



Extend Maintenance Intervals

REDUCE OIL CONSUMPTION, INCREASE ENGINE PROTECTION



Donaldson Blue® premium lube filters remove more than 90% of contaminants that are 10 microns or larger, compared to 50% or less for typical cellulose filters.

Donaldson
BLUE



Diesel Engine Lube Filtration Systems

The difference between the various lube filter configurations can be confusing. There are three common filtration approaches.

Full-Flow Filtration

Full flow-filters receive near 100% of the regulated flow in an engine lube system. Full-flow filters provide essential engine protection for maximum cold flow performance and filter life. Most lube filters available today are full flow.

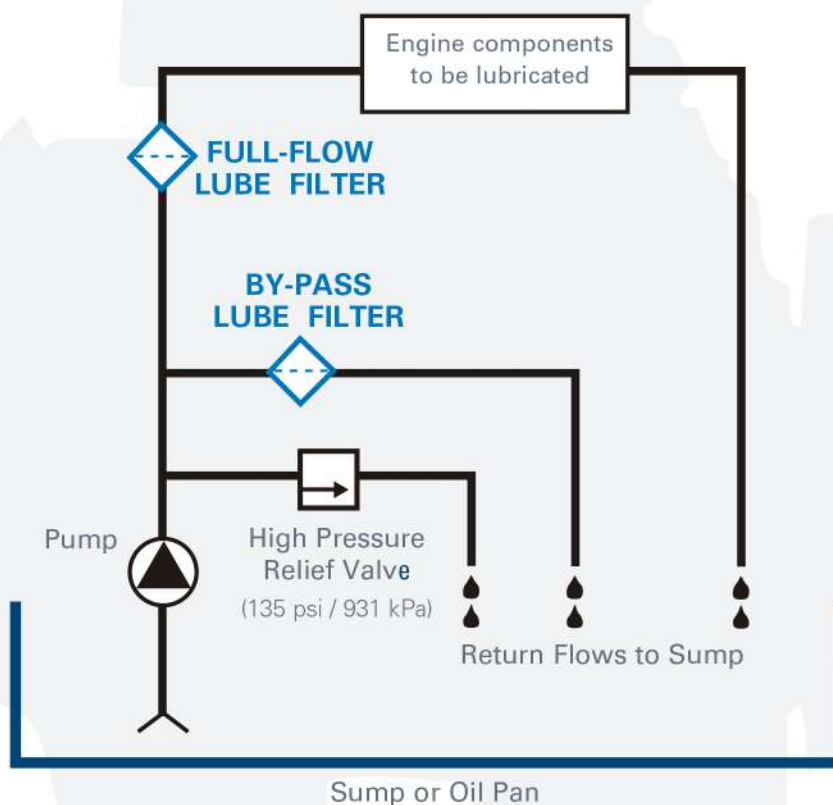
By-pass (Secondary) Filtration

By-pass filtration is when a small portion of the system's oil flow (usually 5-10%) is diverted back to the sump or oil pan before reaching the primary filter. A by-pass filter captures smaller particles than the full-flow filter. Because of the increased efficiency of a by-pass filter, they are more restrictive. To optimize restriction, a by-pass filter should be located in a separate flow path, as illustrated on the right.

Two-stage Filtration

A two-stage filter design attempts to combine the features of both a full-flow and by-pass filter. The two-in-one design significantly increases restriction, causing shorter filter life and decreased cold flow performance. Poor cold flow performance starves the engine of oil during start up, leaving the engine temporarily unprotected. This may lead to increased engine wear that could result in premature repairs or even engine replacement.

TYPICAL DIESEL ENGINE LUBE CIRCUIT





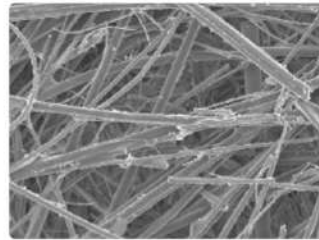
Filter Media

At Donaldson, we have a variety of lube filter medias available to meet the most stringent of engine lube system design requirements. Donaldson engineers have a history of developing media technology that exceeds application cleanliness and service life expectations. In fact, Donaldson was the first company to introduce fully synthetic media to the engine lube market in the early 1980's. This media is now commonly adopted for extended life or enhanced engine protection needs.

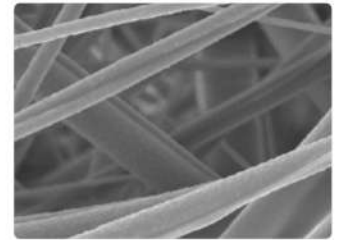
New lube media types are constantly under evaluation in our internal laboratories and in controlled field testing. If you have a specific application requirement, please contact Donaldson to see if there are additional media options to better suit your application.

Synteq™ Synthetic Media

Donaldson's fully synthetic lube filter media is constructed of layered, micro-fiberglass synthetic fibers. It provides enhanced durability for extended drain intervals while maintaining or improving efficiency and capacity. Synteq lube media offers lower restriction. Low restriction allows better flow which ensures component protection over a larger range of engine conditions.



SEM 100x

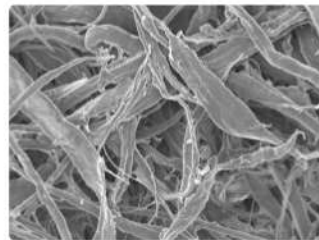


SEM 600x

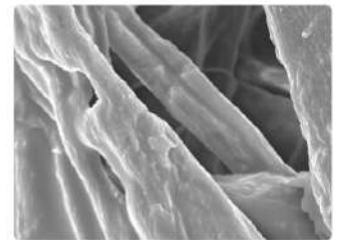
Synthetic Blend – Cellulose & Synteq™ Synthetic Media

This media is a blend of cellulose and synthetic media technologies. It utilizes the best attributes of both media fiber types to achieve an improved cost to performance ratio for more demanding applications than a cellulose only media can achieve.

This media provides the consistency of layered fibers to capture coarse contaminant coupled with the affordability of cellulose to deliver an efficient and effective performance alternative to traditional cellulose media.



SEM 100x

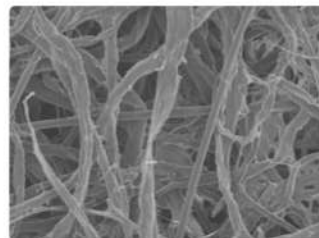


SEM 600x

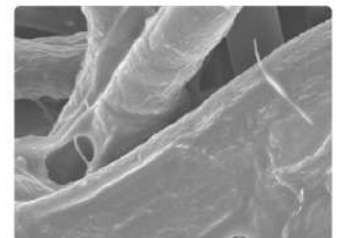
Cellulose Media

This traditional lube filter media is most commonly a pleated cellulose base material. This media effectively combines an application's efficiency and capacity requirements while maintaining cost effectiveness.

As oil flows through the media, large contaminants are captured on the surface of the filter while smaller contaminant becomes embedded in the underlying media layer.



SEM 100x



SEM 600x

Extended Oil Drain Intervals

Oil service intervals are pre-determined by engine manufacturers (OEM's) and are designed to provide maximum engine protection under a wide variety of conditions. While a majority of equipment owners follow these guidelines there is a growing trend to extend oil service intervals beyond the OEM recommendations. However, extended oil drain intervals are not for every application. Consider the following:

- Ensure oil meets the American Petroleum Institutes' (API) qualification criteria
- An extended oil drain schedule beyond the OEM's normal service interval should always be conducted in conjunction with a regular oil sampling and testing program
- Equipment operating extremes of heat, cold, idle time, airborne contaminants, and engine load negatively affect oil
- New engine designs today are cleaner burning with reduced emissions and make excellent candidates for extended oil drain intervals
- High-efficiency oil filters will help remove more contaminants, resulting in longer oil life

Donaldson Blue® Lube Filters

Donaldson Blue lube filters are designed specifically for extended maintenance programs. Donaldson Blue filters maintain oil health over the new drain interval and can last as long as the oil. All it takes is a simple cross reference of your current lube filter and you'll reduce oil consumption, increase engine protection and reduce operating costs.

Our Donaldson Blue lube filters use Synteq™ media, which is more effective than standard cellulose filter media at removing small contaminants. It improves lubricant flow and offers increased dirt holding capacity for extended oil drains. Donaldson Synteq™ media technology delivers the optimal balance of efficiency, capacity and restriction for lube systems.

Features

- Removes more than 90% of contaminants that are 10 microns or larger (cellulose filters typically remove 50% or less)
- Double the contaminant carrying capacity of standard cellulose filters – for much longer life
- Delivers lower restriction to provide maximum oil flow and lubrication.
- Heavy-duty, long life seals to support extended service life

Benefits

- Designed specifically to provide longer filter life
- Increase engine protection
- Reduce operating costs

Applications

- On- and off-road applications



Upgrade from Competitive Filters to Donaldson Blue®

Donaldson Blue filters are direct replacements to standard filters – no system modifications or special disposal requirements. Just a simple cross reference of your current lube filter and you'll reduce oil consumption, increase engine protection and reduce operating costs.

Frequently Asked Questions

LUBE FILTRATION

Can the filter cause low oil pressure?

While some pressure drop across the filter is normal, the oil filter is not capable of regulating the lube system pressure. Low oil pressure is generally the result of another malfunction in the engine such as the oil pump losing its prime or the pressure-regulating valve not functioning properly.

What causes a gasket to displace from the oil filter?

Gasket displacement is the result of insufficient gasket compression during installation, excessive lube system pressure or a combination of the two. Any deformation to the filter, from which the gasket was displaced, is a clear indicator that the filter was exposed to excessive lube system pressure. Excessive lube system pressure is most likely the result of a malfunctioning pressure regulating valve that is failing to open properly.

Is it better to use a filter with higher efficiency, regardless of the capacity of the filter?

The correct filter for an application will have a good balance between efficiency and capacity for the application that it is used in. Using a filter with very high efficiency may lower the dirt holding capacity of the filter enough to shorten the life of the filter on the application, increasing the risk of the system going into by-pass.

What is the difference between a by-pass lube filter and a full-flow lube filter?

The oil that goes through the full-flow lube filter goes on to lubricate the engine. The by-pass lube filter receives about 10% of the amount of oil that flows through the full-flow filters and filters that oil at a much higher efficiency. The oil that flows through the by-pass lube filter then returns to the sump. Due to the high efficiency of the by-pass lube filter, it cannot handle the same volume of flow as the full-flow filter. A metering orifice is commonly used to meter the flow of oil through the by-pass filter.

What is the purpose of a by-pass lube filter?

A by-pass lube filter is used to continually filter the oil in a system at a higher efficiency to remove contaminant that is not efficiently removed by the full-flow filter.

Can some filters be substituted for other filters?

This question is presented when customers are trying to consolidate some of the filters that they carry. The filter manufacturers will not approve of such consolidation. While there are some filters that may work in the place of others, filter manufacturers recommend against consolidation, because each filter is designed after a specific OEM filter. Additionally, if changes are made to a specific filter to keep it up to date with the OEM filter that it replaces, it may no longer be an acceptable substitute for another filter that it could be used in place of, previously.

What is the micron rating and efficiency of the filter?

The micron rating of a filter represents the size of particle that the filter can remove from the fluid passing through it. The micron rating should be associated with an efficiency or beta value to indicate how efficient the filter is at removing that size of particle. Any given filter will remove various sizes of particles. The difference between filters is how efficient they are at removing certain sizes of particles.

What type of media does the filter use?

There are many different types of media that can be used in lube filters. Earlier filters used a depth type media, that type of media is still used in some filters today. Most lube filters now use pleated cellulose or cellulose blended media. Some lube filters in specialized applications use synthetic media (glass) or glass-blended media.

What are the advantages of glass media?

Glass media has more uniformity in the size of the opening in the media, which can provide for better flow performance. Glass media also has more dirt holding capacity per square inch of media than most cellulose media blends.

What is the service interval of the filter?

Aftermarket filter manufacturers design their filters to meet or exceed the performance requirements of the original equipment manufacturer, for which the filter is applied. Therefore, the use of an aftermarket filter will not affect the service interval recommendations of the original equipment manufacturer.