Tank Truck Product Integrity Protection Guidelines
6th Edition, Revision 1
April 15, 2024

Normal Alpha Olefins (NAO)

These Product Integrity Protection Guidelines (Guidelines) have been developed to assist in protecting the quality of normal alpha olefins (NAO) chemicals when shipped by tank truck.

The Guidelines offer information to help reduce losses due to product contamination attributable to activities performed at/by tank truck wash facilities, motor carriers, terminals, and plants. They generally apply to single and multi-compartment MC-307 (DOT-407) stainless steel trailers used to transport the above-named products. Equipment operated as part of the dedicated transportation fleet at the Chevron Phillips Chemical Company (CPChem) Cedar Bayou plant is exempt.

The Guidelines are not legal standards, and are not intended to, and do not replace procedures already in place for tank truck wash facilities, motor carriers, terminals or plants, and do not amend or supplement any contract entered with CPChem. The Guidelines are being provided to highlight those tasks found to be the most important to prevent product contamination.

CPChem regards stains on the inner walls of stainless-steel tanks as the joint responsibility of the motor carrier and the tank truck wash facility. CPChem expects both to make sure any stains that cannot be removed are non-transferable and are not a potential source for product contamination. All equipment tendered for loading should be ready to receive the product and move it to destination in the same condition as it was loaded.

Tank Truck Wash Facilities

Arrival

- Verify the trailer identity and prior cargo upon arrival.
- Review the intended cargo for the trailer, if provided by the motor carrier, to determine any restrictions associated with the prior load.
- Review the current Safety Data Sheet (SDS) for the prior cargo. The SDS for CPChem materials can be found at: (https://www.cpchem.com/resources/safety-data-sheets-sds).
- Determine the method to be employed to clean the trailer and ensure compliance with any established CPChem motor carrier and/or customer requirements (e. g. exterior washing, valve cleaning, hose cleaning, gasket replacement, kosher wash, etc.).

Cleaning

- Clean the interior of the trailer, vapor return line, external piping, valves and hoses as per established procedures. Replace gaskets as necessary and refer to the attached gasket selection guide.
- Make sure all cleaning materials are completely rinsed from the trailer barrel, associated piping and hoses. Residual detergents, caustics and deodorizers may contaminate the products referred to in these guidelines.
- Perform all other related work (e.g., exterior washing, hose cleaning, gasket replacement, etc.) per instructions from CPChem, the motor carrier, or as specified by the customer.
- Completely dry the interior of the trailer, vapor return line, external piping, valves, hoses, and if applicable, the pump.
- Document the cleaning and work performed.

Inspection

- Inspect the interior of the trailer, vapor return line, external piping, valves and hoses for residual cleaning agents, films, debris and/or liquids per instructions from CPChem, the motor carrier, or as specified by the customer.
- Make sure all valves, caps, and manways are secure for transit.
- Re-clean the trailer or related items if the inspection indicates they are not clean, dry, and odor-free. Re-inspect.
- Document the inspection performed and certify the trailer is clean, dry, odor-free and that **no transferable stains** are visible inside the barrel or compartments of the trailer**. If a stain is visible, ensure the stain is non-transferable and document as such on the wash certificate.**
- Provide the driver with the certificate that shows the trailer is clean, dry and odor-free, and keep a copy. This certificate must indicate the prior cargo.

Motor Carriers

Trailer Assignment

- Review the attached Unacceptable Prior Cargo list in Table 1 if the next load is to be normal alpha olefins (NAO) and assign the trailer accordingly.

Trailer Pickup from Tank Truck Wash Facilities

- Obtain and review the wash certificate that shows the trailer and any related equipment have been cleaned pursuant to applicable procedure and/or as requested, and is certified clean, dry and odor-free. Retain a copy of the wash certificate which must indicate the prior cargo. This wash certificate must be presented to the loading terminal or plant prior to loading.

Inspection

- Due to the potential for a liquid or vapor release, terminals and plants may not allow trailer valves and man-ways to be opened on site. Perform these operations at the cleaning facility where liquids can be properly contained.
- Make sure the trailer interior, external piping, valves, pump (if applicable) and hoses are clean, dry, odor-free, and that **no transferable stains** are visible inside the barrel or compartments of the trailer. If stains are visible, they must be listed as non-transferable on the wash certificate from the tank truck wash facility.
- Gaskets should be in good working condition and appropriate for the intended product. Refer to Table 3 - Gasket Selection Guide as needed.
- Verify equipment readiness by ensuring all man-ways, caps and valves are properly closed and secured.
- Any issues related to the trailer, including whether the trailer has been properly prepared for the cargo, should be discussed and resolved with the tank truck wash facility manager before departure.

Dispatch to a Plant or Terminal for Loading

- Review tank truck wash facility documentation; ensure appropriate wash procedure was followed. Check that prior cargo is listed on the wash certificate and the certificate is available for presentation at the loading facility.
- Ensure the trailer temperature gauge is in good working order. The temperature of an empty trailer presented for loading should be below 90° F. An empty trailer with a temperature above 90° F may be loaded as long as it does not exceed ambient temperature.

Terminals & Plants

Arrival

- Collect paperwork (i.e., bill of lading, SDS, wash certificate, etc.) on shipment and trailer from the driver. If paperwork is not available, reject carrier and notify CPChem NAO customer service group about potential delays.
- Review paperwork presented by the carrier certifying the trailer is clean, dry, odor-free and that **no transferable stains** are visible inside the barrel or compartments of the trailer.
- Determine the prior cargo carried in the trailer from the wash certificate. If the prior cargo is listed in the Unacceptable Prior Cargo section of the appropriate Table 1, immediately reject the trailer and notify the CPChem NAO customer service group.
- Ensure the trailer temperature gauge is in good working order. The temperature of an empty trailer presented for loading should be below 90° F. An empty trailer with a temperature above 90° F may be loaded as long as it does not exceed ambient temperature. Reject any trailer that falls outside the acceptable temperature range and notify the CPChem NAO customer service group.

Inspection

- Inspect the trailer per established procedures and ensure it is clean, dry and odor-free – this includes trailers arriving from the tank truck wash facility and are Kosher certified.
- Before loading, check the paperwork presented by the carrier to determine if valves and man-way were opened. Work in conjunction with the motor carrier driver to make sure there is no liquid in the unloading line.
    - If the trailer came directly from a wash facility and the wash certificate is presented, open internal and rear valves to ensure the trailer is free of water.
    - If a wash certificate is not presented, internal and external valves should not be opened and the trailer should be rejected. Note: residual material may contaminate the product and make it unsuitable for the customer's process.
    - If trailer is in dedicated service, inspection of the internal and rear valves is not necessary.
- If stains are visible, ensure they have been documented on the certificate from the tank truck wash facility as non-transferable.
- Verify the integrity of the dome lid gasket before loading; replace if necessary.

Loading

- Load the product according to established procedures.
- Verify the travel readiness of the trailer by ensuring hatches and valves are secured and that all other equipment is secured properly.
- Provide the driver with applicable placard and all necessary documentation for the shipment.

TABLE 1 – NORMAL ALPHA OLEFINS (NAO)	
The following chart lists those materials that are considered unacceptable prior cargos handled in a cargo tank truck and ISO tanks intended for use in shipping NAO. Cargo tank trucks and ISO tanks used for shipping any of these materials should not be used, regardless of tank cleaning activities, to ship CPChem's NAO.	
<u>Unacceptable</u> Prior Cargo List – General Materials or Types of Chemicals	
General Material or Type	**Examples**
Adhesives	All adhesives
Animal oil	Beef Tallow, Sheep Tallow, etc.
Aromatics	Benzene, Styrene, Ethyl Benzene, Xylenes
Aviation Fuel	All grades (such as Jet A 1, Jet A, etc.)
Crude Oil	All Crude Oil, including oil field waste
Dark Colored Products	Asphalt, Tars, Dyes, Inks, etc.
Diesel Fuel	All grades, including low sulfur
Fuel Oil	Marine Bunker Fuels (such as No. 2, No. 6, etc.)
Gasoline	All grades (regular to premium)
High Sulfur Organic Chemicals	Sulfides or Mercaptans (such as Dimethyl Sulfide, Methyl Mercaptan, etc.)
Latex	All latex, Including paints
Lube oil	All grades, brands, and end use (motor, diesel, any lubricant)
Naphtha	All naphthas
Natural Resin	Rosin, Balsam, Linseed Oil
Organic Acids ***(not water soluble)***	Capric acid, Oleic acid
Oxygenates ***(not water soluble)***	Alcohols, Ketones, Aldehydes, Esters, Glycols etc. (such as 1-octanol, dioctylphthalate, etc.)
Paint	Latex, oil and water-based
Strong odor	Alimet, Tallow, Naphthalene, p-Dichlorobenzene, Amines and Acrylic Acid
Synthetic Resin (***not water soluble***)	Synthetic Rubber, Silicones
Tall Oil	All Tall Oil
Vegetable oil	Sunflower, Olive, Cottonseed, Canola, Palm, etc.
Waxes (except CPChem waxes)	Synthetic and petroleum based

TABLE 2 – NORMAL ALPHA OLEFINS (NAO)	
The following chart lists those materials that are considered acceptable prior cargos handled in a cargo tank truck and ISO tanks intended for use in shipping NAO. Proper tank cleaning should take place prior to loading NAO otherwise residue from the prior load may contaminate the product and make it unsuitable for the customer's process. Tank cleaning guidelines are provided below the chart.	
<u>Acceptable</u> Prior Cargo List – General Materials or Types of Chemicals	
Caustic	Bases (such as Sodium Hydroxide, Ammonium Hydroxide, etc.)
Inorganic Acids	Mineral Acids (such as Hydrochloric Acid, Sulfuric Acid, etc.)
Normal Alpha Olefins (NAO)	All fractions
Organic Acids ***(water soluble)***	Glacial Acetic Acid, Vinegar, etc.
Oxygenates ***(water soluble)***	Alcohols, Ketones, Aldehydes, Esters, Glycols etc. (such as Isopropyl Alcohol, Acetone, Ethylene Glycol, etc.)
Poly Alpha Olefins (PAO)	All fractions
Synthetic Resin (***water soluble***)	Water-based Acrylics or Epoxies

Generally, if a cargo tank truck or ISO tank has been used to ship a specific CPChem NAO fraction and returns for loading the same fraction, tank washing is not required. However, if the cargo tank has been used to ship any of the above acceptable materials, or has been used to ship an acceptable NAO fraction different than the material to be loaded, the tank should be cleaned as follows:

<u>Cold water flush, detergent wash, hot water flush, dry</u>

If an odor is associated with any acceptable prior cargo, the tank should be cleaned as follows:

<u>Steam, cold water flush, detergent wash, hot water flush, dry</u>

If any uncertainty exists as to whether a prior cargo is unacceptable or acceptable, please contact the CPChem NAO customer service group.

Questions should be directed to the CPChem NAO customer service group.				
Table 3 - Gasket Selection Guide (Note 1)				
	NAO C6; C8 (Note 2)	**NAO C10; C12**	**NAO C14, C16, C18, C20-24, C24-28, C26-28, C30+, C30+HA**	**NAO C14, C16, C18, C20-24, C24-28, C26-28, C30+, C30+HA**
Teflon®	**X**	**X**	**X**	**X**
Viton®		**X**	**X**	**X**
Garlock® No.70201				
White Canadian Asbestos		**X**		
Grafoil®				
Durable Nitrile®				
Reinforced graphite composite				

Note 1 **X = recommended use**

Note 2 **Viton is not recommended for use with 1-Hexene or 1-Octene. Viton will absorb gases and vapors causing it to swell, making the material incompatible for couplings and connections.**