SHELL

CARGO HANDLING SHEET

Monopropylene Glycol USP

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

Document date 05 Aug. 2024
Revision no. 11

Product Details

Trade Names:	Monopropylene Glycol–USP; BC Monopropylene Glycol – USP, Monopropylene glycol - USP HP, Monopropylene glycol - USP Sustainable, B Monopropylene glycol - USP
IMO Product Name:	Propylene Glycol
Chemical Family:	Alcohols Glycols

Link to Safety Data Sheet

Physical Properties

Density:	1,036 kg/m3 (20 °C / 68 °F)
Dynamic Viscosity:	55 mPa.s (20 °C / 68 °F)
Vapor Pressure:	7 Pa (20 °C / 68 °F)
Boiling Point:	186 °C / 367 °F
Melting Point:	-59°C / -74 °F
Flash Point:	99 °C / 210 °F
Appearance:	Colorless liquid, odorless

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: See SDS for full list of hazards and precautions.

Marpol Details

Marpol Annex:	II
IMO Ship Type:	IBC Chapter 18 cargo, must be double hulled.
Inland Barge:	Double Hull
IMO Pollution Category:	OS
IBC 16.2.6:	No
IBC 16.2.9:	No
Pre-Wash Required:	No
Compatibility Group:	USCG compatibility group 20

Cargo Handling Requirements

N2 Purge Cargo Tanks Prior Loading:	No
N2 Blanket Required:	Yes, Product Quality requirement; Max 5% O2; see notes below and Regional Requirements
Adjacent Space Purge:	No
Loading Temperature Range:	Ambient
Transit Temperature Range:	Ambient - 35 °C / 95 °F
Unloading Temperature Range:	Ambient - 35 °C / 95 °F
Maximum Heating Coil Temperature:	65 °C / 149 °F
Maximum Adjacent Temperature:	35 °C / 95 °F

Note 1: If Nitrogen blanket is in place and Carrier chooses to transship, carrier must reapply nitrogen blanket on the cargo, both on the discharging and receiving vessel, at their time, risk, and expense.
Note 2: N2 Blanket:
a. O2 level in tanks: 5% O2.
b. Vessel to maintain a constant nitrogen overpressure of 20 millibars or more during the voyage.
Daily Log: During the voyage the vessel shall maintain a daily log of the following and the log shall be sent to the Shell Charterer/Planner at the time of unloading. Tank pressure, O2 level and Tank Temperature.
Note 3: For quality assurance, this product should not be transported in tanks that are serviced by a cargo pump room.

Regional Requirements

Note1: MPG shipments from Singapore must be handled in a manner consistent with the CEFIC requirements as per the attached link. https://www.propylene-glycol.com/uploads/documents/GuidelinesUSP_2013_UK_HR.pdf

Note 2: Previous Cargo Restrictions

- 1st last cargo for stowage compartment will be checked against "**Prior Cargo Restriction List**"**Error! Reference source not found.**
- If the 2nd and/or the 3rd last cargoes are on the List, it is highly recommended to carry out an analysis of the product prior to discharge to the shore tank.
- Adjacent cargoes should also be checked.
- Prior and adjacent cargoes must be approved by Shell Charterer/Planner

Note 3: Kosher Procedures

- Last 3 cargoes and current adjacent cargoes will be submitted to Rabbi for approval; Note: only truly adjacent tanks (i.e., tanks with common bulkheads, not cofferdam spaces, need to be considered).

- Substances not included in the "**Prior Cargo Restriction List**", but having a hazardous potential, will need Gas Chromatography Mass Spectroscopy (GCMS) analysis.
- The Owners must communicate to the Shell Charterer/ Planner if any new cargoes are loaded into the adjacent tanks during the voyage from the Shell load port to Shell nominated discharge port. GCMS may conduct test to detect any possible contamination.
- Compliance to the Previous Cargo Restriction List is a must. Any exceptions will require approval from Shell and additional analytical effort at the discharge port.

Note 4: Stainless Steel passivated tanks

- Ship stainless steel tanks which have been passivated shall be considered as new buildings. Cargoes carried prior to the date of such passivation shall not be considered as relevant.
- Owners are required to provide their passivation procedure and prior cargo information for verification when requested.
- Owners should employ a passivation process such as that recommended under the current version of ASTM A 967. Only Citric Acid is accepted as a medium of passivation

Transshipments

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.

Tank Acceptance Requirement	
Banned Prior Cargo:	See notes in Regional Requirements.
Stainless Steel or Coated Tanks:	Stainless steel only
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.	

Wall Wash Test Requirement	
Wall Wash Required:	Yes, must be conducted by Cargo Surveyor

Wall Wash Test	Specification	Standard
Appearance	Clear and free from suspended matter	ASTM D4176
Chlorides	Max 1.0 ppm	IMPCA 002-98
Hydrocarbons	Pass	ASTM D1722
Color Test	Max 5 Pt/Co	ASTM D1209

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

Prior Cargo Restriction List

Prohibited Adjacent Cargo and Prior Cargo List for Monoproylene Glycol (MPG) – USP, and potential contamination sources.

NOTE: Substances not on this list having a hazardous potential will be checked by Shell's Chemical Marine Technical Advisor, Product Steward or Quality Manager for further evaluation.

This list is based in part on NIOP Unacceptable Prior Cargo List, FOSFA List of Banned Immediate Previous Cargoes and Codex Code of Practice for the Storage and Transport of Edible Fats and Oils in Bulk (Codex Alimentarius).

The criteria described in the CEFIC Guidelines for Handling and Distribution of Propylene Glycol USP/EP for all shipments in non-dedicated transportation equipment to protect end- users from product cross-contamination has been applied (see chapter 5.3 of this guideline).

- Chemical substances highlighted in red are prohibited adjacent cargos.
- Non-highlighted chemical substances are allowed as an adjacent cargo only after prior notification to Shell.
- Leaded products shall not be carried as the three previous cargoes.
- Ethylene Dichloride and Styrene Monomer shall not be carried as the three previous cargoes in organic coated tanks, or as the last cargo in stainless steel and inorganic coated tanks.

Substance	Reason To Be On The List
Acetaldehyde	Carcinogen cat 1B
Acetic acid	Strong acid
Acetone cyanohydrin	Reactive with water. Decomposes to form Hydrogen Cyanide. FOSFA list, Codex list
Acrylamide	Carcinogen cat 1B, sensitizer
Acrylic acid	Corrosive. FOSFA list, Codex list
Acrylates (see individual products in the list)	Sensitizers
Acrylonitrile	Carcinogen cat 2. Codex list
Adiponitrile	Toxic by ingestion. FOSFA list, Codex list
Alkyl and Alkyl compounds	Very reactive

Animal products including lard, tallow, etc.	Halal, Kosher
Aniline	Carcinogen and mutagen cat 2, sensitizer. FOSFA list, Codex list
Anisol	Mutagen cat 2
Ammonium Hydroxide	Strong base
Asphalt (paving asphalt, roofer's flux, etc.)	Petroleum product
Benzene including benzene mixtures	Carcinogen cat 1A. Codex list
1,3-butadiene	Carcinogen cat 1A. Codex list
Butyl acrylate	Sensitizer. FOSFA list, Codex list
C9 mixed aromatics	Contains xylenes, petroleum
Caprolactam	Harmful by all routes of exposure.
Carbon tetrachloride	Toxic by inhalation, carcinogen cat 2. FOSFA list, Codex list
Cardura E (trade name for glycidyl esters of versatic 911 acid)	Mutagen and reprox tox cat 2, skin irritating and sensitizing properties. FOSFA list, Codex list
Cashew nutshell liquid	Harmful by ingestion. Strong skin and respiratory sensitizer, symptoms may be delayed. Contact with eyes may cause permanent injury. FOSFA list, Codex list
Chlorinated compounds (examples in the list)	
Chloro benzenes	Harmful by inhalation, chronic aquatic toxicity
Chloroform	Carcinogen cat 2 and reprox tox cat 2, harmful by inhalation
Chloroprene	Carcinogen cat 1B. Codex list
Coal tar and coal tar pitch	Carcinogen cat 1A
Creosote (coal tar or wood)	Carcinogen cat 1B
Cresol (o,m,p and cresylates and cresylic acids)	Corrosive, toxic if contact with skin. Codex list
Cumene	Carcinogen cat 1B
Cyanates (see individual products in the list)	

Cyclohexane	Solvent limitation
Dibutylamine	Harmful by all routes of exposure. FOSFA list, Codex list
Dichloromethane	Codex list
Diethanolamine	Formation of nitrosamines, corrosive, toxic if swallowed. FOSFA list, Codex list
Diethylenetriamine	Corrosive, sensitizer. FOSFA list, Codex list
Diethylene glycol	Harmful if swallowed, USP
Diglycidyl ether of bisphenol A	Digylcidylethers are suspected carcinogens; together with bisphenol A - > discussion on hormone disrupting effects, sensitizer. Codex list
Diisopropylamine	Corrosive. FOSFA list, Codex list
1,2-Dimethoxyethane	Solvent to be limited. Reprox tox cat 1B
Dimethylformamide (DMF)	Reprox tox cat 1B
Dioctyl phthalate	Reprox tox cat 1B
1,4 Dioxane	Solvent to be limited. Carcinogen cat 1B
Diphenyl methane diisocyanate (MDI)	Respiratory and skin sensitizer, carcinogen cat 2
Dipropylamine	Corrosive. Codex list
Divinylbenzene	Intermediate, associated with styrene FOSFA list, Codex list
Epichlorohydrin	Carcinogen cat 1B, corrosive, sensitizer FOSFA list
Epoxy resins (uncured)	Asthmogenic. FOSFA list, Codex list
Ethanol	Halal
Ethanolamine	Corrosive, harmful by all routes of exposure. Codex list
Ethyl acrylate	Sensitizer. Codex list
Ethylbenzene	IARC 2B

Ethyl hexyl acrylate	See other acrylates. Codex list
Ethylene dibromide	Carcinogen cat 1B, chronic aquatic toxicity, Codex list
Ethylene dichloride	Carcinogen cat 1B. FOSFA list, Codex list
Ethylenediamine	Corrosive, sensitizer. FOSFA list, Codex list
Ethylene glycol (Monoethylene glycol MEG)	Harmful if swallowed. USP, Codex list
Ethylene Glycol Ethers, such as: • Ethylene glycol ethyl ether (ethoxy ethanol), • Ethylene glycol ethyl ether acetate (ethoxy ethyl acetate), • Ethylene glycol methyl ether acetate (methoxy ethylacetate), • Ethylene glycol methyl ether (methoxy ethanol), • Ethylene glycol monobutyl ether (butoxyethanol), • Ethylene glycol monoalkyl ether)	Several health hazards including reproductive toxicity. Codex list
Ethylene oxide	Carcinogen, mutagen and reprox tox cat 1B. Codex list
Formaldehyde	IARC 2A, carcinogen cat 1B, mutagen cat 2. Codex list
Furfuryl alcohol	Harmful by all routes of exposure, carcinogen cat 2. FOSFA list, Codex list
Gasoline	Petroleum product (may contain benzene)
Gas oil	Petroleum product (may contain benzene)
Gluteraldehyde	Fatal if inhaled, toxic if swallowed, sensitizer, corrosive, chronic aquatic toxicity. FOSFA list, Codex list
Hexamethylenediamine	Corrosive. FOSFA list, Codex list
Isoprene	Carcinogen cat 1B, mutagen cat 2, chronic aquatic toxicity
Isocyanates (TDI, MDI..)	Asthmogenic, very reactive. FOFSA list, Codex list
Kerosine	Petroleum product (may contain benzene)
Leaded petroleum or other leaded products (three previous cargos)	Petroleum product (may contain benzene)

Lube oil additives	FOSFA list, Codex list
Methyl acrylate	Sensitizer, harmful by all routes of exposure. FOSFA list, Codex list
Methylene chloride	Carcinogen cat 2
Methyl Isobutyl Ketone	IARC 2B Listing, Carcinogen cat 2
Methyl methacrylate monomer	Sensitizer. FOSFA list, Codex list
Methyl styrene monomer	Odour threshold. FOSFA list, Codex list
Methyl tertiary butyl ether	Odour threshold, irritant
Methylene diisocyanate (MDI)	See isocyanates
Methyl isocyanate	See isocyanates
Mineral oils	Petroleum product- skin and inhalation irritant. FOSFA list
Morpholine	Corrosive, harmful by all routes of exposure, IARC group 3. FOSFA list, Codex list
Morpholine ethanol	FOSFA list, Codex list
Naphthalene	Carcinogen cat 2, acute and chronic aquatic toxicity
Nitric acid	Codex list
Nitrobenzene	Carcinogen cat 2 and reprotox cat 1B
Nitropropane	Harmful by all routes of exposure. Codex list
Noxious cargoes	Ref NIOP
Palm Oil Mill Effluent, Palm Oil Mill Effluent oil and Empty Fruit Bunch oil and their derivatives	FOSFA list
Perchloroethylene	Carcinogen cat 2, chronic aquatic toxicity. FOSFA list, Codex list
Pesticides including biocides, insecticides, fungicides, herbicides, and rodenticides	See CEFIC guidelines.
Phenol	Mutagen cat 2, toxic by all routes of exposure, corrosive

Phthalates	IARC concluded not a human carcinogen (group 3) (effects in lab animals related to peroxisome proliferation). FOSFA list, Codex list
Polymethylenene polyphenylisocyanate	See isocyanates
n-propylamine	Corrosive, low odour threshold. FOSFA list, Codex list
Propylene oxide	Carcinogen and mutagen cat 1B. FOSFA list, Codex list
Pygas	Contains benzene
Pyridine	Harmful by all routes of exposure, IARC group 3, low odour threshold. FOSFA list, Codex list
Sodium Hydroxide	Strong base
Styrene monomer	IARC 2A, tainting, low odour threshold. FOSFA list, Codex list
Sulphuric acid	Strong acid
Tall oil	NIOP list, FOSFA list, Codex list
Tall oil fatty acid	NIOP list, FOSFA list, Codex list
Telone II (1-propene, 1,3-dichloro; 1,3-dichloropropene)	Fumigant. NIOP list, Codex list
Tetrahydrofuran	Carcinogen cat 2
Toluene	Reprotox cat 2, neurotox effects, Codex list
Toluene diisocyanate (TDI)	See isocyanates
Toluidine	Carcinogen cat 2, sensitizer, acute aquatic toxicity. Codex list
Transformer oil	FOSFA list (might contain PCB), Codex list
Trichloroethane	Harmful by inhalation, ozone-depleting properties; chlorinated compound. Codex list
Triethylene glycol	Falls into the group of glycols, Codex list
Tricresyl phosphate	Reprotox cat 2, sensitizer, acute and chronic aquatic toxicity
Used Cooking Oil	FOSFA list

Used Cooking Oil Methyl Esters	FOSFA list
Vinyl acetate monomer	Carcinogen cat 2, FOSFA list, Codex list
Vinyl chloride monomer	Carcinogen cat 1A, FOSFA list, Codex list
Xylene (mixed isomer and o-, m-, p-)	Harmful by inhalation/skin contact, contains ethyl benzene. Codex list