Shell

# Cargo Handling Sheet

## Propylene Oxide

Document Date: 12 May 2023
Revision 10

***Cargo Handling Sheets are for the use of vessels chartered on behalf of Shell***

## Product Details

| | |
|---|---|
| Trade Name: | Propylene Oxide |
| IMO Product Name: | Propylene Oxide |
| Chemical Family: | Alkylene Oxides |
| Product Code: | U1112 |

SDS: http://www.shell.com/business-customers/chemicals/safe-product-handling-and-transportation/safety-data-sheets.html

## Physical Properties

| | |
|---|---|
| Density: | 830 kg/m3 (20 °C / 68 °F) |
| Dynamic Viscosity: | 0.58 mPa.s (20 °C / 68 °F) |
| Vapor Pressure: | 25.1 kPa (0 °C / 32 °F) |
| Relative vapour density: | 3.6 |
| Boiling Point: | 35 °C / 95 °F |
| Melting Point: | -112 °C / -170 °F |
| Flash Point: | -37 °C / -35 °F |
| Appearance: | Oily liquid, colourless to yellow, Ethereal odour |

**Note 1:** Physical Properties are for reference only and valid as of date of this revision; see loading terminal for specific properties.
**Note 2:** Hazard Identification: Extremely Flammable, Static Accumulator, High Vapor Pressure, Toxic, Water reactive, Heat Sensitive.
**Note 3:** This product will polymerise at elevated temperatures 50 °C / 122 °F or if contaminated with water.

## Transhipment

Prior to arranging transhipment Charterer must agree to Owner's proposed plan. When arranged by the Owner, Owner must ensure that all transhipment vessels comply with the requirements of this cargo handling sheet.

## Marpol Details

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|---|---|
| Marpol Annex: | II |
| IMO Ship Type: | 2 |
| Inland Barge: | Type C with independent pressure cargo tanks |

| | |
|---|---|
| IMO Pollution Category: | Y |
| IBC 16.2.6: | No |
| IBC 16.2.9: | No |
| Pre-Wash Required: | No |
| Compatibility Group: | USCG compatibility group 16 |

## Cargo Handling Requirements

| | |
|---|---|
| N2 Purge Cargo Tanks Prior Loading: | Yes, Max 0.5% O2. Safety and Product Quality requirement; see Notes below |
| N2 Blanket Required: | Yes, Max 0.5% O2. Safety and Product Quality requirement; min 99.9 % N2 Purity, see Notes below |
| Adjacent Space Purge: | Yes, Max 2% O2, |
| Loading Temperature Range: | Ambient to 25 °C / 77 °F |
| Transit Temperature Range: | Ambient to 33 °C / 91 °F |
| Unloading Temperature Range: | Ambient to 33 °C / 91 °F |
| Maximum Heating Coil Temperature: | Blanked off |
| Maximum Adjacent Temperature: | 33°C / 91 °F |

**Note 1**: Reference should be made to the IBC code Section 15.8 Propylene Oxide
**Note 2:** Propylene Oxide may be carried in pressure tanks or in independent or integral gravity tanks. Cargo tanks of design pressure below 0.6 bar gauge carrying Propylene Oxide shall have a cooling system to maintain the cargo below reference temperature. When required, such cooling systems should consist of at least two cooling plants, each with sufficient capacity to maintain the liquid below boiling temperature at the containment pressure. Cooling medium should be compatible with propylene oxide.
**Note 3:** Vessels without Cooling Systems: Prior to fixing, Owner's representative is to provide a Risk Assessment for Charterers review and agreement, considering the anticipated ambient and adjacent temperatures for the duration of voyage for cargo temperature to not exceed 33°C.
**Note 4**: If Nitrogen blanket is in place and Carrier chooses to tranship, carrier must reapply nitrogen blanket on the cargo, both on the unloading and receiving vessel, at their time, risk, and expense.
**Note 5**: PO must not be carried in tanks serviced by a cargo pump room.
**Note 6:** N2 Blanket Guidance, Reporting Temperatures and Pressures:
a. O2 level in cargo tanks: Max 0.5% O2
b. Vessel to maintain a nitrogen pressure of at least 70 millibars at all times.
c. During the voyage the vessel shall maintain a daily log of the following and, upon request, send the log to the responsible Shell Charterer:

1. Cargo temperature in PO tanks

2. Temperature in cargo tanks, void spaces, and other enclosed spaces adjacent to the PO tanks
3. Oxygen content and pressure in the ullage spaces of all PO tanks and cargo tanks, void spaces, and other enclosed spaces adjacent to the PO tanks
4. Air and Sea Water Temperature

d. If at any time during the voyage PO temperatures reach 33 °C / 91 °F, the responsible Shell charterer should be notified immediately.
e. After completion of unloading the vessel shall provide a copy of the daily log of temperature/ pressure/ O2 content to the responsible Shell Charterer.
**Note 7:** Shipboard common lines should not be used if they last contained one of the banned prior cargoes.

## Regional Requirements

**Inland Barging EU:** In addition to the above notes to the Cargo Handling Requirement section, please see below for EU Type G barges.
**Note 1:** Reference is made to ADN Table C Propylene Oxide, UN 1280
**Note 2:** Tank lining and piping shall be of stainless steel or mild steel.
**Note 3:** The piping system for cargo tanks to be loaded with Propylene Oxide shall be separate from the piping system for all other cargo tanks, including empty tanks
**Note 4:** Cargo tanks and piping shall be efficiently and thoroughly cleaned, dry, free from contamination, rust deposits or visible structural defects. Chemically bounded rust may be acceptable.
The inspection and testing may not be required if tank last contained PO and has not been opened since.
If previous PO was from another supplier; cargo specs of this product shall be reviewed by Shell before Tank can be accepted.
**Note 5:** PO shall not be carried in tanks that have contained as one of the three previous cargoes any product known to catalyse polymerization, such as: Anhydrous ammonia and ammonia solutions, Amines, and amine solutions and/or Oxidizing substances (e.g., chlorine), also see banned immediate last cargoes in below section.
**Note 6:** No air shall be allowed to enter the tanks, pumps, or piping.
**Note 7**: PO must not be carried in tanks serviced by a cargo pump room.
**Note 8:** N2 Blanket Guidance, Reporting Temperatures and Pressures:
a. O2 level in cargo tanks: Max 0.5% O2
b. Vessel to maintain a nitrogen pressure of at least 70 millibars at all times.
c. During the voyage and unloading the vessel shall maintain a daily log of the following and, upon request, send the log to the responsible Shell Charterer:

1. Cargo temperature in all PO tanks
2. Pressure in the vapour space of all PO tanks

d. If at any time during the voyage PO temperatures reach 33 °C / 91 °F, the responsible Shell charterer should be notified immediately.
e. After completion of unloading the vessel shall provide a copy of the daily log of temperature/ pressure content to the responsible Shell Charterer.

## Tank Acceptance Requirements

All nominated shipboard cargo handling systems are to be presented clean (residual free), dry, odor free, rust free, with good gaskets, fit to load this cargo.

Maintenance of heating coils is to be verified in the ship's log. If product is to be heated, heating coils are to be confirmed leak free. If product is not heated, heating coils are to be blown clear and dried with N2 and blanked off.

**Stainless Steel or Coated Tank**: Stainless Steel
Also see Regional Requirements for Inland European barges, Note 2 above.

**Banned Immediate Last Cargoes:**
.1 mineral acids (e.g., sulphuric, hydrochloric, nitric, phosphoric)
.2 carboxylic acids and anhydrides (e.g., formic, acetic)
.3 halogenated carboxylic acids (e.g., chloracetic)
.4 sulphonic acids (e.g., benzenesulphonic)
.5 caustic alkalis (e.g., sodium hydroxide, potassium hydroxide, other metal hydroxides and solutions)
.6 ammonia and ammonia solutions
.7 amines (Ethylamines, Propylamines, Ethylenimines, Ethyleneimines and other amines and solutions)
.8 oxidizing substances
**Ref: IBC 15.8.2 and Cefic Guidelines for the Distribution of Propylene Oxide**

**Wall Wash Required:** Yes, methanol WWT by Cargo Surveyor

| **Wall Wash Test:** | **Specification** | **Standard** | **After Priors** |
|---|---|---|---|
| Hydrocarbons | Pass | ASTM D1722 | All priors |
| Chlorides | Max 1 ppm | IMPCA 002-98 | All priors |
| Colour Test | Max 15 Pt/Co | ASTM D1209 | Veg Oils, waxes, heavy lubes, additives |
| Permanganate | > 40 min | ASTM D1363 | Inhibited priors |
| NVM | Max 50 | ASTM D1353 | Veg Oils, waxes, heavy lubes, additives |

## Safety Information and Incident Reporting

**Safety Information:** Refer the SDS (Safety Data Sheet) or e-SDS.

**Incident Reporting:** All incidents should be reported in accordance with regulations and charter party requirements.

For additional marine cargo handling advice or information, contact the regional Chemical Marine Technical Advisor.

**Shell Chemical LP**
PO Box 4407
Houston
Texas 77210 USA