

**GAS FORM C****Main Particulars****2.1 PREAMBLE**

<b>Ship's name</b>	BW SAKURA
<b>Owners</b>	BW VLGC LIMITED
<b>Flag – Registry</b>	Isle of Man (IOM)
<b>Builder</b>	Mitsubishi Heavy Industries, Hull no. 2243, Japan
<b>Delivery</b>	
<b>Class</b>	Det Norske Veritas (DNV)
<b>Class notation</b>	1A1 Tanker for Liquefied Gas E0
<b>IMO No.</b>	9397080

<b>GRT / NRT</b>	
<b>International</b>	46025 / 13808
<b>Suez</b>	46025 / 13808
<b>Panama</b>	NA

**2.2 HULL**

	<b>Metres</b>
<b>LOA</b>	230.00 mtrs
<b>LBP</b>	219.00 mtrs
<b>Breadth</b>	36.60 mtrs
<b>Depth (Moulded)</b>	20.80 mtrs
<b>Keel to highest point</b>	47.14 mtrs

<b>Max summer draft</b>	10.81 mtrs	<b>Corresponding deadweight</b>	49,999.00mt
<b>Freeboard summer draft</b>	10.03 mtrs		

<b>TPC fully loaded</b>	70.30 mt
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<b>Mean draft with 95% full bunkers and full cargo</b>		
<b>Specific Gravity</b>	<b>Mean draft</b>	<b>Corresponding DW</b>
0.5800	10.420 m	49,999.00
0.6100	10.465 m	49,999.00



Communication equipment	
International call sign	2IGK9
Radio Station	Isle of Man
Satcom FBB 500 (Capt Office/Dayroom)	+870 773929903
- Telefax	+870 783159694
V-SAT (Bridge/Capt Office/Dayroom)	+47 85295440 / +65 31589829 / +47 85295438
Satcom C	435778610
Cell phone	
MMSI	235109536
E-mail	sakura@bwfleet.com

2.3 MACHINERY

Main Engine	
Mitsubishi – UE 7UEC60LS II Mitsui Engineering & Ship Building Co., Ltd.	
Max Cont.	MR 12,360 kW x 100 min <sup>-1</sup> NR 10,510 kW x 94.7 min <sup>-1</sup>
Grade fuel used	Up to 380 cSt at 50 Deg. C

Auxiliaries	
Diesel	3 units
Make	YANMAR
kW/RPM	970 KW x 900rpm 4-stroke cycle engine
Grade fuel used	Up to 380 cSt at 50 Deg. C

Speed/Consumption*	
Guaranteed average loaded/ballast speed over 12 months	
Average consumption on Main Engine guaranteed speed	
Average consumption on auxiliaries	

\*) Above based on 50/50 propane/butane and max force 5 Beaufort

Slow speed/consumption figures as guidance only	
Average loaded/ballast	Consumption
13 Knots	
14 Knots	
15 Knots	

Average consumption in port	
Inert gas plant when operating	
Boiler consumption	

Permanent bunkers capacity (95% full) (Excl. daily service and settling tanks)		
HFO	2899.0 m <sup>3</sup>	2867 mt
LSFO	0.000 m <sup>3</sup>	0.00 mt
LS Marine GAS OIL	297.2 m <sup>3</sup>	252.7 mt
MDO	NA	NA



Transportable products and respective quantities							
Tank No.	100 % m <sup>3</sup>	98 % m <sup>3</sup>	Butane 0.6012 -0.0°C Mt	Propane 0.5813 -42.0°C mt			
1	17,985.852	17,626.134	10,751.942	10,223.158			
2	20518.362	20,107.994	12,265.876	11,662.637			
3	20517.374	20,107.026	12,265.286	11,662.075			
4	19,879.652	19,482.058	11,884.055	11,299.594			
<b>Total</b>	<b>78,901.240</b>	<b>77,323.212</b>	<b>47,167.159</b>	<b>44,847.463</b>			
<b>Deck tank capacity</b>				<b>NA</b>			
Transportable products and respective quantities							
<i>Other transportable products: Pure Propane, Commercial Propane, Commercial Butane, Mixture of Propane and Butane in any proportion</i>							
(* Commercial Propane containing up to 2.5 MOL % of Ethane, and 1 to 3 MOL% of Butane and higher hydrocarbon.)							
(* Commercial Butane containing up to 2 MOL % of Propane, and 1 to 3 MOL% of Pentane and higher hydrocarbon.)							
**Therefore, cargoes including too much ethane, pentane, hydrocarbon content are not to be loaded in the view points of reliquefaction plant capacity and design temperature of the cargo handling equipment.							

<b>Scantlings of the cargo tanks are based on a maximum density of cargo of 610kg/m<sup>3</sup>.</b>	
For density of 1,000 kg/m <sup>3</sup>	N/A

Tank working pressure	
Maximum pressure	0.50 bar in port / 0.28 bar at sea
Minimum pressure	0.00 bar always positive pressure
Minimum temperature acceptable in tanks	-46°C

Loading rate - tons/hour	2200 Tons / Hr on two manifolds with vapour return (without vapour return Butane 1250 mt/hr , Propane 1100 mt/hr.)
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2.5 CARGO PUMPS

Number and type	8 x 550 m3/hr Submerged ( Make EBARA, Japan)
Location	2 x pumps in each cargo tank + 1 emergency Pump in each cargo tank
Max permissible specific gravity	100 mLC, 0.610 kg/m3
Time for discharging full cargo using all pumps against no backpressure	19 hrs (excluding stripping)
Cargo remaining onboard in cargo tanks after completion pumping	Total appr 26 m3 unpumpable liquid (all cargo tanks)
Total head when working in series with booster pump	150 mLC (1 submerged + 1 BP)
Booster pumps	1 x 300 m3/hr at 150 mLC / Hamworthy Svanehøj, (Denmark) , 0.610 kg/m3



## 2.6 CARGO COMPRESSORS

<b>Number and type</b>	5 x Electric motor driven reciprocating two stage Make :SUCTION GAS ENGINE MFG. CO., LTD, Japan
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	<b>Propane</b>	<b>Butane</b>
<b>Refrigeration Capacity</b>	189,000 kcal/h / set (Propane),	302,000 kcal./h / set (Butane),
<b>Suction pressure</b>	0.05 bar g	0.05 bar g
<b>Condensate Temp.</b>	28°C	

## 2.7 INERT GAS SYSTEM

<b>Does the vessel use inert gas?</b>	Yes
<b>Utilization</b>	Inerting of Void spaces and Cargo tanks as required

<b>Does the vessel produce inert gas?</b>	Yes
<b>Type</b>	Smit GAS
<b>Daily production</b>	3000 Nm <sup>3</sup> per hour

<b>Composition of inert gas</b>	
<b>Carbon dioxide</b>	13 %
<b>Oxygen max.</b>	Max 1.0 %
<b>Carbon monoxide max.</b>	1000 ppm by volume
<b>Hydrogen max.</b>	-
<b>Nitrogen</b>	85%
<b>Soot</b>	0 on Bacharach scale
<b>Sulphur oxides max.</b>	max 10 ppm by volume
<b>Dew point</b>	-10.0 °C at 760 mmHG

<b>State if any shore supply of liquid nitrogen may be required</b>	No
<b>What quantity?</b>	NA

## 2.8 GAS FREEING

<b>Can this operation be carried out at sea?</b>	Yes
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<b>State method incl. all details</b>		
<b>For LPG</b>	<b>Boil Off</b>	42 hrs C3/C4
	<b>Inerting</b>	35 hrs
	<b>Ventilating for Entry</b>	35 hrs (IGG on aeration mode)
<b>For NH<sub>3</sub></b>		N/A

<b>Advise time required and consumption of inert gas if any</b>	
<b>From LPG approximately</b>	35 hrs / 79000 m <sup>3</sup>
<b>From NH<sub>3</sub> approximately</b>	N/A

<b>Is the vessel equipped with inert gas blower?</b>	Yes
<b>Capacity</b>	3000Nm <sup>3</sup> / hr at 0.4 barg

<b>Ventilation fan – 1 set ( 2 nos) of portable water turbine fan</b>	9000 m <sup>3</sup> /hr per fan
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**2.9 CHANGING GRADE**

<b>Can this operation be carried out at sea?</b>	Yes
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From complete discharge of cargo A, time taken in hours for changing grade by B vapour without inerting a tank.

<b>A \ B</b>	<b>BUTANE</b>	<b>PROPANE</b>
<b>BUTANE</b>		55 Hr
<b>PROPANE</b>	35 Hr.	

**State method used and time required for changing from LPG to NH3, Vessel cannot carry for NH3**

<b>Can vessel reduce in tank atmosphere and gas installation concentration of previous cargo below 50 ppm?</b>	NA
<b>Method used, time required and extra shore supply if any</b>	NA
<b>How can it be checked that no liquid gas remain onboard</b>	Temperature indication & Pressure Rise

**2.10 CARGO HEATER**

<b>State discharging rate for propane with 2.5 mol % ethane to be brought from -42 °C to 0 °C at sea temperature of 15 °C</b>	300 cub m/hr
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**2.11 CARGO VAPORIZER**

<b>In case of need of vapour gas during discharge, can vessel produce its own if no shore gas available?</b>	Yes ( 2000 Nm3/Hr)
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**2.12 REFRIGERATING APPARATUS**

<b>Is it independent of cargo?</b>	No
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**2.13 MEASURING APPARATUS**

<b>What gauges onboard</b>	Level Gauge
<b>Location and type</b>	2 for each cargo tank Magnetic float type
<b>Number of temperature sensors/gauges pr tank</b>	8 – (4 each side of tank)
<b>Number of pressure sensors/gauges pr tank</b>	1 in each tank

**2.14 SAMPLES**

<b>Where can samples be taken?</b>	1) Cargo tank dome using cargo pump (liquid) 2) Manifold (liquid) 3) Cargo tank dome (vapour)
<b>Are sample bottles available onboard?</b>	Yes (6 nos.)

**2.15 CARGO LINES**

(See also last page of this gas form C)

<b>Is vessel fitted with midship manifolds</b>	Yes
<b>Distance from cargo manifold to bow</b>	113.700 mtrs
<b>Distance from manifold to stern</b>	116.300 mtrs
<b>Height cargo manifold above main deck</b>	1.770 mtrs
<b>Height cargo manifold above waterline when in ballast</b>	15.910 mtrs
<b>Height cargo manifold above waterline when loaded</b>	12.210* mtrs
<b>Distance from shipside to manifold flange</b>	4.000 mtrs
<b>Distance between loading and vapour return connections</b>	2.000 mtrs
<b>Windage area in normal ballast condition</b>	3700.0m2
<b>Is vessel fitted with SPM chainstopper suitable for 76 mm chain.</b>	No
<b>Is vessel fitted with cruziform bollards/fairleads/eye-pads in manifold area</b>	YES

\*Summer Draught.

<b>Dimension of lines</b>		
	<b>Diameter</b>	<b>Flange size</b>
<b>Liquid</b>	400 mm / 16 inch (Manifold)	16"
<b>Gas Line</b>	250 mm / 10 inch (Manifold)	10"
<b>Booster Line</b>	150 mm / 6 inch* (Manifold)	6"(* separate booster manifold)

<b>REDUCERS ON BOARD</b>		
<b>Inlet</b>	<b>Outlet</b>	<b>Qty</b>
16" (ANSI 150)	12" (ANSI 150)	6
16" (ANSI 150)	10" (ANSI 150)	3
12" (ANSI 150)	10" (ANSI 150)	2
10" (ANSI 150)	8" (ANSI 150)	4
10" (ANSI 150)	6" (ANSI 150)	2
6" (ANSI 300)	6" (ANSI 300)	2
10" (ANSI 300)	6" (ANSI 300)	1
16" (ANSI 150)	12" (ANSI 300)	1
16" (ANSI 150)	10" (ANSI 300)	1

**2.16 LIFTING DEVICE**

<b>Where situated</b>	<b>Aft</b>	<b>Amidship</b>
<b>Number and type</b>	2, Electro Hydraulic	1, Electro Hydraulic
<b>Lifting capacity</b>	Port: 0.9 and Stbd: 5 tons	5 tons
<b>Max. distance from ship's side of lifting hook</b>	Port 1.5 mtrs Stb. 1.5 mtrs	4 mtrs

**2.17 HOSES**

<b>For what products are hoses suitable</b>	No Cargo Hoses Carried on-board
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Number	Length	Diameter	Working pressure	Flange
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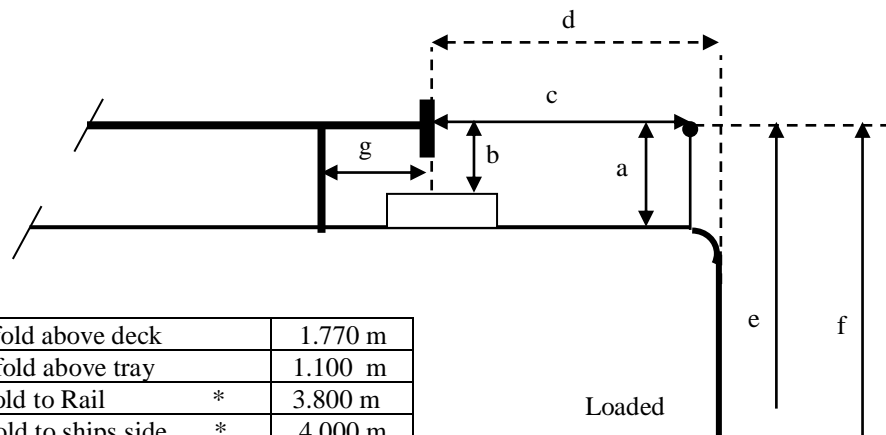
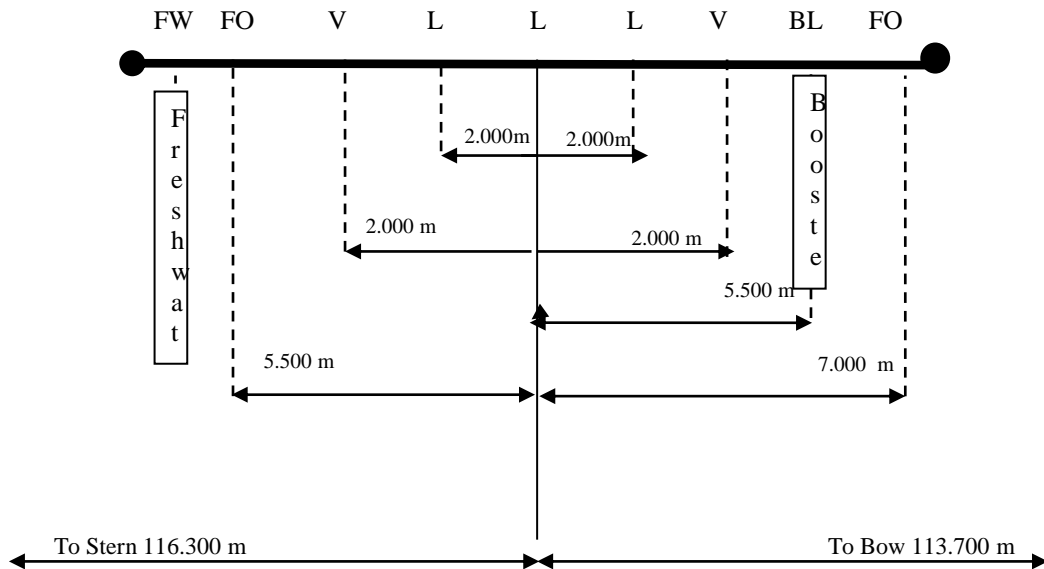
**2.18 SPECIAL FACILITIES**

How many grades can vessel segregate?	2
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Indicate systems	Any tanks and any combinations
Is vessel able to load/discharge two or more grades simultaneously?	Yes
Can vessel sail with slack tanks?	Yes
Is vessel fitted with purge tank?	No



### ARRANGEMENT OF CARGO MANIFOLD



a) Height of manifold above deck	1.770 m
b) Height of manifold above tray	1.100 m
c) Distance manifold to Rail	* 3.800 m
d) Distance manifold to ships side	* 4.000 m
e) Dist. waterline loaded to manifold	12.210m
f) Dist. waterline ballast to manifold	15.910m
g) Dist. 1 <sup>st</sup> stander to manifold	0.450 m

\* without reducer

### PARALLEL BODY LENGTH

LOADED CONDITION

