

2      **MAIN PARTICULARS OF VESSEL/GAS FORM C**

**2.1      PREAMBLE**

<b>Ship's name</b>	Berge Ningbo
<b>Owners</b>	Orion Navigation Corporation Limited
<b>Flag – Registry</b>	Hong Kong
<b>Builder</b>	Hyundai Heavy Industries Co., Ltd.
<b>Delivery</b>	Feb. 27, 2006
<b>Class</b>	DNV
<b>IMO No.</b>	9308493

<b>GRT/NRT</b>	
<b>International</b>	47012 / 17305
<b>Suez</b>	50223 / 45505
<b>Panama</b>	

<b>Is vessel approved?</b>	
<b>USCG</b>	To be complied
<b>IMO</b>	To be complied

**2.2      HULL**

	<b>Metres</b>	<b>Feet</b>
<b>LOA</b>	225.3	739.16
<b>LBP</b>	215	705.37
<b>Breadth</b>	36.60 (moulded)	120.08
<b>Depth</b>	22.0 (moulded)	72.18
<b>Keel to highest point</b>	50	164.04

<b>Max summer draft(equivalent)</b>	12.55 (moulded)	<b>Corresponding deadweight</b>	58899 m/tons
-------------------------------------	-----------------	---------------------------------	--------------

<b>TPC fully loaded</b>	71.19
-------------------------	-------

<b>Mean draft with full bunkers and full cargo</b>		
<b>Specific Gravity</b>	<b>Mean draft</b>	<b>Corresponding DW</b>
0.581	11.38	<b>50471</b>
0.596	11.56	<b>51736</b>
0.680	12.49	<b>58302</b>

<b>Communication equipment</b>	
<b>International call sign</b>	<b>VRBQ2</b>
<b>Radio station</b>	MF/HF 400W X 1 set
<b>Satcom F</b>	1 set
<b>- Telephone</b>	3 sets
<b>- TeleX</b>	1 set
<b>- Telefax</b>	1 set

Satcom C	1 set
MMSI	Automatic Identification System
E-mail	Available in PC

### 2.3 MACHINERY

<b>Main Engine</b>	
Hyundai-B&W 6S60MC-C	
Max Cont.	18420 BHP X 105 RPM
Grade fuel used	HFO 380 CST

<b>Auxiliaries</b>	
Diesel	5L28/32H
Make	Hyundai-B&W
kW/RPM	1052 kW / 720 RPM
Grade fuel used	HFO 380CST

<b>Speed/Consumption *)</b>		
Guaranteed average loaded/ballast speed over 12 months		
Consumption on guaranteed speed at design draft	Main Engine	
	Auxiliaries	

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

<b>Slow speed/consumption figures as guidance only</b>	
Average loaded/ballast	Consumption (based on H.F.O=9,700kcal/kg)
13.5 Knots	
14.0 Knots	
15.0 Knots	
16.0 Knots	

Gas oil consumption alongside in port	NA
Inert gas plant when operating	505kg/h at design capacity
Boiler consumption	Max 225kg/h (Fuel consumption)

<b>Permanent bunkers capacity (Excl. daily service tanks)</b>			
HFO	2757 m <sup>3</sup> including settling and service tanks + 610 m <sup>3</sup> Low sulphur HFO		
MDO	216.5 m <sup>3</sup>	Gas Oil	64.4 m <sup>3</sup>

### 2.4 CARGO INSTALLATION

<b>Transportable products and respective quantities</b>								
Tank No.	100 % m <sup>3</sup>	98 % m <sup>3</sup>	Butane 0.596 -2°C mt	Propane 0.581 -41.5°C mt	NH <sub>3</sub> 0.680 -32°C mt	Butadiene 0.651 -5°C mt	Naphtha 0.703 30°C mt	Naphtha 0.676 30°C mt
1	17892	17534	10450	10187	11923	11415		
2	21828	21392	12750	12429	14547	13926		
3	21835	21398	12753	12432	14551	13930		
4	20697	20283	12089	11784	13792	13204		

<b>Total</b>	<b>82252</b>	<b>80607</b>	<b>48042</b>	<b>46833</b>	<b>54813</b>	<b>52475</b>		
<i>Other transportable products: Butylene, Propylene</i>								

Scantlings of the cargo tanks are based on a maximum density of cargo of 690 kg/m<sup>3</sup> per contract. Cargo with density up to 1,000 kg/m<sup>3</sup> may be carried in the cargo tanks on the following conditions:

<b>For density of 1,000 kg/m<sup>3</sup></b>	Up to 67% filling
<b>For densities between 690 and 1,000 kg/m<sup>3</sup></b>	Inversely linear proportional to cargo density from 98% filling at S.G =0.69 to 67% filling at S.G=1.0
<b>For densities between 600 and 690 kg/m<sup>3</sup></b>	Up to 98% filling (no filling restriction)

<b>Tank working pressure</b> (Per contract)	
<b>Maximum pressure</b>	0.4 barg (harbour), 0.25 barg (sea)
<b>Minimum pressure</b>	-0.05 barg
<b>Minimum temperature acceptable in tanks</b>	-50°C

<b>Loading rate - tons/hour</b>	5000 m <sup>3</sup> (propane with vapour return)
---------------------------------	--

## 2.5 CARGO PUMPS

<b>Number and type</b>	8 off HKSE DW 250/200-3-K+I
<b>Location</b>	Cargo tank hatches
<b>Max permissible specific gravity</b>	690 kg/m <sup>3</sup>
<b>Time for discharging full cargo using all pumps against no backpressure</b>	18 hours (Excluding Stripping with vapour return)
<b>Cargo remaining onboard in cargo tanks after completion pumping</b>	80 m <sup>3</sup> (approximate Liquid)
<b>Total head when working in series with booster pump</b>	235 mlc
<b>Booster pumps</b>	2 off HKSE NMB 150E

## 2.6 CARGO COMPRESSORS

<b>Number and type</b>	4 off Burckhardt 3K-140-3A
------------------------	----------------------------

	<b>Propane</b>	<b>Ammonia</b>
<b>Refrigeration Capacity</b>	308 kW	508 kW
<b>Suction pressure</b>	1.4 bar abs	1.4 bar abs

## 2.7 INERT GAS SYSTEM

<b>Does the vessel use inert gas?</b>	Yes
<b>Utilization</b>	Hold space, cargo tank condition

<b>Does the vessel produce inert gas?</b>	Yes
<b>Type</b>	Combustion
<b>Daily production</b>	5300 Nm <sup>3</sup> /hr

<b>Composition of inert gas</b>	
<b>Carbon dioxide</b>	14% VOL
<b>Oxygen max.</b>	0.5% VOL

Carbon monoxide max.	100ppm
Hydrogen max.	
Nitrogen	Balance
Soot	0 on Bacharach scale
Sulphur oxides max.	1 ppm
Dewpoint	-40°C

<b>State if any shore supply of liquid nitrogen may be required</b>	
Tank conditioning for ammonia, butylene, propylene, butadiene cargoes	
What quantity?	

## 2.8 GAS FREEING

Can this operation be carried out at sea?	Yes
---	-----

<b>State method incl. all details</b>	
For LPG	Inert gas
For NH <sub>3</sub>	Ventilation fans

<b>Advise time required and consumption of inert gas if any ***does not include liquid freeing,***</b>	
From LPG approximately	48 hours, 125,000 Nm <sup>3</sup>
From NH <sub>3</sub> approximately	98 hours

Is the vessel equipped with inert gas blower?	No
Capacity	

Ventilation fan	2 off 10,000 Nm <sup>3</sup> /hr
-----------------	----------------------------------

## 2.9 CHANGING GRADE

Can this operation be carried out at sea?	Partially
---	-----------

<b>State method used and time required for changing from NH<sub>3</sub> to LPG and vice versa, to reach 50 ppm of previous cargo in tanks atmosphere, the tanks being dry and free of moisture (dewpoint plus 10 degrees C)</b>
---

From NH <sub>3</sub> to LPG	Puddle heating, ventilation, inerting, (purging, cooldown alongside)
Time required	162 hours, (108 hrs)

From LPG to NH <sub>3</sub>	Puddle heating, inerting, ventilation, (purging, cooldown alongside)
Time required	56 hours, (120 hrs)

Can vessel reduce in tank atmosphere and gas installation concentration of previous cargo below 50 ppm?	Yes
Method used, time required and extra shore supply if any	Inert gas, air ventilation
How can it be checked that no liquid gas remain onboard	Sample connections Temperature Indication

## 2.10 CARGO HEATER

State discharging rate for propane with 2.5 mol % ethane to be brought from -44°C to -5°C at sea temperature of 15°C	600 m <sup>3</sup> /hr
--	------------------------

## 2.11 CARGO VAPORIZER

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

**2.12 REFRIGERATING APPARATUS**

Is it independent of cargo?	No
-----------------------------	----

**2.13 MEASURING APPARATUS**

What gauges onboard	Float type level gauge
Location and type	Cargo tank hatches - 8 off UASI 806 MHN/HT37

**2.14 SAMPLES**

Where can samples be taken?	Cargo tanks, deepwell pump discharge, compressor discharge
Are sample bottles available onboard?	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	109.50 m
Distance from manifold to stern	115.80 m
Height cargo manifold above deck	2.1 m
Height cargo manifold above waterline when in ballast	17.10 m
Height cargo manifold above waterline when loaded	11.526m
Distance from shipside to manifold flange	4 m
Distance between loading and vapour return connections	2.25 m
Is vessel fitted with stern discharge	NO
Is vessel fitted with fore discharge	NO

Dimension of lines		
	Diameter	Flange size
Liquid	14"	300#
Gas Line	10"	150#
Booster Line	Uses liquid Manifold	-

What reducers onboard		
Number	Diameter	Pressure rating
2	14" x 16"	300#
2	14" x 12"	300#
2	14" x 10"	300#
2	14" x 8"	300#
2	14" x 14"	300# x 150#

2	14" x 12"	300# x 150#
1	14" x 8"	300# x 150#
2	10" x 12"	150# x 300#
2	10" x 10"	150# x 300#
2	10" x 8"	150# x 300#
2	10" x 6"	150# x 300#
2	10" x 12"	150# x 150#
2	10" x 8"	150# x 150#

## 2.16 LIFTING DEVICE

<b>Where situated</b>	<b>Aft</b>	<b>Amidship</b>
<b>Number and type</b>	Two x electro hydraulic	One x electro hydraulic
<b>Lifting capacity</b>	5 ton	10 ton
<b>Max. distance from ship's side of lifting hook</b>	5m	6m

## 2.17 HOSES

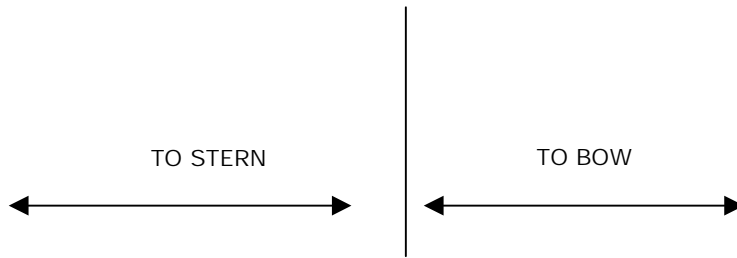
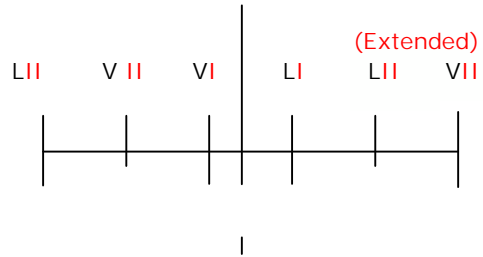
<b>For what products are hoses suitable</b>	NA			
<b>Number</b>	<b>Length</b>	<b>Diameter</b>	<b>Working pressure</b>	<b>Flange</b>

## 2.18 SPECIAL FACILITIES

<b>How many grades can vessel segregate?</b>	Two
--	-----

<b>Indicate systems</b>	
<b>Is vessel able to load/discharge two or more grades simultaneously?</b>	Yes (two)
<b>Can vessel sail with slack tanks?</b>	Yes
<b>Is vessel fitted with purge tank?</b>	No

# ARRANGEMENT OF CARGO MANIFOLD



## PARALLELL BODY LENGTH BALLAST and LOADED CONDITIONS

