#  GAS CARRIERI – TBN

#

all details "abt." given in good faith but without guarantee

##  GENERAL INFORMATION

## Flag GERMANY

**Class** Lloyds Register

**Builders** South Korea

**Delivery** 18 October 2010

##  PRINCIPLE DIMENSIONS

|  |  |  |  |
| --- | --- | --- | --- |
| **Length o.a. Length b.p.****Breadth overall hull** |  | 173,70 m165,00 m28,04 m | Draft SW on SFB 10,42 mDraft FW 10,64 mMax draft full cargo NH3 (dens. 0,68) 10,50 m |
| **Depth moulded** |  | 17,80 m | Max draft full cargo LPG (dens. 0,58) 9,85 m (100% cons.) |
| **Distance Keel-Antenna** |  | 48,41 m | Max draft ballast cond. (AP) 7,85 m (100% cons.) |
| **Antenna folded** |  | n/a m | Normal draft ballast cond. (AP) 6,85 m |
|  |  |  | TPC on summer draft 41,51 mts/cm |
| **International** | **Gross** | 22.977 | Light ship 10.463 mts |
|  | **Net** | 6.893 | Max DWT (SFB) 26.645 mts |
| **Suez** | **Gross** | 24.433,18 |  |
|  | **Net** | 20.572,49 |  |
| **Panama** | **Gross** |  | **Draft calculation:** 90pct bunkers / FW optimized / full stores / lubes |
|  | **Net** | 19.143 | Seawater 1,025 |

 **PROPULSION AND MACHINERY Main Engine HYUNDAI-MAN 6S50MC-C7 (MCR : 9,480 kW x 127 RPM)**

**Auxiliary engines HYUNDAI-MAN 7L23/30H (960kW, 2Sets), 6L23/30H (780kW, 1Set) Shaft Generator N/A**

**Bow Thruster No KW**

**Propeller Type: Keyless, Four(4) blades, Dia. 5,800mm FPP**

**Speed/consumption upto and including sea state/beaufort scale 4**

**Fuel Grade:**

**IFO 380cst**

**MGO:**

**Auxiliaries to run on MGO where compulsory**

|  |  |  |  |
| --- | --- | --- | --- |
| **at sea service speed** | **ME HFO** | 27 | **mts/day** |
| **AUX HFO** | 3,5 | **mts/day** |
| **at sea economical speed** | **ME HFO** | TBA | **mts/day** |
| **AUX HFO** | 3,5 | **mts/day** |
| **at sea service speed -****while cooling cargo** | **ME HFO** | 27 | **mts/day** |
| **AUX HFO** | 8 | **mts/day** |
| **at sea economical speed****while cooling cargo** | **ME HFO** | TBA | **mts/day** |
| **AUX HFO** | 8 | **mts/day** |
| **in port loading** | **AUX HFO** | 6 | **mts/day** |
| **Boiler** | 2,5 | **mts/day** |
| **in port loading - while cooling cargo** | **AUX HFO** | 6 | **mts/day** |
| **Boiler** | 2,5 | **mts/day** |
| **in port discharging - 6 DWL pumps** | **AUX HFO** | 8 | **mts/day** |
| **Boiler** | 2,5 | **mts/day** |
| **in port idle** | **AUX HFO** | 3,5 | **mts/day** |
| **Boiler** | 2,5 | **mts/day** |
| **Boiler for evaporator water production, if required Boiler for heating up cargo, if required****Incenerator for burning sludge, if required** | **Evaporator Cargoheater****Incenerator** | **-****-**0,2 | **mts/day mts/day****mts/day** |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Service Speed** | **abt. 15,0****abt. 14,5** | **in ballast****laden** | **Economical Speed** | **abt. 13,5****abt. 13,0** | **in ballast****laden** |  |
|  |  |  |  |  |  |  |
| **Full Speed** | **abt. 16,5****abt. 16,0** | **in ballast****laden** | **Consumption for full speed upon request but****not guaranteed** |  |  |  |
| **Consumption details** |  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |
|  |

Fuels to be used, to be in line with IMO requirements

1. THIS TABLE IS PREPARED FOR PREDICTION OF APPROXIMATE FUEL OIL COMSUMPTION AND THESE VALUES SHOULD BE USED

FOR REFERENCE DATA ONLY, DIFFERING FROM ACTUAL VALUES OF SHIP OPERATIONAL CONDITION UNDER VARIABLE CIRCUMSTANCE.

1. S.F.O.C. OF H.F.O. IS CONVERTED BY : S.F.O.C. (M.D.O.) X 10,200 / 9,700
2. S.F.O.C. FOR M/E, D/G & COMPOSITE BOILER IS BASED ON DESIGN VALUES FROM EACH MAKER.
3. S.F.O.C. OF H.F.O. IS CONVERTED BY : S.F.O.C. (M.D.O.) X 10,200 / 9,700
4. S.F.O.C. FOR M/E, D/G & COMPOSITE BOILER IS BASED ON DESIGN VALUES FROM EACH MAKER.

 **TANKS & CAPACITIES**

|  |  |
| --- | --- |
| **Bunker HFO** | 1.591 cbm |
| **MDO** | 131 cbm |
| **Location of Bunker Flange** | Manifold area (IFO - FWD and AFT / MGO - AFT from Cargo Manifold) |
| **Ballast water** | 11.392 cbm |
| **Pumping capacity** | 2 x 500 cbm/hr |
| **Filling time** | 11,5 hours |
| **Discharge time** | 11,5 hours |
| **Fresh water** | 298 cbm |
| **Fresh water generator** | 20 mts/day |

 **PRODUCTS**

Propane (Pure)

Anhydrous Ammonia Propylene

1,3 - Butadiene Commercial Propane (maximum 2.5 mole% Ethane in Liquid Phase)

Butane (i, n) Vinyl Chioride Monomer (reduced filling limits)

Butylenes Propane and Butane mixtures

##  CARGO HANDLING EQUIPMENT

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cargo tanks** |  | **Volume** | **Type** | IMO Independent Type A (prismatic) |
|  | **No.** | **100%** | **98% Material** | Fine grain, fully killed low temp. carbon manganese steel |

**Segregation**

**1**

## 2

|  |  |
| --- | --- |
| 9.770,97 | 9.575,55 |
| 14.767,38 | 14.472,04 |
| 10.694,11 | 10.480,23 |
| 100,05 | 98,05 |
| 241,16 | 236,34 |
| 35.573,68 | 34.862,21 |

**3**

**DTK (P)**

**DTK (S)**

**Transport grade Discharge grade Reliquefaction grade Sequences**

**Max. tank pressure:**

**IMO** 0,25 bar (g)

**USCG** 0,25 bar (g)

**fully ref** 0,45 bar (g) (Harbour Setting)

**vaccum** 0,95 bar (a) (5% vacuum)

**min. temp.** -50 degC

**max. density** 700 kg/m³ (98% Full)

**max. density** 970 kg/m³ (reduced filling limit 70% Full)

2

2

2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **System 1** | 1 | 1+2 | 1+3 | 1+2+3 | - |
| **System 2** | 2+3 | 3 | 2 | - | 1+2+3 |

**Deck tank Type** IMO type C Cylindrical

**Material** low temp. carbon, manganese steel

Arrangement of Cargo / Deck Tanks

|  |  |  |
| --- | --- | --- |
|  | D.TK. (P) |  |
| Aftship | C.TK. 3 (P) | C.TK. 2 (P) | C.TK. 1 (P) | Foreship |
| C.TK. 3 (S) | C.TK. 2 (S) | C.TK. 1 (S) |
|  |  |  |
| D.TK. (S) |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Capacity 1** | 100 | cbm |  |  |  |
| **Capacity 2** | 240 | cbm |  |  |
| **Max. press.** | 18,2 | bar (g) for (C3+NH3) |  |  |
| **Max. press.** | 6,7 | bar (g) for (C4+VCM) |  |  |
| **min. temp.** | -50 | °C |  |  |
| **max. density** | 700 | kg/m³ (98% Full) |  | 18,20 bar(g) |
| **max. density** | 970 | kg/m³ |  | 6,70 bar(g) |  |  |  |
| **Cargo pumps** | **Type** | Deepwell | Booster |  |  |  |  |  |
|  | **Maker** | Hamworthy | Hamworthy |  |  |  |  |  |
|  | **Number** | 6 | 2 |  |  |  |  |  |
|  | **Capacity** | 400 | 400 cbm/hr |  |  |  |  |  |
|  | **Disch. head** | 120 | 120 m.l.c. |  |  |  |  |  |
|  | **Max. density** | 700 | 700 kg/m³ | (98% Full) |  |  |  |  |
|  | **Max. density** | 970 | 970 kg/m³ |  |  |  |  |  |

## Loading

From fully refrigerated storage

Vapour return

From semi.-ref. storage cargo

**t= +20°C / IMO & USCG setting**

Vapour return

without with without with

TE/hr TE/hr TE/hr TE/hr

3 compressors in operation

reliquefaction plant usually not in service

1-3

compressors in operation

- 87

12

13

74

71

- 87

12

13

74

71

2.864

2.529

2.559

2.430

2.732

4.084

1.550

1.651

737

777

1.736

2.289

Ammonia Butane Propylene Propane BTD VCM

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Discharging** |  |  |  |  |  |
|  | **capacity** | 2.400 |  | cbm/hr | Using all depwell pumps and both manifolds |
| **Cargo Compressor** |  |  |  |  |  |
|  | **Cargo** | Commercial Propane (2.5 mole% Ethane) | Motor Rating. 270 kW |
|  | **Number** | 3 |  |  | power abs. 220 kW |
|  | **Booster** | 0 |  |  |  |
| **Cargo Heating** | **Direct Cargo** |  |  |  |  |
|  | Number |  | 1 |  |  |
|  | System |  |  |  |  |
|  | Type |  | shell and tube |  |  |
|  | Heating |  | seawater |  |  |
|  | Sea water |  | 15°C |  |  |
|  | Capacity | Ammonia | 330 cbm/hr |  |  |
|  |  | Propane | 400 cbm/hr |  |  |
|  |  | Propylene | - |  |  |
|  | Min. working temperature | -42.8°C |  |  |
| **The cargo heaters may also serve as cargo vaporizer with a capacity of approx. 3500 Nm³/h** |
| **Cargo vapourizer** | Number |  | 1 (combined use with heater as above) |
|  | Type |  |  |  |  |
|  | Heating medium | 50 / 50 | Freshwater / Glycol |
|  | Capacity |  | 3.500 | Nm³/h | vapour production |
| **Hose Handling** | Number |  | 1 |  |  |
|  | SWL |  | 5 | mts |  |
|  | Outreach |  | 22 | mts | ( approx. 8 m outboards ) |
| **Measuring** | **Level** |  | Henri system Float type level gauge 807 |
|  | **Temperature inside** | ABB Automation Products |  |
| **Temperature tank wall** |
|  | **Pressure** |  | ABB Automation Products |  |
|  | **Samples** |  |  |  |  |
|  | **Liq. Samples** |  | Cargo Tanks - Top, Middle, Bottom |
| Deck Tanks - Top, Bottom |
| Deepwell Pumps - Discharge lines |
|  **CHANGE GRADE EQUIPMENT**  |
| **Type** |  |  | Fuel Oil Combustion |  |
| **Inert Gas capacity** |  |  | 3.000 | Nm³/h at 0.5 % Oxygen (Dewpoint -40° inert Gas) |
| **Inert Gas capacity** |  |  | 3.000 | ~Nm³/h at 1.0 % Oxygen |
| **Inert Gas capacity** |  |  | - | m³/h at 2.0 % Oxygen |
| **Discharge pressure** |  |  | 0,4 | bar(g) |  |
| **Dry air capacity** |  |  | 3.000 | m³/h (Dewpoint -20°) |
| **Blower** | **Capacity** |  | 10.000 | Nm³/h at 120 mbar |
|  | **Dewpoint** |  | - | °C |  |
| **Padding** | **N/A** |  |  |  |  |
| **Decktank** | **Capacity (P)** | (100%) | 100,051 | m³ |  |
|  | **Capacity (S)** | (100%) | 241,161 | m³ |  |
|  | **max. press.** |  | 18,2 | bar (g) |  |
|  | **max. density** |  | 0,97 | kg/dm³ |  |
|  | **suitable for** |  | same as cargo tank |  |
|  **MANIFOLD POSITION**  |  |  |  |  |  |
| **Number of liquid lines** |  |  | 2 |  |  |
| **Number of vapour lines** |  | 2 |  |  |
| **Flanges liquid lines** |  | L1 - 30bar (300#) 12" Raised Face |  |  |
| L2 - 30bar (300#) 12" Raised Face |
| **Flanges vapour lines** |  | V1 - 18.6bar (150#) 8" Raised Face |  |  |
| V2 - 18.6bar (150#) 8" Raised Face |
| **Reducers on board (ASA):** |
|  |  | Reducer |  | Number of sets |
|  |  | 12" #300 X 16" #300 | 2 |  |
|  |  | 12" #300 X 12" #300 | 2 |  |
|  |  | 12" #300 X 10" #300 | 2 |  |
|  |  | 12" #300 X 8" #300 | 2 |  |
|  |  | 12" #300 X 6" #300 | 2 |  |
|  |  | 12" #300 X 16" #150 | 2 |  |
|  |  | 12" #300 X 12" #150 | 2 |  |
|  |  | 12" #300 X 10" #150 | 2 |  |
|  |  | 12" #300 X 8" #150 | 2 |  |
|  |  | 12" #300 X 6" #150 | 2 |  |
|  |  | 8" #150 X 10" #150 | 2 |  |
|  |  | 8" #150 X 6" #150 | 2 |  |
|  |  | 8" #150 X 4" #150 | 2 |  |

## Sequence of manifold

**from bow to stern** L1 - V1- V2 - L2

**Distance manifold** (always centre)

**above keel** 19,832 m

**above deck** 2,000 m **Hose crane** Number 1

**above WL at summer draft** 9,413 m SWL 5

**above WL at ballast draft** 12,982 m outreach 22

## from rail m

**L2 V2 V1 L1**

**from bow** 91.245 89.245 87.245 85.245 mm

mts

m (8m outboards)

## from stern between flanges

**Parallel mid-body length**

**at ballast draft**

82.455

84.455

2,00

65,84

86.455

m

m

88.455 mm

3,75m

**at summer draft** 83,32 m distance from stern … 84.98 m distance from bow … 88.72 m

stern

bow

L2

12" 300 lbs

V2

8" 150 lbs

V1

8" 150 lbs

L1

12" 300 lbs

2.000mm

525mm

1.475mm

2.000mm

2,00m

10,419m

9,41m

summer draft

ballast draft

12,98m

6,85m

19,83m

##  CARGO CAPACITIES

all intakes calculated on 98% tankfilling shrinkage not corrected / drafts at full bunkers

Tank No.

Tank capacities Cap.

100%

Cap. 98%

1 (P&S)

2 (P&S)

3 (P&S)

9.770,97

14.767,38

10.694,11

9.575,55

14.472,04

10.480,23

(cbm) **35.232,47**

**34.527,82**

all details "abt:" any may differ between ships of same class.

## Ammonia

Tank No. -33,5

s.g. 0,6800

## Propane

Tank No. -42,1

s.g. 0,5820

## Butane

Tank No. -0,5

s.g. 0,6007

1 6.511

2 9.841

3 7.127

1 5.573

2 8.423

3 6.099

1 5.752

2 8.693

3 6.295

(mts)

## DFTs F/A in Mtrs:

**23.479**

**10.00/10.50**

(mts)

## DFTs F/A in Mtrs:

**20.095**

**9.30/9.80**

(mts)

## DFTs F/A in Mtrs:

**20.741**

**9.45/9.95**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Propylene** |  |  | **Butadiene** |  |  | **Crude C4** |  |
| Tank No. | -47,3 |  | Tank No. | -4,5 |  | Tank No. | -5 |
| s.g. | 0,6100 |  | s.g. | 0,6500 |  | s.g. | 0,6323 |
| 1 | 5.841 |  | 1 | 6.224 |  | 1 | 6.055 |
| 2 | 8.828 |  | 2 | 9.407 |  | 2 | 9.151 |
| 3 | 6.393 |  | 3 | 6.812 |  | 3 | 6.627 |
| (mts) | **21.062** |  | (mts) | **22.443** |  | (mts) | **21.832** |
| **DFTs F/A in Mtrs:** | **9.50/10.00** |  | **DFTs F/A in Mtrs:** | **9.80/10.30** |  | **DFTs F/A in Mtrs:** | **9.70/10.20** |

|  |  |
| --- | --- |
| **VCM** |  |
| Tank No. | -13,9 |
| s.g. | 0,9700 |
| 1 | 6.634 |
| 2 | 10.027 |
| 3 | 7.261 |
| (mts) | **23.923** |
| **DFTs F/A in Mtrs:** | **10.10/10.60** |