

# VESSEL PARTICULARS(FORMC)

## LPG/CGAS CERBERUS

(Last Updated 14/01/2020)

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

### (A) VESSEL'S CHARACTERISTICS

#### PREAMBLE

Name : LPG/VCM : GAS CERBERUS  
Owner : CARINTHIA INC.  
Flag : LIBERIA  
Build : Kanrei Shipbuilding Co. Ltd., Japan  
Date on Service : Apr. 20, 2011  
Class : AMERICAN BUREAU OF SHIPPING (ABS)

GRT International : 4,312 ton                      Suez : 4986.64 ton  
Panama : 15,203.111m<sup>3</sup>

NRT International : 1,381 ton                      Suez : 4016.51 ton  
Panama : 3682.35 ton

Is vessel build according to                      USCG regulations? : Yes  
RINA regulations? : N/A  
Japanese regulation? : JIS

Has vessel received                      USCG approval? : YES (for foreign vessel  
inUSwater)  
RINA approval? : N/A

#### HULL

LOA : 99.90 M  
LBP : 93.50 M  
Breadth : 17.60 M  
Depth : 8.00 M  
Summer Draft : 6.165 M corresponding to Summer DWT = 5,002 t

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

Product	Draft Fore' (m)	Draft Aft' (m)	Draft Mean (m)	Corresponding Deadweight (t)
Propane (98%)	4.15	6.01	5.08	3,450
Butadiene (98%)	4.82	6.22	5.52	4,084
VCM	5.60	6.70	6.15	5,002

Propeller immersion :

At draft      At      6.01m correspond.                      :      109.39%  
At draft      At      6.22m correspond.                      :      115.76%  
At draft      At      6.69m correspond.                      :      130.00%

COMMUNICATION  
EQUIPMENT

Call letter : A8YQ2  
Radio Station normally watched : GMDSS  
Radio MF/HF NBDP : FURUNOFS-5070  
Radio MF/HFTEL/DSC : FURUNOFS-5070  
VHF : FURUNO FM-8800D x 2 SETS  
Satellite Inmarsat 'C' : JRC JUE-87  
Communication  
Inmarsat 'F' / VSAT : (Voice1) +30 2119902468, (Voice2) +30  
2119902469, FBB +870 773257424  
:(Fax) +870 765080280  
:(E-mail) gascerberus@stealth.gr

MACHINERY

Main Engine x 1 Type and make : MAKITA CORPORATION 5L35MC  
Service power : 2,925 Kw (3,977 ps) x 203 rpm (90%MCR)  
No of Cylinders : 5  
Cyl Bore x Stroke : 350 mm x 1050 mm  
Grade of fuel used : HFO having a viscosity of not more than 380cst @50°C

Auxiliaries Type and make (Electrical) : Yanmar (6NY16L-SN) - A.C. drip proof, self-venti-  
lated 360 Kw x 445V x 3 phase x 60 Hz  
(Mechanical) : 4 stroke x 400 Kw x 1,200 rpm  
Grade of fuel used : Diesel Oil - 6Cst at 40°C / Marine Gas Oil - 1.8cst  
No off : 2

Emergency Gen Type : Deutz (F5L912) - 50Kw, AC 450V,  
3 phase, 60 Hz  
No off : 1

Fire & Bilge pump Type : Taiko Kikai Industries Co, Ltd (EMSE-150MD)  
Vert. Elect. M. Driven Centrifugal Mechanical seal  
No off : 1  
Capacity : 190/80 m<sup>3</sup>/hr at 20 / 75 m

Fire & GS pump Type : Taiko Kikai Industries Co, Ltd (EMSE-150MD)  
Vert. Elect. M. Driven Centrifugal Mechanical seal  
No off : 1  
Capacity : 190/80 m<sup>3</sup>/hr at 20 / 75 m

Boiler Type : Miura Z Boiler (VWH-600E) Fully automatic  
water-tube boiler of natural circulating type  
Evaporation : 538 Kg/Hr  
Max Design Pressure : 0.7 Mpa Saturated  
Feed Water Temp : 60°C  
No off : 1

Exhaust Economiser	Type	: Miura (KF-91F)
	Evaporation	: 400Kg/Hr actual @ continuous service output of main engine
	No off	: 1
Air Compressors (Main)	Type / Capacity	: Matsubara (MH-108) - Vertical, EMD driven, 2-stage, F.W cooled type / 45.0 m <sup>3</sup> / Hr
	No off	: 2
Air Compressors (Emergency)	Type	: Sanwa Iron (GS2AR) - Horizontal, ENG driven, 2-stage, air cooled type 6.0 m <sup>3</sup> / Hr
	No off	: 1
Fuel Oil Purifier	Type	: Mitsubishi SJ20G - Centrifugal
	No off	: 2
	Capacity	: 800 Ltrs / Hr at 98°C
Lub Oil Purifier	Type	: Mitsubishi SJ10G - Centrifugal
	No off	: 1
	Capacity	: 800 Ltrs / Hr at 90°C
Evaporator	Type	: Miura Co., Ltd (WM-10DK) - Waste heat recovery
	Capacity	: 1 x 10 t/day
Fresh Water Sterilizer	Type	: Uzushio Electric Co., Ltd (USS-2K) - Electric Ultra Violet lamp with filter
	Capacity	: 1 x 2,000 litre/h
Fresh Water Mineraliser	Type / Capacity	: 1 x 1000 litre/h / Nippon Controls Co Ltd (RF-1000S1) - Vertical. Welded stainless steel
Waste Oil Incinerator (IMO MEPC 76 (40))	Type	: Miura Co Ltd (BGW-20N - Horizontal air atomizing type with aux burner
	Capacity	: Oil @ 24.3 lit/h & Solids @ 20 Kg/h
Oily Water Separator	Type	: Taiko Kikai Industries Co, Ltd (USH-10) - automatic oil discharge type
	Capacity	: 1 x 1.0 m <sup>3</sup> /h
Sewage Treatment plant	Type	: Taiko Kikai Industries Co, Ltd (SBH-25) Activated sludge aeration (Biological) - USCG certified
	Capacity	: 1 x 25 persons per day
Hot Water Set (Calorifier unit)	No off	: Harison Co Ltd (CFT-400-E) 400L tank with 2 x 10Kw heaters (1 Stby) / 1 set
Steering Gear	Type	: Electro-Hydraulic system with 2-pump units (dual system) - (one pump to be able to supply full power)
	Duty Capacity	: 18.5 t-m
	Hydraulic pump unit	: Electric motor driven, 2 x 5.5 Kw

Speed

Up to Beaufort Scale 4 Douglas Sea state 3

About: 13.0 Knots

CONSUMPTION/ DAY

At Sea

Main Engine	HFO	380 est	About 12.5 mt/day	
Auxiliary Engine	MGO	OMA	About 1.0 mt/day	Without N2 Generator
	MGO	OMA	About 2.0 mt/day	Using N2 generator

At Port

Boiler	IFO	About 0.50 mt/day
Idle/anchor	MGO	About 1.0 mt/day
Loading	MGO	About 1.0 mt/day
Discharging	MGO	About 2.0 mt/day
Use of N2 Gener.	MGO	About 2.0 mt/day

Permanent bunker  
capacity (100%)

HFO	410.00 mts
Diesel	102.00 mts
Fresh Water	212.00 mts

(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	2,507.814	2,457.657		
NO.2 CARGO TANK	2,508.303	2,458.136		
TOTAL	5,016.117	4,915.793		
	SPSV (bar g)	Ref. Temp. (deg. C.)	Density at (Ref. Temp.)	Corresponding Quantity (MT)
Propane	17.65	45.0	0.459	2,256
Propylene	17.65	45.0	0.470	2,310
B/P Mixture	17.65	45.0	0.487	2,393
I-Butane	17.65	45.0	0.526	2,585
N-Butane	17.65	45.0	0.548	2,693
Butylene	17.65	45.0	0.565	2,777
Butadiene	17.65	45.0	0.588	2,890
V.C.M.	17.65	45.0	0.872	4,286
Isoprene	17.65	45.0	0.656	3,224
Pentane	17.65	45.0	0.600	2,949
Pentene	17.65	45.0	0.611	3,003
B/P Mixtures	12.75	45.0	0.487	2,393
N-Butane	12.75	45.0	0.548	2,693
I-Butane	12.75	45.0	0.526	2,585
Butadiene	12.75	45.0	0.588	2,890
Butylene	12.75	45.0	0.565	2,777
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Pentene	12.75	45.0	0.611	3,003

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, 1.275 MPa g @ 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)
N/A				
N/A				
N/A				

3. TANKS

- 3.1 Design pressure (Vapour) – ABS-IGC : 17.65 bar g (1.765 MPa g)  
 - USCG : 12.75 bar g (1.275 MPa g)
- 3.2 Valve setting : 17.65 bar g (1.765 MPa g) /  
 12.75 bar g (1.275 MPa g)
- 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 barg (2.648 MPag)

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

Ex-atmospheric storage with gas : 1 tank : about 410 m<sup>3</sup> per hour for LPG  
return : about 250 m<sup>3</sup> per hour for VCM  
2 tanks : about 730 m<sup>3</sup> per hour for LPG  
about 450 m<sup>3</sup> per hour for VCM

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 m<sup>3</sup> 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 : Deepwell type of vertical centrifugal multistage design  
Make : Hamworthy Svanehoj A/S  
How many : 1 set per tank (2 sets)  
Maximum specific gravity : 0.601 (LPG) / 0.948 (VCM)

5.2 Capacity (CMB/Hour) : 300 m<sup>3</sup>/hr at 110 m (SG 0.601)  
250 m<sup>3</sup>/hr at 132 m (SG 0.948)  
Two speed or variable speed : Single Speed  
Rated kW (each) : 130 kW  
Working pressure maximum : 20 bar g

5.3 Location : At each cargo tank  
Removable : Yes

5.4 Booster pumps : N/A  
Type : N/A  
Maker : N/A

5.5 Capacity (CMB/Hour) : N/A  
Working pressure : N/A

5.6 Location : N/A

5.7 Time to discharge a full liquid cargo using all pumps against back pressure at pump  
1 bar : about 19 hours for LPG  
5 bars : about 53 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 bar  
Nominal pressure at rail (propane) : about 13 bar at 20 degree C of cargo temperature

5.9 What amount of cargo remains in tanks after completion pumping before stripping:

- liquid : about 1.5m<sup>3</sup>per one tank
- vapour : about 40 ton per one tank for LPG

NOTE: To reduce pressure by 1 bar/tank:- 3.8 hrs.

#### 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 2hours

#### 7. CARGO COMPRESSORS

- 7.1 Type : Vertical water cooled 1 stage double acting
- Make : Tanabe pneumatic machinery Co Ltd
- How many : 2 sets
- Piston displacement : 460m<sup>3</sup>/h
- Rated Kw : 75 kW
- Stroke : 177.8mm
- Max discharge pressure : 20 bar g
- Pressure differential : 4 bar
- Max 7 bar at single action
- No of Revolutions : 540 rpm
- 7.2 Are compressors oil free : Yes
- 7.3 Can they reliquefy VCM without risk : N/A
- 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 (N2)
- If so, state utilization and quantities : TBA
- 8.2 Can the vessel produce inert gas? : Yes (N2)
- If so, state type and composition of gas produce:
  - Nitrogen: 99 % to 99.95% Capacity (discharge) @99.00%N2 is 280Nm<sup>3</sup>/h
  - Capacity (discharge) @99.90%N2 is 180Nm<sup>3</sup>/h
  - Capacity (discharge) @99.95%N2 is 140Nm<sup>3</sup>/h
  - Oxygen: 1.0 % to 0.05%
  - Discharge Capacity : TBA
- 8.3 Maximum production obtainable : TBA

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 : TBA

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: TBA

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? : No

10.5 Deck tanks : NIL

Capacity :

Purpose :

11. COOLING BEFORE LOADING :

12. CARGO HEATER

12.1 Type : Shell and Tube

12.2 Inside Diameter 600 mm

12.3 Overall length 5600 mm

12.4 Cargo flow rate 250 m<sup>3</sup>/h (Propane)

12.5 Min Inlet Temp -48 °C

12.6 Min Outlet Temp 0 °C

12.7 Required Sea water Capacity 450 m<sup>3</sup>/h (Min 16°C)

12.8 Design Pressure 25 barg

12.9 Hydrostatic Test Pressure 37.5 barg

12.10 Tightness Test Pressure 19.8 barg with cargo piping

12.0 State discharging rate for propane to be brought from atmospheric pressure NA

Loading rate for Propane – minus 42 °C / 0 °C: about 145 Mt/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 NA

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?

Sample points at tank bottom, mid and top

Standard of fitting? : JIS PT1/4 thread

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 : 54.75 m  
 - distance from bow : 45.15 m  
 - height above deck : 1.076 m for Liquid manifold  
 - distance from ship's rail : 2.40 m  
 - underside keel to manifold : 9.115 m

17.3 Liquid line

- flange-size : 8 in.  
 - type : ANSI 300LB RF

Gas line

- flange-size : 5 in.  
 - type : ANSI 300LB RF

17.4 What reducers on board? : 20 carbon steel pieces supplied

For Liquid line (low temperature)

8" ANSI 300LB to 10" ANSI 300LB, 6" ANSI 300LB, 5" ANSI 300LB  
 4" ANSI 300LB, 3" ANSI 300LB  
 8" ANSI 150LB, 6" ANSI 150LB, 4" ANSI 150LB  
 8" JIS20K, 6" JIS20K, 4" JIS20K

For Vapor line (normal temp.)

5" ANSI 300LB to 4" ANSI 300LB, 3" ANSI 300LB, 2" ANSI 300LB  
 6" ANSI 150LB, 5" ANSI 150LB, 3" ANSI 150LB  
 2" ANSI 150LB  
 5" JIS20K, 4" JIS20K

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 : TBA - Owners  
Length : TBA - Owners  
Diameter : TBA - Owners  
Flange-size : TBA - Owners  
Type : TBA - Owners  
Bending radius : TBA - Owners
- 18.2 Minimum temperature acceptable : TBA - Owners  
Maximum pressure acceptable : TBA - Owners
- 18.3 For what products are hoses suitable? : TBA - Owners

19. DERRICKS

- Hose cranes : 1 set  
- Where situated : Mid-ship(center)  
- Lifting capacity : 4.0 tons @ 10m/min  
- Working radius : 15m

20. SPECIAL FACILITIES

- 20.1 How many grades can be segregated? : SingleGrade
- 20.2 How many cooled? : N/A
- 20.3 Can vessel sail with slack cargo tanks? : Yes