



Shell Chemicals

Cargo Handling Sheet

Styrene Monomer

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Revision 12

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

Product Details

Product Name: Styrene Monomer
Shipping Name: Styrene Monomer
Chemical Family: Olefins
Product Code: Q9211, Q9215, Q9257

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

Physical Properties

Density: 906 kg/m³ (20 °C / 68 °F)
Dynamic Viscosity: 0.7 mPa.s (25 °C / 77 °F)
Vapor Pressure: 670 Pa (20 °C / 68 °F)
Boiling Point: 145 °C / 293 °F
Melting Point: -31 °C / -24 °F
Flash Point: 32 °C / 90 °F
Appearance: Colourless to yellowish oily liquid, Aromatic hydrocarbon 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: This product is a static accumulator.

Note 3: This product is self-reactive and inhibited.

Transhipments

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

Marpol Annex: II
IMO Ship Type: 3; must be double hull
Inland Barges: Double hull
IMO Pollution Category: Y
IBC 16.2.6: No

IBC 16.2.9:	No
Pre-Wash Required:	No
Compatibility Group:	USCG compatibility group 30

Cargo Handling Requirements

N2 Purge Cargo Tanks Prior Loading:	No; see Regional Requirements
N2 Blanket Required:	Not a PQ requirement; see notes below
Adjacent Space Purge:	No
Loading Temperature Range:	13 – 23 °C / 55 - 73 °F; see Regional Requirements
Transit Temperature Range:	Ambient
Discharge Temperature Range:	Ambient
Maximum Heating Coil Temperature:	Blanked Off
Adjacent Maximum Cargo Temperature:	35°C

Note 1: This product is heat sensitive, self-reactive and inhibited.

Note 2: Shell Chemical SM is generally inhibited with Para-tertiary Butyl Catechol (p-TBC), typically at 10-20 ppm or more, depending on duration of voyage. Where required to add additional inhibitor to a loaded tank of styrene, this should be done using closed equipment. If the equipment is not available and there is a requirement to add inhibitor, the local Chemical MTA should be consulted.

Note 3: If vessel must inert tanks in accordance with regulation and/or Shell Chemical Inert Gas Clause, then only N2 is accepted as an inerting medium.

Note 4: Inert gas generators are required by regulation to produce inert gas $\leq 5\%$ O₂ content, however it should be noted that the inhibitor p-TBC requires $> 4\%$ O₂ level to work, with an optimum level of 6% -8% oxygen. At no time should the O₂ level be allowed to fall below 4%.

Note 5: 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 6: PQ = Product Quality

Note 7: N2 Blanket Guidance:

- O₂ level in tanks: Optimum is 6 to 8% O₂, Minimum is 4% O₂
- 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, upon request, send the log to the responsible Shell Chemicals Charterer:
 1. cargo (Styrene) temperature
 2. adjacent cargo temperature
 3. air and sea water temperatures
 4. oxygen content in vapour space of cargo (styrene) tanks, if inerted
 5. pressure in the cargo (styrene) tanks

d. If during the voyage any of the following is observed, the responsible Shell Chemicals Charterer shall be notified immediately:

- 1 °C rise of cargo (styrene) temp per day, over 3 consecutive days
- > 2 °C rise of cargo (styrene) temperature within any 24 hours
- Cargo temperature at any time raises above > 30°C
- O₂ content in cargo (styrene) tank ≤4% by volume, when inerted

e. After completion of cargo (Styrene) discharge the vessel shall provide a copy of the daily log of temperature/ pressure/ O₂ content to the responsible Shell Chemicals Charterer.

Note 8: Due to risk of polymerization, Styrene should not be carried in tanks serviced by a cargo pump room.

Regional Requirements

Note 1: When loading at Shell Moerdijk, ship's or inland barge's tanks will have to be N₂ purged to 6-10% O₂ content prior to loading when:

- Temperature in shore tank is >21°C / 70 °F and/or
- Temperature in ship's tanks > 32 °C / 90 °F
- Tank's capacity > 3000 m³

Note 2: Shell Moerdijk: loading temperature is ambient and generally ranges between 5 – 30 °C / 41 - 86 °F.

Note 3: Shell Seraya: shore tank temperatures are maintained at 13 – 14 °C / 55 - 57 °F. Loading temperatures are generally between 17 – 23 °C / 63 - 73 °F

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: Either, carrier to verify suitability of coating for product
Banned Prior Cargo:

Coated tanks: cannot be used if one of the prior 2 cargoes were:

- benzene
- mixtures containing ≥ 0.1% benzene
- caustic
- fuel or lube oils

Wall Wash Required: Yes, all conducted with Methanol except PH test, which uses DI water

Coated Tanks: WWT conducted by cargo surveyor.

Stainless Steel Tanks: verification of shipboard WWT may be accepted if below specs are met. (Send WWT Verification to the responsible Shell Chemicals charterer and present to cargo surveyor and loading master at loading terminal.)

Wall Wash Test:	Specification	Standard
Hydrocarbons	= Pass	ASTM D1722
Chlorides	≤ 1.0 ppm	IMPCA 002-98

Additional WWT for Coated Tanks if Prior Cargo is:

Prior Cargo	Wall Wash Test:	Specification	Standard
Acrylate	PPT	> 30 minutes	ASTM D1363
Oils, Waxes, Veg Oils, Fame	NVM	100 ppm	ASTM D1353
Acids, Alkilis	PH Test	6 – 8	ASTM E70

Link to: [WWT Verification Form](#)

Safety Information and Incident Reporting

Safety Information:

For more detailed information, refer to the SDS or e-SDS for reportable spill/release quantities whether in the water, air or ground.

Incident Reporting:

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 Bommel at +31104415992.



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