



**Shell Chemicals**

# Cargo Handling Sheet

Propylene Oxide

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Revision 9

*Cargo Handling Sheets are for the use of vessels chartered by Shell Chemicals*

## Product Details

Product Name: Propylene Oxide  
Shipping 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/m<sup>3</sup> (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.

## Transshipment

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

## Marpol Details

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, PQ requirement; Max 0.5% O <sub>2</sub> , 99.50 % N <sub>2</sub> Purity, see Notes below
N2 Blanket Required:	Yes, PQ requirement; Max 0.5% O <sub>2</sub> , 99.50 % N <sub>2</sub> Purity, see Notes below
Adjacent Space Purge:	Yes, Max 2% O <sub>2</sub> , including empty cargo tanks
Loading Temperature Range:	< 25 °C / 77 °F
Transit Temperature Range:	≤ 33 °C / 91 °F
Discharge Temperature Range:	≤ 33 °C / 91 °F
Maximum Heating Coil Temperature:	Blanked off
Adjacent Maximum Cargo 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, unless waived by the Flag State as per IBC Code. 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, the regional MTA-C must engage with the vessel Technical Operator to:

1. Ensure a 'risk assessment' by the Master which shall include crew briefing about the hazards of PO, the risks in relation to the vessel's limitations against high ambient temperature, voyage duration and adjacent cargoes.
2. Verify the ship's Certificate of Fitness for the nominated cargo tank(s)
3. Verify the stowage plan, including Maximum Adjacent Temperature.
4. Consider the ambient temperature along the voyage, in due consideration of area, season and duration to ensure that cargo temperature remains below 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 discharging and receiving vessel, at their time, risk, and expense.

**Note 5:** Due to products hazardous nature, PO should not be carried in tanks serviced by a cargo pump room.

**Note 6:** PQ = Product Quality

**Note 7:** N2 Blanket Guidance, Reporting Temperatures and Pressures:

- a. O<sub>2</sub> level in cargo tanks: Max 0.5% O<sub>2</sub>
  - b. Vessel to maintain a constant nitrogen overpressure of 70 millibars or more during the voyage
  - c. During the voyage the vessel shall maintain a daily log of the following and, upon request, send the log to the responsible Shell Chemicals Charterer:
    1. Cargo temperature in PO tanks
    2. Temperature in tanks adjacent to the PO tanks
    3. Oxygen content and pressure in the ullage spaces of all PO tanks and tanks 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 Chemical charterer should be notified immediately.
  - e. After completion of discharge the vessel shall provide a copy of the daily log of temperature/ pressure/ O<sub>2</sub> content to the responsible Shell Chemicals Charterer.
- Note 8:** 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 Chemicals 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:** Due to product's hazardous nature, PO should not be carried in tanks serviced by a cargo pump room.

**Note 8:** N2 Blanket Guidance, Reporting Temperatures and Pressures:

- a. O<sub>2</sub> level in cargo tanks: Max 0.5% O<sub>2</sub>
- b. Vessel to maintain a constant nitrogen overpressure of 70 millibars/7kPa or more during the voyage
- c. During the voyage and discharge the vessel shall maintain a daily log of the following and, upon request, send the log to the responsible Shell Chemicals 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 Chemical charterer should be notified immediately.
- e. After completion of discharge the vessel shall provide a copy of the daily log of temperature/ pressure content to the responsible Shell Chemicals 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, Ethyleneamines, Methyleneamines and other amines and solutions)
- .8 oxidizing substances

Source: 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	< 1 ppm	IMPCA 002-98	All priors
Color Test	< 15 Pt/Co Max	ASTM D1209	Veg Oils, waxes, heavy lubes, additives
Permanganate	> 40 min	ASTM D1363	Inhibited priors
NVM	< 50	ASTM D1353	Veg Oils, waxes, heavy lubes, additives

## Safety Information and Incident Reporting

### Safety Information:

HSSE information can be found in the SDS or e-SDS.

### Incident Reporting:

All incidents should be reported in accordance with regulations and charter party requirements.

International Registered Vessels: If an incident occurs call Shell International Trading and Shipping in London on +442079347777.

Jones Act Vessels: call the Shell 24 hr. incident number at +17132412532. The USA National Response Center telephone number is +18004248802.

For additional marine cargo handling advice or information, contact Captain Stephen Boudreaux at +18323376982 or Capt. Ben van Bemmelen at +31104415992.



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