



Tech topic

# Storage and handling

Recommendations and best practices

## Key insight

First-in, first-out, (FIFO) is an inventory management rule that helps reduce the risks of deterioration caused by lengthy storage.

## Introduction

Lubricating oils and greases are formulated to satisfy specific kinds of service. If not handled and stored properly, they can deteriorate or become contaminated and, as a result, provide inadequate lubrication or become waste that requires disposal.

## Containers

Drums, pails, tins, quarts and cans of lubricants from virtually all suppliers are leak-proof and clearly labeled with a brand name and type of lubricant inside. Careless handling, however, can cause leaks and contamination of the contents, and smudge, tear or otherwise damage the labels.

- Never unload containers by dropping them from delivery vehicles to the ground or unloading docks. This can cause seams to be punctured or burst, and potentially result in a hazardous spill situation.

Using correct unloading procedures can prevent damage, injury and unnecessary cleanup/waste. Many delivery trucks are equipped with hydraulic lift gates, hand-winch hoists or ramps and dollies/hand carts to support proper off-loading.

## Common causes of contamination, deterioration and waste

Damaged containers	Poor outdoor storage practices
Moisture condensation <ul style="list-style-type: none"><li>▪ Phosphate esters are hygroscopic and known to absorb water from the air and fatty layers of the skin (e.g., Mobil™ HyJet™ hydraulic fluids)</li></ul>	Mixing different brands or types
Dirty dispensing equipment; transfer equipment should be dry and clean prior to use	Exposure to excessive heat or cold
Exposure to dust, chemical fumes or other foreign fluids	Poor inventory management practices; exceeded shelf life

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## Indoor storage



Contaminants and extreme temperatures can affect the lifespan and performance of lubricants in storage. For this reason, when storing lubricants indoors, we recommend they are stored in a designated location that is clean and dry. Ideally, this location should be air conditioned, or in a temperature-controlled environment where maintaining a constant temperature is possible.

Racks and shelving that adequately protect all containers should be used, if possible, along with a device to hoist heavier containers such as drums. Do not store lubricants near steam lines or heaters.

As an inventory management best practice, we recommend rotating older stock to the front in order to reduce the potential for use of product beyond its recommended shelf life or expiration date. This practice may also help you avoid increased costs associated with waste and disposal of aged product. Adopting a "first-in, first-out" (FIFO) rule will help reduce the risks of deterioration caused by lengthy storage.

### Best practices for safe and functional indoor storage

Flooring should be level and oil-resistant

Install shelving that adequately protects all containers

Store drums on their sides

Store cartridges in the upright position (see cartons for directional indication)

Make sure transfer/dispensing equipment is clean and dry prior to use; filter product during transfer if possible

Never store product in unlabeled containers

Minimize product exposure to air; keep containers sealed while in storage

▪ Some products are known to absorb moisture from the air, which causes hydrolysis and contamination (e.g., Mobil™ HyJet™ V and Mobil™ HyJet™ IV-A™)

Do not store previously opened containers with low fluid content for long periods of time

Ensure area is well-ventilated and free of external sources of contamination (e.g., dust, humidity, foreign fluids)

Avoid storing containers near drains, sewers or other sources of water. Ensure area has appropriate containment system

Make sure storage area temperatures are within temperature range recommended by manufacturer

Never store product above maximum recommended temperature as outlined on the product's product data sheet (PDS)

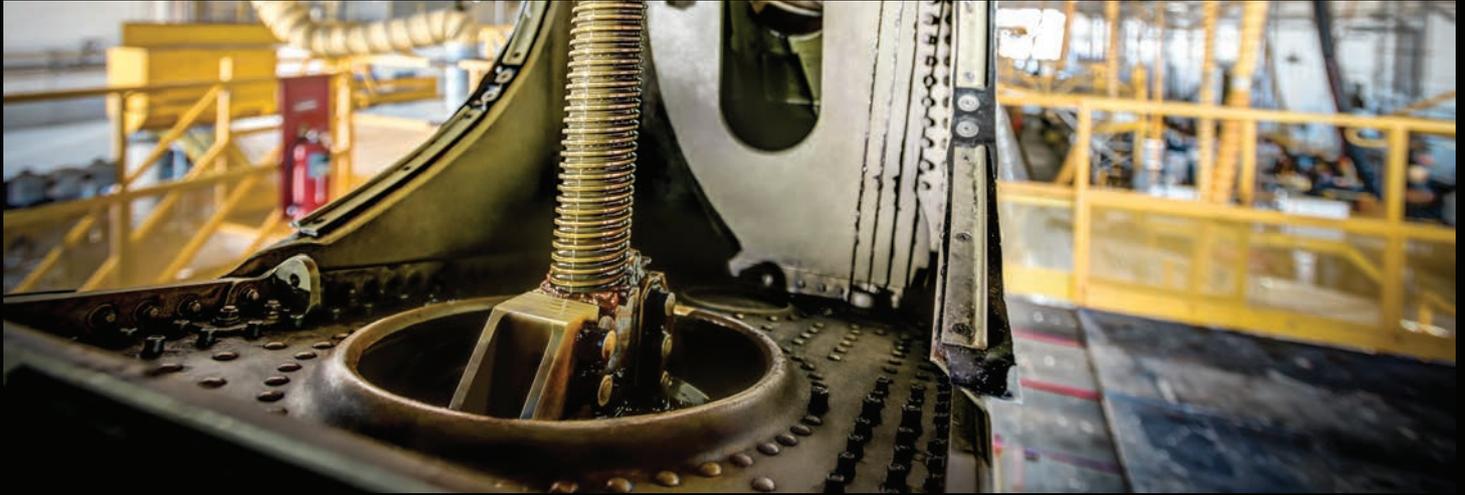
Designate separate areas for new product vs. product in use to support inventory management best practice

Ensure area has proper signage (e.g., No Smoking, Slippery Surface, Hazardous, etc.)

Install easy access for off-loading (e.g., accessibility for trolley, forklifts, etc.)

Keep area locked for security

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## Outdoor storage

Storing lubricants outdoors is a poor practice and not recommended. However, if lubricants must be stored outdoors, we recommend taking certain precautions to minimize harmful effects.

- A temporary shelter, lean-to, or waterproof tarpaulin will protect drums/pails/totes from rain and snow. Place product on blocks or racks several inches above the ground to prevent moisture damage.
- Special caution should be taken in storing drums to avoid contamination, destruction of contents and formation of rust on the inside of the drum.
  - Avoid storing drums on end with bungs on top, as this may cause water to seep into the drums.
    - Rain or condensed atmospheric moisture, which collects inside the chime, can be drawn down through the bung as the drum breathes with the rise and fall of ambient temperature and pressure. This can occur even if the drums have never been opened.
  - Instead, we recommend storing drums on their sides with bungs (port holes) horizontal to each other. A drum that has a bung on the side should be stored on end or on its side, with the bung down.
  - In this position, the underside of the bungs are submerged by the drum contents, thus preventing the drum from breathing in moisture.
  - For maximum protection, the drums can be placed on end (bung end down) on a well-drained surface.
  - If drums must be stored with the bung end up, we suggest tilting them on blocks with the bungs parallel to the block to keep water away from the bung openings.
- Never store open/used containers outdoors.

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## Handling

Always wear appropriate personal protective equipment (PPE) such as gloves and eye protection.

Before handling product, review the Material Safety Data Sheet (MSDS) to understand chemicals used, recommendations on safety measures/precautions to exercise when handling the product, and to understand other safety implications/risks associated with the product.

### Best practices and recommendations for product handling

Special care should be taken when handling phosphate esters (e.g., Mobil™ HyJet™ hydraulic fluids). We recommend reviewing the MSDS to learn more about recommended precautions and appropriate personal protective equipment to use.

Avoid contact with eyes

Avoid contact with skin

- Phosphate esters are hygroscopic and known to absorb water from the air and fatty layers of the skin

Wear appropriate hand protection/gloves (i.e., use recommended gloves based on chemicals/products)

- When handling phosphate esters, we recommend using appropriate gloves for protection
- ExxonMobil Research and Engineering (EMRE) laboratories use N-Dex nitrile disposable gloves, which offer good grip and resist exposure to phosphates esters such as Mobil HyJet products for up to one hour.

Wear protective clothing designed to prevent contact with skin and eyes

- Long-term exposure to phosphate ester based products (e.g., Mobil™ HyJet™ V and Mobil™ HyJet™ IV-A<sup>plus</sup>) can cause irritation and dry skin

Avoid unnecessary contact with paints and non-metallic materials/surfaces (if applicable; e.g., phosphate ester-based hydraulic fluids)

Avoid vapors from heated materials to prevent exposure to potentially toxic/irritating fumes

Take precautionary measures to prevent small spills and leakage to avoid slip hazard

### For more information

Please contact your ExxonMobil aviation sales representative, or download the Material Safety Data Sheet (MSDS).