

VESSEL PARTICULARS (FORM C)

LPG/C 3,500 M³

ECO CORSAIR

LAST UPDATE 25/05/15

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

(A) VESSEL'S CHARACTERISTICS

PREAMBLE

Name : **ECO CORSAIR**
Owner : **SIKOUSIS LEGACY INC.**
Flag : **Marshall Islands**
Build : **KITANIHON SHIPBUILDING CO., LTD.**
Date on Service :
Class : **AMERICAN BUREAU OF SHIPPING (ABS)
+A1, Ⓜ, Liquefied Petroleum Gas Carrier with Independent Tanks,
+AMS, +ACCU, GP, BWT+, CPS, TCM, UWILD,
(Liquefied Petroleum Gas Carrier, Maximum Vapour Pressure 1.765 MPa,
Minimum Temperature -10 degree C, Ship Type 2PG)**

GRT International : **3,589** Suez : **3997 ton**
Panama : **12723.793m3**

NRT International : **1,076** Suez : **3073 ton**
Panama : **3073.67 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 in US water)
RINA approval? : **N/A**

HULL

LOA : **95.00 M**
LBP : **89.00 M**
Breadth : **15.96 M**
Depth : **7.10 M**
Summer Draft : **5.512 M** Summer DWT = **abt 3,700 t** TPC 12.8

Air draft at full load condition : **24.80 M**
Air draft at ballast load condition : **25.19 M**

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%)	3.93	5.81	4.87	2,910.3
Butadiene (98%)	4.40	6.03	5.22	3,355.8
VCM (98%)	4.02	6.86	5.44	3,702.6
Propylene (98%)	3.97	5.83	4.90	2,948.3
n-butane (98%)	4.26	5.96	5.11	3,217.7
i-butane (98%)	4.18	5.93	5.05	3,141.7

(Loading capacity of VCM cargo to be about 3,000m.tons, Fuel oil and fresh water filling ratio to be adjusted.)

Propeller immersion :

Propane	Aft draft	At	5.81 m correspond.	:	104 %
Butadiene	Aft draft	At	6.03 m correspond.	:	110 %
VCM	Aft draft	At	6.86 m correspond.	:	134 %
Propylene	Aft draft	At	5.83 m correspond.	:	104 %
n-Butane	Aft draft	At	5.96 m correspond.	:	108 %
i-Butane	Aft draft	At	5.93 m correspond.	:	107 %

COMMUNICATION EQUIPMENT

Call letter	:	V7HV5
Radio Station normally watched	:	GMDSS
Radio MF/HF NBDP	:	JRC JSS-2250
Radio MF/HF TEL/DSC	:	JRC JSS-2250
VHF	:	
Satellite Communication	Inmarsat 'C'	JRC JUE-87
	Inmarsat 'F'	JRC JUE-501
	:	

MACHINERY

Main Engine x 1	Type and make	: MAKITA CORPORATION 5L35MC6.1
	Service power	: 2,125 kw (2,890 ps) x 168.6 rpm (85%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)	NISHISHIBA A.C. drip proof, self-vent lated 360 kw x 450V x 3 phase x 60 Hz
	(Mechanical)	YANMAR(6N165L-EW) 4 stroke x 397 kw x 900 rpm
	Grade of fuel used	Heavy Oil or Diesel Oil - 380cst @ 50°C
	No off	2
Emergency Gen	Type	Cumminus Generator Technologies (HC, M434D1) 200kw, AC 450V, 3 phase, 60 Hz
	No off	1

Boiler	Type	Miura Co., Ltd. (GK-1424-600/300)
	Evaporation	Vertical water tube, composite boiler
	Max Design Pressure	OIL BURNING SIDE : 600 kg/hr
	Feed Water Temp	EXH. GAS SIDE : 300 kg/hr at M/E CSO
No off		0.7 MPa Saturated
Exhaust Economiser	Type	NIL
	Evaporation	NIL
	No off	NIL
Air Compressors (Main)	Type / Capacity	Yanmer (SC-10N)
	No off	45.0 m³ / hr x 2.94 MPa
Air Compressors (Emergency)	Type	2
	No off	Yanmer (KSC-3)
Fuel Oil Purifier	Type	7.7 m³ / hr x 2.94 MPa
	No off	1
	Capacity	Mitsubishi (SJ-10)
Lub Oil Purifier	Type	2
	No off	900 ltrs/hr (380mm²/s at 50 deg.C)
	Capacity	Mitsubishi (SJ-10)
Evaporator	Type	2
	No off	500 ltrs/hr (100mm²/s at 40 deg.C)
	Capacity	Miura (GK-1424-600/300)
Fresh Water Sterilizer	Type	1 x 600 kg/h x 0.5 ~ 0.6 MPa
	Capacity	Alfa-Laval (JWP-16-C50)
Fresh Water Mineraliser	Type / Capacity	1 x10 t/day (with heater) or 6 t/day (without heater)
	No off	NIL
Waste Oil Incinerator	Type	NIL
	Capacity	Miura (BGW-10N)
Oily Water Separator	Type	Oil @ 24.3 lit/h & Solids @ 10 kg/h
	Capacity	Taiko (USH-10)
Sewage Treatment plant	Type	1 x 1.0 m³/h
	Capacity	Taiko (SBH-25)
Hot Water Set (Calorifier unit)	Type	1 x 25 persons per day
	No off	Harison (CFL-1002)
Steering Gear	Type	1 x 1,000 ltr/hr
	No off	Electro-Hydraulic
		1-ram 2-cylinder Rapson-Slide type

	Duty Capacity	13.3 t-m
	Hydraulic pump unit	Electric motor driven, 2 x 3.7 kW (one unit stand-by)
Bow Thruster	Type	4-Blade, Electro-Hydraulic Motor driven CPP
	Capacity	about 47 kN (4.8 t)

Speed

About: 13.2 Knots, Up to and Beaufort scale 4 Douglas sea state 3

CONSUMPTION/DAY

Main Engine	HFO	: abt 9.5 MT/day
Auxiliary Engine	MGO	: abt 1.1 MT/day
In Port Discharging	MGO	: abt 2.1 MT/day
In Port Idle / Loading	MGO	: abt 1.1 MT/day
Use IGG	MGO	: abt 2.1 MT/day

Permanent bunker capacity (100%)

HFO	:	451.08 m³
Diesel	:	107.40 m³
Fresh Water	:	177.21 m³

(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	1,761.780	1,726.544		
NO.2 CARGO TANK	1,762.496	1,727.246		
TOTAL	3,524.276	3,453.791		
	SPSV (bar g)	Ref. Temp. (deg. C.)	Density at (Ref. Temp.)	Corresponding Quantity (MT) at 98%
Propylene	17.65	45.0	0.470	1,623.282
Propane	17.65	45.0	0.459	1585.290
B/P Mixture	17.65	45.0	0.487	1681.996
n-Butane	17.65	45.0	0.548	1892.677
i-Butane	17.65	45.0	0.526	1816.694
Butadiene	17.65	45.0	0.588	2030.829
Butylene	17.65	45.0	0.565	1951.392
V.C.M.	17.65	45.0	0.872	3011.706
Isoprene	17.65	45.0	0.656	2265.687
Pentanes	17.65	45.0	0.600	2072.275
Pentene	17.65	45.0	0.611	2110.266
B/P Mixtures	12.75	45.0	0.487	1681.996
n-Butane	12.75	45.0	0.548	1892.677
i-Butane	12.75	45.0	0.526	1816.694
Butadiene	12.75	45.0	0.588	2030.829
Butylene	12.75	45.0	0.565	1951.392
V.C.M.	12.75	45.0	0.872	3011.706
Isoprene	12.75	45.0	0.656	2265.687
Pentanes	12.75	45.0	0.600	2072.275
Pentene	12.75	45.0	0.611	2110.266

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

3. TANKS

3.1	Design pressure (Vapour) - 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	:	-10 °C
3.7	Hydrostatic Test Pressure	:	26.48 bar g (2.648 MPa g)

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

Ex-atmospheric storage with gas : 1 tank : **about 340 m³ per hour**
 return : 2 tanks : **about 600 m³ per hour**

Remarks:

- * Calculated based on 5.5m/sec. in velocity head at 150A OF TANK INLET PIPE NOMI. DIA.(FOR 1TANK FILLING),200A OF MANIFOLD NOMI. DIA. (FOR 2TANK FILLING) of liquid line. 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(propane). inlet design temp.-48°C、 out let design temp.0°C.
- * 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 : **Wartsila Svanehoj**
 How many : **1 set per tank (2 sets)**
 Maximum specific gravity : **0.948**
- 5.2 Capacity (CMB/Hour) : **300 m³/hr at 110 m (SG 0.601)**
250 m³/hr at 130 m (SG 0.948)
 Two speed or variable speed : **Single Speed**
 Rated kW (each) : **130 kW**
 Working pressure maximum : **18 bar g**
- 5.3 Location : **At each cargo tank**
 Removable : **Yes**
- 5.4 Booster pumps :
 Type : **Horizontal Centrifugal**
 Maker : **Wartsila Svanehoj**
- 5.5 Capacity (CMB/Hour) : **300 m³/hr at 100 m (SG 0.601)**
250 m³/hr at 130 m (SG 0.948)
 Working pressure : **14 bar g**
- 5.6 Location : **On upper deck side**
- 5.7 Time to discharge a full liquid cargo using all pumps against back pressure at pump
 1 bar : **about 14 hours for LPG(SG0.601)**
 5 bars : **about. 50 hours for LPG (SG0.601)**
 10 bars : -----
- 5.8 Nominal back pressure when working : **about 1 bar**
 In series corresponding head : **about 14 bar**
 Maximum back pressure : **about 5 bar**
 Nominal pressure at rail (propane) : **about 13 bar at 20 degree C of temperature**
- 5.9 What amount of cargo remains in tanks after completion pumping before stripping:
 - liquid : **about 1.7 m3 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 : **by vaporization and gas recovery**

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 : **460m3/h**
Rated Kw : **75 kW**
Stroke : **177.8 mm**
Max discharge pressure : **20 bar g**
Pressure differential : **7 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 : **Gas freeing, Inerting, Airing**
- 8.2 Can the vessel produce inert gas? : **Yes (N2)**
If so, state type and composition of gas produce:
Nitrogen: 97.0 % to 99.9% : **415Nm3/h @N2 97.0%**
: **335Nm3/h @N2 99.0%**
: **200Nm3/h @N2 99.9%**
- Discharge Capacity : **See above**
- 8.3 Maximum production obtainable : **415Nm3/h @N2 97.0%**
NOTE:- Above quantities obtained at engine room temperature 45° C
- 8.4 State if there are storage facilities for inert gas onboard: **Nil**
- Size : **N/A**
- Pressure : **N/A**
- 8.5 State if any shore supply of nitrogen may be required: : **Yes. If necessary**
- for what purpose : **Gas freeing , Inerting**
- what quantities : **TBA**

9. GAS FREEING

- 9.1 State method used giving all details : **N/A**
9.2 State time required including stripping : **N/A**

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.
N2 required=17500cbm
Time required: about 88 hours to produced N2 by N2 generator at 99/9%, If N2 is supplied by shore the time needed is about 24hours

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 : **N/A**

12. CARGO HEATER

12.1 Type : **Shell and Tube**
12.2 Inside Diameter **About 700 mm**
12.3 Overall length **About 6,430 mm**
12.4 Cargo flow rate **250 m3/h (Propane)**
12.5 Min Inlet Temp **-48 °C**
12.6 Min Outlet Temp **0 °C**
12.7 Required Sea water Capacity **450 m3/h (Min 16°C)**
12.8 Design Pressure **20 bar g**
12.9 Hydrostatic Test Pressure
12.10 Tightness Test Pressure

12.0 State discharging rate for propane to be brought from atmospheric pressure **N/A**
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 **N/A**

14.1 Is it independent of cargo? : **N/A**
Is so, state cooling agents : **N/A**

14.2 What minimum temperature can be maintained : **N/A**

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

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 G1/2 female**
- 16.2 Same question for cargo : **See above**
Sample points at tank bottom and middle
- 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) : **48.2 m**
 - distance from stem (FP) : **40.8 m**
 - height above deck : **1.55 m for Liquid manifold**
 - distance from ship's rail : **2.20 m**
 - underside keel to manifold : **8.70 m**
- 17.3 Liquid line
- flange-size : **8 in.**
 - type : **ANSI300LB**
- Gas line
- flange-size : **5 in.**
 - type : **ANSI300LB**
- 17.4 What reducers on board? : **25 carbon steel pieces supplied**
- For Liquid line (low temperature)**
- ANSI 300LB 200A (8inch) :
 - (10-6-5-4-3)" – ANSI 300 LB (5pcs)
 - (10-8-6-5-4-3)" – ANSI 150 LB (6pcs)
 - (6-5-4)" – JIS20K (3pcs)
- For Vapor line (normal temp.)**
- ANSI 300LB 125A (5inch) :
 - (6-4-3)" – ANSI 300 LB (3pcs)
 - (6-5-4-3)" – ANSI 150 LB (4pcs)
 - (6-3)" – JIS20K (2pcs)
 - (3)" – JIS10K (1pcs)
 - (6)" – ANSI 150 LB with stud (1pcs)
- 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 : **1 set**
- Where situated : **Mid-ship(center)**
- Lifting capacity : **4.0 tons**
- Working radius : **14.5m**

20. SPECIAL FACILITIES

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