max operating pressure < 350 psi (24 bar)

Low pressure filters are the most commonly used type of filter in hydraulic circuits, used most often in return line applications.

Donaldson low pressure filters are rated for working pressures up to 350 psi (2400 kPa). In-tank and in-line configurations are available to accommodate virtually any application.

- Sensors, valves, and switches in various styles and port sizes
- Unique filtration performance options
- Integrated mounting brackets
- Broad range of package sizes
- Custom design options

Medium Pressure Filtration

Max operating pressure < 2,000 psi (138 bar)

Medium pressure filters can be used in applications up to 2000 psi (13790 kPa). Donaldson offers both spin-on and in-line cartridge-style filters.

Donaldson Duramax® filters are the highest rated medium pressure spin-on filters available. Duramax filters are proven, reliable, long-lived and easy to install.

- Die-cast and sand-cast custom head assemblies integrated into systems
- Enhanced system component protection
- Customized to existing filter interface – no system modification required

High Pressure Filtration

Max operating pressure < 6,500 psi (450 bar)

High pressure filters are positioned between pumps and critical components such as cylinders, motors and valves. They help protect these critical components from catastrophic failure.

Donaldson heavy-duty high pressure filters are rated for working pressures up to 6500 psi (44818 kPa). Various porting sizes and types, including manifold style, are available for a wide range of applications.

- High-performance filtration media options such as Synteq™
- Metal or plastic material options
- Multiple head interfaces

Off-Line Filtration

The Donaldson Filter Cart, Filter Panel and Filter Buddy™ offer convenient off-line filtration, flushing and fluid transfer. Use them with your stationary and mobile equipment to achieve and maintain proper ISO cleanliness levels.

Filter Cart

Designed with performance, convenience and safety in mind. Includes value-added features to protect your machinery and equipment from breakdowns caused by contamination.

Filter Panel

Provides fixed/mounted offline filtration and a turn-key approach to supplemental filtration.

Filter Buddy™

This handheld portable system provides the capability to kidney loop reservoirs that you normally cannot reach with larger filter carts. Its small size and light weight allow for carrying up and down stairs and access into tight spaces.

Replacement Filters

Donaldson offers a complete line of hydraulic filter heads and housings for low, medium, and high pressure applications. Spin-ons and cartridges are available in a wide range of filter medias.

When replacing another filter brand, our comprehensive and up-to-date cross-reference guide, available at shop.donaldson.com, can guide you through performance improvement possibilities.

Our worldwide network of authorized distributors is ready to serve you with their extensive experience with hydraulic circuits and with Donaldson filters. Most distributors stock our filters and we have quick-ship programs so you can get the filter you need, when you need it.

Accessories

Accessories for hydraulic circuits, lines and reservoirs that will help you maintain proper ISO cleanliness levels.

Service indicators to maximize filter life

Pressure gauges for monitoring system pressure

Hoses and test points for sampling oil and determining ISO cleanliness levels

Flanges to connect components

Valves for system control

Suction strainers help protect pumps from damage

Diffusers for reducing aeration, foaming, turbulence and noise caused by return lines

Sight and level gauges available, including plastic or steel screw-in styles for use in a variety of applications

Plugs, caps and vents for small power units and gearboxes

Filler breathers and caps come in chrome, zinc, epoxy-coated weatherproof finishes, and corrosion-resistance techno polymer – lockable, dipsticks and side-mount versions available

T.R.A.P. breathers provide fast-acting protection against airborne moisture and particulate contamination. They stop solid particulate down to 3 µm at 97% efficiency and prevent moisture from entering the reservoir. Water-holding capacity is regenerated with every oil return phase. This self-regenerating capability enables extended breather life.

Warranty

Donaldson warrants its aftermarket products against failure due to defects in materials and workmanship for the period specified under the Terms and Conditions for the particular product. You have a choice. You can always choose top-quality Donaldson filters designed specifically for your engines and equipment and – as long as you change them according to the engine manufacturer's maintenance schedule – using Donaldson filters will not void your engine manufacturer's warranty.

Go to **donaldson.com** to learn out more on our aftermarket warranty.

Filter Media Design and Development

From traditional cellulose to synthetic, the development of proprietary filtration substrates is at the heart of every Donaldson filtration system. If our existing media formulation doesn't meet our customer's specifications, our scientists use our in-house media development laboratory to design new formulations to meet your needs.

- Permeability
- Tensile strength
- Mullen burst
- Basis weight
- Pore size
- Thickness
- Gurley stiffness
- LEFS bench
- 3-Point bend

- For application development
- Trial media production runs
- Development of proprietary formulations

- Particle counting
- Multi-pass testing
- Water removal efficiency

Donaldson Media Formulations Set the Standard for Filtration Performance!

Donaldson offers over 35 different media formulations for hydraulic filters, allowing our engineers to deliver filtration solutions that meet our customer's unique requirements.

We use a variety of techniques to enhance filter media so it can withstand the high differential pressures found in hydraulic systems. Oven-curing, wire backing and multiple layers all contribute to our media integrity. Our medias include:

DT High-Performance media utilizes a blend of borosilicate glass fiber whose matrix is bonded together with an epoxy-based resin system. Donaldson filter media scientists found this to provide the best available chemical resistance for the broadest array of hydraulic applications. This media is also ideal for use with phosphate ester and water glycol fluids.

This media's uniform synthetic fiber structure delivers higher filtration efficiency and longer filter life. Synteq filter media technology is ideal for synthetic fluids, water glycols, water/oil emulsions, HWCF (high water content fluids) and petroleum-based fluids. The smooth rounded fibers provide low resistance to fluid flow.

Synteq™

This media often has lower beta ratings, providing effective filtration for a wide variety of petroleum-based fluids. The smaller pores result in greater flow resistance, in turn causing higher pressure drop.

This media is formulated with absorbents and resins to remove moisture and condensation from petroleum-based fluids.

Wire mesh media consists of stainless steel, epoxy-coated wire mesh. This media is used to catch very large, harsh particulate that would rip up a normal filter. It is also useful as a coarse filter in viscous fluid applications.

Donaldson has pioneered the use of a wide range of engineering, design and testing tools used during the product development and validation process.

Engineering Capabilities

Global design centers

Prediction and simulation

Development and Validation

Filtration performance testing per SAE and ISO standards

Test & Evaluation Tools

Structural analysis per SAE, ISO, and NFPA standards

Filtration performance testing

Analytical chemistry laboratory

Design Validation

Global test cell locations

Tests for: pressure drop, high temp, flow fatigue, used oil analysis, component durability, and fluid compatibility

Vibration/Shaker

Field testing

Field data acquisition

Quality Certified

All facilities are ISO/AS certified

Quality controls

Manufacturing

Global manufacturing locations

Engineered and manufactured to ensure long-life, durability, corrosion resistance and liquid compatibility

Packaging options to meet international shipping and compliance specifications

Logistics / Distribution

Global distribution network

Regional distribution centers

Transportation, third party logistics, consolidators and cross-docking networks