

Strategies for Controlling Contamination with Proper Filtration

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Tags: [contamination control](#), [oil filters](#)



"We are currently experiencing occasional particulate contamination in the opened drums of our synthetic gear oil. We have just begun using a portable filtration pump but are still at a loss as to the appropriate micron size. Do you have any ideas or suggestions?"

New oils delivered in bulk as well as in drums or smaller containers frequently have contamination levels higher than what is recommended by the original equipment manufacturer (OEM) or for your reliability goals. As a rule, it is best to filter oil when it is transferred, stored or applied to the equipment.

A cleanliness target should be defined for each critical machine or group of machines in the plant. For example, you might set an ISO cleanliness target of 17/15/12 for hydraulic systems. Be sure to discuss your cleanliness targets and the desired filter characteristics with your filter provider.

A general recommendation is to use 3-micron filters for lubricants with a viscosity grade up to ISO VG 100. For higher viscosities, choose 6-micron filters.

Typically, low viscosity oils such as hydraulic fluids (ISO VG 32 to 68) are easier to filter because the resistance to flow through the filters is reduced. If you experience difficulties filtering heavier oils, there are a few ways to ensure that the lubricant is filtered appropriately, such as by increasing the oil temperature (no more than 150 degrees F), installing filters in parallel to lessen the flow restriction, and reducing the pump's flow rate to decrease resistance and pressure drop.

Also, do not forget about the filter's beta ratio. This is also referred to as the filter's capture efficiency and is related to the percentage of particles that can be retained. The higher the beta ratio, the better the filter quality. Filters with beta ratios greater than 100 for a defined micron size are considered to be of good quality. Recent filter manufacturing technologies have resulted in beta ratios greater than 1,000 for 2 to 10 microns.

Remember, a good contamination control strategy considers the elimination of contaminants before the oil is used (contaminant exclusion) as well as an effective way to remove the contaminants in the used oil (contaminant removal).

If you determine that your established cleanliness target is far from the current levels, try implementing a few progressive goals that will allow for improvement but will not create operational problems due to filter saturation