

VESSEL PARTICULARS (FORM C)
LPG/C ECO CZAR
(Updated 25/09/2019)

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

(A) VESSEL'S CHARACTERISTICS

PREAMBLE

Name : **LPG/C ECO CZAR**
Owner : **SANTA MONICA INC.**
Flag : **Marshall Islands**
Build : **Kitanihon Shipbuilding Co., Ltd., JAPAN**
Date on Service : **05 August 2015**
Class : **American Bureau of Shipping (ABS)**
IMO Number : **9719513**
GRT International : **4,748** Suez :5,466 T
Panama :4,748 T
NRT International : **1,424** Suez :4,302 T
Suez Cert. no. P15037
Panama : 1,424 T
Is vessel build according to USCG regulations? : Yes
Japanese regulation? : Yes
Has vessel received USCG approval? :will be arranged

HULL

LOA : **99.98 M**
LBP : **95.50 M**
Breadth(Moulded) : **17.80 M**
Depth (Moulded) : **8.00 M**
Summer Draft : **6.213 M corresponding to Summer DWT =abt. 5,200 T (TPC: 15.69MTS)**
Dual Summer Draft : **5.789 M corresponding to Summer DWT =abt. 4,500 T (TPC: 15.69MTS)**

Freeboard (summer) : 1.824 M / (dual summer) : 2.248 M
Light Draft: 2.65M
Full load displacement: 8451 Ts / for dual loadline 7793 Ts
Light displacement: 3250 T
Parallel Length perpendiculars: 23.2mtrs
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%)	3.90 M	6.32 M	5.11 M	3524Mtons
N-Butane (98%)	4.31 M	6.48 M	5.39 M	3961Mtons
Butadiene (98%)	4.49 M	6.55 M	5.52 M	4157Mtons
VCM (98%)	5.15 M	7.17 M	6.16 M	5173Mtons

Propeller immersion : In Condition which Ballast Water properly arranged.

Immersion (TPC) in Salt water :

At draft 4.01 m correspond. : 14.01 tons per centimetre (Ballast Condition)

At draft 5.11 m correspond. : 14.98 tons per centimetre (Propane load condition)

COMMUNICATION EQUIPMENT

Call letter : **V7MR2**
Radio Station normally watched : **GMDSS**
Radio MF/HFNBDF : **JRC JSS- 2250 / 538006399 ECZA**
Radio MF/HFTEL/DSC : **JRC JSS-2250 / MMSI 538006399**
VHF : **JRC JHS-770S on CH.16/70**
Satellite Communication **Inmarsat 'C'** : **JRC JUE-87 / TLX NR: 453841516 ECZA**
TELEPHONE NR : **+ 870 773213403**
FAX NR : **+ 870 783234450**
EMAIL : **ecoczar@stealth.gr**

MACHINERY

Main Engine x 1 . Type and make : **MAKITACORPORATION, two cycle, singleacting, cross head type diesel engine, B&W 5L35MC6.1**
. Max. Power / RPM : **2850 KW / 185**
. No of Cylinders : **5 Cylinder**
. Cyl Bore x Stroke : **350mm x 1050mm**
. Grade of fuel used : **380 CST**

Auxiliaries Type and make : **Yanmar Diesel Engine 6EY18ALWx 2 sets**
(Electrical) : **400 KW, 900 RPM, AC450V, 60HZ, 3 phase, 642A**
(Mechanical) : **619PS (455KW)**
Grade of fuel used : **HFO, MDO, MGO**
No off : **2**

Emergency Gen Maker : **mitsui ZOSEN MACH.**
Type : **NT855D(M)**
No off : **1**

Bow Thruster Type : **KT-55B3**
Maker : **KAWASAKI HEAVY IND., LTD.**
Capacity : **58 kN**
No off : **1**

Boiler Type : **GK-1628-800/400, Vertical water tube composite boiler**
Maker : **MIURA CO., LTD.**
Evaporation : **800 kg/h**
Max Design Pressure : **0.7 MPa**
No off : **1**
Grade of Fuel used : **Same as ME used heavy oil**

Exhaust Economiser : **N/A**

Air Compressors (Main) Type / Capacity : **YANMAR SC-10N**
45 M3/H X 2.94 MPa
No off : **2**

Air Compressors (Emergency) Type : **YANMAR KSC3N**
10.3 M3/H X 2.94 MPa

	No off	:	1 set
Fuel Oil Purifier	Type	:	SJ-10A (Maker : MITSUBISHI SELFJECTOR)
	No off	:	2 sets
	Capacity	:	1000 L/H at 380 CST / 50 deg. C
Lub Oil Purifier	Type	:	SJ-10A (Maker: MITSUBISHI SELFJECTOR)
	No off	:	1 unit
	Capacity	:	500 L/H (Cross H./Trunk P.)
Evaporator	Type	:	ALFA LAVAL Model : JWP-16-C50
	Capacity	:	10 tons/day
Fresh Water Sterilizer	Type	:	CEMCO CO., LTD., IDN6
	Capacity	:	26cc/min
Fresh Water Mineraliser	Type / Capacity	:	NIL
Waste Oil Incinerator (IMO MEPC 76 (40))	Type	:	BGW-30N (Maker: MIURA CO. LTD)
	Capacity	:	20 kg/h
Oily Water Separator	Type	:	TAIKO KIKAI,USH-10
	Capacity	:	1 m3/H
Sewage Treatment plant	Type	:	SBH-25 (Maker : TAIKO KIKAI)
	Capacity	:	Rated number of persons = 25 men / day unit Sewage BOD volume = 13.5 g / Man – Day Sewage volume – 60 L / Man – Day
Hot Water Set (Calorifier unit)	No off	:	1 set – type : CFL-1002 S (HARISON)
Steering Gear	Type	:	Electro hydraulic steering gear , RV22-013-H
	Duty Capacity	:	130 kN-M
	Hydraulic pump unit	:	2 sets – type : Bent axis type axial piston pump unit

SPEED

About 13.0 knots up to Beaufort scale 4 and max significant wave height of 1.25m

CONSUMPTION/ DAY

Main Engine	:	IFO	abt 11.0 MT/day
Auxiliary Engine	:	MGO	abt 0.90 MT/day
In Port Discharging	:	MGO	abt 1.50 MT/day
In Port Idle / Loading	:	MGO	abt 0.75 MT/day
Use IGG	:	MGO	abt _1.20 MT/day
Use of Boiler	:	MGO	abt _0.50 MT/day

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.

Permanent bunker capacity (100%)

HFO	:	520 m3
Diesel	:	105 m3
Fresh Water	:	179 m3
Sludge Tank	:	23.71 m3 (per IOPP cert)

(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	2500	2450		
NO.2 CARGO TANK	2500	2450		
T O T A L	5000	4900		
	SPSV (MPa)	Ref. Temp. (deg. C.)	Density at (Ref. Temp.)	Corresponding Quantity (MT)
Propane	1.765	45.0	0.459	2248
Propylene	1.765	45.0	0.470	2302
B/P Mixture(1)	1.765/1.275(3)	45.0	0.487	2386
I-Butane	1.765/1.275(3)	45.0	0.526	2576
N-Butane	1.765/1.275(3)	45.0	0.548	2684
Butylene	1.765/1.275(3)	45.0	0.565	2768
Butadiene	1.765/1.275(3)	45.0	0.588	2880
V.C.M.	1.765/1.275(3)	45.0	0.872	4272 (2)
Isoprene	1.765/1.275(3)	45.0	0.656	3214
Pentanes	1.765/1.275(3)	45.0	0.600	2940
Pentene	1.765/1.275(3)	45.0	0.611	2992

Note (1): Mixing ratio of B/P mixture : Butane 35 wt% and propane 65 wt%.

Note (2): Loading capacity of VCM cargo to be about 4,270 MT, fuel oil & fresh water filling ratio to be adjusted.

Note (3): In case of there is requested by USCG, Propylene, Propane and B/P Mixture are not to be carried except the vapour pressure of B/P Mixture is not more than 1.275 MPa @ 45 degree C.

2. Other transportable products **N/A**

	SPSV	Ref. Temp. (°C.)	Density at Ref. Temp.	Corresponding Quantity (MT)
Butadiene - Butylene mixture	*	*	*	*
C4	*	*	*	*

* Figures are varied in accordance with the mixing proportion of the components and are to be determined on the basis of the characteristics of main component having the highest vapour pressure in the mixing products.

3. TANKS

3.1	Design pressure (Vapour) - IGC	1.765 MPa
	- USCG	1.765 MPa
3.2	Valve setting	1.765 MPa
3.3	Maximum vacuum obtainable	Atmospheric
3.5	Maximum temperature acceptable	45 °C
3.6	Minimum temperature acceptable	-10 °C
3.7	Hydrostatic Test Pressure	2.648 MPa

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

Ex-atmospheric storage with gas	1 tank	:	450 m³ / h (LPG), 320m³ / h (VCM)
Return	2 tanks	:	790 m³ / h (LPG), 570m³ / h (VCM)

Remarks:

* Calculated based on 5.5m/sec. in velocity head at 150A of inlet pipe., 200A Manifold liquid line.
Except VCM, and 4.0 meters/sec for VCM in the liquid piping.

* If cargo temperature is less than -10 °C, shore heater to be used. If ship cargo heater used, max rate is **250 m³/h**. Inlet design temp. -48deg.C, outlet design temp. -10°C.

5. CARGO PUMPS

- 5.1 Type : **Vertical multistage centrifugal Deep well**
Make : **WARTSILA SVANEHOJ A/S**
How many : **1 Set / Each Tank**
Maximum specific gravity : **0.965 VCM, 0.610 LPG**
- 5.2 Capacity (CMB/Hour) : **300m³/h (for LPG), 250m³/h (for VCM)**
Two speed or variable speed : **FIXED SPEED @ 1780 rpm**
Rated kW (each) : **130 KW**
Working pressure maximum : **2.12 MPa g**
- 5.3 Location : **On the Cargo Tank**
Removable : **Not removable**
- 5.4 Booster pumps :
Type : **Horizontal, 1 Stage**
Maker : **WARTSILA SVANEHOJ A/S**
- 5.5 Capacity (CMB/Hour) : **300 m³/h (for LPG), 200m³ / h (for VCM)**
Working pressure : **Discharge pressure Max 2.4 MPa**
- 5.6 Location : **On Upper Deck near Manifold**
- 5.7 Time to discharge a full liquid cargo using all pumps against back pressure at pump 1
bar : **about hours for LPG : 18 Hrs**
3 bars : **about hours for LPG :24 Hrs**
Time will vary depending on shore tank condition
- 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 per one tank : 1.5m³**
- vapour : **about per one tank : 30 ton**

6. STRIPPING

- 6.1 Stripping system, if any : **Not equipped**
- 6.2 Time required to remove all traces of liquid cargo as stated in 5.9 for:
- LPG : **about 3 hours**

7. CARGO COMPRESSORS

- 7.1 Type : **Vertical single stage double action fresh water cooled, oil less compressor**
LPGOS-97A
Make : **Tanabe Pneumatic Machinery Co.**
Ltd.
How many : **2 set**

Piston displacement : **460 m3 / H**
Rated Kw : **75 kw**
Stroke : **177.8mm**
Max discharge pressure : **2 MPa g**
Pressure differential(Suction pressure) : **0.4 MPa at double action, 0.7 MPa 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 :
N/A to atmospheric pressure from

8. N2 SYSTEM

8.1 Does the vessel use N2? : **Kashiwa**
If so, state utilization and quantities : **250 NM³/H @ 99.9%**
340 NM³/h @ 99.0%

8.2 Can the vessel produce N2 gas? :
Yes
If so, state type and composition of gas produce:

Discharge pressure **0.4MPa**
8.3 Maximum production obtainable :

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 : **Blow off remaining cargo vapour in cargo tank by N2**
and **thereafter gas free by dry air.**

9.2 State time required including stripping : **About 5-6days**

10. CHANGING GRADE

10.1 From completion discharge of cargo Propane, time required in hours and N2 in CBM required to reach a tank and gas installation atmosphere of less than 100 ppm of Propane in Vapour phase.
Time required: About 5 days (Base on 185m³/h of N2 capacity)

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 : **Not required**

12. CARGO HEATER

12.1	Type	:	Horizontal Shell and Tube
12.2	Inside Diameter	:	700 mm
12.3	Overall length	:	5500 mm
12.4	Cargo flow rate	:	250 m³/H
12.5	Min Inlet Temp	:	-48 degrees C
12.6	Min Outlet Temp	:	-10 degrees C
12.7	Required Sea water Capacity	:	450 m³/H
12.8	Design Pressure	:	2 MPa g (cargo side), 0.5MPa g (sea water side)
12.9	Hydrostatic Test Pressure	:	3.0 MPa g
12.10	Tightness Test Pressure	:	2.0 MPa g

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

Loading rate for Propane –° C/0° C: M3/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 : **2sets each cargo tank at tank dome**

16. SAMPLES

16.1 State how tank atmosphere samples can be taken and where from? From Slip tube and from drain line

: **Top**

: **Middle**

Bottom

Standard of fitting? : **ISO PF1/2**

16.2 Same question for cargo : **Closed loop sampling**

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 bow : **45.45 M**

- distance from Aft : **54.53 M**

- height above deck : **1.72 M**

- distance from ship's rail : **2.45 M**

- underside keel to manifold : **9.72 M**

- height above grating to center of manifold : **1.25 M**

- 17.3 Liquid line - diameter : 200 mm (OD)
- flange-size : 8 inches ANSI 300 lbs
- type : Rise face (RF)
- Gas line - : 125 mm (OD)
- flange-size : 5 inches ANSI 300 lbs
- type : Rise face ANSI 300 lbs
- 17.4 What reducers on board? : ANSI 300 lb – 10"x8", 6"x8", 5"x8", 4"x8" 3"x8",
ANSI 150 lb – 8"x8", 6"x8", 4"x8"
JIS 20K –8"x8", 6"x8", 4"x8"
- For Vapor line (normal temp.) : ANSI 300 lb –4"x 5", 3"x5", 2"x5"
ANSI 150 lb –6"x5", 5"x5", 3"x5", 2"x5"
JIS 20K –5"x5", 4"x5"
- 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 : Electric – Hydraulic
- Where situated : Cargo manifold
- Lifting capacity : 5.0Ton at max distance from ship's side : 5.3 meter
- Working radius : 360 degrees

20. SPECIAL FACILITIES

- 20.1 How many grades can be segregated? : 1 (one)
20.2 How many cooled? : N/A
20.3 Can vessel sail with slack cargo tanks? : Yes