

Off-Line Filtration Package

Technical Bulletin

OLF 15V



New Off-Line Filtration Package Offers Ultra High Efficiency, Low Flow Concept

The cleanliness level of hydraulic fluid in an active system reaches an equilibrium when the amount of contamination going into the system (ingression) plus the amount of contamination that is internally generated (wear particles), equal the amount of dirt being taken out by filter systems.

The amount of dirt removed by filter systems is a function of only two parameters:

- Flow rate through the filter
- Efficiency of the filter in removing contaminants from the fluid at system conditions

Therefore, the same fluid cleanliness can be achieved with a high-flow pump and a low-efficiency filter, or a medium-flow pump and a medium-efficiency filter, or a low-flow pump and an ultra-high-efficiency filter.

The Product

Eaton's new Off-Line Filtration OLF 15V is a low-flow, ultra-high-efficiency package. Its flow rate is approximately 5 gpm, and the element is extremely efficient with a beta ratio of more than 1000 at removing 2 micron particles. The high-efficiency rating is achieved by using membrane filter element technology, rather than standard mechanical particle removal.

The filter element configuration of the OLF 15V also lends itself to very high dirt-holding capacities. The 2-micron element will hold approximately 200 grams (.45 lbs.) of dirt.

Also available is an element that will remove water, as well as dirt, from hydraulic fluid. The water-removal element has the same high-efficiency, particle-removal capability as the standard 2-micron element, and will hold approximately 1/2 liter of water.

In addition, a 20-micron element, with or without water-removal capability, is available for gearbox applications.

Suitable, Unsuitable Applications

The OLF 15V is ideal for systems in which the ingress rate of contamination is relatively low. Applications well suited for the new product include:

- Plastic injection molding systems
- In-plant press systems
- Low-ingress lubrication systems
- Systems that contain less than 500 gallons of fluid

The following systems, with a high-ingress rate of contamination, are more suited for a high-flow OLF, and therefore, the OLF 15V should not be used:

- Die casting operations
- Steel mill applications
- High dust environments
- Test stands
- Systems with more than 500 gallons of fluid

Expected Results

As a general rule of thumb, use of the new OLF 15V package should result in a two ISO code improvement in the fluid cleanliness level. Please note: every increase in the ISO cleanliness level amounts to double the amount of contamination in the fluid.

If the target cleanliness level of a system (the level at which failures will not be caused by contamination) is exceeded by two ISO codes, four times the recommended amount of contaminate is present in the system. Again, by simply applying the OLF 15V, two ISO codes worth of dirt can be removed.

Gearbox Applications

Gearbox applications are very similar to hydraulic applications in that both use fluid as a lubricant, and both experience shortened life when contamination is present. Gear teeth are separated only by the film thickness of the fluid. Therefore, any particle that is larger than the film thickness will cause local stress risers and potential for damage. Many gearbox systems use high-viscosity lubricants to keep film thickness as large as possible.

Gearbox applications and the associated fluid viscosity, limit the media that can be used in the OLF 15V. The 2-micron element is limited to a viscosity of 2500 SUS. The 20-micron element can be used up to a viscosity level of 5000 SUS.

The 20-micron element is normally more than adequate for gearbox applications, since there is very little gearbox breathing, and therefore, very little ingressed dirt to remove from the lubricant. The water-removal element is also very important in these applications. Because the systems normally run hot, a significant amount of condensation is likely to result in the gearbox each time they are shut down.

The OLF 15V can benefit large gearbox applications, such as in chemical plants, where the boxes run extremely hot and downtime is critical.

Summary

The easiest way to improve system reliability is to improve fluid cleanliness, and the easiest way to improve system cleanliness is to add a new ultra-high efficiency, low-flow OLF 15V from Eaton. The system is easy to install and easy to maintain and is an important tool to significantly improve system reliability.

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