

VESSEL PARTICULARS (FORM C)
LPG/C GAS IMPERIALE
(last updated **01/06/2021**)

Specifications of the vessel and the gas installation which are representations by the Owners.

(A) VESSEL'S CHARACTERISTICS

PREAMBLE

Name : **GAS IMPERIALE**
Owner : **MANAMA PRIDE INC.**
Flag : **Marshall Islands**
Build : **2008, Miura Shipbuilding Co., Ltd.**
Date on Service : **2008**
Class : **Nippon Kaiji Kyokai (NKK)**

GRT International : **2997 tons** Suez : **3509 tons**
Panama :

NRT International : **948 tons** Suez : **2712 tons**
Panama : **2573 tons**

Is vessel build according to USCG regulations? : **Yes**
RINA regulations? : **Yes**
Japanese regulation? : **Yes**

Has vessel received USCG approval? : **N/A**
RINA approval? : **N/A**

HULL

LOA : **95.98 M**
LBP : **89.50 M**
Breadth : **15.00 M**
Depth : **7.00 M**
Summer Draft : **5.500 M corresponding to Summer DWT = 3161 tons**
Multiple Draft : **5.358 M corresponding to Multiple DWT = 2998 tons**

Estimated draft with full cargo and full bunkers are as follows.

Product	Draft Fore' (m)	Draft Aft' (m)	Draft Mean (m)	Corresponding Deadweight (t)
Propylene (98%)	4.49	6.11	5.30	2,994
N-Butane (98%)	4.76	6.17	5.46	3,179
VCM (98%)	4.39	6.51	5.45	3,190

Propeller immersion :

At aft draft At 6.11 m correspond. : 100 %
At aft draft At 6.17 m correspond. : 126 %
At aft draft At 6.56 m correspond. : 142 %

COMMUNICATION EQUIPMENT

Call letter : **V7IB5**
Radio Station normally watched : **VHF Ch. 16**
Radio MF/HF NBDP : **YES**
Radio MF/HFTEL/DSC : **YES**
VHF : **YES**
Satellite Communication **Inmarsat (FBB)** : **+870-773213838**
E-mail : **gasimperiale@stealth.gr**
Inmarsat 'C' : **453840719**

MACHINERY

Main Engine x 1 . Type and make : **Vertical, 4 Cycle, Single Acting, Self Reversing Cross Head type, Diesel Engine with Turbo Charger**
THE HANSHIN DIESEL CO., LTD.
LH41LA
. Service power : **2,647 Kw (3,600 BHP) x 240 min⁻¹**
No of Cylinders : **6 cylinders**
Cyl Bore x Stroke : **410mm x 800mm**
. Grade of fuel used : **IFO – 180cst with Iso 8217 RME 25**

Auxiliaries Type and make (Electrical) : **4 Cycle, Single Acting, Trunk Piston Type Diesel Engine**
(Mechanical) : **YANMAR CO. LTD.**
6NY16L-DN
Grade of fuel used : **MGO (DMA) with Iso 8217 DMA**
No off : **2 sets**

Emergency Gen. Type : **Brushless AC Generator**
Yanmar Co. Ltd.
(NF 19-HF)
No off : **1 set**

Bow Thruster : **KAMONE PROPELLER – TCB-55MA**
Electric Driven Controllable Pitch Propeller
318 HP / 234 kW

Boiler Type : **Steam Boiler Water Tube Type**
Miura Protech. Co. Ltd.
VWH-600E
Evaporation : **538 kg/h actual evaporation**
Max Design Pressure : **0.69 Mpa**
Feed Water Temp : **About 80-90 ° C**
No off : **1 Set**

Exhaust Economiser	Type Evaporation No off	MIURA PROTECH CO.,LTD. / KF-39F 340 kg/h at 85% and 400 kg/h at 100 % 1 set
Air Compressors (Main)	Type / Capacity No off	Vertical 2 Stage Compressor Water Cooled Matsubara Iron works Ltd. MH-111 (Cap: 53 m3/h) 2 Sets
Air Compressors (Emergency)	Type No off	L-Type 2-Stage Sanwa Iron Works Co. Ltd. (GS 3AR) 1 Set
Fuel Oil Purifier	Type No off Capacity	Self Ejector, Mitsubishi Kakoki Kaisha, Ltd. (SJ 10-G) 2 Sets 1150 L/h
Lub Oil Purifier	Type No off 1 set Capacity	Self Ejector, Mitsubishi Kakoki Kaisha, Ltd. (SJ 10-G) 1 Set 1300 L/h
Diesel Oil Purifier	Type No off Capacity	Mitsubishi Kakoki Kaisha Ltd. – SJ10G 1 1150 L/h
Evaporator	Type Capacity	Jacket Water Utilizing, Miura Protech. Co. Ltd. WM-10SS 9 ton/day
Fresh Water Sterilizer	Type Capacity	USS-1000 Usuzhio Electric Co. Ltd. 9 ton/day
Fresh Water Mineraliser	Type / Capacity	N/A
Waste Oil Incinerator (IMO MEPC 76 (40))	Type Capacity	Distillation Type Miura Protech Co. Ltd. BGW-20N 24.3 L/h
Oily Water Separator	Type Capacity	USH-20 Taiko Kikai Industries Co. Ltd. 2.0 m3/hr
Sewage Treatment plant	Type Capacity	Biological System Taiko Kikai Industries Co. Ltd. SBT-25 Maximum 25 persons/Day

Hot Water Set (Calorifier unit)	No off	1 Set
Steering Gear	Type	TOKIMEC INC. / SP-W12-200S
	Duty Capacity	11 Kw, 440V, 60hz
		58.8 L/min @ 1730 min⁻¹ 15.4 MPa
	Hydraulic pump unit	TOKIMEC (V20-2F11F-1C11-JA-S47)

Speed

About 13 knots up to Beaufort scale 4 and max significant wave height of 1.25m

CONSUMPTION/DAY

Main Engine	HFO	9 MT
Auxiliary Engine	DO	0.9 MT
In Port Discharging	DO	1.70 MGO
In Port Idle / Loading	DO	0.9
Use IGG	DO	1.0

All figures are about, defined as +/- 5% on consumption and speed respectively.

Notes:

1. Speed and consumption figures at sea, are best estimated basis daily weather conditions are up to Beaufort scale 4 – max.significant wave height 1.25 m, without effect of sea currents or swell, and vessel en route under a steady course, with a net sea passage duration of at least 24 hrs.
2. Consumption figures at port, are subject to port movements, port and/or harbour, terminal requirements, for the safe manoeuvring, approach, inland navigation, and port stay of the vessel throughout her call.

(B) CARGO INSTALLATIONS

1. Transportable products and respective quantities, calculated in accordance with IMO – maximum filling formula. (Tonnes)

	100% (CBM)	98% (CBM)		
NO.1 CARGO TANK	1757.665	1722.511		
NO.2 CARGO TANK	1757.255	1722.110		
T O T A L	3514.93	3444.621		
	SPSV (bar g)	Ref. Temp. (deg. C.)	Density at (Ref. Temp.)	Corresponding Quantity (MT)
Propane	17.65	45.0	0.459	1,581.08
Propylene	17.65	45.0	0.470	1,618.97
Butane Propane Mixtures	17.65	45.0	0.487	1,677.53
i-Butane	17.65	45.0	0.526	1,811.87
n-Butane	17.65	45.0	0.548	1,887.65
Butylene	17.65	45.0	0.565	1,946.21
Butadiene	17.65	45.0	0.588	2,025.43
V.C.M.	17.65	45.0	0.872	3,003.70
Isoprene	17.65	45.0	0.656	2,259.67
Pentane	17.65	45.0	0.600	2,066.77
Pentene	17.65	45.0	0.611	2,104.66

Note(1): In case of USCG, propylene, propane and B/P mixtures are not to be carried except the vapour pressure of B/P mixtures is not more than 12.75 bar g, 13.0 kg/cm² @ 45 °C

Note(2): On and after, the pressure value in parentheses is shown as a conversion value

Mixing ratio of above mentioned B/P mixtures is as follows:

Butane 35 wt% and propane 65 wt%

2. Other transportable products N/A

	SPSV	Ref. Temp. (°C.)	Density at Ref. Temp.	Corresponding Quantity (MT)

3. TANKS

- 3.1 Design pressure (Vapour) – BV-IGC : **17.65 bar g (1.765 MPag)**
- USCG : **12.75 bar g (1.275 MPag)**
- 3.2 Valve setting : **17.65 bar g (1.765 MPag) / 12.75 bar g (1.275 MPag)**
- 3.3 Maximum vacuum obtainable : **Atmospheric**
- 3.5 Maximum temperature acceptable : **45 °C**

- 3.6 Minimum temperature acceptable : **0 °C**
 3.7 Hydrostatic Test Pressure : **26.48 bar g (2.648 MPag)**

4. LOADING RATE (TONS/HOUR) – For Full Cargo Parcels

- Ex-atmospheric storage with gas : 1 tank : **320 cbm/hr**
 Return : 2 tanks : **570 cbm/hr**

Remarks:

- * Based on maximum velocity of 6.5 metres/sec except VCM, and 4.0 meters/sec for VCM in the liquid piping.
- * If cargo temperature is less than 0 °C, shore heater to be used. If ship heater used, max rate is **250 m³** per hour.
- * Loading by shore pump only, proper size gas return line to be connected
- * Subject to both ship and shore tanks being under favourable conditions

5. CARGO PUMPS

- 5.1 Type : **Electric Motor Driven Deepwell pump, Vertical Multi Stage 14M-160-4-1**
 Make : **Nigata Worthington Co. Ltd.**
 How many : **2 Sets**
 Maximum specific gravity : **0.948**
- 5.2 Capacity (CMB/Hour) : **2 x 300 m3/hr**
 Two speed or variable speed : **Single speed electric motor**
 Rated kW (each) : **120Kw**
 Working pressure maximum : **17.65 bar.g**
- 5.3 Location : **On the mounting nozzle fitted on the cargo tank**
 Removable : **Not removable**
- 5.4 Booster pumps : **Not equipped**
 Type :
 Maker :
- 5.5 Capacity (CMB/Hour) :
 Working pressure :
- 5.6 Location :
- 5.7 Time to discharge a full liquid cargo using all pumps against back pressure at pump
 1 bar : **about hours for LPG**
 5 bars : **about hours for LPG**
 10 bars : **-----**
- 5.8 Nominal back pressure when working : **about 1 bar**
 In series corresponding head : **N/A**
 Maximum back pressure : **about 5 bars**
 Nominal pressure at rail (propane) : **about 13 bars at 20 degree C of cargo temperature**
- 5.9 What amount of cargo remains in tanks after completion pumping before stripping:
 - liquid : **about 2.2cbm per one tank**

- vapour : about 3.3ton per one tank for LPG

6. STRIPPING

6.1 Stripping system, if any : Nil

6.2 Time required to remove all traces of liquid cargo as stated in 5.9 for:
- LPG : about hours

7. CARGO COMPRESSORS

7.1 Type : Vertical Single Stage, Water Cooled 1 Stage
Double Acting oil Free Type
LPGOS-97A

Make : Tanabe Pneumatic Machinery Co. Ltd.

How many : 2 Sets

Piston displacement 460 cbm/hr x 75 kw

Rated Kw 75 Kw

Stroke

Max discharge pressure 20 bar.g

Pressure differential 4.0 bar (max. 7.0 bar at single action)

Cap- 460 m3/hr

No of Revolutions 540 Rpm

7.2 Are compressors oil free : Yes

7.3 Can they reliquefy VCM without risk : No. Only for compression of vapor

7.4 State time to bring full cargo of butane to atmospheric pressure from : N/A

8. INERT GAS SYSTEM

8.1 Does the vessel use inert gas? : YES

If so, state utilization and quantities : Cargo tank conditioning

8.2 Can the vessel produce inert gas? : YES

If so, state type and composition of gas produce: PSA Nitrogen Generation System
TAIYO TOYO SANSO CO., LTD

Dew Point at Atmospheric Temp. : minus (-) 60 deg.C.

Discharge Capacity : 180 Nm³/hr at 99.95% N2 purity

122 Nm³/hr at 99.90% N2 purity

310 Nm³/hr at 99.50% N2 purity

370 Nm³/hr at 99.00% N2 purity

400 Nm³/hr at 98.00% N2 purity

450 Nm³/hr at 97.00% N2 purity

8.3 Maximum production obtainable : 99.95 % / 180 Nm³/hr

NOTE:- Above quantities obtained at engine room temperature 45° C

8.4 State if there are storage facilities for inert gas onboard: N/A

- Size : N/A

- Pressure : N/A

- 8.5 State if any shore supply of nitrogen may be required: : **N/A**
 - for what purpose : **N/A**
 - what quantities : **N/A**

9. GAS FREEING

- 9.1 State method used giving all details : **Nitrogen Plant / Fans**
 9.2 State time required including stripping : **40 Hours**

10. CHANGING GRADE

- 10.1 From completion discharge of cargo Propane, time required in hours and inert gas in CBM required to reach a tank and gas installation atmosphere of less than 100 ppm of Propane in Vapour phase.
Time required: 40 Hours
- 10.2 Can this operation be carried out at sea? : **Yes**
- 10.3 Can the ship measure the number of ppm in vapour phase? : **Yes**
- 10.4 Has vessel deck tank for changing grade/cooling operations? : **NONE**
- 10.5 Deck tanks : **NONE**
 Capacity :
 Purpose :

11. COOLING BEFORE LOADING

12. CARGO HEATER

- 12.1 Type : **Horizontal Shell & Tube Type
Nissin Refrigeration & Engineering Ltd.**
- 12.2 Inside Diameter **650 mm**
- 12.3 Overall length **5968 mm**
- 12.4 Cargo flow rate **150 m3/hr**
- 12.5 Min Inlet Temp **-48 deg.C.**
- 12.6 Min Outlet Temp **0 deg.C.**
- 12.7 Required Sea water Capacity **420 cbm/hr**
- 12.8 Design Pressure **20 Bar**
- 12.9 Hydrostatic Test Pressure
- 12.10 Tightness Test Pressure

- 12.0 State discharging rate for propane to be brought from atmospheric pressure
 Loading rate for Propane – 48° C up to 0° C: **about 150 cbm/hr**

13. CARGO VAPORIZER

In case vapour gas is needed to feed compressors, can vessel produce its own if no shore available:
No

14. REFRIGERATING APPARATUS

- 14.1 Is it independent of cargo? : **NA**
 Is so, state cooling agents : **NA**
- 14.2 What minimum temperature can be maintained : **NA**

14.3 What time required at sea to lower by 1°C the full cargo of : **NA**

15. MEASURING APPARATUS

What gauges on board?

Type : **Float type level gauge**
Location : **At each cargo tank dome**

16. SAMPLES

16.1 State how tank atmosphere samples can be taken and where from?
Fixed sampling connection at tank domes (3 different height position)

Standard of fitting? : **Closed loop Sampling**

16.2 Same question for cargo : **TBA**

16.3 Are sample bottles available on board? : **No**

17. CARGO LINES

17.1 Is ship fitted with a port and starboard cargo manifold? : **Yes**

17.2 Position of cargo manifold

- distance from stern (AP) (S / P) : **51.3 M**
- distance from stem (FP) (S / P) : **44.7 M**
- height above deck : **1.169 m for Liquid manifold**
- distance from ship's rail : **2.30 M**
- underside keel to manifold : **8.169 M**

All the figures are as center of presentation flange Liquid Line

17.3 Liquid line

- flange-size : **8 in. ANSI 300 lbs at manifold**
- type : **Vertical Flange, Raised Face**

Gas line

- flange-size : **5 in. ANSI 300 lbs at manifold**
- type : **Vertical Flange, Raised Face**

17.4 What reducers on board? :

For Liquid line (low temperature)

ANSI standards

8" / 300 lbs - 10" / 300 lbs – 1 pc
8" / 300 lbs - 6" / 300 lbs – 1 pc
8" / 300 lbs - 5" / 300 lbs – 1 pc
8" / 300 lbs - 4" / 300 lbs – 1 pc
8" / 300 lbs - 3" / 300 lbs – 1 pc
8" / 300 lbs - 6" / 150 lbs – 1 pc
8" / 300 lbs - 4" / 150 lbs – 1 pc
8" / 300 lbs - 3" / 150 lbs – 1 pc
8" / 300 lbs - 8" / JIS20K – 1 pc
8" / 300 lbs - 6" / JIS20K – 1 pc
8" / 300 lbs - 5" / JIS20K – 1 pc
8" / 300 lbs - 4" / JIS20K (100A) – 1 pc
8" / 300 lbs - 4" / JIS20K - (80A) – 1 pc

For Vapor line (normal temp.)

ANSI standards

5" / 300 lbs - 6" / 300 lbs – 1 pc
5" / 300 lbs - 4" / 300 lbs – 1 pc
5" / 300 lbs - 3" / 300 lbs – 1 pc
5" / 300 lbs - 2" / 300 lbs – 1 pc
5" / 300 lbs - 6" / 150 lbs – 1 pc
5" / 300 lbs - 4" / 150 lbs – 1 pc
5" / 300 lbs - 3" / 150 lbs – 1 pc
5" / 300 lbs - 2" / 150 lbs – 1 pc
5" / 300 lbs - 5" / JIS20K – 1 pc
5" / 300 lbs - 4" / JIS20K – 1 pc
5" / 300 lbs - 3" / JIS20K – 1 pc
5" / 300 lbs - 2" / JIS20K – 1 pc

FOR VCS

5" / 300 lbs - 6" / 150 lbs – 1 pc
5" / 300 lbs - 4" / 150 lbs – 1 pc

17.5 Is ship fitted with stern discharge? **No**
- Liquid line - diameter : **N/A**
- flange – size : **N/A**
- type : **N/A**

18. HOSES

Are serviceable hoses available on board? : **None**

18.1 Two pieces, each : **N/A**
Length : **N/A**
Diameter : **N/A**
Flange-size : **N/A**
Type : **N/A**
Bending radius : **N/A**

18.2 Minimum temperature acceptable : **N/A**
Maximum pressure acceptable : **N/A**

18.3 For what products are hoses suitable? : **N/A**

19. DERRICKS

- Hose cranes : **One**
- Where situated : Upper Deck near Transverse Midship between No.1 Cargo Tank and No.2 Cargo Tank (at Frame No. 70).
- Lifting capacity : S.W.L. 4.0 MT
- Working radius : 2.25 meters (Starb'd side at Frame No.)
7.25 meters (Port side at Frame No.)

20. SPECIAL FACILITIES

20.1 How many grades can be segregated? : **CAN CARRY ONE GRADE ONLY**

20.2 How many cooled? : **N/A**

20.3 Can vessel sail with slack cargo tanks? : **Yes**