Lubricants Storage: Best Practice

More than 50% of mechanical failures that affect lubricated industrial equipment are related to contamination of the oil or grease. It is therefore important to store lubricants correctly.

A correctly designed lubricant storage room must respond to constraints of functionality, of safety and must allow determined volumes of lubricants to be made available via appropriate dispensing systems under the best conditions of cleanliness.

The design of a quality storage room starts with the selection of an appropriate place. The storage of products inside it must follow the rules that at the same time make common sense and follow regulatory requirements.

Construction of the storage room

- Spacious, to store all the products and to allow for their handling
- Enclosed and correctly oriented taking into account the direction of wind and rain, safer from frost for the conservation of certain products (soluble oil, metalworking fluids, textile fluids, etc)
- Mechanical ventilation ensuring air renewal must be provided. Large temperature variations in the storage room can be at the origin of fluid degradation and accentuate the tank breathing phenomenon. Measures must be taken accordingly to maintain the room temperature at an appropriate level
- Sealed and resistant to chemical products. It can be built at a slight angle towards an evacuation chute linked to a recovery ditch. Retaining capacities must be provided depending upon the type of products and the containers stored, compliant with the local regulations in force.
- Resistant to loads

Storage method

Depending upon the available ground space, the number and type of containers to store, several options are possible: bulk storage, stacking on pallets, shelf storage. Each of these methods must be the object of individual precautions intended to ensure storage under the best conditions of cleanliness and safety.

i) Bulk

Metallic or plastic tanks can be chosen. Stainless steel or anodized aluminum can be safely used but galvanized steel is to be avoided due to the risk of reaction between the zinc that it contains and additives in certain oils.

Metallic tanks are robust and stand the test of time but possess some inconveniences compared with polyethylene plastic tanks:

- the risk of corrosion
- the impossibility of seeing the level of fluid in the absence of level gauges
- higher price

ii) Stacking on pallets

In the case of stacking on pallets, the maximum storage height must be chosen so as to avoid damaging the recipients in case of falls. Special accessories are used for plastic cans that must not be piled one on top of the other to avoid damaging the containers.

Stacking on pallets requires the means for the appropriate handling procedures; this method of storage is reserved for large storage rooms.

iii) Shelf storage

Shelves used for storing at height must be designed and installed so as to prevent falls. Oil drums must preferably be stored horizontally on their sides with the two bungs aligned horizontally.

In the case of greases, storage in drums in a vertical position is compulsory because of the removable cover that limits the leak tightness of the container.

Identification and labelling of stored products

Storage rooms must be clearly identified. The display of a storage map could also be provided (location of different products, maximum capacity, etc), a labelling table of stored products, and a reminder of possible incompatibilities.

Stocking procedures for products must be written and applied in order to avoid accidental damage

to containers. Lastly, up-to-date safety data sheets must be accessible.

Plastic coated sheets describing the products stored and their use could be displayed close to the articles concerned in order to facilitate their identification.

Beyond the regulation labelling of products, an 'operational' identification could be established in order to ensure that an identified product will be used in the right place thus eliminating the risk of mixing. A system of codes or of colours could thus be used to identify:

- a type of lubricant
- the tank in which it is stored
- its distribution container
- the mechanical device in which it must be used

Certain categories of lubricants can command special attention:

- biodegradable lubricants
- food grade lubricants
- lubricants that are incompatible with others (eg, polyalkylene glycols, greases, etc)
- risky products (soluble oils, metalworking and textile oils, etc).

It is better to store these lubricants in a dedicated and correctly identified location so as to avoid any confusion or any accidental mixing with standard lubricants.

Prevent pollution

To actively fight against oil pollution during storage, the installation of drying breathers and distribution filters are effective solutions.

When a tank breathes, the air containing water vapor is ingested into the system. Temperature fluctuations will make this water vapour condense which could accelerate the oxidation of the fluid and afterwards cause damage to the lubricated machines. Drying breathers (also called desiccantn breathers or desiccant filters) serve to ensure tightness, to absorb air humidity by means of silica gel and to retain impurities. Humidity is absorbed by the silica gel that changes colour, indicating its saturation.

The use of activated charcoal in certain models allows air to be de-oiled during the breathing phase of the tank.

The key parameter dictating the choice of desiccant filter is the input and output air flow rate of the tank. Two phenomena are at the origin of this air flow:

- temperature variations
- fluid volume variations in the tank (due to emptying and filling).

The drying breather can be mounted directly on the tank or away from it by means of a hose when the air flow rates and silica gel saturation speed allow it.

In summary, to avoid contamination of stored products, the tanks must be equipped with drying breathers, level gauges and quick-connects facilitating the filtration and dispensing of lubricants.

When they are transferred to top-up containers, oils must be filtered so as to guarantee their level of cleanliness.

Polyethylene bulk tanks

Metallic bulk tanks

Certain manufacturers supply compact turnkey storage stations. These custom solutions consist of a set of colour-coded custom tanks, pumps, hose reels and dispensing filters, as well as tools and equipment for additional handling.

Once the right storage conditions have been determined, the cleanliness of the lubricant transfer container must under no circumstance be neglected.

Small volume top-ups: for each type of oil, the use of a pitcher, preferably plastic, with a cover and clearly identified, limits the risk of pollution and chemical reaction between incompatible products.

Large top-ups: the use of a top-up trolley equipped with quick-connects and an integrated filtration system is the safest means of avoiding accidental contamination.

In all cases, the clear identification of container and content is a prerequisite for the safest lubricating of equipment.

Storage in small top-up containers and grease pumps

Storage of oil cans, grease pumps and other cleaning material is also an important challenge when looking to limit lubricant contamination. Lubricant dispensing equipment must be stored in dedicated, fire resistant and easy access locations.

Grease pumps must be stored in a clean place and be regularly maintained to preserve their reliability over time. In particular, grease pumps must be checked, cleaned and calibrated once per year. The calibration allows the user to know precisely the quantity dispensed at each pump stroke.

Other equipment dedicated to lubricant use and implementation or to operators' safety can be provided in the storage room:

- eye-wash station
- spare filter cartridges
- compressed air pumps
- drum transport trolleys
- hose carrier

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