Lubricant Storage and Handling Tips for World Class Contamination Control

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Introduction

The methods by which lubricants are stored transferred and applied to machines play a large role in the success of a contamination control program.

After all, if you start out with contaminated oil, you will not likely achieve cleanliness targets for machinery.

Developing and implementing a world-class contamination control program is a sizable undertaking, and it usually requires significant modifications to machinery as well as changes in procedures and methodologies which can take years.

However, there is one component of contamination control where you can affect the entire plant, and that component is the storage, handling and application of new lubricants. Because storage and handling affects the cleanliness of all lubricated machinery, it is usually a good place to start improving your program.
Is New Oil Clean? (Hint: No.)

For the most part, new lubricants are unsuitably dirty for most applications. There are, of course, exceptions. A few manufacturers offer a specified maximum particle count and some suppliers will filter bulk oil as it is dispensed, but these are the exceptions. It is imperative new oil is properly cleaned before it is installed for use. A new drum of lubricating oil will often have particle count around 19/16/13 or higher. That means that every cubic centimeter of oil in the drum contains between 2500 and 5000 particles that are at least 4 microns in diameter, or about one billion particles for the whole drum. So if particle contamination is the number one cause of machine wear – and it is – we have a compelling case for filtering “new” oil.

How do you control contamination in new oil?

Step 1: Get it clean.

The first step in new oil cleanliness it to filter it to an acceptable level.

How we filter the new oil depends on the method of delivery. If it comes in drums, we can filter each drum using a filter cart. This is an excellent and inexpensive way to clean new oil when it arrives to further ensure the oil’s cleanliness by filtering the oil as it is applied to a reservoir or dispensed into a transfer container. Filtration units come in a variety of shapes and sizes, like the compact unit to the right, or the more traditional “trolley.”

Another popular method, which covers a wider range of storage and handling issues, is the use of a comprehensive lubricant management system. Systems, like the one shown at left, can be configured with a wide range of options including separate pumps and filters for each different lubricant, high quality desiccant breathers to prevent subsequent contamination to the fluid, fittings and spigots that minimize contamination and even flow meters to measure and track the amount of oil dispensed. Systems like these are probably the most convenient way to address most storage and handling concerns in one stroke. They allow us to easily clean new oil, keep it clean, prevent cross-contamination and track lubricant consumption by product type without having to engineer the process from scratch.
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Step 2: Keep it clean.

Keeping the oil clean is not difficult if you use the right tools. It certainly helps to have an enclosed storage area with climate control, but these items are not essential for keeping oil clean. Common sense measures like good house-keeping, wiping fittings, using dust covers, etc. can go a long way toward keeping dirt out of stored lubricants, but the best way to prevent dirt and moisture from entering a tank or drum is a high quality desiccant breather. Remember, when you remove 5 gallons of oil from a drum, you pull in 5 gallons of air. If that air is not clean and dry, neither will the oil be.

The desiccant breather prevents most particles and moisture from entering the drum. Quick-connect hydraulic fittings provide an effective means to remove and/or circulate the oil with a filter cart or drum topper without exposing the oil to the ambient atmosphere.

Step 3: Transfer it clean.

It really doesn’t matter how well you filter your new oil or how clean it’s kept in storage if you dispense it into a dirty container. There are several acceptable options for delivering oil to machinery and some are better than others. For large reservoirs the best transfer method is to use fixed plumbing to pipe the machine reservoirs to the storage tanks. However, this is only feasible for very large systems as it is very expensive and impractical for small equipment. For other large systems, or those with a moderate size reservoir, the best method is usually to pump oil directly into the sump from a drum or tote tank using a filter cart. Portable filter carts are one of the most versatile and effective tools available to lubricant transfers and decontamination. One important thing to remember when using filter carts is to make sure you use the right fittings on the equipment sumps to make the fluid transfer or decontamination efficient and effective. Additionally, it is important to consider using units that are dedicated to specific oil types to prevent cross-contamination of lubricants and avoid the labor intensive process of flushing carts to switch products. Some manufacturers allow you to color code your filtration unit to help identify which cart should be used with a particular lubricant.

As a side benefit, most users find that performing an oil change with a filter cart only takes about half the time as performing the job with conventional methods.

Yet another filter cart option is to combine the storage tank and the filter cart. Top-off carts such as the one shown here, offer a convenient solution to performing oil changes and top ups on small to medium size sumps. In addition to perform fluid transfers, these units can also be used as a traditions offline filter cart for remediation tasks eliminating the need for separate units for transfer and filtration.

Finally, for those applications with very small sumps or those that are located such that a filter or top-off cart is impractical, standard oil cans are acceptable as long as they meet certain criteria. A good quality oil transfer
container should be plastic, sealable, color-coded or marked for product type and it must be cleaned on a regular basis. It should also have an opening large enough to allow the inside of the container to be effectively cleaned. When using top-up containers, remember to avoid funnels whenever possible. Many of the new containers utilize hand pumps that eliminate the need for funnels. Also, remember to wipe the container nozzle and the fill port area on the reservoir before transferring the oil. Even a minute amount of material around the fill port can add millions or billions of particles to the oil in the reservoir.

World-class contamination control can't happen in the absence of good lubricant handling practices. Any good storage and handling policy or system has several common elements: good filtration, high quality breathers, filter carts and a highly conspicuous tagging or color coding system to avoid cross-contamination of products. When these four items are addressed, the majority of the work is done. The rest is just fine tuning.

About the Author

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