

**GAS FORM C
(BW KIZOKU)**

MAIN PARTICULARS OF VESSELS/GAS FORM C

2.1 PREAMBLE

Verified: Date: 29-Nov-2019

Date Updated: 29-Nov-2019

Ship's name	BW KIZOKU		
Owners	Grace Ocean Private Limited		
Flag – Registry	Singapore		
Builder	Mitsubishi Shipbuilding Co., Ltd.		
Delivery	29 November, 2019		
Class	Nippon Kaiji Kyokai		
IMO No.	9810032		
GRT/NRT :			
International	GRT: 48122 T / NRT: 14437 T		
Suez	GRT: 50216.25 T // NRT: 44914.97 T		
Panama	39678 Tonne		
Is vessel approved?			
USCG	Yes		
IMO	Yes		

2.2 HULL

	Metres		Feet	
LOA	230.0		754.59	
LBP	219.0		718.50	
Breadth	36.60		120.08	
Depth	21.65		71.03	
Keel to highest point	46.67		153.12	
Max summer draft(equivalent)	11.575m(ext.)	Corresponding deadweight (mt)	54,907	
TPC fully loaded(mt)	71.0 tonne / cm at scantling draft			
Mean draft with full bunkers and full cargo				
Specific Gravity	Mean draft (m)		Corresponding DW(mt)	
1.025	11.39		53,758	
Communication Equipment				
International call sign	9V5837			
Radio station	563094300			
Satcom FBB	+870 77393 0535			
- Telephone (VSAT)	+65 3165 6571			
- Telex	+65 3165 6572			
Satcom C Telex	456603035			
MMSI	563094300			
E-mail	BWKizoku@synergyship.com			

2.3 MACHINERY

Main Engine	
MAN Energy Solutions 7S60ME-C8.5	
Max Cont.	13000@100 RPM (MCR) and 11700@96.5 RPM (NCR)
Grade fuel used	IFO 380 CST
Auxiliaries	
Diesel	6EY22ALW
Make	YANMAR
kW/RPM	1370kW x 900RPM
Grade fuel used	IFO 380 CST
Speed/Consumption *)	
Guaranteed loaded speed over 12 months	
Consumption on guaranteed speed at design draft	Main Engine
	Auxiliaries
Speed/consumption figures as guidance only	
Average loaded/ballast	Consumption (based on H.F.O=40400 kJ/kg)
Loaded Based on following Conditions Summer Draft =11.575 m <ul style="list-style-type: none"> • M/E output : 90% M.C.O. • F.O. L.C.V : 40400 kJ/kg • Condition : ISO reference condition • Tolerance Margin: Included • Electric demand : 1,600 kW(peak) (Reliquefaction plant working) 	
Ballast Based on followings (6.90 at normal ballast) <ul style="list-style-type: none"> • M/E output : 90% M.C.O. • F.O. L.C.V : 40400 kJ/kg • Condition : ISO reference condition • Tolerance Margin: Included • Electric demand : 900 kW(peak) 	
Consumption alongside in port Based on followings <ul style="list-style-type: none"> • F.O. L.C.V : 40400 kJ/kg • Condition : ISO reference condition • Tolerance Margin: Included • Electric demand : 1980 kW (peak) 	
Inert gas plant when operating	
Boiler consumption	
Permanent bunkers capacity (Excl. daily service tanks)	
HFO (100%)	3,335.5 m3
GAS OIL (100% Full)	353.5 m3
GAS OIL for an Inert gas generator	-

2.4 CARGO INSTALLATION

Transportable products and respective quantities								
Tank No.	100 % m ³	98 % m ³	Propane at 0.58 -46°C mt	Butane 0.61 at -5°C mt				
1 (P)	9,644.583	9,451.691	5,482	5,766				
1 (S)	9,644.583	9,451.691	5,482	5,766				
2 (P)	10,982.693	19,763.039	6,243	6,565				
2 (S)	10,982.693	19,763.039	6,243	6,565				
3 (P)	10,984.284	10,764.598	6,243	6,243				
3 (S)	10,984.284	10,764.598	6,243	6,243				
4 (P)	10,050.713	9,849.699	5,713	6,008				
4 (S)	10,050.713	9,849.699	5,713	6,008				
Total	83,324.546	81,658.054	47,362	49,810				
<i>Other transportable products:</i> Butane/Propane Mixture, Commercial Propane (max. 5 mole% ethane in liquid phase)								
Scantlings of the cargo tanks are based on a maximum density of cargo of 610 kg/m ³ .								
Tank working pressure								
Maximum pressure: MARVS – Sea: 0.28 Barg, Harbour: 0.57 Barg, Berth: 0.69 Barg								
Minimum pressure: -0.02 Bar								
Minimum temperature acceptable in tanks: -50 Deg Celcius								
Loading rate - tons/hour: 2550 MT/Hr – Using 8 Cargo pump and both Manifold line								
(At cargo density in standard atmosphere pressure) 0.5900								

2.5 CARGO PUMPS

Number and type	1 each half tank (2 pumps in each tank) & Submersible Type
Location	Cargo Tank-Each Half
Max permissible specific gravity	0.6100
Time for discharging full cargo using all pumps against no backpressure	20 Hrs
Cargo remaining onboard in cargo tanks after completion pumping	About 400 MT – Coolant
Total head when working in series with booster pump	250 Meter;
Booster pumps	2 X 550 m ³ /Hr, Delivery Head : 150 Meter

2.6 CARGO COMPRESSORS

Number and type	3K160-3K / 3 sets	
	C. Propane (max. 5 mole% ethane in the liquid phase)	Ammonia
Refrigeration Capacity	368kW / set	NA
Suction pressure	1.21 Bar A	NA

2.7 INERT GAS SYSTEM

Does the vessel use inert gas?	Yes
Utilization	For Inerting of Cargo Tanks & Hold space.
Does the vessel produce inert gas?	Yes
Type	GIN 3000-0.3 BUFD
Daily production	72,000 Nm ³ / day (3,000 Nm ³ /h)
Composition of inert gas	
Carbon dioxide	Approx. 13 vol %
Oxygen max.	1 vol %
Carbon monoxide max.	Max. 1000 ppm
Hydrogen max.	-
Nitrogen	Balance
Soot	-
Sulphur oxides max.	Normal 10 ppm
Dew point	Less than -10 deg.C
State if any shore supply of liquid nitrogen may be required - No	
For Purging Loading / Discharging Arms	
What quantity?	NA

2.8 GAS FREEING

Can this operation be carried out at sea?	Yes
State method incl. all details	
For LPG	<ol style="list-style-type: none"> 1. Start Inert gas generator. 2. Connect flexible hoses between inert gas main and ventilation line connection at each tank dome.

For LPG	<ol style="list-style-type: none"> 3. When IGG is running satisfactory, and producing gas with O₂ content of 0.5% - 1.5% by volume and a dew point of less than -10 °C, gradually admit the inert gas to top of cargo tank via ventilation line. 4. The admission of inert gas will begin to increase the tank pressure, which should then be maintained near atmospheric pressure by starting one or more cargo compressors or venting to atmosphere. 5. Continue inerting until the cargo vapour content is below 2% and also check the temperature of the tank atmosphere is at least 0 °C. 6. After the tanks have been inerted it will be necessary to inert all the remaining cargo piping systems and equipment. This is best accomplished by pressurising one or more cargo tanks to approximately 0.2 barg. 7. On completion of inerting, ventilation to be done using gas free fan.
For NH ₃	Not Applicable
Advise time required and consumption of inert gas if any ***does not include liquid freeing, ***	
From LPG approximately	36 Hrs for Inerting // 107900 m ³ of IG
From NH ₃ approximately	NA
Is the vessel equipped with inert gas blower?	Yes
Capacity	3000 m ³ /Hr
Ventilation fan	IGG Blower is used for ventilation

2.9 CHANGING GRADE

Can this operation be carried out at sea?	Yes
State method used and time required for changing from NH ₃ to LPG and vice versa, to reach 50 ppm of previous cargo in tanks atmosphere, the tanks being dry and free of moisture (dew point plus 10 degrees C)	
From NH ₃ to LPG	NA
Time required	NA

From LPG to NH ₃	NA
Time required	NA
Can vessel reduce in tank atmosphere and gas installation concentration of previous cargo below 50 ppm?	NA
How can it be checked that no liquid gas remain onboard	Observation of cargo tank skin temperature at sump. Gas detection using sampling tube in cargo tanks at 0%, 50%, 100% levels.

2.10 CARGO HEATER

State discharging rate for propane to be brought from -42oC to 0oC at sea temperature of 15oC	550 m3/Hr Abt 320 MT/Hr
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2.11 CARGO VAPORIZER

In case of need of vapour gas during discharge, can vessel produce its own if no shore gas available?	Yes
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2.12 REFRIGERATING APPARATUS

Is it independent of cargo?	No
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2.13 MEASURING APPARATUS

What gauges onboard	Level gauge, float type
Location and type	Cargo Tank, Make: Musashino Company Limited, Float Type

2.14 SAMPLES

Where can samples be taken?	Cargo tank hatch and Deck tank top
What is the location of sampling point	Top, Middle, Bottom for cargo tanks
Are sample bottles available on board?	No

2.15 CARGO LINES

(See also last page of this gas form C)

Is vessel fitted with midship manifolds	Yes	
Distance from cargo manifold to bow	115.5 Meter	
Distance from manifold to stern	114.5 Meter	
Height cargo manifold above deck	1770 mm	
Height cargo manifold above waterline when in ballast	16561 mm	
Height cargo manifold above waterline when loaded (at propane)	12161 mm	
Distance from shipside to manifold flange	4000 mm	
Distance between loading and vapour return connections	225 mm	
Is vessel fitted with stern discharge	No	
Is vessel fitted with fore discharge	No	
Dimension of lines		
	Diameter	Flange size
Liquid	16"	12" X 150 ASA
Gas Line	10"	08" X 150 ASA
Booster Line	16"	16" X 300 ASA - & Reducers as per shore connection requirement

What reducers onboard		
Number	Diameter	Pressure rating
Number	Diameter	Pressure rating
16"	300 ANSI X 12"	150 ANSI: 06 Nos (Fixed)
16"	300 ANSI X 16"	150 ANSI: 02 Nos
16"	300 ANSI X 10"	150 ANSI: 02 Nos
16"	300 ANSI X 08"	150 ANSI: 02 Nos
16"	300 ANSI X 06"	X300 ANSI: 02 Nos
10"	150 ANSI X 08"	150 ANSI: 02 Nos
10"	150 ANSI X 10"	150 ANSI: 02 Nos
12"	150 ANSI X 10"	150 ANSI: 02 Nos
10"	150 ANSI X 06"	150 ANSI: 02 Nos

2.16 LIFTING DEVICE

Where situated	Aft	Amidship
Number and type	Provision Crane : Stbd: 1 X 5.0 T, Port: 1 X 0.9 Tonne	Hose Handling Crane
Lifting capacity	Stbd: 5.0 Tonne, Port : 0.9 Tonne	10 Tonne
Max. distance from ship's side of lifting hook when outboard	Stbd: 3.3 m, Port : 1.5 m	4.60 m

2.17 HOSES

For what products are hoses suitable			N/A	
Number	Length	Diameter	Working pressure	Flange
None				

2.18 SPECIAL FACILITIES

How many grades can vessel segregate?	2 Grade
Indicate systems	System-1 & System-2, all 16 combinations: PPPP, BBBB, BPPP, PBPP, PPBP, PPPB, PBBB, BPBB, BBPB, BBBP, PPBB, PBPB, BPBP, BBPP, BPPB, PBBP
Is vessel able to load/discharge two or more grades simultaneously?	Two Grade Simultaneously
Can vessel sail with slack tanks?	Yes
Is vessel fitted with purge tank?	No