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**Economic Commission for Europe**

18 June 2024

**ADN Administrative Committee**

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**Thirty-second session**

Geneva, 30 August 2024

Item 3 (b) of the provisional agenda

**Matters relating to the implementation of ADN:  
special authorizations, derogations and equivalents**

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**Request for a recommendation on the use of methanol as fuel  
for the propulsion of the tank vessel “Stolt Ijssel”**

**Transmitted by the Government of the Netherlands**

**Annexes to document ECE/ADN/2024/6**

## Annex I

## Methanol

### SECTION 1: Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

<b>Trade name</b>	Methanol
<b>Name of the chemical</b>	Methanol
<b>CAS No.</b>	67-56-1
<b>EC number</b>	200-659-6
<b>REACH registration number</b>	01-2119433307-44

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

<b>Use</b>	ES 1: Manufacture of methanol/Use as an intermediate/Use as a process chemical ES 2: Distribution of methanol ES 3: Formulation and (re)packing of methanol ES 4: Industrial use as wastewater treatment chemical ES 5: Industrial use in cleaning agents ES 6: Professional use in cleaning agents ES 7: Industrial use in oilfield drilling and production operations ES 8: Use as a fuel in industrial settings ES 9: Use as a fuel in professional settings ES 10: Use as a laboratory reagent in industrial settings ES 11: Use as a laboratory reagent in professional settings ES 12: Consumer use of cleaning agents and de-icers (liquid products) ES 13: Consumer use of cleaning agents and de-icers (spray products) ES 14: Consumer use of fuels indoors (Domestic/hobby use e.g in model engines, fuel cells, fondue sets) ES 15: Consumer use of fuels outdoors (gasoline additive at petrol stations)
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#### 1.3. Details of the supplier of the safety data sheet

<b>Supplier</b>	Södra Skogsägarna ekonomisk förening
Street address	Skogsudden 351 89 Växjö Sweden
Telephone	0470 – 890 00
<b>Contact person</b>	Anders Rydne
<b>Email adress</b>	anders.rydne@sodra.com

#### 1.4. Emergency telephone number

<b>Emergency phone number</b>	NHS 111
<b>Available outside office hours</b>	Yes

Other

Not applicable

## Methanol

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture




Classification according to Regulation (EC) No 1272/2008

<b>Danger classes</b>	Flammable liquids, hazard category 2 Acute toxicity, oral, hazard category 3 Acute toxicity, dermal, hazard category 3 Acute toxicity, inhalation, hazard category 3 Specific Target Organ Toxicity — Single exposure, hazard category 1
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<b>Hazard phrases</b>	H225, H301, H311, H331, H370
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#### 2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008

<b>Danger codes</b>	  
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<b>Signal word</b>	Danger
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<b>Hazard phrases</b>	H225 Highly flammable liquid and vapour. H301 Toxic if swallowed. H311 Toxic in contact with skin. H331 Toxic if inhaled. H370 Causes damage to organs.
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<b>Safety phrases</b>	P233 Keep container tightly closed. P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P280 Wear protective gloves/protective clothing/eye protection/face protection. P309 + P311 IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician. P405 Store locked up.
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#### 2.3. Other hazards

<b>Other hazards</b>	This substance does not fulfill the PBT/vPvB- criteria according to the REACH-regulations, Annex XIII.
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Other

Not applicable

### SECTION 3: Composition/information on ingredients

#### 3.1. Substances

Chemical name	CAS No. EC No. REACH No. Index No.	Concentration	Classification	H-phrase M factor acute M factor chronic	Note
Methanol	67-56-1 200-659-6 01-2119433307-44 -	100%	Flam. Liq. 2, Acute Tox. 3 - oral, Acute Tox. 3 - dermal, Acute Tox. 3 - inhalation, STOT SE 1	H225, H301, H311, H331, H370 - -	-

## Methanol

**Substance additional information**

For the complete meaning of H phrases mentioned in this section, see section 16.

### SECTION 4: First aid measures

#### 4.1. Description of first aid measures

**Description of first aid measures**

Take off all contaminated clothing immediately. First aid personnel should pay attention to their own safety.

**Inhalation**

Move the affected person to fresh air and place in a resting position that facilitates breathing. Consult a physician.

**Skin contact**

Wash off immediately with soap and plenty of water removing all contaminated clothes and shoes. Get medical attention.

**Eye contact**

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

**Ingestion**

Clean mouth with water and drink afterwards plenty of water. Induce vomiting. Administer 50 ml of pure ethanol in a drinkable concentration. Get medical attention.

#### 4.2. Most important symptoms and effects, both acute and delayed

**Most important symptoms and effects, both acute and delayed**

Symptoms may appear after 12-48 hours. Single large oral doses may result in such adverse effects as disturbance of vision and skin irritation.

#### 4.3. Indication of any immediate medical attention and special treatment needed

**Indication of any immediate medical attention and special treatment needed**

Treat symptomatically.

*Other*

Not applicable

### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

**Suitable extinguishing media**

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

#### 5.2. Special hazards arising from the substance or mixture

**Special hazards arising from the substance or mixture**

Fire may produce hazardous combustion products such as carbon dioxide and carbon monoxide.

#### 5.3. Advice for firefighters

**Special protective equipment for fire-fighters**

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

**Measures in case of fire:**

Collect contaminated fire extinguishing water separately. This must not be discharged into drains. Polluted extinguisher water should not run off into the soil, ground or surface water.

Cool containers/tanks with water spray.

*Other*

Not applicable

## Methanol

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

##### Personal precautions, protective equipment and emergency procedures

Avoid contact with skin, eyes and clothing. Do not inhale. Take off all contaminated clothing immediately.

#### 6.2. Environmental precautions

##### Environmental precautions

Do not discharge directly into the environment or into the sewer system.

#### 6.3. Methods and material for containment and cleaning up

##### Methods and material for containment and cleaning up

Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).

#### 6.4. Reference to other sections

##### Reference to other sections

For personal protection see section 8 and for disposal see section 13.

#### Other

Not applicable

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

##### Preventive handling precautions

Keep away from fire, sparks and heated surfaces. Do not use an open flame. No smoking. Remove all sources of ignition. Keep container closed. Use only explosion-proof equipment. Ground/Bond container and receiving equipment. Use non-sparking tools and appliances. Take measures to prevent the build up of electrostatic charge.

##### General hygiene

Wear eye/face protection. Use protective gloves. Use protective clothing.

#### 7.2. Conditions for safe storage, including any incompatibilities

##### Conditions for safe storage, including any incompatibilities

Keep in a cool, well-ventilated place.

#### 7.3. Specific end use(s)

##### Specific end use(s)

See section 1.2 or the annex to the safety data sheet - exposure scenarios.

#### Other

Not applicable

## Methanol

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

##### Exposure limits

Indicative occupational exposure limit value according to Commission directive 2006/15/EC:

200 ppm  
260 mg/m<sup>3</sup>

Notation: Skin

##### National occupational exposure limits

Ingredient	CAS No. EC No.	Exposure limit ppm / mg/m <sup>3</sup>	Short-term exposure limit ppm / mg/m <sup>3</sup>	Source	Remark	Year
Methanol	67-56-1 200-659-6	200 266	250 333	EH40/2005 Workplace exposure lim- its	Sk - Can be absorbed through the skin	-

##### DNEL/DMEL

Product/Substance name (CAS No./EC No.)	Type	Exposure	Value	Population	Effects
Methanol (67-56-1/200-659-6)	DNEL	Chronic (long term) Inhalation	260 mg/m <sup>3</sup>	Workers	Systemic
Methanol (67-56-1/200-659-6)	DNEL	Acute (short term) Inhalation	260 mg/m <sup>3</sup>	Workers	Systemic
Methanol (67-56-1/200-659-6)	DNEL	Chronic (long term) Dermal	40 µg/kg bw/day	Workers	Systemic
Methanol (67-56-1/200-659-6)	DNEL	Acute (short term) Dermal	40 mg/kg bw/day	Workers	Systemic
Methanol (67-56-1/200-659-6)	DNEL	Chronic (long term) Inhalation	50 mg/m <sup>3</sup>	Consumers	Systemic
Methanol (67-56-1/200-659-6)	DNEL	Chronic (long term) Dermal	8 mg/kg bw/day	Consumers	Systemic
Methanol (67-56-1/200-659-6)	DNEL	Acute (short term) Inhalation	50 mg/m <sup>3</sup>	Consumers	Systemic
Methanol (67-56-1/200-659-6)	DNEL	Acute (short term) Dermal	8 mg/kg bw/day	Consumers	Systemic

##### PNEC/PEC

Product/Substance name (CAS No./EC No.)	Type	Environmental compartment	Value
Methanol (67-56-1/200-659-6)	PNEC	Freshwater	20.8 mg/l
Methanol (67-56-1/200-659-6)	PNEC	Marine water	2.08 mg/l
Methanol (67-56-1/200-659-6)	PNEC	Intermittent release (freshwater)	1540 mg/l
Methanol (67-56-1/200-659-6)	PNEC	Sediment (freshwater)	77 mg/kg dwt
Methanol (67-56-1/200-659-6)	PNEC	Sediment (marine water)	7.7 mg/kg dwt

## Methanol

<i>Product/Substance name (CAS No./EC No.)</i>	<i>Type</i>	<i>Environmental compartment</i>	<i>Value</i>
Methanol (67-56-1/200-659-6)	PNEC	Sewage Treatment Plant	100 mg/l
Methanol (67-56-1/200-659-6)	PNEC	Soil	100 mg/kg dwt

### 8.2. Exposure controls

#### Technical precaution measures

For detailed information, see annexed ES.Workplace:Provision of very good ventilation in the working area.Washing facility at the workplace required.When handling excessive amounts of the substance an emergency shower is required.

Equipment:Use only closed apparatus.If release of the substance cannot be prevented, then it should be suctioned off at the point of exit.Label containers and pipelines clearly.

Suitable materials:GlassSteelStainless steelUnsuitable materials:AluminiumGalvanised ironZinc alloys-Magnesium alloysPlastics have to be proven for their resistibility on a case-by-case basis

Advice on safer handling:Take care to maintain a clean working place.Do not leave container open.Use leak-proof equipment with exhaust for refilling or transfer.Do not transport with/using compressed air.Avoid any contact when handling the substance.Cleaning and maintenance:Use protective equipment while cleaning if necessary.

#### Eye / face protection

Wear eye/face protection.

#### Safety gloves

Use protective gloves.

Check the tightness before wear.Gloves should be well cleaned before being removed, then stored in a well ventilated location.

The following materials are suitable for protective gloves (Permeation time  $\geq$  8 hours):

Butyl rubber - Butyl (0,5 mm)

Protective gloves of the following materials should not be worn longer than 4 hours continually (Permeation time  $\geq$  4 hours):

Fluoro carbon rubber - FKM (0,4 mm)

Protective gloves of the following materials should not be worn longer than 1 hour continually (Permeation time  $\geq$  1 hour):

Polychloroprene - CR (0,5 mm)

The following materials are unsuitable for protective gloves with regard to methanol exposure because of degradation, severe swelling or low permeation time:

Natural rubber/Natural latex - NR

Nitrile rubber/Nitrile latex - NBR

Polyvinyl chloride - PVC

The times listed are suggested by measurements taken at 22 °C and constant contact.Temperatures raised by warmed substances, body heat, etc. and a weakening of the effective layer thickness caused by expansion can lead to a significantly shorter breakthrough time. In case of doubt contact the gloves' manufacturer. A 1.5-times increase/decrease in the layer thickness doubles/halves the breakthrough time.

#### Environmental exposure controls

As no environmental hazard was identified no environmental-related exposure assessment and risk characterization was performed.

#### Other

#### Personal protective equipment

For personal protective equipment, see the attached relevant exposure scenario.



## Methanol

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

<b>Appearance, physical state</b>	Liquid
<b>Appearance, colour</b>	Not applicable
<b>Odour</b>	Not applicable
<b>Odour treshold</b>	Not applicable
<b>pH value</b>	Not applicable
<b>Melting point / freezing point</b>	-97.8 °C (101.3 kPa)
<b>Initial boiling point and boiling range</b>	64.7 °C (101.3 kPa)
<b>Flash point</b>	9.7 °C
<b>Evaporation rate</b>	Not applicable
<b>Flammability (solid, gas)</b>	Flammable Liquid
<b>Upper / lower flammability or explosive limits</b>	Not applicable
<b>Vapour pressure</b>	169.27 hPa (25 °C)
<b>Vapour density</b>	Not applicable
<b>Relative density</b>	0.79 (20°C)
<b>Solubility</b>	Substance is completely miscible in water at 20°C
<b>Partition coefficient: n-octanol / water</b>	Log Kow (Log Pow): -0.77 (20°C)
<b>Auto-ignition temperature</b>	455°C (1013 hPa)
<b>Decomposition temperature</b>	Not applicable
<b>Viscosity, kinematic</b>	Not applicable
<b>Viscosity, dynamic</b>	0.544 - 0.59 mPa s (25°C)
<b>Explosive properties</b>	Not explosive
<b>Oxidising properties</b>	Not oxidizing

#### 9.2. Other information

<b>Other information</b>	No additional information available.
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## Methanol

### Other

**Other****Flash point:**

A study (BASF SE, SIK 72/0239) was conducted according EU Method A.9 to determine flash point of the test item using a closed cup method. The flash point of the test item was determined to be 9.7 °C at 1013.25 hPa.

**Self-ignition temperature:**

A study (BASF SE, SIK 78/1255) was conducted according DIN 51794 (1979). The auto-ignition temperature was determined to be 455 °C at 1013 hPa. According to EN 60079-0 the test item has to be classified in temperature class T1.

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

**Reactivity**

No dangerous reactions known under normal conditions of use.

### 10.2. Chemical stability

**Chemical stability**

This product is stable under normal conditions of handling and use.

### 10.3. Possibility of hazardous reactions

**Possibility of hazardous reactions**

None known.

### 10.4. Conditions to avoid

**Conditions to avoid**

Avoid the evaporation of the product as it contains flammable substances, which could form flammable vapour/air mixtures in the presence of sources of ignition.  
Keep away from ignition sources.

### 10.5. Incompatible materials

**Incompatible materials**

Strong oxidizers, acids and bases.

### 10.6. Hazardous decomposition products

**Hazardous decomposition products**

None known.

### Other

Not applicable

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

**Acute toxicity**

The product is classified as toxic if swallowed, inhaled or in contact with skin.

LD50/oral/rat (Sprague-Dawley) = > 1187-2769 mg/kg bw (male/female) (15 to 35 % aqueous solution).  
Reference: BASF AG 1975

LC50/inhalation/cat = 43700 mg/m<sup>3</sup> (43.68 mg/l air).  
Reference: von Burg, R. 1994

LD50/dermal/rabbit = 17100 mg/kg bw (corresponding to 20 ml/kg bw).  
Reference: Rowe, V.C and McCollister, S.B. 1981

## Methanol

<b>Skin corrosion/irritation</b>	<p>The criteria for classification may not be considered to be met on the basis of available data.</p> <p>Rabbit: No adverse effect observed (not irritating).</p>
<b>Serious eye damage/irritation</b>	<p>The criteria for classification may not be considered to be met on the basis of available data.</p> <p>Rabbit: No adverse effect observed (not irritating).</p>
<b>Respiratory/skin sensitization</b>	<p>The criteria for classification may not be considered to be met on the basis of available data.</p> <p>Skin sensitization Guinea pig: no adverse effect observed (not sensitising).</p> <p>Respiratory sensitisation No data available.</p>
<b>Germ cell mutagenicity</b>	<p>The criteria for classification may not be considered to be met on the basis of available data.</p> <p>Genetic toxicity in vitro: adverse effect observed (positive). The following information is taken into account for any hazard/risk assessment: the available in vivo assays are negative for mutagenicity and clastogenicity.</p> <p>Genetic toxicity in vivo: no adverse effect observed (negative).</p>
<b>Carcinogenicity</b>	<p>The criteria for classification may not be considered to be met on the basis of available data.</p> <p>LOAEL/oral = 1800 mg/kg bw/day (mouse) - adverse effect observed. NOAEC/inhalation = 1300 mg/m<sup>3</sup> (chronic) (mouse) - no adverse effect observed.</p> <p>In mouse and rat effects were shown, but can not be transferred to humans. As a result the substance is not considered to be classified for carcinogenicity.</p>
<b>Reproductive toxicity</b>	<p>The criteria for classification may not be considered to be met on the basis of available data.</p> <p>NOAEL/oral = 1000 mg/kg bw/day (subchronic) (mouse) - no adverse effect observed. NOAEC/inhalation = 1300 mg/m<sup>3</sup> (chronic) (rat) - no adverse effect observed.</p>
<b>STOT-single exposure</b>	<p>Causes damage to organs.</p> <p>Target organs: Optic nerve (nervus opticus), central nervous system.</p>
<b>STOT-repeated exposure</b>	<p>The criteria for classification may not be considered to be met on the basis of available data.</p> <p>Oral: LOAEL subacute = 2340 mg/kg/bw in monkeys (mortality 7/7 after 3 d exposure) Inhalation: NOAEC chronic = 0.013 mg/l air in monkeys (7 to 29 months exposure)</p> <p>Via oral route - systemic effects (target organ) Neurologic: eyes (retina, optic nerve)</p> <p>Inhalation - systemic effects (target organ) Cardiovascular/hematological: heart Digestive: liver Neurologic: brain (multiple sections)</p>
<b>Aspiration hazard</b>	<p>Product is not classified for aspiration hazard.</p>
<b>Symptoms related to the physical, chemical and toxicological characteristics</b>	<p>The symptoms and signs of methanol poisoning, which may not appear until after an asymptomatic period of about 12 to 24 hours, include visual disturbances, nausea, abdominal and muscle pain, dizziness, weakness and disturbances of consciousness ranging from coma to clonic seizures.</p> <p>Visual disturbances generally develop between 12 and 48 h after methanol ingestion and range from mild photophobia and misty or blurred vision to markedly reduced visual acuity and complete blindness. In extreme cases death results.</p>

## Methanol

Other

Not applicable

### SECTION 12: Ecological information

#### 12.1. Toxicity

**Acute toxicity** Available data demonstrate consistently very low acute toxicity to methanol for aquatic organisms.

**Acute fish toxicity** LC50/96h = 15400 mg/l (Lepomis macrochirus).

**Acute algae toxicity** EC50/96h = ca. 22000 mg/l (Selenastrum capricornutum).

**Acute crustacean toxicity** EC50/48h = > 10000 mg/l (Daphnia magna).

**Chronical toxicity** The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.

EC10/LC10 = 450 mg/l (freshwater fish).  
 EC10/LC10 = 208 mg/l (marine invertebrates).  
 EC10/LC10 = 10000 mg/kg soil dw (macro-organisms).  
 EC10/LC10 = 1000 mg/kg soil dw (soil dwelling arthropods).  
 EC10/LC10 = 1555 mg/kg soil dw (terrestrial plants).

#### 12.2. Persistence and degradability

**Persistence and degradability** The substance is classified as ready biodegradable according to the OECD criteria.

Biodegradation:  
 71.5 - 95 % (freshwater, wastewater) after 5 and 20 days.  
 69 - 97 % (marine water).

#### 12.3. Bioaccumulative potential

**Bioaccumulative potential** BCF < 10

#### 12.4. Mobility in soil

**Mobility** Adsorption on soil is not to be expected due to the high solubility of methanol as well as its low octanol-water partition coefficient.

#### 12.5. Results of PBT and vPvB assessment

**Results of PBT and vPvB assessment** This substance does not fulfil the PBT/vPvB- criteria according to the REACH-regulations, Annex XIII.

Not P/vP based on ready biodegradability.  
 Due to the very low n-octanol/water distribution coefficient (log Pow: -0.77) of methanol an accumulation in organisms is not to be expected. Conclusion: Not B/vB.

#### 12.6. Other adverse effects

**Other adverse effects** No other adverse effects.

Other

Not applicable

## Methanol

### SECTION 13: Disposal considerations

#### 13.1. Waste treatment methods

**Disposal considerations** Disposal should be in accordance with applicable regional, national, and local laws and regulations.

#### Other

**Waste code** Waste codes should be assigned by the user based on the application for which the product was used.

### SECTION 14: Transport information

#### 14.1. UN number

**UN number** 1230

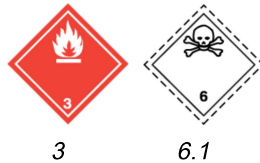
#### 14.2. UN proper shipping name

**Name** METHANOL

**IMDG proper shipping name** METHANOL

#### 14.3. Transport hazard class(es)

**Label**



**ADR / RID Class** 3

**ADR / RID Classification code** FT1

**ADR / RID hazard identification number** 336

**IMDG Class** 3

**IMDG Marine Pollutant** No.

**IMDG EmS** F-E, S-D

**ADN Class** 3

**ADN Class Code** FT1

#### 14.4. Packing group

**Packing group** II

#### 14.5. Environmental hazards

**Environmental hazards** No.

#### 14.6. Special precautions for user

**Special precautions for user** Tunnel restriction code D/E

## Methanol

### 14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

Methyl alcohol  
Pollution category: Y  
Hazards: P

*Other*

Not applicable

## SECTION 15: Regulatory information

### 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

**EU regulations**

Regulation (EC) No 1907/2006 of the European Parliament and of the Council, REACH.  
European Parliament and Council Regulation (EC) No 1272/2008, CLP.  
SEVESO III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.  
Waste must be handled in accordance with Directive 2008/98/EC.

**National regulations**

The Control of Substances Hazardous to Health Regulations 2002.  
EH40/2005 Workplace exposure limits.

**Other regulations, limitations and legal regulations**

Local laws and regulations should be carefully observed.

### 15.2. Chemical safety assessment

**Chemical safety assessment**

A chemical safety assessment has been carried out.  
Relevant information can be found in the attached exposure scenario.

*Other*

Not applicable

## SECTION 16: Other information

**Abbreviations**

BCF: Bioconcentration factor.  
DNEL: Derived No Effect Level (Derived level not based on observed effects).  
EC10: The concentration that causes the measured effect in 10 % of the test organisms.  
EC50: The concentration of a substance that affects 50 % of a population over a given period of time.  
ES: Exposure scenario.  
Kow: Partition coefficient for octanol-water.  
LC10: Lethal concentration for 10% of a test population.  
LC50: Deadly concentration for 50 % of a test population.  
LD50: Leathal dose for 50 % of the test population (leathal median dose).  
LOAEL: Lowest observed adverse effect level.  
LogPow: The octanol/water partition coefficient.  
NOAEC: Concentration where no harmful effect is observed.  
PBT: Persistent, Bioaccumulative and Toxic.  
PNEC: predicted no effect concentration.  
vPvB: very Persistent and very Bioaccumulative.

## Methanol

### References to key literature and data sources

REACH - Registration dossiers.  
The supplier's chemical safety report.

The following relevant exposure scenarios (ES) have been developed as part of the methanol registration dossier according to The REACH Regulation (EC) and is attached to the safety data sheet depending on the life cycle stage:

#### Manufacture/formulation:

ES 1: Manufacture of methanol/Use as an intermediate/Use as a process chemical

ES 2: Distribution of methanol

ES 3: Formulation and (re)packing of methanol

Industrial use:ES 1: Manufacture of methanol/Use as an intermediate/Use as a process chemical

ES 2: Distribution of methanol

ES 3: Formulation and (re)packing of methanol

ES 4: Industrial use as wastewater treatment chemical

ES 5: Industrial use in cleaning agents

ES 7: Industrial use in oilfield drilling and production operations

ES 8: Use as a fuel in industrial settings

ES 10: Use as a laboratory reagent in industrial settings

#### Professional use:

ES 6: Professional use in cleaning agents

ES 9: Use as a fuel in professional settings

ES 11: Use as a laboratory reagent in professional settings

#### Consumer use:

ES 12: Consumer use of cleaning agents and de-icers (liquid products)

ES 13: Consumer use of cleaning agents and de-icers (spray products)

ES 14: Consumer use of fuels indoors (Domestic/hobby use e.g in model engines, fuel cells, fondue sets)

ES 15: Consumer use of fuels outdoors (gasoline additive at petrol stations)

### Phrase meaning

Flam. Liq. 2 - Flammable liquids, hazard category 2

Acute Tox. 3 - oral - Acute toxicity, oral, hazard category 3

Acute Tox. 3 - dermal - Acute toxicity, dermal, hazard category 3

Acute Tox. 3 - inhalation - Acute toxicity, inhalation, hazard category 3

STOT SE 1 - Specific Target Organ Toxicity — Single exposure, hazard category 1

H225 Highly flammable liquid and vapour.

H301 Toxic if swallowed.

H311 Toxic in contact with skin.

H331 Toxic if inhaled.

H370 Causes damage to organs.

### Other

Not applicable

## Annex II



# ADN – System Design Document

## “STOLT IJSSEL”

<b>Subject</b>	System Design Document
<b>Date</b>	04-03-2024
<b>Revision</b>	A
<b>Shiptype</b>	Inland Stainless Steel Tanker Type C
<b>Shipname</b>	STOLT IJSSEL
<b>Document No.</b>	SB1702.RAP.04



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## 1. INTRODUCTION

This document summarizes the system design for mts Stolt Ijssel which will be equipped with one methanol powered generator set.

Due to the low flashpoint and toxicity of the methanol the risk-based certification procedure has been followed as per ADN 7.2.3.31.

### ***ADN - 7.2.3.31 Engines***

**7.2.3.31.1** The use of engines running on fuels having a flashpoint equal to or lower than 55 °C (e.g. petrol engines) is prohibited. This provision does not apply to:

– the propulsion and auxiliary systems which meet the requirements of Chapter 30 and Annex 8, Section 1 of the European Standard laying down Technical Requirements for Inland Navigation vessels (ES-TRIN) as amended.<sup>1</sup>

Recommended attachment, Annex 1, Safety Data Sheet

## 2. SYSTEM OUTLINE

### 2.1. General

The design has the following main principles:

- 1. Methanol storage tank located on the main deck.
- 2. PS fore engine room, to contain 1 dual fuel diesel-methanol engine generator set.
- 3. SB bow engine room, will contain 1 diesel engine, serving as main backup system for the vessel.
- 4. Electrical propulsion drives are installed in the aftship.

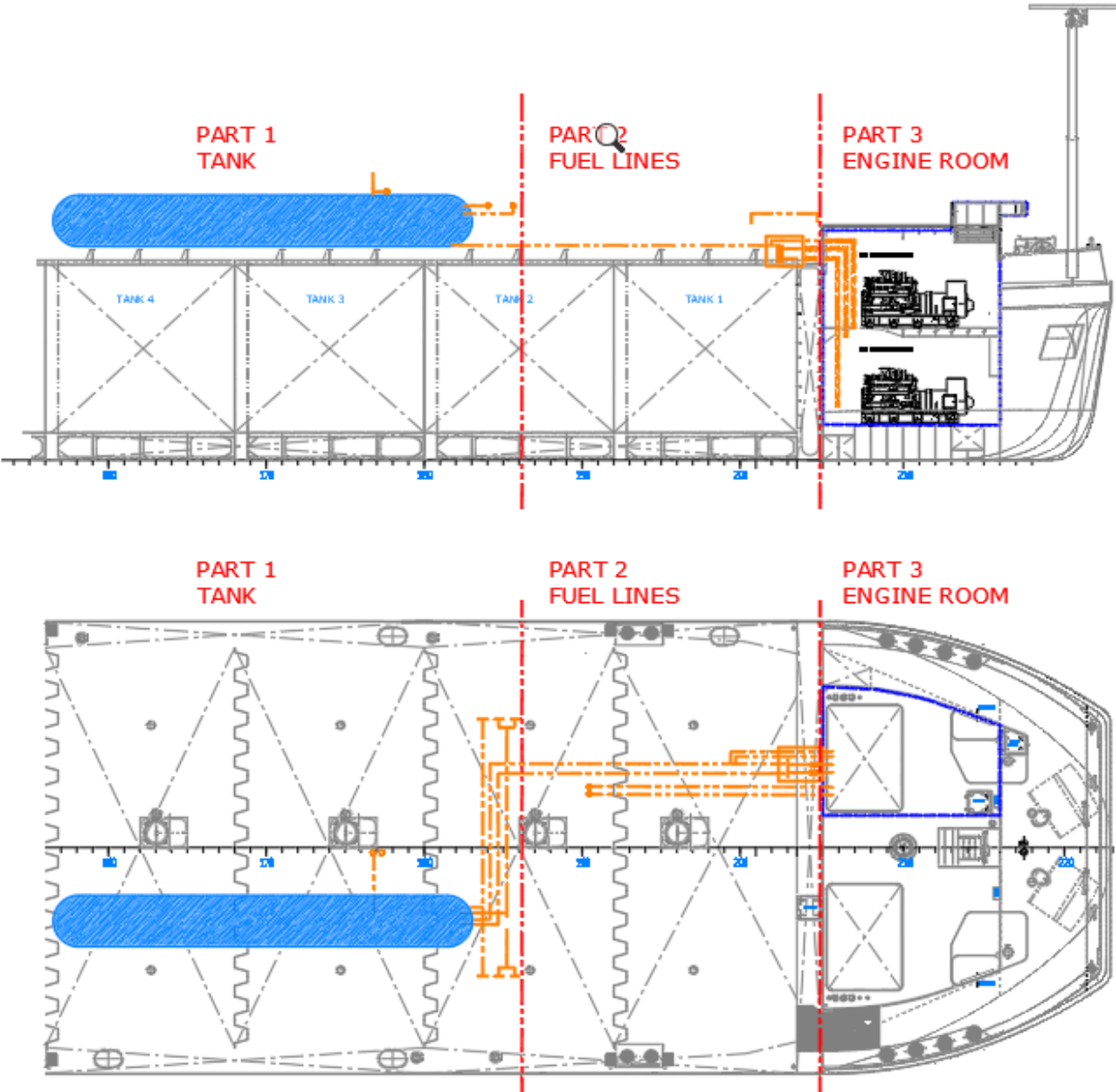
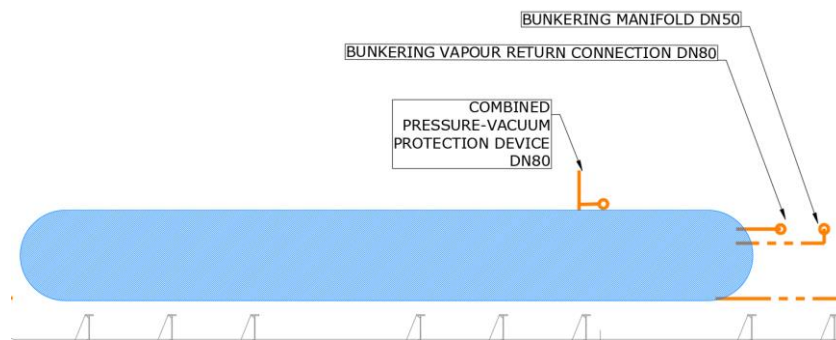


Figure 1. System Outline

## 2.2. PART 1 Methanol fuel tank

- The methanol storage tank of around 30m<sup>3</sup>
- Made from stainless steel.
- Located on deck in the cargo area, zone 1.
- The tank will be firmly attached to the ships structure.
- The tank will be earthed.
- The tank design pressure is 50 kPa, test pressure 65 kPa.
- The tank will be fitted with a 40 kPa pressure alarm to be used to activate the deck sprinkler installation for cooling down the tank.

***All alarms, devices and connections comply with the ADN requirements for tankers carrying Methanol.***

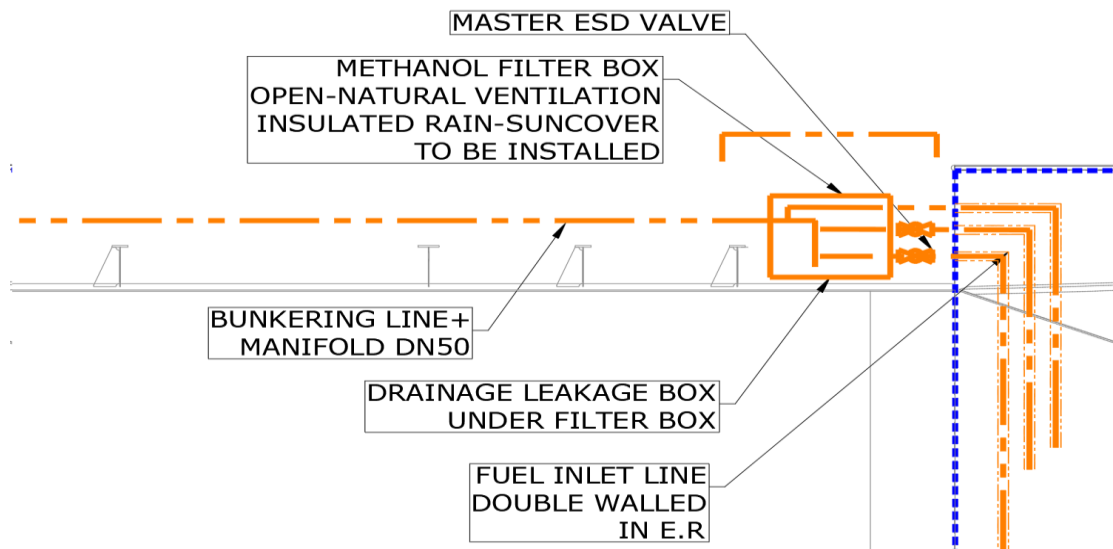


**Figure 2. Methanol fuel tank**

### 2.3. PART 2 Fuel Lines

- The Engine will be supplied with methanol fuel via the supply line from the storage tank on deck.
- The engine return line will be routed back into the storage tank.
- The fuel supply line is running from the tank to the most forward part of the cargo zone, in this location the filter set is located.
- The filter set has a drip tray below and sun/rain cover on top.
- The fuel lines (supply and return) are single seamless stainless-steel pipes.
- From the foreship superstructure into the vessels forward engine room the fuel lines will be double walled.
- The double wall air space (annulus space) will be fitted with leakage detection and purge facilities.
- In case of maintenance, the methanol fuel piping system can be purged in several locations.
- Drip trays and drainage systems are foreseen under the tank connections, fuel filters, and the engine in the forward engine room.
- The drip trays on the open deck have a connection to the stripping line on cargo deck, which is routed to the slop tanks.

***All fuel lines inside are double walled.***



**Figure 3. Methanol fuel lines**

## 2.4. PART 3 PS Engine Room

- The PS engine room, is completely separated from the SB engine room.
- Engines dual fuel diesel-methanol (3%/97 %)
- The engines are based on the gas-free concept
- Ventilation air supply via a dedicated Ex(e) spark free ventilator.
- The ventilator will be normally running on low speed in order to allow the 1% LEL / 500 ppm gas sensor to detect any leakages.
- The capacity can be increased to minimum 30 air changes per hour in case the area needs to be cleared from gases.
- Emergency shutdown system, remotely controlled master fuel valve acting as part of the main ESD system.
- The master fuel valve is situated outside the engine room on the superstructure wall.
- The master fuel valve is operable locally within and from outside the engine room plus wheelhouse.
- The fuel system itself can be switched of via remote controls operated from the wheelhouse, locally and from the bunkering station.
- Spaces, where equipment containing fuel is installed and where a fire hazard cannot be excluded, will comply with the fire protection requirements for engine rooms category A.
- Fire detectors will be selected based on the characteristics of the methanol and gasoil. Smoke / methanol flame fire detectors will be installed.
- The PS bow engine room will be fitted with a fixed fire system ( NOVEC 1230 ) and a sprinkler system connected to the foreships fire main in the SB engine room.

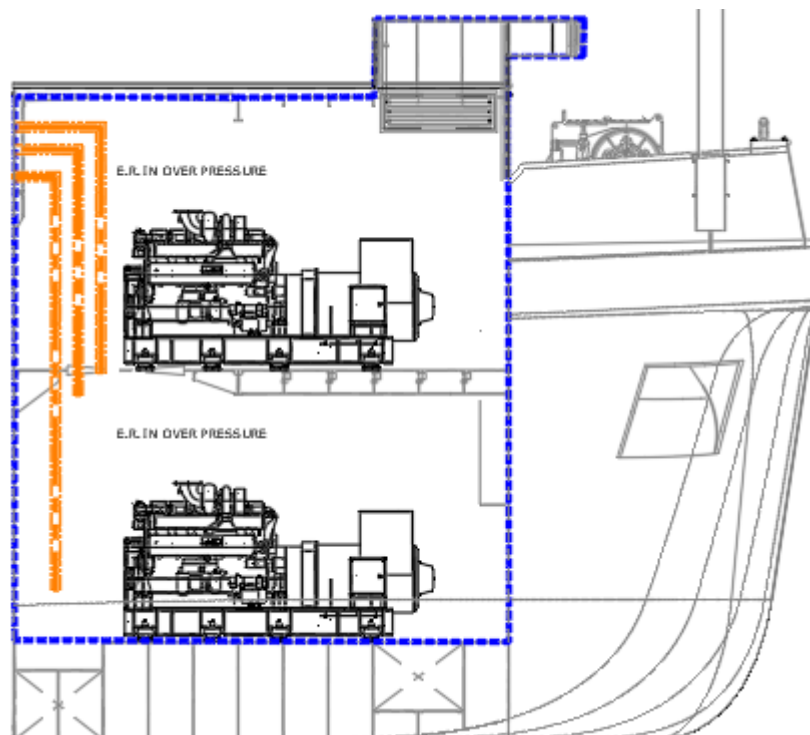



Figure 4. Fore Engine Room

### 3. Fuel / Cargo Interaction

Methanol is allowed to be transported in the cargo tanks conform ADN cargo list which is issued by Lloyds Register.

The methanol storage tank used for the propulsion is designed and equipped equal to the integrated cargotanks of mts Stolt IJssel, waterspray system included.

Due to the separation, no direct boundaries to other cargo tanks, there is no risk of contamination with other products.



27 June 2023  
STOLT IJSSEL - LR 9932347

UN	Description	Class	Classification code	Packing group	Dangers	%	Equipment	Remarks
1213	ISOBUTYL ACETATE	3	F1	II	3, N3	97.0	PP, EX, A	
1214	ISOBUTYLAMINE	3	FC	II	3, 8, N3	95.0	PP, EP, EX, A	23
1216	ISOOCETENES	3	F1	II	3, N2	97.0	PP, EX, A	
1219	ISOPROPANOL (isopropyl alcohol)	3	F1	II	3	97.0	PP, EX, A	
1220	ISOPROPYL ACETATE	3	F1	II	3	97.0	PP, EX, A	
1223	KEROSENE	3	F1	III	3, N2, F	97.0	PP, EX, A	14
1224	KETONES, LIQUID, N.O.S. (Flash point < 23°C with 110 kPa<=vP50<150 kPa)	3	F1	II	3 + (N1, N2, N3, CMR, F or S)	97.0	PP, EP, EX, TOX, A	14, 22, 27, 301
1224	KETONES, LIQUID, N.O.S. (Flash point < 23°C with vP50<110 kPa)	3	F1	II	3 + (N1, N2, N3, CMR, F or S)	97.0	PP, EP, EX, TOX, A	14, 22, 27, 301
1224	KETONES, LIQUID, N.O.S. Flash point >= 23°C but <= 60°C	3	F1	III	3 + (N1, N2, N3, CMR, F or S)	97.0	PP, EP, EX, TOX, A	14, 22, 27, 301
1224	KETONES, LIQUID, N.O.S. (Flash point < 23°C with 110 kPa<=vP50<175 kPa)	3	F1	II	3 + (N1, N2, N3, CMR, F or S)	97.0	PP, EP, EX, TOX, A	14, 27, 301
1229	MESITYL OXIDE	3	F1	III	3	97.0	PP, EX, A	
1230	METHANOL	3	FT1	II	3, 6.1	95.0	PP, EP, EX, TOX, A	23

Note 23 The instrument for measuring the pressure of the vapour phase in the cargo tank shall activate the alarm when the internal pressure reaches 40 kPa. The water-spray system shall immediately be activated and remain in operation until the internal pressure drops to 30 kPa.

Figure 5. Abstract from the Cargo List



## 4. Bunkering Principle

A bunkering procedure will be in place for loading the fuel methanol tank. The procedure consists of the following phases.

### *General bunkering notes*

- Bunker line to be sloped towards the storage tank.
- Bunkering connection design should withstand the mechanical loads.
- Bunkering connection in accordance with EN14420-6:2013 with a dry disc break away coupling.
- Bunkering auto stop system @ 95% high level coupling with the storage tank sensor

### *Phase 0: Safe surroundings*

- Park truck at a safe distance from quay wall Place wedges
- Cordon off surrounding area (EX-zone): e.g. traffic cones, non-smoking signs.
- Utilize all PPE in the manner prescribed in the SDS
- Ground the truck using an earth spike (where available)

### *Phase 1: Preparation phase*

- Establish and secure communication channels with captain (EX walkie-talkie)
- Captain and truck driver jointly appoint deck supervisor
- Agree on specific amount of fuel to be bunkered
- Captain and truck driver specify and agree on pumping speed
- Ground / Earth truck with ship
- Place drip tray under coupling with truck
- Plug in automatic overfill protection connector(s)
- Connect and check Camlock vapour return line
- Connect fuel hose, specific attention to gasket material and correct TODO dry break coupling
- Prepare relevant telematics for fuel bunkering
- Fill out ship checklist and bunker checklist
- Fill out ADN checklist (where applicable)

### *Phase 2: Bunkering*

- Open valves
- Start pumping in low flow, check for leakages
- Captain and drivers verify there are no deviations
- Start pumping in high flow
- Maintain continuous supervision
- When close to target volume, switch to low flow
- Stop pump
- Close valves

### *Phase 3: Closing actions*

- De-couple vapour return line
- Disconnect fuel hose
- Decouple automatic overfill protection connector(s)
- Remove ground line connected to ship
- Remove drip tray
- Sign relevant documentation (bunker statement, telematics receipt(s))
- Return walkie-talkie
- Sign off with relevant local authorities (e.g. port authorities)

## 5. Training

Crew training is foreseen by the operator.

<b>STOLT TANKERS B.V.</b>			
<b>CERTIFICATE</b>			
This is to certify that the following crewmembers of the:			
<i>mts "Stolt IJssel"</i>			
_____		_____	
_____		_____	
Have attended the			
<b><u>ON BOARD TRAINING: METHANOL BUNKERING</u></b>			
<input checked="" type="checkbox"/>	Use of PPE's applicable for Methanol According AND table C column 18	<input checked="" type="checkbox"/>	Communication Ship - Truck
<input checked="" type="checkbox"/>	Awareness of WIC Methanol UN 1230	<input checked="" type="checkbox"/>	Load line plan Methanol bunker
<input checked="" type="checkbox"/>	Connecting bunker hose/Mannetek DDcouplings	<input checked="" type="checkbox"/>	Gas measurements equipment
<input checked="" type="checkbox"/>	Connecting vapor return hose/Mannetek DDcouplings	<input type="checkbox"/>	Other.....
Place:			
Date:			
Performed by:			

All works on the methanol systems will be carried out by specialized companies and authorized persons.