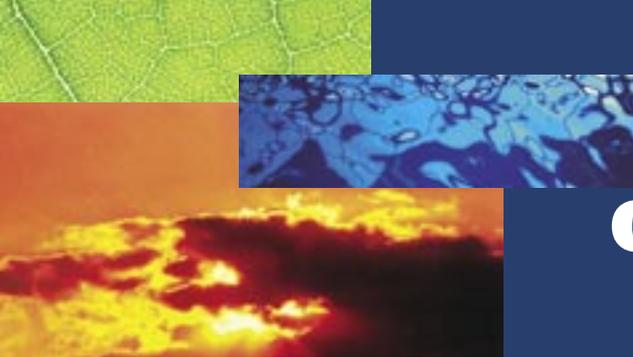




Donaldson®  
*Filtration Solutions*

A Cleaner World for Industry



# Global Resources for Filtration Solutions

## GLOBAL RESOURCES FOR FILTRATION SOLUTIONS

Donaldson Company, Inc., headquartered in Minneapolis, Minnesota, is the leader in providing filtration solutions to customers around the world. Donaldson creates a broad spectrum of filtration products and services to meet the evolving needs of its diverse customers. These filtration solutions span the entire life cycle of a customer's application, from initial system design through replacement products.

Donaldson serves customers in the industrial and engine markets, including dust, fume and mist collection, power generation, specialty filtration, compressed air purification, off-road and industrial equipment, light-, medium- and heavy-duty vehicles and emissions control products.

Since 1915 Donaldson has differentiated itself through technological innovation — delivering the best filtration products in the markets it serves, providing superior selling and customer support, and establishing the broadest global network in the industry. All this combines to make Donaldson the premier source of quality filtration solutions for customers around the globe.



### MANUFACTURING

Donaldson dust, fume and oil mist collectors improve air quality and provide energy savings. Donaldson hydraulic filters help safeguard critical components in machinery.



### AGRICULTURE

For hardworking agriculture equipment engines, Donaldson provides that extra measure of engine protection in difficult working environments.

### CONSTRUCTION

Donaldson is the world's leading first fit supplier of air filtration, exhaust and hydraulic systems for construction and mining markets, requiring heavy-duty protection.





### **POWER GENERATION**

Donaldson self-cleaning air filtration systems have been cleaning combustion air on gas turbines, generators, and compressors since the early 1970s, providing blade protection and boosting power output.

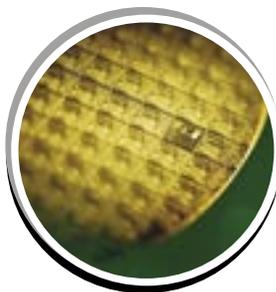


### **AEROSPACE**

Donaldson has developed a wide range of state-of-the-art filters for commercial airliners and general aviation aircraft.

### **SEMICONDUCTORS**

Chemical and particulate filtration for semiconductor process.



### **DISK DRIVE / MICROELECTRONICS**

Donaldson precision manufacturing and assembly capabilities allow seamless integration of filtration components with a wide variety of microelectronic devices.



### **TRANSPORTATION**

Leading truck and bus manufacturers around the globe rely on Donaldson for quality engine protection products. Superior design features optimize performance and efficiency while reducing maintenance costs.

# Engine Filtration Technology

for long-life and reduced maintenance

Applying innovative technology, Donaldson products maximize equipment performance and reduce maintenance costs for customers all over the world.





## Filter Media Technology

Donaldson manufactures the world's most advanced engine filtration products — thanks to our innovative media technologies for both air and liquid filters. We rely on continuous advancements by our dedicated scientists and engineers to maintain our leadership position.

## Air Filtration Systems

Donaldson has pioneered the development of nearly every major advancement in heavy-duty engine air filtration since 1915. We've expanded this tradition by introducing new designs for SUVs, light-duty trucks and high performance cars.

Donaldson air filtration technology for vehicle and equipment manufacturers includes PowerCore™, Ultra-Web® and Spiracle™ Filtration Technologies, among others.

PowerCore Filtration Technology (pictured on the left) is 10 times more efficient and considerably more compact than standard pleated cellulose filters. Our Spiracle Filtration System reduces engine oil consumption, underhood odor/fumes, road drops and emissions.

## Liquid Filtration Systems

Changes in emissions laws and new engine technologies place ever increasing demands on filtration systems. Today's diesel engines run at higher temperatures and require optimum filtration performance. With greater efficiency, more capacity and long service life, you get maximum engine protection. Donaldson has the unique capability to design and integrate your entire liquid filtration system.

Donaldson hydraulic filtration sets the standard for performance, reliability, value and ease of use. Hydraulic system designs include sensors, porting options, high performance spin-on filters and metal or metal-free cartridges.

## Aerospace and Defense

Our products are used in the roughest aircraft and military applications — effectively filtering air, lube, oil, fuel, transmission and hydraulic fluids, as well as reducing exhaust noise and emissions.

Donaldson delivers industry-leading inertial air separation systems for avionics, rotocraft engines, cooling systems and marine applications — delivering reliable, low-maintenance air filtration.



# Emissions & Exhaust Systems

for a cleaner, quieter world

For more than 50 years, Donaldson has led the development of exhaust systems, components and accessories by utilizing acoustics, flow distribution, thermal management, durability and system integration technologies.





## Diesel Emission Reduction Systems

Donaldson has been producing emissions reduction systems since the 1990s. We work with our customers to design and apply the best available reduction technologies both for tailpipe and crankcase emissions.

### Design Capabilities for Original Equipment Manufacturers

Donaldson leads the development and supply of exhaust and emissions systems for medium- and heavy-duty diesel-powered vehicles and equipment. By applying our on-site technologies in flow distribution, thermal management, durability, system integration and acoustics, we design efficient and cost-effective solutions.

### Emissions Retrofit Solutions

Public awareness and government regulations make emissions reduction a must for diesel engines. Donaldson works closely with national, state and local government agencies to educate and recommend solutions that meet applicable regulations.

Donaldson retrofit solutions can reduce emissions by over 85%. Our most cost-effective solution is our Diesel Oxidation Catalyst (DOC) Muffler combined with our Spiracle™ Crankcase Filtration System. Our solution for the most efficient emission particulate matter reduction is our Diesel Particulate Filter (DPF) combined with our Spiracle Crankcase Filtration System.

Our Active Regeneration DPF System provides a reliable solution for equipment operating in low temperature, transient and extended idling conditions.



### Crankcase Filtration Systems



Up to 25% of a vehicle's total diesel emissions are attributed to an open crankcase. The Donaldson Spiracle Crankcase Filtration System closes the crankcase and eliminates emissions as well as diesel blow-by odor and oil drain.

### Exhaust Mufflers, Clamps, Flex Tubing and More

We offer a complete line of replacement exhaust products for on- and off-highway vehicles through our extensive distribution system.



# Replacement Filters for Engines & Equipment

available through a global distribution system

The Donaldson global distribution network delivers filtration and exhaust products quickly and accurately to meet the needs of our customers around the world.

Our streamlined delivery processes are key to saving our customers time and money.





## Quality and Value

Donaldson replacement products meet the same quality standards as the products we supply to equipment and vehicle manufacturers. They are durable, reliable and built to withstand the intended operating condition.



## Technology

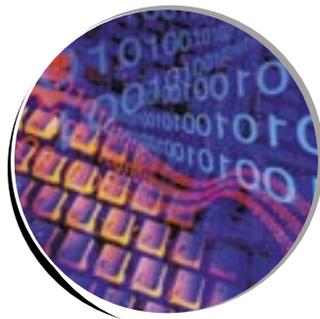
Donaldson filters utilize the latest in filtration technology, such as Ultra-Web®, PowerCore™ and Synteq™ filtration technologies.

Donaldson Endurance™ air filters last twice as long as conventional filters, while providing increased engine protection.



## Global Distribution System

The Donaldson global distribution network delivers filtration and exhaust products quickly and accurately to meet the needs of our customers around the world. Our streamlined delivery process saves our customers time and money.



## E-Commerce

Through our web site, Donaldson customers can easily find the proper replacement part, view detailed product information, place orders and track order progress. Donaldson also uses a variety of other business transaction methods for communicating with customers of all sizes.



## Diverse Customer Reach

Donaldson products are readily available through authorized independent and original equipment distribution outlets throughout the world. Visit [www.donaldson.com](http://www.donaldson.com) to find the location nearest you!

# Compressed Air & Gas

**quality is our philosophy**

Donaldson delivers a complete system of filtration and separation products for compressed air systems. Our technology in the field of compressed air, gas, fluid separation and condensate management extends from the compressor room to all points of use in the factory.





## System Solutions

Donaldson provides total system solutions for the reliable and economical use of compressed air and gas. Donaldson mobile and stationary compressor solutions include filters and housings for air intake, air/oil separators, fuel and lube filters, emissions and exhaust systems. Donaldson has the analytical tools and engineering expertise to tailor comprehensive solutions for specific production requirements.



## Dry Compressed Air

A dryer is essential in treating compressed air and gases. Ultrapac Classic adsorption dryers ensure clean, dry air in even the most extreme conditions. These desiccant dryers offer high capacity, operation in high ambient temperature and high humidity environments and low operation pressure.



## AG/SG Superplus Industrial Filters

Superplus is the only industrial filter system to include electronic zero-loss drain with a three-part filter housing and a microprocessor-controlled economizer, achieving energy savings of up to 70%.

## Refrigerated Air Dryers

Providing premium quality refrigerant compressed air dryers which significantly improve the reliability of the compressed air system, optimize productivity and help to keep compressed air operating costs to a minimum.



# Industrial Hydraulics

**lowering costs of ownership through clean oil**

Whether it's located inside a plant or outdoors, manufacturing machinery needs clean oil for maximum life and optimal productivity.

Donaldson industrial hydraulic filters and accessories reduce contaminants to keep equipment running smoothly.

Our value proposition is to provide industry the lowest cost of ownership via clean oil. That means less downtime, longer machine life and lower maintenance cost. To that end, we strive to design highly effective filters with consistent and verifiable performance.





## Comprehensive Filter Line

Donaldson offers a full line of low, medium and high pressure hydraulic filters, filter housings, assemblies, heads and spin-ons for in-plant and mobile industrial applications. Advanced Synteq® synthetic media and Duramax® spin-on filters protect machinery and clean hydraulic oil in thousands of applications around the world.



## Hydraulic System Accessories

Hydraulic systems are made up of more than filters. That's why Donaldson offers a wide selection of indicators, reservoir tank breathers, suction strainers, filler breather caps, gauges, flanges, valves, test points and more.



## Filtering Bulk Oil

In bulk applications, oil can easily get contaminated with built-in, ingressed or induced particulate and bacteria growth. Filtering oil in bulk storage tanks and reservoirs makes it easier to keep it clean in machines and hydraulic circuits.



## Replacement Elements

Donaldson carries the industry's largest selection of replacement hydraulic filters — in stock and ready to ship. A convenient part number cross-reference guide is located on our web site [www.donaldson.com](http://www.donaldson.com).

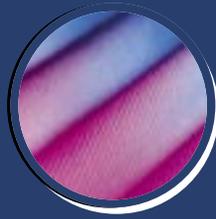
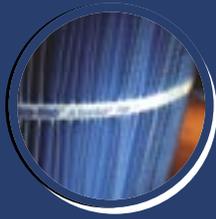
# Industrial Air Filtration

**dust, fume and oil mist collection**

All industrial operations and processing activities generate either dust, fume or oil mist. These contaminants must be reduced to enhance air quality.

The Donaldson Industrial Air Filtration group contains a wealth of experience and expertise through its product brand Donaldson Torit®.





## Nuisance Dust Collection

Through leading product brands such as Downflo® Oval, Unimaster®, Vibra Shake™, and Dalamatic®. Donaldson possesses unrivaled quality and versatility to solve most nuisance dust control problems.

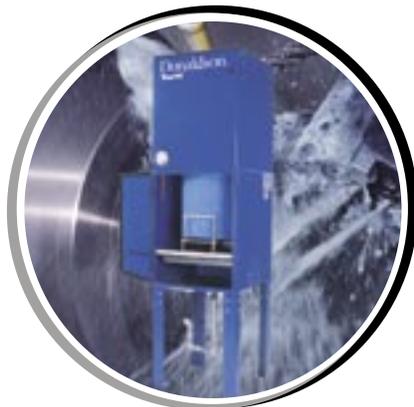
## Process Dust Collection

Process industries such as cement manufacturing, chemicals, pharmaceuticals and the food processing sector demand a special type of dust control system. World-renowned products such as Downflo and Dalamatic both deliver effective solutions in these demanding applications.



## Fume Control and Collection

Industrial processes such as welding and laser and plasma cutting generate heavy fumes, which may contain particulates that are often comprised of submicron-sized particles. At the heart of Downflo Oval and Downflo II collectors is Donaldson's Ultra-Web® nanofiber technology, delivering the highest possible standard of filtration efficiency.



## Oil Mist Collection

Uncollected coolant and machine oil mist leaves condensation and residue on floors, machines, walls and ceilings, creating an unclean manufacturing environment. Donaldson Torit provides a comprehensive range of mist collectors, which are engineered to provide an effective and efficient solution.

## Replacement Filters and Service

Torit-Built® filters and bags are stocked and distributed quickly through two strategically located Product Distribution Centers.



# Gas Turbine Filtration

**for optimal performance in all environments**

**Donaldson is the leading supplier of custom-engineered complete air intake systems for gas turbines and industrial compressors, for new and retrofit applications.**

**The on-going development efforts in gas turbine air treatment are supported by the most advanced engineering tools in the industry including structural analysis, fluid dynamic analysis and filter modeling.**



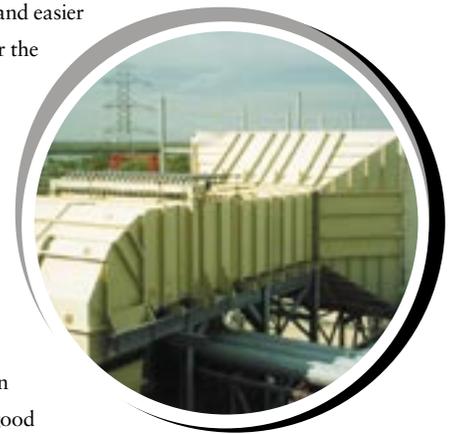


## Self-Cleaning Air Filtration Systems

Donaldson self-cleaning air intake systems offer high-performance/low-maintenance protection for gas turbines, generators, and compressors. Choose the GDX™ with pairs of cartridge filters or the new XLR™ with PowerCore™ media technology in a 40% smaller system. Our UniMod component designs yield faster and easier field assembly. Donaldson facilities are located all over the globe to serve turbine OEM's and engineering firms.

## Air Inlet Enhancements

Donaldson evaporative coolers and chiller coil systems help optimize turbine output in warm operating environments. Ducting from the filter system into the turbine can also include an inlet silencer section, which is especially good in urban areas. Perhaps you need a Donaldson inlet heater, anti-icing device or an inlet bleed heater to optimize and/or boost turbine output.



## Static Filter Systems

When the self-cleaning function is not needed, choose a Donaldson GDST™ system for on-shore or GTM™ system for off-shore usage. This multi-stage unit works well in urban, industrial, off-shore and marine environments. A full range of inlet enhancements is available.

## Conversions, Modifications and Upgrades

When it's time to upgrade, update or add a feature to your air inlet system, please call Donaldson. Our CM&U team stands ready to discuss your specific needs and find the best solution for your update.

## Replacement Filters & System Spare Parts

Cartridge & panel filters with our patented Spider-Web® media technology..... pre-filter panels & wraps....mist eliminators & coalescers... solenoids & valves.... gauges & switches....everything you need for inlet system maintenance.



# Donaldson Membranes

**industrial filtration, technical products  
and performance fabrics**

Donaldson Membranes manufactures Tetratex® PTFE films, which are designed for use in a diverse range of applications such as environmental and pollution control, fluid separation, water-resistant venting, medical, military and emergency service garments.



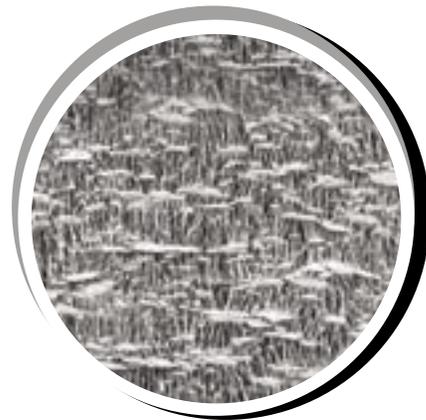


## Quality & Expertise

PTFE (polytetrafluoroethylene) is chemically and thermally stable even in extreme conditions. Our expertise enables us to manufacture PTFE membranes to a wide range of specifications to meet the most demanding requirements.

## Membrane Technology

The microstructure of Tetratex® is comprised of millions of small, randomly connected fibriles that create unique performance characteristics.



## Industrial Air Filtration

Tetratex PTFE filter media is the technology of choice in many industries. The benefits of this membrane technology — including improved air flow, reduced pressure drop, increased air-to-cloth ratio, longer bag life, near zero particle emissions and reduced energy conditions — meet the demands of modern plant operations.

## Technical Applications

Tetratex is dimensionally and chemically stable in almost any environment ranging in temperature from -270 C to 260 C. This means Tetratex is ideally suited for advanced technical applications — in microfiltration, medical products, chemical processing and other demanding end uses — where other materials may fail.

## Laminated Performance Fabrics

Laminated structures of Tetratex PTFE membranes are extremely water repellent while allowing moisture vapor to pass through. These characteristics result in breathable and waterproof fabrics that provide superior comfort and protection from wind, rain and freezing temperatures.



# High Purity Products

controlling the chemistry of ambient air

Donaldson focuses on critical applications requiring a high degree of cleanliness and protection for processes and equipment.

Our products are designed to control airborne molecular contaminants in highly sensitive process environments, such as semiconductor manufacturing, industrial photocopiers and fuel cells.



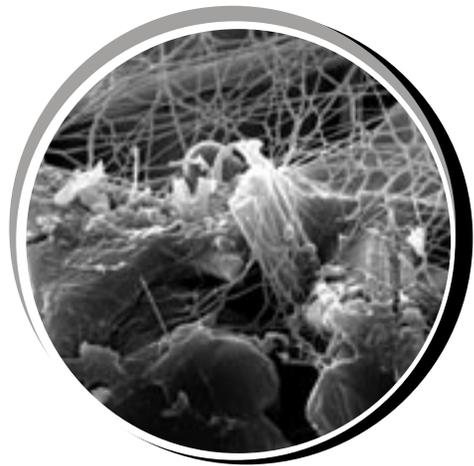


## **Filtration for Semiconductors**

Working closely with Original Equipment Manufacturers, fabricators and academic institutions, Donaldson Semiconductor Applications Group offers solutions to the control of chemistry in ambient air.

## **Nanofiber Technology for Non-Filtration Applications**

After using our exclusive electrospun media technology in air filters for two decades, Donaldson is now leveraging our nanofibers and electrospinning capabilities into a wide range of new applications, including cell biology, vacuum cleaners and many others.



## **Filters for Fuel Cells**

Fuel cells need specialized air management and filtration to maintain stack performance and durability, and Donaldson is at the forefront in providing particulate/chemical filtration and noise reduction systems, all integrated with ducting, sensors, heat exchangers and other components of the fuel cell.

## **Filters for Imaging Applications**

Our filters remove toner, ozone and other gases generated within copy machines and high speed printers. We improve the environment and safeguard the sensitive parts of the equipment.



# Disk Drive & Microelectronics

**contamination control for critical applications**

Donaldson precision manufacturing, injection molding, conversion and assembly capabilities allow seamless integration of filtration components with a wide variety of microelectronics devices.

Donaldson Disk Drive and Microelectronics group combines ePTFE membrane, filtration and adsorbent technologies with device integration expertise to develop contamination control solutions for a diverse range of applications. These include innovative solutions for disk drives, sensors, portable/micro fuel cells, optical devices as well as gas vents and/or liquid barriers for batteries, horns, headlamps, critical enclosures and a host of other applications.





## Disk Drives

Donaldson ePTFE membrane filters, combined with carbon or desiccants, help to protect disk drives from contamination by particles, hydrocarbons, acid gases and water vapor condensation.

## Sensors

Long-term exposure to airborne contamination such as particles, oil, water, salt water, hydrocarbons, water vapor and acid gases can lead to signal error, calibration drift and finally, sensor failure. Donaldson makes a wide variety of filters and breathers designed to help protect sensitive electronic devices from this contamination.



## Portable/Micro Fuel Cells

Donaldson's Fuel Cell Contamination Control Group is applying our design and manufacturing technologies to the contamination control requirements of portable/micro fuel cells.

## Optical Devices

Precision optical devices such as cameras, telescopes, binoculars, video camcorders, scanners and night vision equipment can be sensitive to water vapor condensation, hydrocarbon condensation and fungal growth. Unique assembly capabilities and high-density adsorbent elements allow these products to be installed in devices with extremely restrictive spaces.



## General Breathers & Venting

The unique hydrophobic, oleophobic and high filtration efficiency properties of Donaldson membranes have led to use in pellicles, batteries, medical container venting, inkjet cartridge venting and general applications requiring simultaneous pressure relief and liquid barrier properties.





# Donaldson®

Filtration Solutions

*Worldwide Headquarters, est. 1915*  
Donaldson Company, Inc.  
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*Regional Headquarters*  
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For a complete list of Donaldson locations and distribution outlets, visit [www.donaldson.com](http://www.donaldson.com)



# Compleat Confidence with the **New** and **Improved** Donaldson® **Triboguard™** *Premium uptime protection™*



It's more than a filter – it's a  
**critical uptime component**

# Our **new** and **improved** pleat pack offers **even better uptime protection**

## **Compleat Redesign**

You asked for better filtration. You got it again. Our engineers redesigned our pleat pack to give you up to **73% more dirt-holding capacity** than previous Donaldson® Triboguard™ filters AND up to a **47% lower initial pressure drop**.

## **Compleat Protection**

Every hydraulic system has suspended particles in its fluid. Contaminants grind and wear at the surface of moving parts, introducing even more particles into the system. **These contaminants cause more than 70% of all hydraulic system downtime.** The new and improved Donaldson® Triboguard™ filters offer you better protection from the particles and contaminants that reduce the effectiveness of lubricant and hydraulic fluid.

## **Compleat Confidence**

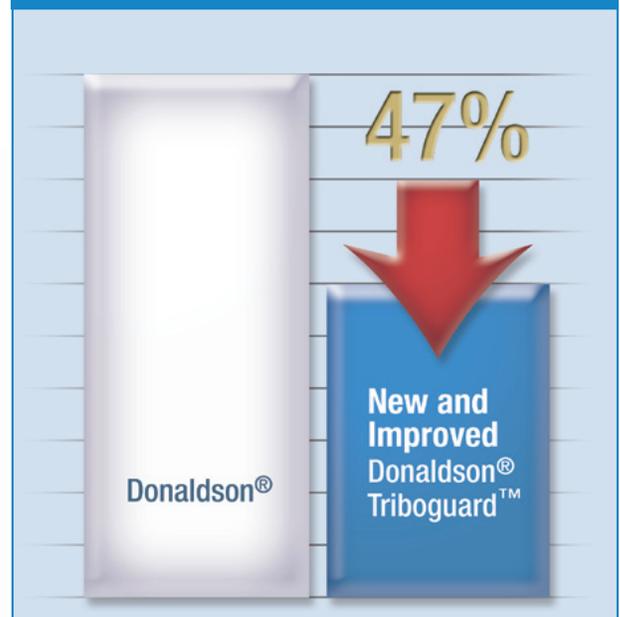
Downtime isn't an option. If you're not productive, you're not profitable. **Better protection** means **better productivity**, and that boosts your bottom line. Protect your uptime with Donaldson® Triboguard™.



## Dirt-Holding Capacity Improvement

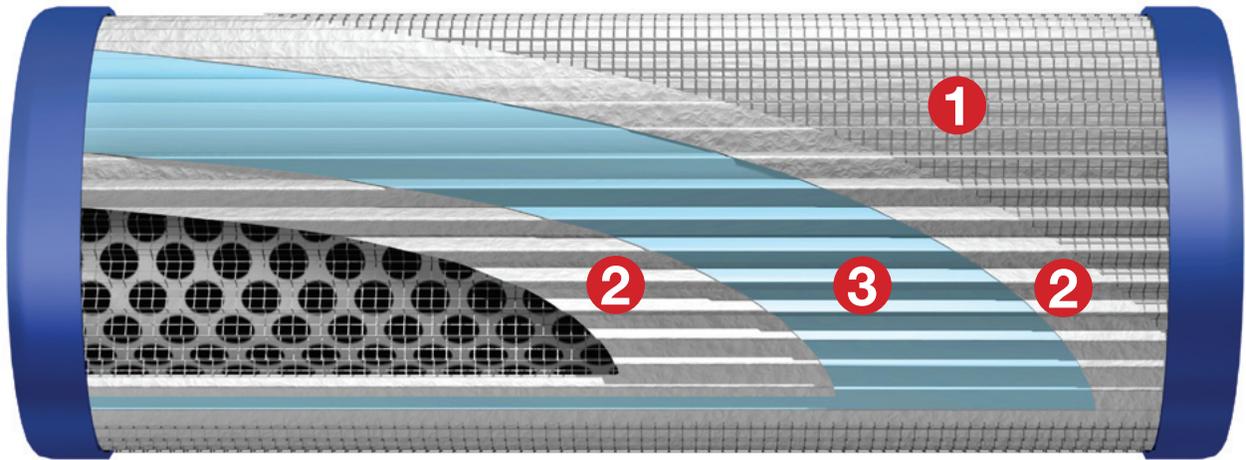


## Pressure Drop Improvement



## How uptime protection works

**New** and **improved** Donaldson® Triboguard™ filters feature an advanced pleat pack design that provides premium protection for your system:



### 1 Epoxy-Coated Steel Support Mesh (Upstream and Downstream)

- Provides excellent pleat support and spacing
- Protects against media damage during handling and installation
- Excellent compatibility
- Allows for maximum effective media area

### 2 Media Support Layers (Upstream and Downstream)

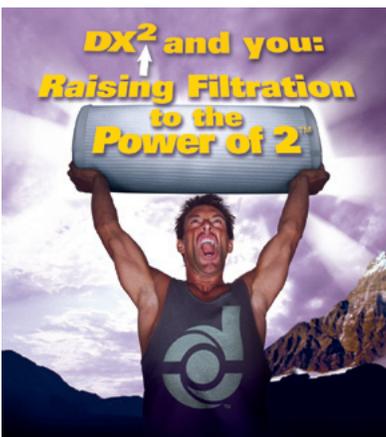
- Optimizes media support
- Protects media during pressure surges

### 3 Synteq® Media

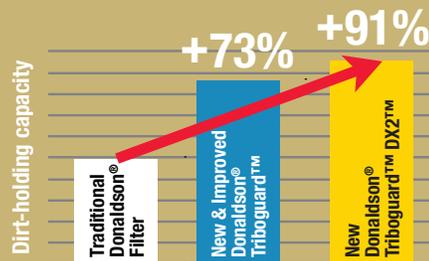
Donaldson-developed Synteq® synthetic filter media has smooth, rounded fibers for low resistance to fluid flow. Synteq® media is ideal for filtering synthetic fluids, water glycols, water/oil emulsions, HWCF and petroleum-based fluids.



- Donaldson's synthetic filter media is specially developed for fluid filtration
- High-efficiency media grades with performance to  $\beta_{<4(c)}=1000$  (per ISO 16889)
- Exceptionally low flow resistance
- Consistent performance throughout the life of the filter
- Excellent compatibility



Ask about the **new Donaldson® Triboguard™ DX2™**. This new, innovative 2-in-1 filter design results in **91% more dirt-holding capacity**, reducing maintenance costs.



- **Up to 43% more pleats** than other leading hydraulic filters
- **All the features of a coreless design** – without the expense of housing modifications
- **Environmentally friendly**, fully disposable – reduces waste and disposal costs

**Compleat**  
**Confidence**  
 with the  
**New and Improved**  
**Donaldson**  
**Triboguard™**  
*Premium uptime protection™*



Donaldson® Triboguard™ replacement elements are engineered to fit many competitive applications including some of the most popular listed below.

<b>Fairey Arlon</b>	170, 270, 370, 1000, TXW, TXW2, TXW3, TXW3D, TXW4, TXW5, TXW8A, TXW8C
<b>Hydac</b>	0030D, 0060D/R, 0075D, 0110D/R, 0140D, 0160D/R, 0165R, 0240D/R, 0280D, 0330D/R, 0660D/R, 0850R, 0950R, 1300R, 2600R
<b>Pall</b>	4704, 6300, 6400, 6500, 7500, 8200, 8300, 8310, 8314, 8800, 8900, 8904, 9020, 9021, 9024, 9100, 9101, 9104, 9400, 9404, 9600, 9601, 9604, 9650, 9651, 9800, 9801, 9804, 9901
<b>Parker</b>	18P, 25P, 28P, 30P, 31P, 38P, 61P, IL8, RF2/IL2
<b>Schroeder</b>	A, C, J, K, KK, KKK, KX, N, V

Don't see what you're looking for? Contact customer service for recent additions and for hard to find applications.

**It's time to install uptime in your equipment!**

All it takes to find your distributor is one simple phone call to Donaldson ... or, find your distributor by visiting our website.

**1-800-846-1846**

[www.donaldson.com](http://www.donaldson.com)



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 Fax: 65-6311-7398

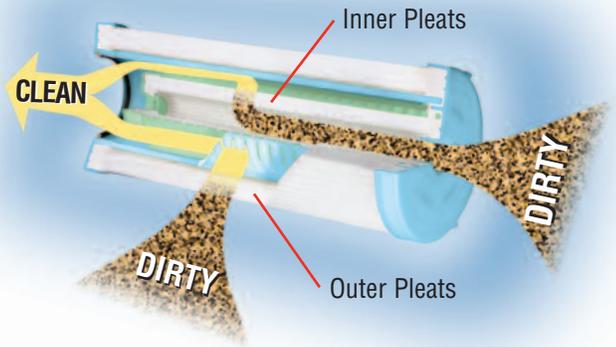
**Europe, Middle East, Africa**  
 Tel.: 32-16-38-3811  
 Fax: 32-16-38-3939

**South Africa**  
 Tel.: 27-21-530-2900  
 Fax: 27-21-534-7708

**Latin America & Caribbean**  
 Tel.: 01-449-910-6385  
 Fax: 01-449-910-6180

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# Donaldson® Triboguard™ DX2™

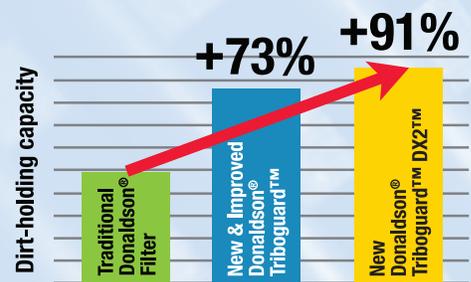


New Innovative **2-in-1** Filter Design Technology

**Raising Filtration  
to the  
Power of 2™**



**DX2™** - 91% more  
dirt-holding capacity  
reducing maintenance costs

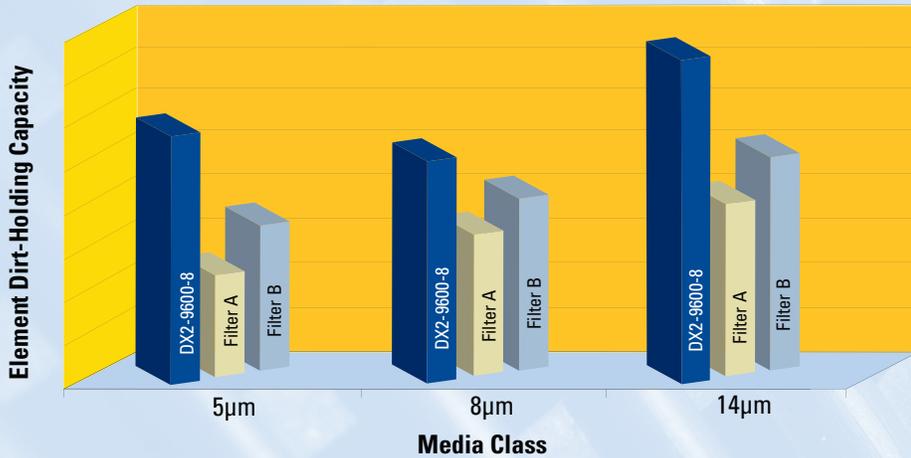


- Up to 43% more pleats than other leading hydraulic filters
- All the features of a coreless design – without the expense of housing modifications
- Environmentally-friendly, fully disposable – reduces waste and disposal costs
- Patent pending

Schedule your Free Trial of Donaldson® Triboguard™ **DX2™**  
Call 1-800-846-1846.

# Raising Filtration to the Power of 2™

**DX2-9600-8 Element Dirt-Holding Competitive Comparison**  
(114 l/min to 345 kPa - ISO 16889 multi-pass)

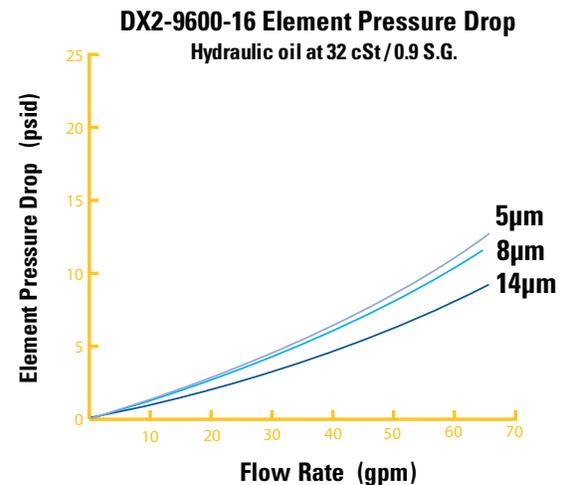
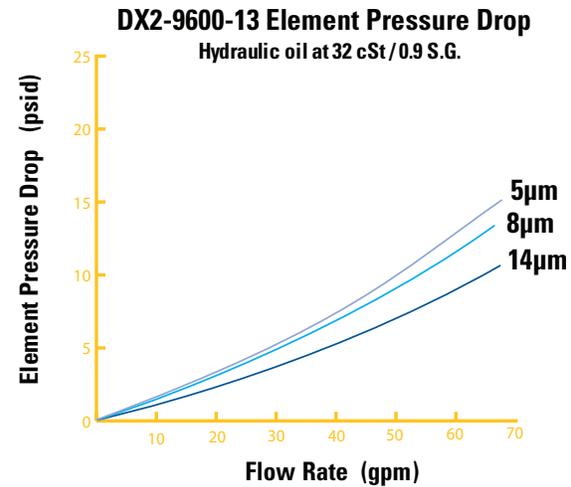
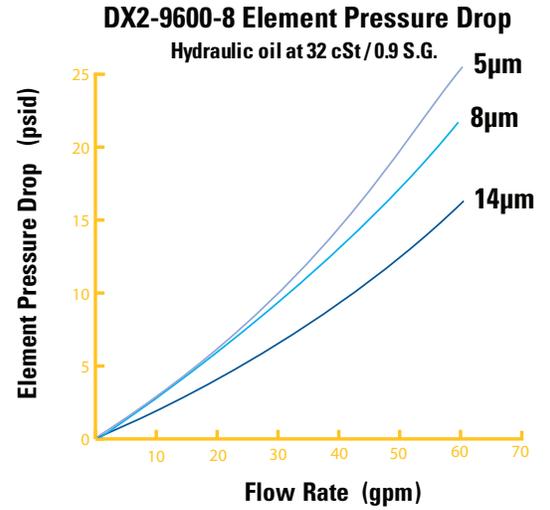


The increase in filtration area reduces fluid velocity across the media, resulting in increased dirt holding capacity.

\*Material compatibility: Check with Donaldson Company, Inc. for applications other than hydraulic & transmission oils.

## DX2™ Element List

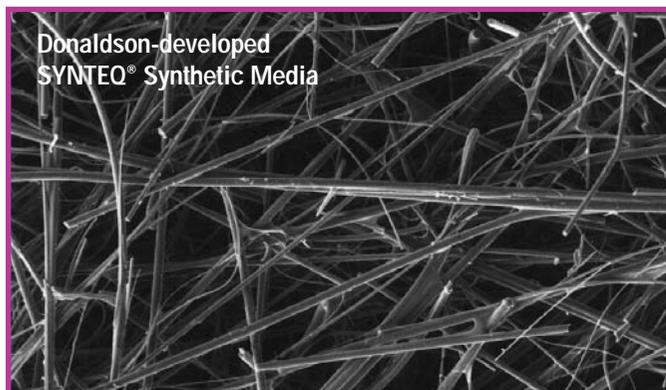
PART NUMBER	Length (nominal)	BETA <sub>x(c)</sub> = 1000
DX2-9600-8-5um	8"	5 µm
DX2-9600-8-8um	8"	8 µm
DX2-9600-8-14um	8"	14 µm
DX2-9600-13-5um	13"	5 µm
DX2-9600-13-8um	13"	8 µm
DX2-9600-13-14um	13"	14 µm
DX2-9600-16-5um	16"	5 µm
DX2-9600-16-8um	16"	8 µm
DX2-9600-16-14um	16"	14 µm



Increase the life of your filter – reduce maintenance costs

## A Closer Look at MEDIA — the Heart of the Filter

Choose Donaldson Synteq® synthetic, natural fiber cellulose, or wiremesh to obtain exactly the cleanliness level you need.



Media is, of course, the main factor influencing pressure drop; indeed, it causes pressure drop. That's why having a low-friction, high-flowing media is so important. See the differences in media in these close-up photos from our scanning electron microscope in which the media mat is magnified hundreds of times.

Above left you see Donaldson-developed *Synteq® synthetic* filter media with its smooth, rounded fibers consistently shaped so that we can control the fiber size and distribution pattern throughout the media mat, and still allow the smoothest, least inhibited fluid flow.

Consistency of fiber shape allows the maximum amount of contaminant-catching surface area and specific pore size control. The result is media with predictable filtration efficiencies at removing specified contaminants (i.g., 10µm) and maximum dirt holding capacity.

The low resistance of Synteq® to fluid flow makes it ideal for synthetic fluids, water glycols, water/oil emulsions, HWCF, and petroleum-based fluids.

In the photo on the right, you see magnification of our natural fiber *cellulose* media.

Note that the natural cellulose fibers are larger than synthetic fibers and jagged in shape, so controlling pore size is difficult and there is less open volume.

Lower beta ratings mean there are smaller pores in the media; smaller media pores cause more flow resistance, in turn causing higher pressure drop.

While cellulose provides effective filtration for a wide variety of petroleum-base fluids, in certain applications it results in poor filtration performance as compared to synthetic filters.

Not pictured: Wiremesh media. Made of stainless steel for durability and long life, Donaldson wiremesh media is designed extra tough for environments where large, rough particulate needs to be filtered.

Donaldson also offers *water removal media*. This is media formulated with dessicants and resins to remove moisture and condensation from petroleum-based fluids. (For concentration of water greater than half of 1 percent [.005%] in the hydraulic oil, we recommend using a vacuum dehydrator unit.)

**Further media discussion can be found in our Technical Reference Guide, “the blue pages” of this catalog.**

# Donaldson Filter Media Efficiency Ratings Per ISO 16889 Test Standards

ISO 16889 is the international standard for Multi-Pass Testing to determine the efficiency (beta rating or beta ratio) and the dirt-holding capacity of the filter element. It replaced the ISO 4572 test standard.

Donaldson filter media has been re-tested per the new standard and the current beta ratios are shown at right. New beta ratios are shown at 200 and 1000, with a (c) to indicate test adherence to the ISO 16889 standard and traceability to NIST test dust.

Learn more about ISO 16889 in the Blue Pages of this catalog.

Fluid to be Filtered	Recommended Media
Petroleum-based	Synteq Cellulose
Phosphate Ester	Synteq
Diester	Synteq
Water Glycol	Synteq
Water-Oil Emulsion	Synteq
Biodegradable Fluid	Synteq
HWCF (high water content fluids)	Synteq
Coarse Filtration	Wire Mesh

## NEW Donaldson Filter Media Efficiency Ratings Per ISO 16889 Test Standards

Media Number	FORMER Rating Beta <sub>x</sub> =75 <small>per ISO 4572</small>	NEW Rating Beta <sub>x(c)</sub> =200 <small>per ISO 16889</small>	NEW Rating Beta <sub>x(c)</sub> =1000 <small>per ISO 16889</small>
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### Donaldson Synteq® Synthetic Media

No. ½	2µm	<3µm <sub>(c)</sub>	<3µm <sub>(c)</sub>
No. 1	3µm	4µm <sub>(c)</sub>	6µm <sub>(c)</sub>
No. 2	5µm	5µm <sub>(c)</sub>	9µm <sub>(c)</sub>
No. 2½	10µm	8µm <sub>(c)</sub>	10µm <sub>(c)</sub>
No. 3	15µm	12µm <sub>(c)</sub>	14µm <sub>(c)</sub>
No. 4	16µm	15µm <sub>(c)</sub>	20µm <sub>(c)</sub>
No. 6	13µm	10µm <sub>(c)</sub>	13µm <sub>(c)</sub>
No. 9	22µm	18µm <sub>(c)</sub>	23µm <sub>(c)</sub>
No. 16	37µm	16µm <sub>(c)</sub>	22µm <sub>(c)</sub>
No. 20	40µm	>50µm <sub>(c)</sub>	>50µm <sub>(c)</sub>

### Donaldson Cellulose Media

No. 3	16µm	18µm <sub>(c)</sub>	24µm <sub>(c)</sub>
No. 10	25µm	19µm <sub>(c)</sub>	23µm <sub>(c)</sub>
No. 15	35µm	25µm <sub>(c)</sub>	29µm <sub>(c)</sub>
No. 25	na	32µm <sub>(c)</sub>	>40µm <sub>(c)</sub>

### Donaldson Wire Mesh Media

No. 44	45µm nominal		
No. 74	75µm nominal		
No. 149	150µm nominal		



# Compleat Confidence with the **New** and **Improved** Donaldson® **Triboguard**™ *Premium uptime protection*™



It's more than a filter – it's a  
**critical uptime** component

# Our **new** and **improved** pleat pack offers **even better uptime protection**

## **Compleat Redesign**

You asked for better filtration. You got it again. Our engineers redesigned our pleat pack to give you up to **73% more dirt-holding capacity** than previous Donaldson® Triboguard™ filters AND up to a **47% lower initial pressure drop**.

## **Compleat Protection**

Every hydraulic system has suspended particles in its fluid. Contaminants grind and wear at the surface of moving parts, introducing even more particles into the system. **These contaminants cause more than 70% of all hydraulic system downtime.** The new and improved Donaldson® Triboguard™ filters offer you better protection from the particles and contaminants that reduce the effectiveness of lubricant and hydraulic fluid.

## **Compleat Confidence**

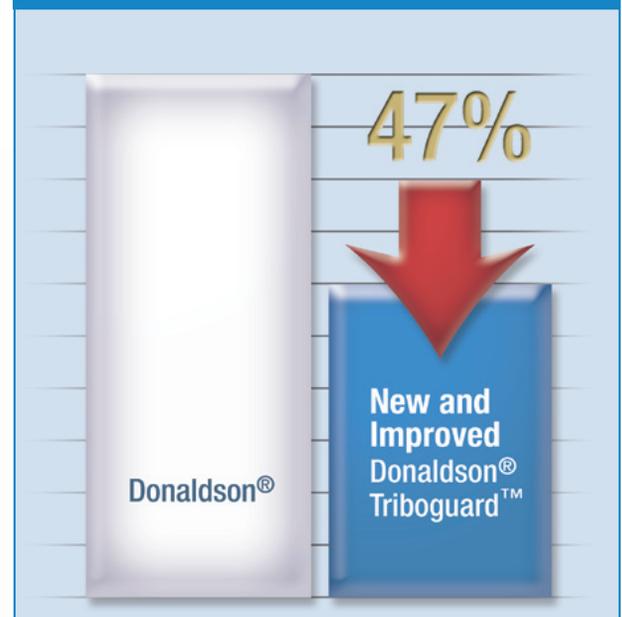
Downtime isn't an option. If you're not productive, you're not profitable. **Better protection** means **better productivity**, and that boosts your bottom line. Protect your uptime with Donaldson® Triboguard™.



## **Dirt-Holding Capacity Improvement**

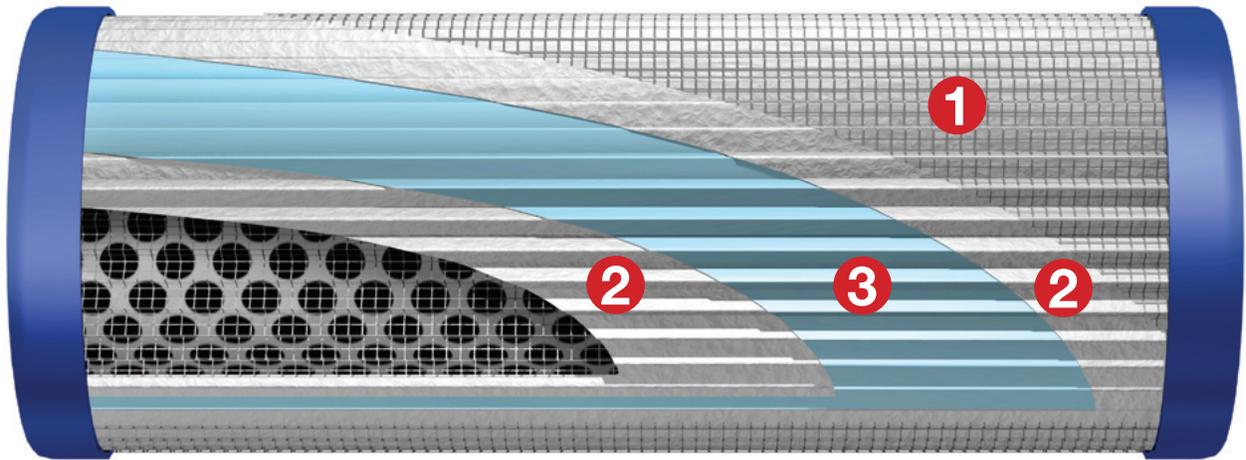


## **Pressure Drop Improvement**



## How uptime protection works

**New** and **improved** Donaldson® Triboguard™ filters feature an advanced pleat pack design that provides premium protection for your system:



### 1 Epoxy-Coated Steel Support Mesh (Upstream and Downstream)

- Provides excellent pleat support and spacing
- Protects against media damage during handling and installation
- Excellent compatibility
- Allows for maximum effective media area

### 2 Media Support Layers (Upstream and Downstream)

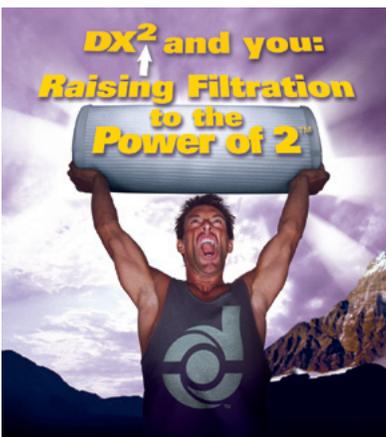
- Optimizes media support
- Protects media during pressure surges

### 3 Synteq® Media

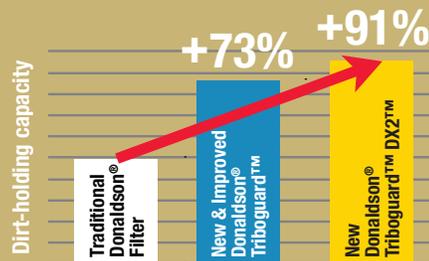
Donaldson-developed Synteq® synthetic filter media has smooth, rounded fibers for low resistance to fluid flow. Synteq® media is ideal for filtering synthetic fluids, water glycols, water/oil emulsions, HWCF and petroleum-based fluids.



- Donaldson's synthetic filter media is specially developed for fluid filtration
- High-efficiency media grades with performance to  $\beta_{<4(c)}=1000$  (per ISO 16889)
- Exceptionally low flow resistance
- Consistent performance throughout the life of the filter
- Excellent compatibility



Ask about the **new Donaldson® Triboguard™ DX2™**. This new, innovative 2-in-1 filter design results in **91% more dirt-holding capacity**, reducing maintenance costs.



- **Up to 43% more pleats** than other leading hydraulic filters
- **All the features of a coreless design** – without the expense of housing modifications
- **Environmentally friendly**, fully disposable – reduces waste and disposal costs

**Compleat**  
**Confidence**  
 with the  
**New and Improved**  
**Donaldson**  
**Triboguard™**  
*Premium uptime protection™*



Donaldson® Triboguard™ replacement elements are engineered to fit many competitive applications including some of the most popular listed below.

<b>Fairey Arlon</b>	170, 270, 370, 1000, TXW, TXW2, TXW3, TXW3D, TXW4, TXW5, TXW8A, TXW8C
<b>Hydac</b>	0030D, 0060D/R, 0075D, 0110D/R, 0140D, 0160D/R, 0165R, 0240D/R, 0280D, 0330D/R, 0660D/R, 0850R, 0950R, 1300R, 2600R
<b>Pall</b>	4704, 6300, 6400, 6500, 7500, 8200, 8300, 8310, 8314, 8800, 8900, 8904, 9020, 9021, 9024, 9100, 9101, 9104, 9400, 9404, 9600, 9601, 9604, 9650, 9651, 9800, 9801, 9804, 9901
<b>Parker</b>	18P, 25P, 28P, 30P, 31P, 38P, 61P, IL8, RF2/IL2
<b>Schroeder</b>	A, C, J, K, KK, KKK, KX, N, V

Don't see what you're looking for? Contact customer service for recent additions and for hard to find applications.

**It's time to install uptime in your equipment!**

All it takes to find your distributor is one simple phone call to Donaldson ... or, find your distributor by visiting our website.

**1-800-846-1846**

**www.donaldson.com**



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