Owner’s Requirements, Specification, Parent ships Data (선주요구조건,사양서,기준 실적선 자료)

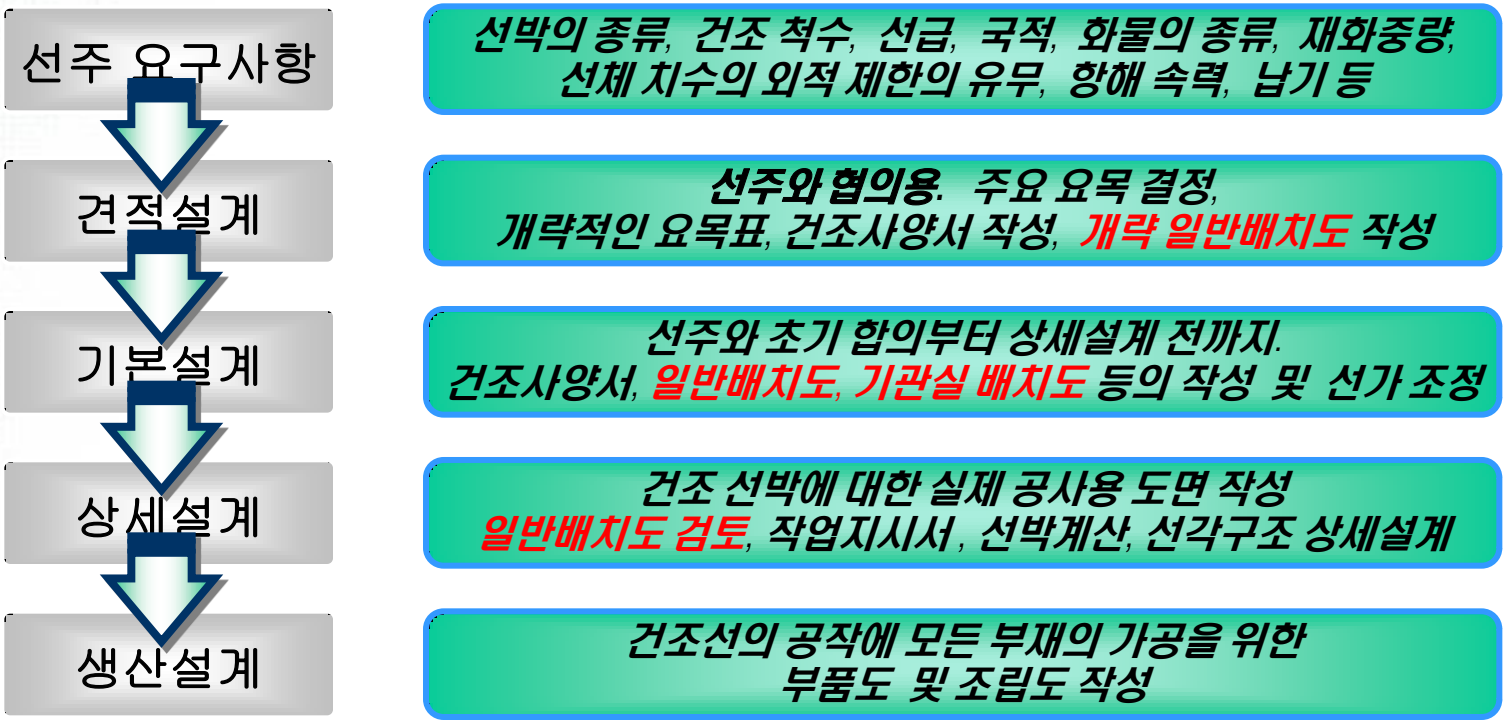
2008.3

서울대학교 조선해양공학과
이규열

Advanced
Ship
Design
Automation
Laboratory

선박의 정의 : 바다에서 화물과 승객을 싣고, 떠서, 움직이는 대형 구조물

- 선박의 특성 : 적재성, 부양성, 이동성, 안전성
- 선박의 설계 과정



선박설계에서 고려해야 할 점

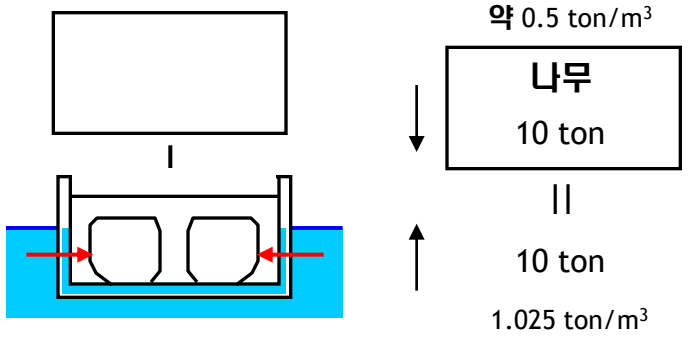
철의 밀도 = 7.85 ton/m³

■ 선박의 기본적인 요건

1) 물에 떠야 한다

선박안정론

→ 선박의 무게 = 밀어낸 물의 무게*



2) 원하는 목적지로 빨리 갈 수 있어야 한다

→ 형상: 물의 저항이 작은 형태(ex. 유선형)

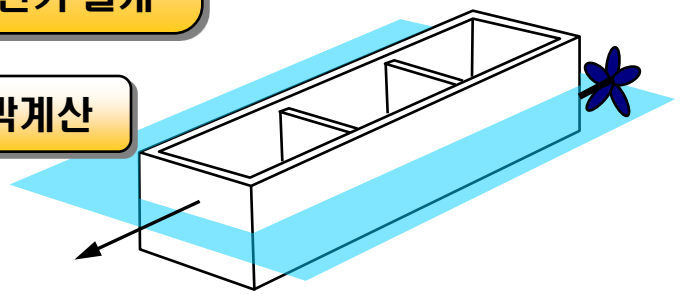
→ 추진기관: 디젤 엔진, 나선형 프로펠러

선박형상설계, 선박유체역학, 추진기 설계

3) 짐을 실을 수 있어야 한다

선박구획배치설계/선박계산

→ 최대한 많은 짐을 실을 수 있도록 내부가 비어있어야 함



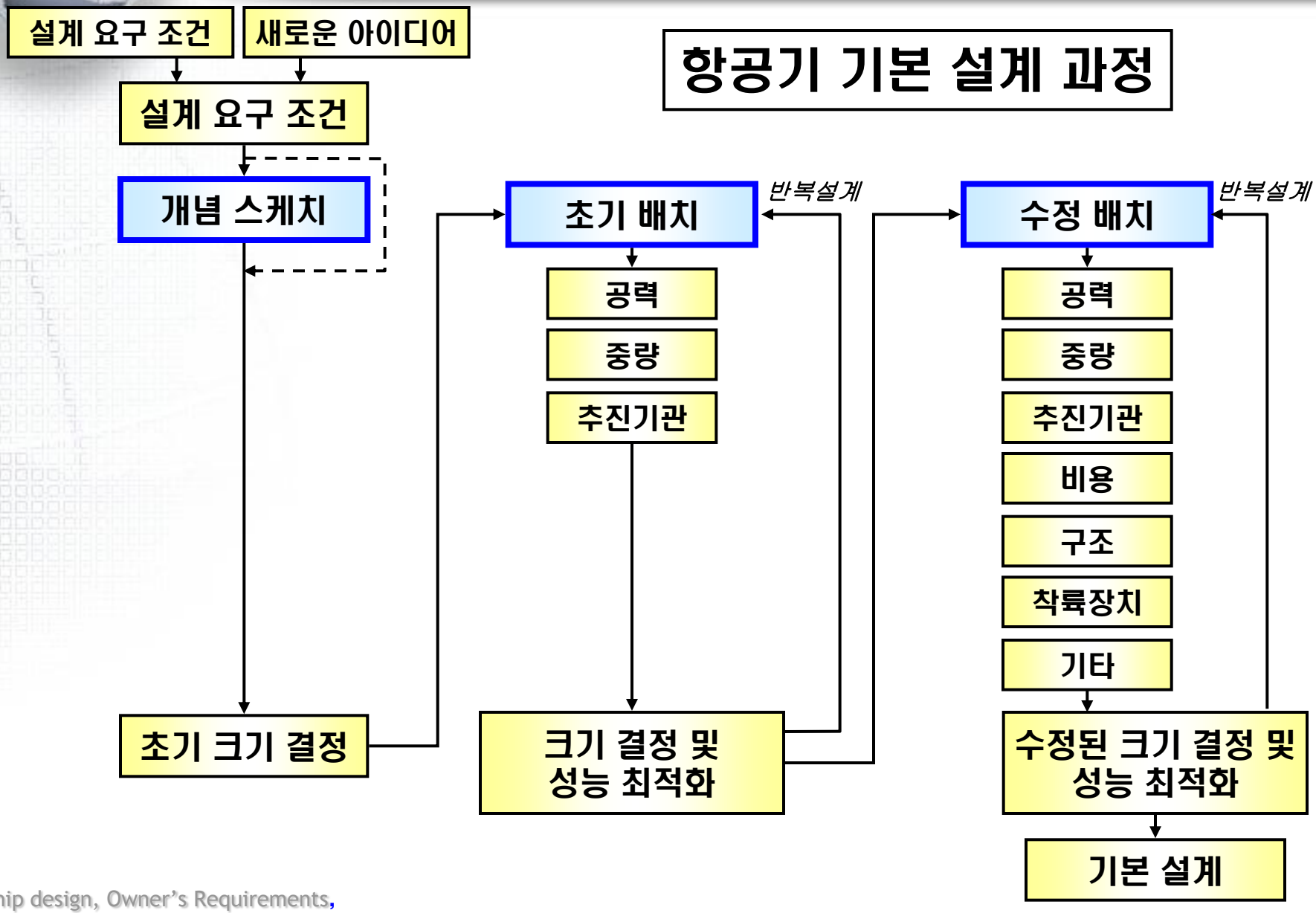
4) 튼튼한 그릇으로서의 역할을 해야 한다

→ 철판(약 10~30 mm두께)과 보강재를 용접한 구조물

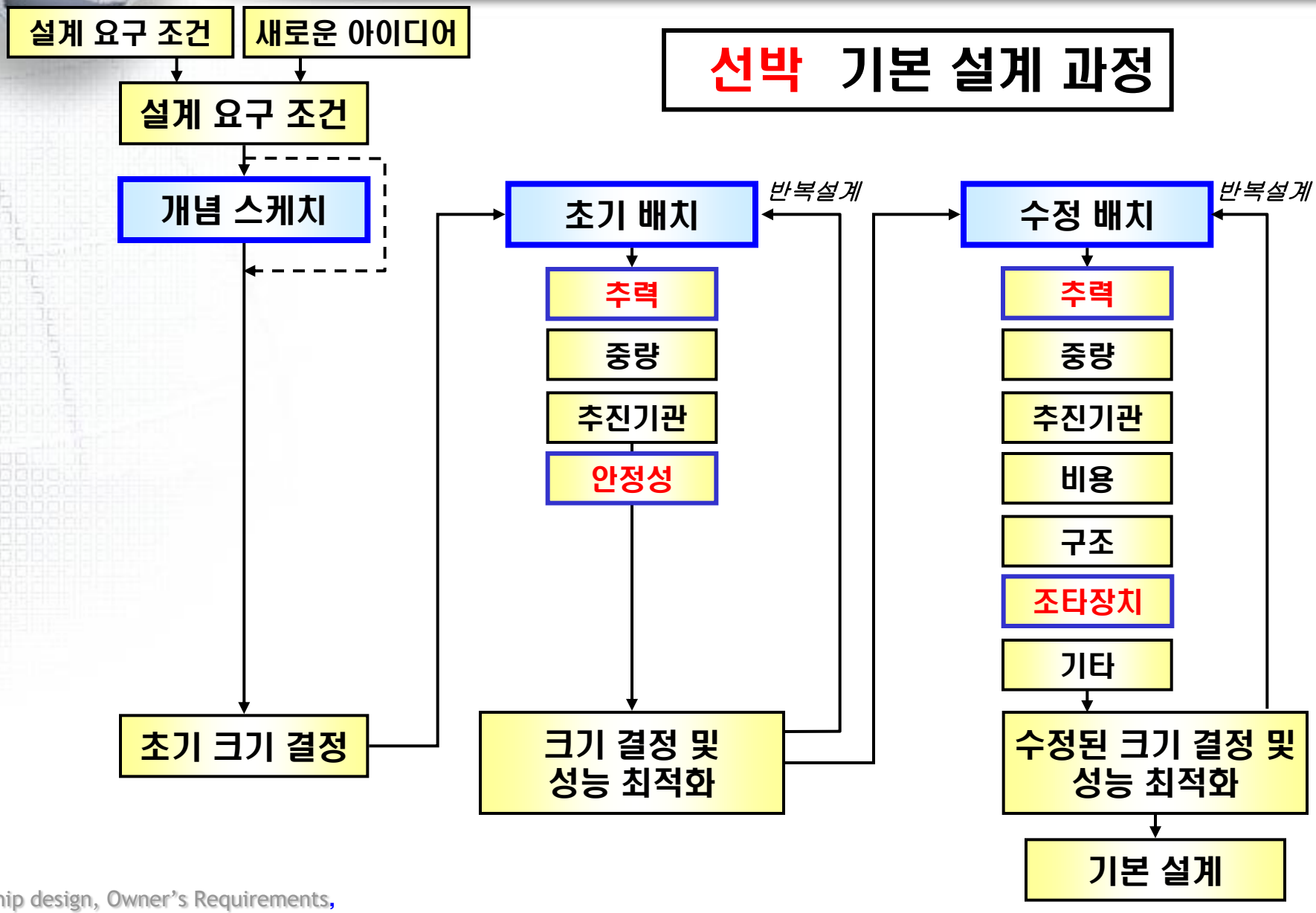
선박구조역학/구조설계.해석

* 아르키메데스의 원리: 유체 속에 있는 물체(부유체)가 받는 부력의 크기는 그 물체가 밀어낸 유체의 무게와 같고 그 방향은 중력과 반대 방향이다.

항공기 와 선박의 기본 설계 과정 비교



항공기 와 선박의 기본 설계 과정 비교



선박 기본 설계의 순서

1. 선주 요구 조건(owner's requirements)
2. 유사 실적선 자료 조사
3. 관련 rules & regulation 검토
4. 주요 치수 선정
   - 배수량 추정 -
5. 경하 중량(lightweight) 추정
6. 저항 및 마력 추정/주기관 선정
   - 저항 성능 추정, 프로펠러 주요 치수 선정 -
7. 화물창 용적(cargo capacity) 추정
8. 건현(freeboard) 계산
9. 복원 성능(stability) 추정
10. 개략 일반 배치(Sketch G/A 작성)
11. 개략 선형 및 선박 제 계산
12. 견적 물량 및 견적가 산정
13. Technical documents 작성

1.선주의 요구조건

- **선주 요구 조건**
  - **선종**(Ship's Type)
  - **재화중량**(Deadweight)
  - **최대 흘수**(Max. Draft)
  - **화물용적**(Cargo Capacity)
    - Cargo Capacity: Cargo Hold Volume/ Container in Hold & on Deck/ Car Deck Area
    - Water Ballast Capacity
  - **속력**(Speed)
    - Service Speed at _Draft with _Sea Margin,_ Engine Power & _RPM , DFOC (Daily Fuel Oil Consumption)
  - **운하 및 수로 제한**(Canal Limitations): Panama, Suez, Kiel, St. Lawrence Seaway, Port limitations
  - Special Requirements
    - Ice Class, Air Draft, Bow/Stern Thruster, Special Rudder, Twin Skeg

1. 선주의 요구조건 예 : SPECIFICATION FOR 4,100TEU CONTAINER SHIPS

11. **GENERAL DESCRIPTION AND PARTICULARS**
    - 111. General Description
    - 112. Principal Dimensions
    - 113. Deck Heights, Camber and Sheer
    - 114. Deadweight and Capacities
    - 115. Dangerous Cargoes
    - 116. Trim and Stability
    - 117. Speed, Daily Fuel Oil Consumption and Cruising Range
    - 118. Hull Form
    - 119. Complement
    - 120. Guaranteed Figures
12. **CLASSIFICATION, RULES, REGULATIONS AND CERTIFICATES**
    - 121. Classification
    - 122. Rules and Regulations
    - 123. Certificates

11. GENERAL DESCRIPTION AND PARTICULARS

111. General Description

The Vessel shall have a continuous upper deck without forecastle, a raked stem with bulbous bow, a transom stern with open water type stern frame, a semi-balanced rudder and a fixed pitch propeller directly driven by a slow speed diesel engine.

The propulsion machinery and living quarters including navigation bridge shall be located semi-aft as shown on the General Arrangement.

The Vessel shall be built generally as double skinned construction in way of cargo holds except No.1 hold and shall be arranged with eight(8) cargo holds.

The Vessel shall consist of eighteen(18) bays with seventeen(17) hatches, with three(3) panel hatch covers in way of each cargo hold (Except No.1 and 16 hatches).

The cargo holds shall be equipped with cell guides and support structure for the carriage of 20 ft (bay No.1 and 3) and 40 ft (other bays) ISO containers, eleven(11) rows and eight(8) tiers, with depth of holds suitable for containers of six(6) tiers with 8'-6" and two(2) tiers with 9'-6" high in general.

Loading of 20 ft containers up to six(6) tiers above inner bottom shall be considered in the 40 ft cell guide in general.

Containers on deck shall be generally carried with thirteen(13) rows in three(3) or four(4) tiers. Hatch covers, deck supports and lashing points shall be arranged for 20 ft and/or 40 ft containers in general.

One hundred(100) units of 45 ft containers on hatch cover shall be arranged from 2nd tier on deck aft accommodation.

One(1) bow thruster and one(1) stern thruster shall be arranged.

Pipe duct in double bottom shall be arranged.

** ***Two hundred and fifty(250)*** electric sockets shall be arranged for the carriage of two hundred and twenty(220) FEU refrigerated containers on deck and ***thirty(30)*** FEU refrigerated containers in hold with 9'-6" high. ***In addition, fifty(50) FEU electric sockets shall be provided in holds for the flexibility of loading.***

* Passageway from engine room to ***steering gear room and*** forward cargo hold space shall be arranged below the upper deck at both sides.

The arrangement for containers, cargo holds, water ballast tanks, fuel oil tanks, fresh water tanks, etc. shall be as shown on the General Arrangement.

112. Principal Dimensions

Length overall	approx.	294.0	m
Length between perpendiculars		281.00	m
Breadth, moulded		***32.26***	m
Depth, moulded		21.50	m
Designed/scantling draft, moulded		10.78	m
Freeboard type		"B" type	
* Freeboard deck	***approx.***	***13.952 m***	
** Air draft (from designed draft of 10.78 m to the top of mast)	approx.	***43.5***	m

113. Deck Heights, Camber and Sheer

(1) Deck height [illegible]er line, moulded

Upper deck [illegible]k	3.4	m
A deck to B deck	3.4	m
B deck to C deck	3.4	m
C deck to D deck	3.4	m
D deck to E deck	3.4	m
E deck to nav. bridge deck	3.4	m
Nav. bridge deck to compass deck	2.8	m

(2) Camber and sheer of decks

Camber for upper deck	0.2 m, trapezoid type
Camber for superstructure	nil except straight camber for bridge wings
Sheer for upper deck	nil

114. Deadweight and Capacities

(1) Deadweight

** The guaranteed deadweight of the Vessel shall be ***47,790*** metric tonnes at the designed/ scantling draft of 10.78 m, without trim, with the Vessel afloat in sea water with specific gravity of 1.025.

(2) Capacities (100% full)

*	Water ballast tanks	approx. ***21,000*** m^3
	Heavy fuel oil tanks including settling and service tanks	approx. 4,300 m^3
	Diesel oil tanks including settling and service tanks	approx. 300 m^3
	Fresh water tanks	approx. 250 m^3

(3) Container capacity

Containers eight(8) tiers x eleven(11) rows in hold and three(3) or four(4) tiers x thirteen(13) rows on deck generally shall be arranged as follows :

- No. of containers

On deck	approx. 1,758 TEU
In hold	approx. 2,322 TEU
Total	approx. 4,080 TEU

- Container unit

TEU : 8.5 ft(H) x 8 ft(B) x 20 ft(L)
FEU : 8.5 ft(H) x 8 ft(B) x 40 ft(L)

- The above mentioned number of containers on deck shall be counted in accordance with IMO visibility requirement at the scantling draft (even keel).

115. Dangerous Cargoes

Location : No. 1, 2, 3, 4, 5, 6 and 7 holds (except on Bay No. 59)
** IMDG - classes : 1.4S, 2, 3, 4, 5.1, 6.1, ***6.2, 7,*** 8 and 9

Location : On upper deck (except on Bay No. 59)
IMDG - classes : All classes of dangerous goods as permitted by Classification Society

The above mentioned dangerous cargoes shall be carried under the following conditions :

(a) The cargoes shall be carried in the form of closed freight containers.
(b) Dangerous cargoes which require certified electrical equipment with the protection grade II C, such as hydrogen, hydrogen mixture, acetylene, ethyl nitrite, ethyl nitrate and carbon disulphide, etc. shall not be loaded.
** (c) Packing, storage and transportation, etc. governed by ***IAEA and/or*** port authority shall be properly performed by the Owner in consideration of ***all*** operational safety aspects.
** (d) Mixed loading of reefer containers and ***low grade*** dangerous cargoes ***(except IMDG - Classes 1.1-1.6, 2.1, 2.3, 3.1, 3.2, 4.3, 6.1, 6.2, 7 and 8)*** shall be considered in the cargo holds ***as permitted by Classification Society***.
(e) Dangerous cargoes in the No. 7 cargo hold shall be loaded at least 3 m away from the engine room bulkhead.

116. Trim and Stability

(1) Preliminary trim and stability calculation shall be submitted to the Owner to demonstrate that the Vessel will have suitable trim and stability for the following loading conditions :

(a) Lightship.
(b) Ballast, departure and arrival.
(c) Average loaded containers at Europe departure condition (13.85 mt and 12.26 mt)
* ***(H.F.O. 2,500 mt and full supplies of other consumables)***.
(d) Average loaded containers at Montreal arrival condition (13.85 mt and 12.26 mt) (H.F.O. 1,500 mt, D.O. 100 mt and other consumables 10% of departure condition).
(e) Average loaded containers at Montreal departure condition (13.85 mt and 12.26 mt) (approx. 50% supplies of bunkers and other consumables).
(f) Average loaded containers at Europe arrival (13.85 mt and 12.26 mt) (approx. 10% supplies of bunkers and consumables).
(g) Homogeneous loaded containers with 14.0 mt/TEU at the designed/scantling draft, departure and arrival.
(h) Homogeneous loaded containers with 13.85 mt/TEU at the designed/scantling draft, departure and arrival.
(i) Homogeneous loaded containers with 12.26 mt/TEU at the designed/scantling draft, departure and arrival.
* ***(j) Homogeneous loaded containers with 10.0 m/TEU, 11.0 mt/TEU and 14.0 mt/TEU at the designed/scantling draft departure condition (H.F.O. 2,500 mt and full supplies of other consumables).***

** ***(k) Pre-docking condition (H.F.O. 380 mt and 10% supplies of other consumables).***
(l) Dry docking, arrival.

* ***"Departure condition" shall be based on the full supplies of bunkers and othe consumables, and "arrival condition" on approx. 10% supplies of departure conditio or approx. 50% supplies of departure condition.***

(2) Unit weight of containers at the designed/scantling draft of 10.78 m for average loade conditions are as follows :

** (a) Average loaded containers with 13.85 mt

Item	No. of containers#	Unit weight (MT)
20 ft container (TEU)	100	7
	161	13
	927	23
40 ft container (FEU)	***174***	8
	356	18
	476	26

** (b) Average loaded containers with 12.26 mt

Item	No. of containers#	Unit weight (MT)
20 ft container (TEU)	130	6
	447	16
	575	23
40 ft container (FEU)	***208***	7
	317	15
	670	24

Number of containers may be modified according to the design development.

The number of loaded containers based on average container unit weight of approx. 13.85 mt/TEU shall be ***3,190*** TEU on the following conditions :

(a) Vertical center of gravity of loaded container shall be assumed to be 45% of 8'-6" height ***and 9'6" height.***

(b) Transverse metacentric height (GoM) after the corrections due to free surface shall be not less than 0.60 m at Montreal arrival condition with H.F.O. 1,500 mt, D.O. 100 mt and other consumables 10% of departure condition (icing effect shall not be considered).

(3) For the adjustment of trim, stability, visibility, bending moment and shear force at the above loading conditions, ballast water may be fully or partially filled, if necessary.

A.P.TK & F.P.TK shall be used as water ballast tank within the designed criteria
(Allowable S.W.B.M : Hogging +310,000 T-M
Sagging - 25,000 T-M).

Final trim and stability calculation for above loading conditions shall be made on the basis of the center of gravity and the light weight of the Vessel obtained from the inclining experiment and deadweight measurement, and shall be submitted to the Owner.

If the final trim and stability booklet is under process of approval by the Classification Society and/or other assigned Authority, the Builder shall provide the provisional trim and stability booklet upon the delivery of the Vessel.

The icing allowance shall be based on the requirement of British Loadline A5-10.22.

Specific gravities of water and oil for the trim and stability calculation shall be as follows :

Sea water	:	1.025
Fresh water	:	1.000
Heavy fuel oil	:	0.980
Diesel oil	:	0.850
Lube oil	:	0.900

117. Speed, Daily Fuel Oil Consumption and Cruising Range

(1) Speed

The guaranteed speed of the Vessel at the designed draft of 10.78 m on even keel shall be
* 23.0 knots with the main engine running at 85% MCR (***42,230*** PS) with 20% sea margin.

The above speed shall be based on the Vessel with clean hull in infinitely deep and the weather condition of Beaufort Scale 3 with no currents.

The actual speed performance of the Vessel at the designed draft shall be based on the model test results which shall be corrected by applying the same correlation between the trial prediction by model test and the actual results obtained from the speed trials at trial condition.

Type and rating of the main engine are as follows :

*	Type and number	:	***B&W 8K90MC-C*** x 1 set
*	Maximum continuous rating (MCR)	:	***49,680*** PS x ***104.0*** rpm
*	Normal continuous rating (NCR)	:	***42,230*** PS x ***98.5*** rpm

(2) Daily fuel oil consumption of main engine

* Approx. ***125.8*** metric tonnes per day at NCR of the main engine on the basis of the fuel oil with lower calorific value of 10,200 kcal/kg and ISO standard reference conditions.

The above daily fuel oil consumption has been calculated by applying the specific fuel oil
* consumption of ***124.1*** g/BHP.h at NCR of the main engine according to the main engine manufacturer without considering the tolerance margin of 5%.

(3) Cruising range

* Approx. ***15,000*** nautical miles on the basis of the following conditions :

- Service speed of 23.0 knots at the designed/scantling draft.
- Main engine running at NCR.
- Fuel oil with specific gravity of 0.980 and lower calorific value of 9,700 kcal/kg.
- Fuel oil tanks 98% full, 2% unpumpable with reserve for three(3) days.

118. Hull Form

(1) Hull form

The Builder shall decide the hull form and the propeller of the Vessel in view of the performances of the Vessel with regard to :

- Resistance and propulsive efficiency.
- Propeller induced vibration.
- Seakeeping.
- Manoeuvrability.
- Stability.

(2) Model tests

Model tests with the following test scope shall be carried out in HSVA according to the Builder's practice and the results shall be submitted to the Owner for reference :

- Resistance tests at the designed draft and ballast draft.

*

- Self-propulsion tests with stock propeller at the designed draft and ballast draft.
- Streamline test with paint at the designed draft.
- Wake measurements at the designed draft.
- Open water tests with the designed propeller model.
- Self-propulsion tests with the designed propeller at the designed draft and ballast draft.
- Cavitation tests at the designed draft.

** ***Hull form including bulbous bow shape shall be optimized with the draft range from 9 m to 10.78 m to achieve optimum speed performance by using CFD (Computational Fluid Dynamics) and the only selected hull form(s) shall be tested in the model basin.***

** ***Owner's representative will be absolutely welcome and the Builder will fully discuss the model test results with the Owner during the model testing, and in the event that the tested hull form and propeller require further improvements, the Builder shall make all reasonable efforts including additional tests to achieve optimum Vessel's speed performance.***

(3) Propeller

*
*

The propeller shall be designed to absorb ***42,230*** PS (which corresponds to the power of the normal continuous rating) at approx. ***104.4*** rpm (which corresponds to the revolution of the normal continuous rating with approx. 6.0% margin) on the basis of the Vessel at the designed draft and with clean hull in calm sea.

119. Complement

	Class	No.
	Captain	2
	Senior officer	2
**	Junior officer (including two(2) pilots ***and two(2) cadets***)	***9***
	Petty officer	4
**	Crew	***7***
**	Passenger	***3***
**	Total	***27*** persons

****120. *Guaranteed Figures***

The Builder shall guarantee the specified figures of the following items under the conditions mentioned in this section.

These guaranteed figures shall be subject to adjustment due to the modification and/or alternation to the Specifications mutually agreed after the execution of the Contract.

Deadweight :	***47,790 metric tonnes, at the designed/scantling draft of 10.78 m.***
Vessel's speed :	***23.0 knots at the designed draft of 10.78 m even keel with clean hull in infinitely deep and BF Scale 3 at 85% MCR (42,230 PS) of main engine with 20% sea margin.***
Main engine specific fuel oil consumption :	***126.0 g/BHP.h +5% tolerance at MCR based on the marine diesel oil with lower calorific value of 10,200 kcal/kg and ISO standard reference conditions (measured at shop test bed).***
Nominal container capacity :	***4,080 TEU in total***
Homogeneous 14 MT/TEU container capacity at scantling draft of 10.78 m :	***2,760 TEU***

12. CLASSIFICATION, RULES, REGULATIONS AND CERTIFICATES

121. Classification

The Vessel, including her hull, machinery, equipment and outfits shall be constructed under the survey of Det Norske Veritas (herein called the "Classification Society"), and shall be distinguished in the register by the symbols of :

+1A1, "Container Carrier", E0, NAUTICUS (Newbuilding), ICE-1C, W1-OC, DG-P

The provisions for in-water survey shall be applied.

122. Rules and Regulations

The Vessel shall be registered in a port of Bermuda and shall comply with the following Rules and Regulations (edition and amendments thereto being compulsory as of the date of signing the Contract) :

(a) International Convention on Load Lines, 1966 with the Protocol of 1988.
(b) International Convention for the Safety of Life at Sea, 1974 with the Protocol of 1978/
* 1988 and Amendments up to ***2000*** (herein called "SOLAS").
*
(c) International Convention for the Prevention of Pollution from Ships, 1973 (Annex I, IV, V & VI (Regulation 12, 13 and 16)), as modified by the Protocol of 1978 and
* Amendments up to ***1999***. (herein called "MARPOL 73/78").
(d) Convention on the International Regulations for Preventing Collisions at Sea, 1972 with the Amendments up to 1993.
(e) International Convention on Tonnage Measurement of Ships, 1969.
(f) International Telecommunication Union(ITU) Radio Regulation, 1997.
(g) Rules of Navigation of the Suez Canal Authority including Regulations for the Measurement of Tonnage.
(h) Rules and Regulations Governing Navigation of the Panama Canal and Adjacent Waters and Rules for the Measurement (Panama Canal Universal Measurement System) of
** Vessels.
(i) Rules and Regulations of USCG for Foreign Vessels Operating in the Navigable Waters of the United States (CFR Title 33 - Navigation and Navigable Waters, Part 155, 156, 159 and 164 without Certificate nor Inspection).
(j) Requirements of the Maritime Union of Australia (MUA).
(k) IMO Res. A.468(12) Code on Noise Levels on Board Ships.
(l) ISO Draft Proposal No. 6954 "Guidelines for Overall Evaluation of Vibration in Merchant Ships, 1984".
(m) ILO Convention Concerning Crew Accommodation on Board Ships (No. 92 and 133).
(n) Standard Specification and Regulations of International Maritime Satellite Organization (INMARSAT).

(o) IMO Resolution A. 749(18) Code on Intact Stability for all Types of Ships Covered by IMO Instruments.
(p) IMO Resolution A. 830(19) "Code on Alarms and indicators".
(q) IMPA recommendation for Pilot Ladder.
(r) British Factory Act for Cargo handling/safety (with reference to newbuilding only).
(s) Canadian Arctic Shipping Pollution Prevention Regulation as type B (without certificate).
(t) USCG CFR Title 29 - Part 1918, US Safety and Health Regulations for Longshoring (for permanent fitting only, without Certificate nor Inspection).
(u) USCG Weather Criterion for Safety (CFR Title 46-170).

** ***(w) Marine Orders Part 32 Issue 2 (Order No. 14 of 1997) by AMSA - Cargo Handling Equipment.***

* ***(x) The requirement of OSHA for Container Fittings.***

** ***(y) ILO Convention concerning Food and Catering for Crews on Board Ships (No. 68, physical requirements only).***

** ***(z) ILO Convention concerning Minimum Standards in Merchant Ships (No. 147, physical requirements only).***

** ***(aa) IMO Res. A.868(20) Guidelines for the Control and Management of Ship's Ballast Water to Minimize the Transfer of Harmful Aquatic Organisms and Pathogens.***

** ***(bb) Implementation of the National Invasive Species Act of 1996 (NISA).***

** ***(cc) Australian New Mandatory Ballast Water Requirements.***

** ***(dd) Paris Memorandum for Accommodation (physical requirements only).***

(ee) National Maritime Regulations.

123. Certificates

The Builder shall obtain the following certificates and deliver to the Owner at the time of the Vessel's delivery in triplicate, one(1) original and two(2) copies :

(a) Builder's Certificate issued by the Builder.
(b) Classification Certificate issued by the Classification Society.
(c) International Load Line Certificate issued by the Classification Society.
(d) International Tonnage Certificate issued by the Classification Society or other assigned Authority.
(e) International Oil Pollution Prevention Certificate issued by the Classification Society or other assigned Authority.
(f) Cargo Ship Safety Radio Certificate issued by the Classification Society or other assigned Authority.
(g) Cargo Ship Safety Construction Certificate issued by the Classification Society or other assigned Authority.
(h) Cargo Ship Safety Equipment Certificate issued by the Classification Society or other assigned Authority.
(i) Suez Canal special Tonnage Certificate issued by the Classification Society or other assigned Authority.
(j) Documentation for the Issuance of Panama Canal PC/UMS Certificate issued by the Classification Society or other assigned Authority.

** (k) Statement of Compliance with USCG Rules and Regulations ***(including CFR Title 29 Part 1918 and CFR Title 46 part 170)*** for Foreign Vessels issued by the Classification Society.

(l) Statement of Compliance of EIAPP for Main Engine and Auxiliary Engine issued by the Classification Society or other assigned Authority.

(m) Statement of Compliance of MARPOL Annex VI for Incinerator issued by the Classification Society or other assigned Authority.

* (n) Statement of Compliance of IAPP for NOx ***including technical files*** issued by the Classification Society or other assigned Authority.

(o) Statement of Compliance of International Sewage Pollution Prevention Certificate issued by the Classification Society or other assigned Authority.

(p) International Garbage Pollution Prevention Certificate issued by the Classification Society or other assigned Authority.

(q) Crew Accommodation Certificate corresponding to ILO Convention No. 92 and 133 issued by the Classification Society or other assigned Authority.

** ***(r) Letter of Compliance for ILO Convention No. 68 concerning Food and Catering for Crews on Board Ships issued by Classification Society or other assigned Authority.***

** ***(s) Letter of Compliance for ILO Convention No. 147 concerning Minimum Standards in Merchant Ships issued by Classification Society or other assigned Authority.***

(t) Deratting Exemption Certificate issued by the Korean Government.

(u) Cargo Gear Certificate corresponding to ILO forms issued by the Builder (Provision cranes and engine room crane only).

(v) Adjustment Certificates for magnetic Compass issued by the Builder.

(w) Document of Compliance for the Carriage of Dangerous Goods (SOLAS Chapter II-2/Regulation 54) issued by the Classification Society or other assigned Authority.

* ***(x) Fixed container fitting Certificate issued by the Classification Society.***

* ***(y) Deadweight Certificate issued by the Builder.***

** (z) Minor Certificates including ***shop test record, onboard test record,*** Manufacturers' Certificates and Builder's Certificates which are normally issued for Machinery, Equipment and Outfits of the Vessel.

** ***(aa) Statement of Compliance for Lashing Gears issued by the Classification Society.***

** ***(bb) Statement of Compliance and Management Plan (DNV format for flow through method) for IMO Res. A.868(20) issued by the Classification Society.***

** ***(cc) Statement of Compliance for Implementation of the National Invasive Species Act of 1996 (NISA) issued by the Classification Society.***

** ***(dd) Statement of Compliance for Australian New Mandatory Ballast Water Requirements issued by the Classification Society.***

* ***Following manuals/drawings stamped by the Classification Society or other assigned Authority shall be provided :***

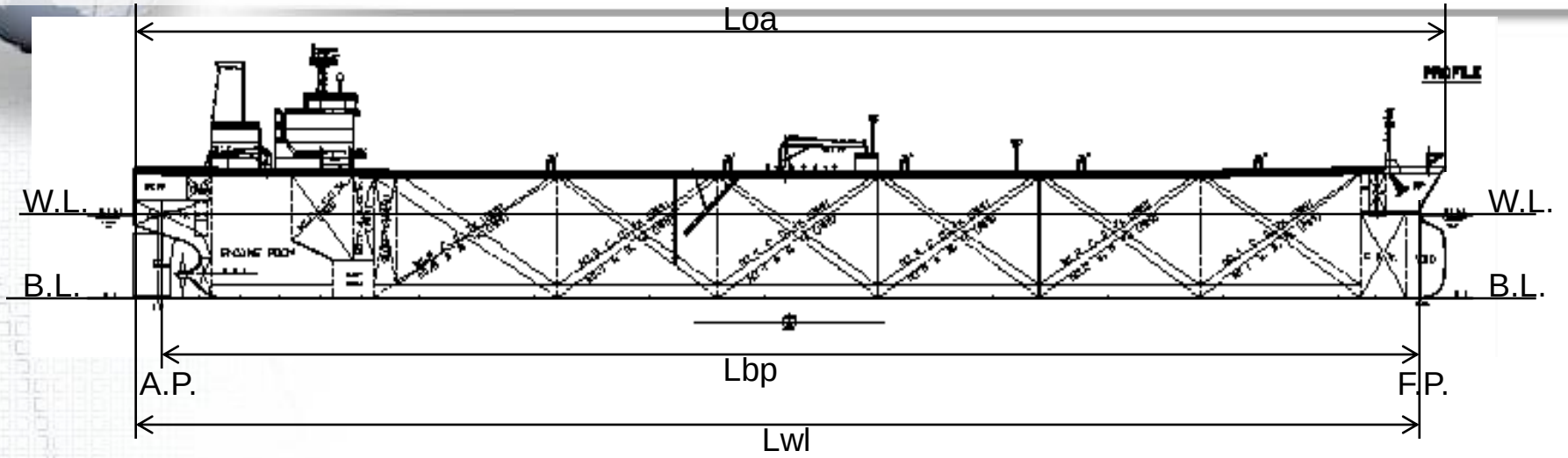
- ***Trim and stability booklet.***
- ***Cargo Securing Manual.***
- ***Approved drawings by both Panama and Suez Canal Authority.***
- ***Approved drawings of Australia marine order part 32 for hold ladder.***

11. **GENERAL DESCRIPTION AND PARTICULARS**
    - 111. General Description
    - 112. Principal Dimensions
    - 113. Deck Heights, Camber and Sheer
    - 114. Deadweight and Capacities
    - 115. Dangerous Cargoes
    - 116. Trim and Stability
    - 117. Speed, Daily Fuel Oil Consumption and Cruising Range
    - 118. Hull Form
    - 119. Complement
    - 120. Guaranteed Figures
12. **CLASSIFICATION, RULES, REGULATIONS AND CERTIFICATES**
    - 121. Classification
    - 122. Rules and Regulations
    - **123. Certificates**

Should the formal certificate(s) not be obtained at the time of the Vessel's delivery, the Builder shall furnish the Owner with the provisional certificate(s).
In such case(s), the Builder shall deliver the formal certificate(s) to the Owner as soon as available after the Vessel's delivery.

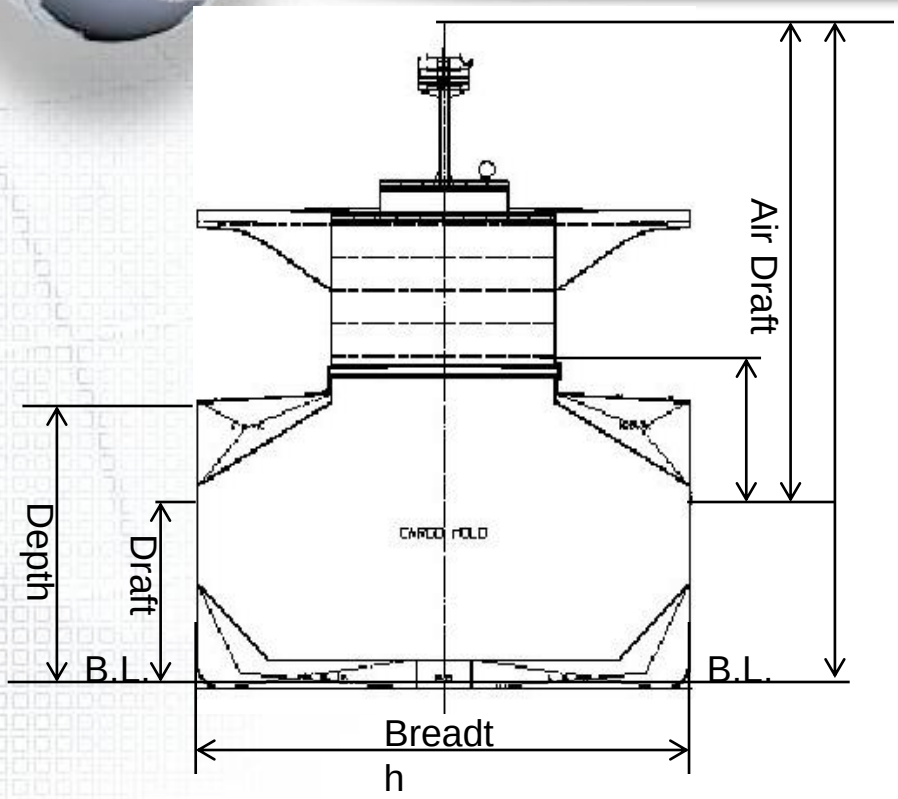
1.2 주요 용어

1.2. 주요용어-Introduction to main terminology



- Loa (Length OverAll) (m) : Maximum Length of Ship
- Lbp (Length Between Perpendiculars (A.P. ~ F.P.)) (m)
  - A.P.: After Perpendicular (Normally, Center line of the Rudder Stock)
  - F.P.: Inter-section line between Designed draft and fore side of the Stem, which is perpendicular to the baseline
- Lf (Freeboard Length) (m): Basis of Freeboard assignment, Damage Stability Calculation
  - 0.96 Lwl at 0.85 D or Lbp at 0.85 D, whichever is greater
- Rule Length (Scantling Length) (m): Basis of Structural Design and Equipment selection
  - Intermediate one among (0.96 Lwl at Ts, 0.97 Lwl at Ts, Lbp at Ts)

Introduction to main terminology



- B (Breadth) (m)
  - ✖ Maximum breadth of the ship, measured amidships
  - ✖ moulded : excluding shell plate thickness
  - ✖ extreme : including shell plate thickness
- D (Depth) (m)
  - ✖ Distance from the base line to the deck side line
  - ✖ moulded : excluding keel plate thickness
  - ✖ extreme : including keel plate thickness
- Td (Designed Draft) (m)
  - ✖ Main operating Draft.
  - ✖ In general, basis of Ship's Deadweight and Speed/Power performance
- Ts (Scantling Draft) (m)
  - ✖ Basis of Ship's Structural Design

- Air Draft

  Distance(height above water line only or including operating draft, see below for the detail) restricted by the

  port facilities, navigating route, etc.
  - ✖ Air draft from base line to the top of the mast
  - ✖ Air draft from water line to the top of the mast
  - ✖ Air draft from water line to the top of hatch cover

Introduction to main terminology

- Displacement (tonnes)
- Weight of water displaced by the Ship's submerged part

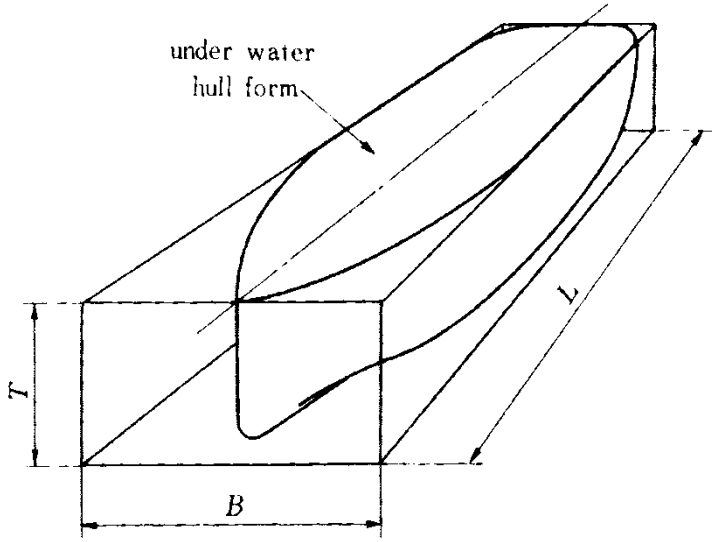
- Deadweight (tonnes) : Cargo payload + Consumables (F.O., D.O., L.O., F.W., etc.) + DWT Constant (Displacement - Lightweight)

- Cargo Payload (tonnes): Weight of loaded cargo at the loaded draft

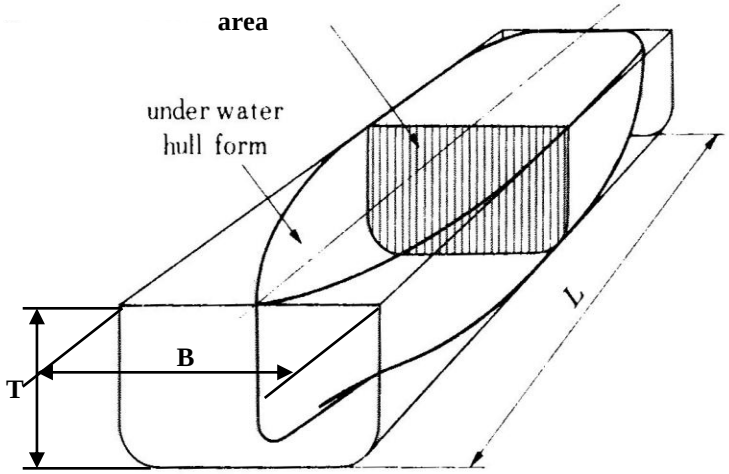
- DWT Constant (tonnes): Operational Liquid in the machinery and pipes, Provisions for crew, etc.

- LWT (tonnes): Total of hull steel weight and weight of equipment on board (Displacement - Deadweight)

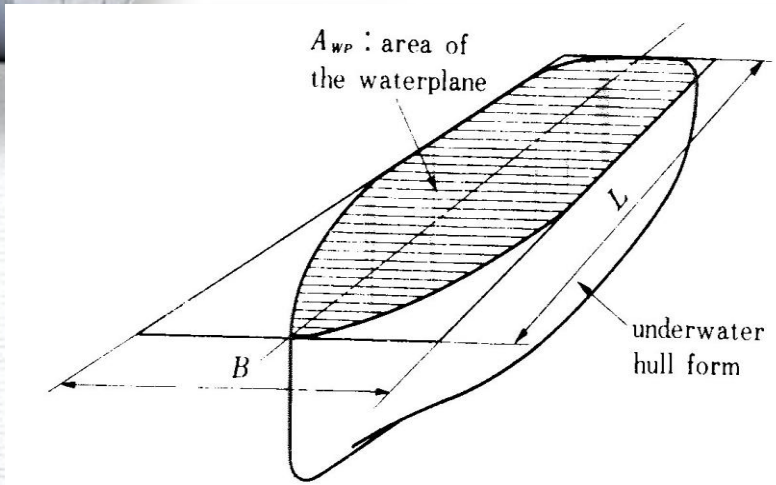
- Trim : difference between draft at A.P. and F.P.
- Trim = {Displacement x (LCB - LCG)} / (MTC x 100)
- LCB : Longitudinal Center of Buoyancy
- LCG : Longitudinal Center of Gravity



Am : maximum transverse underwater area



- **Cb** (Block Coefficient)
  - × Displacement / (L x B x T x SG)
  - × SG of Sea Water = 1.025 tonnes/m3
- **Cm** (Midship Section Coefficient)
  - × (Am) / (B x T)
- **Cp** (Prismatic Coefficient)
  - × Displacement / {(Am) x L}



- **Cw (Water Plane Area Coefficient)**
  - × Awp / (L x B)

Introduction to main terminology

- MCR (Maximum Continuous Rating) (PS x rpm)
  - ✖NMCR (Nominal MCR)
  - ✖DMCR (Derated MCR) / SMCR (Selected MCR)
- NCR (Normal Continuous Rating) (PS x rpm)
- Trial Power (PS x rpm): Required power without Sea Margin at the service speed
- Sea Margin (%): Power reserve for the influence of storm seas and wind including the effects of fouling and corrosion.
- Service Speed (knots): Speed at NCR Power with the specific sea margin.

Introduction to main terminology

- DHP: Delivered Horse Power
  - Power actually delivered to the propeller with some power loss in the stern tube bearing and in any shaft tunnel bearings between the stern tube and the site of the torsion-meter
- EHP : Effective Horse Power
  - Required power to maintain intended speed of the vessel
- η_D : quasi-propulsive coefficient = EHP / DHP
- RPM margin
  - To compensate for the expected future drop in revolutions for constant-power operation
  - To provide a sufficient torque reserve whenever full power must be attained under unfavorable weather conditions

Introduction to main terminology

- **Tonnage** : normally, 100 ft^3 = 1 ton
  - × Basis of various fee and tax
  - × GT (Gross Tonnage) : Total sum of the Volumes of every enclosed space
  - × NT (Net Tonnage): Total sum of the Volumes of every cargo space
  - × CGT (Compensated Gross Tonnage)
  - × Panama and Suez canal have their own tonnage regulations.

Introduction to main terminology

- Unit
  - API (American Petroleum Institute) = (141.5 / S.G.) – 131.5
    - ex) API 40 → SG = 0.8251 tonnes/m3
  - 1 LT (Long Ton) = 1.016 tonnes
  - SG (Specific Gravity) → tonnes/m3
  - SF (Stowage Factor) → ft3 / LT
    - ex) SF = 15 ft3 / LT → SG = 2.4 tonnes/m3
  - 1 knots = 1 nm/hr = 1.852 km/hr = 0.5144 m/sec
  - 1 Barrel = 0.159 m3
    - ex) 1 mil. Barrels = 159,000 m3
  - 1 PS = 0.736 kW
    - ex) NMCR of B&W6S60MC : 12,240 kW = 16,680 PS

선박 개념 설계의 순서

1. 선주 요구 조건(owner's requirements)
2. 유사 실적선 자료 조사
3. 관련 rules & regulation 검토
4. 주요 치수 선정
   - 배수량 추정 -
5. 경하 중량(lightweight) 추정
6. 저항 및 마력 추정/주기관 선정
   - 저항 성능 추정, 프로펠러 주요 치수 선정 -
7. 화물창 용적(cargo capacity) 추정
8. 건현(freeboard) 계산
9. 복원 성능(stability) 추정
10. 개략 일반 배치(Sketch G/A 작성)
11. 개략 선형 및 선박 제 계산
12. 견적 물량 및 견적가 산정
13. Technical documents 작성

2. 유사 실적선 자료 조사

- **유사 실적선 자료 조사**
  - **"선박 설계는 무에서 유를 창조하는 혁신적인 업무라기보다는 실적 자료를 토대로 한 개선이다"**
  - **유사 실적선 자료 조사**
    - **주요 치수**: L/B, L/D, B/D, D/T, C_B
    - **경하중량**(Lightweight), Deadweight/Displacement
    - Capacity: Cargo, Ballast, F.O
    - Speed, Power, Propeller, etc.
  - **관련 선급, 모형 시험소, 선주 및 유관 기관과의 업무 협의 및 자료 입수**

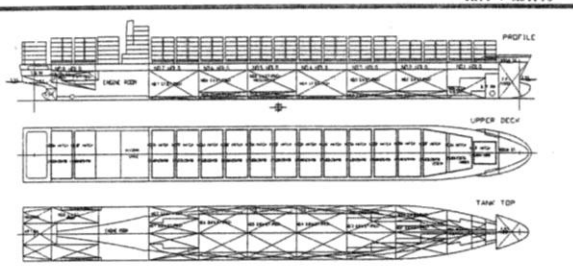
Container Carrier "Dragor Maersk" Outlined Specification

NAME DRAGOR MAERSK

Unit : Metric

Kind of ship	4300teu container carrier
Intend. cargo	container
Nav. area	
Class	LR
Route	
Builder	H. H. I.
Owner	Aktieselskabet Dampskibsselskab
Nationality	Denmark

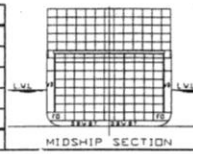
Keel laid	Launched	Delivered
95-06-21	95-09-30	95-11-30



Principal Dimension (M)

LOA	292.081	=289+1.5	
LBP	277		
Bmld	32.25		
Dmld	21.7		
dmld (d1, des.)	12.2		
dext (d2, sum.)	13.522		
DWT at d1	52433		
DWT at d2	62441.8		
△ at d2			
Cb / Cp			
Cw			
LCB (%LBP)	-5.449	(-1.967%)	
L/B / L/D	8.59	12.76	
B/D / B/d	1.49	2.643	
Camber	200		
Sheer (F. A)	-		
Length Fore	13.22	+ 7.2	
Length Hold	224.8		
Length Mach. Rm	30.4		
Length Aft	8.58	+ 7.8	
Tween Deck Height			

International Tonnage		Speed at d. (des.)	
GT	50698	Vs (%MCR, SM)	24.32 kts (85 15)
NT	29707	Endurance	20000 NM
Rudder		F. O. consump.	147.5 t/day
Af/A		P. T. O	BHP
Area , Area / (Lxd)	65.0, 1.88%	Complement	
Type x No.	semi-balanced type x 1set		28 + 6



Capacity

W. B	17732.4	On DK. (TEU)	2206	TEU 13x5	(RxT)	C. O. TK.
W. B. (hold)		In hld. (TEU)	2116	TEU 11x8	(RxT)	Slop TK.
		Total (TEU)	4322	TEU		Hold volume
F. O	6109.6	Reefer Cont.	180 + 120	FEU (deck + hold)		Flood. hld. No
D. O	416.2	Dang. cargo hld				Car
L. O	439.3	Lane length				Truck
F. W	319.2	Car deck area				Trailer

Light Weight Data

LWT MT.

KG LCG

Net Steel wt (HT. %) MT.

Special Regulation

Cargo Handling (hatch size, cover type, cargo pump, car ramp cargo gear, etc.)

Size of hatch: No. 1f 12480 x 12820
No. 1a 12480 x 22792/18100
No. 2f 12480 x 28050/23358
No. 2a, 3f, 3a, 4f, 4a, 5f, 5a, 6f, 6a, 7f, 7a, 8f, 8a 12480 x 23550

type: steel pontoon, non-sequential operation type

tightness: No. 1f, 1a, 2f and 2a : weathertight
Others : non-tight, but 3-faces of side panels to have packing

cleating: manual quick acting cleat between panel and hatch coaming top plate

Anchor & Cable

Equip. No.	4090
Anchor	2xstockless JIS type, 12300kg/ea
Anchor chain	87mm Dia. x 715m
Moor. rope	deltaflex offshore type rope
	64mm dia. x 200m x 10sets

Deck Machinery & Miscel. Fitting

Steer. gear	1xelec-hydr, 2-ram-four cylinde
Windlass	2set x separate type combined
	with the mooring winch
Moor. winch	4set x 20ton x 15m/min
Capstan	
Hoist	
Ref mach. / Air cond. Chamber	

Life Saving

Life boat	2 x fiberglass enclosed type
Rescue boat	life boat at portside in common
Life raft	4 x 15persons, 1 x 6persons
Boat devit	hinged gravity type
Boat winch	fixed electric motor

Fire fighting

Detector		
Cargo hold	Co2, sea water	
Mach. room	Co2, Sea Water, port. fire. ext.	
Accomo.	Sea Water, port. fire. extingu.	
Em. F. pump	elec-motor, vert. centrifugal	

Ventilation Fan

Cargo hold	axial flow type
Accomo.	axial flow type

Tank Heating

F. O. T.	steam heat. steel pipe: 50mm
	heating area ratio: 0.06m2/m3

Piping

W. B. pipe & Valve cont.	250mm above: ERW S 38 (12.7mm)
	200mm below: STPG 38E (sch. 80)
	remote controlled valves
W. B. pump	500m3/h x 25mTH x 2sets
Bilge pipe	STPG 38E, sch. 80
F. O. pipe	STPG 38E, sch. 40
Heat. pipe	STPG 38S, sch. 80

Painting

Outside Shell	Bottom	T. E., V. T., S. P. C.
	Boottop	T. E., P. Urethane
	Top side	I. Z. S., E., P. Urethane
W. B. T	T. E.	
Cargo hld	tank top : I. Z. S., E. tie, E. fin.	
	others : I. Z. S.	

Accommodation

Area. No. of DK	1813 m2, 8 tiers
Cabin	moulded plastic. shelf inside
Toilet	wall mount
Public Space	msss and smoking rm, duty mess rm
	gymnasium, library, conference r

Others

Elev. Sw. pool	Elev. : 2nd - F dk, pool : E dk
Ref. chamber	meat : 25m3, veg. : 29m3

NAME DRAGOR MAERSK

Unit : Metric

Main engine

Type & No.	HYUNDAI-B&W 10K90MC-C		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	58600 x 104	58600 x 104	49810 x 98.5
F. O. C. rate (10, 200kcal/kg)	123.4 g/PS. hr at NCR		
Type of balancer			

Reduction Gear

Type & No.			
Shaft output	M. C. R.	PS x	rpm
x Revol.	N. C. R	PS x	rpm

Shafting

	Inter. shaft.	Prop. shaft.
No.		
Dia.	mm	mm
Length	mm	mm

Propeller

Type & No.	fixed type x 1set
blade NO.	6
Dia. x pitch (0.7R)	7800 mm x 7986.2 mm
Exp. area ratio	
Material	N1, AL, BR

Auxiliary Machinery

Item	Type	No.	Capacity
Sea water cooling P.	M. D. V. C.	3	940m3/h x 20mTH
Fresh water cooling P.	M. D. V. C.	3	780m3/h x 25mTH
Main lub. oil pump	M. D. C. deepwell	2	1020m3/h x 45mTH
F. O. burning pump			
Boiler feed water pump	M. D. H. C.	2	8.6m3/h x 100mTH
Hot water circ. pump	M. D. H. C.	1	2m3 x 5mTH
Forced draft fan			
Heel pump			
Sea W. service pump			
Fire & G. S. pump			
Bilge, fire & service P.	M. D. V. C.	2	310/90m3/h x 30/90mTH
Bilge pump	M. D. H. piston	1	5m3/h x 3.5kg/cm2g
Fresh water pump			
F. O. trnasfer pump	M. D. H. G.	1	50m3/h x 3kg/cm2g
D. O. transfer pump	M. D. H. G.	1	50m3/h x 3kg/cm2g
L. O. transfer pump	M. D. H. G.	1	15m3/h x 6kg/cm2g
Vent. fan (supply)			
Main air compressor	M. D., 2stage	4	375m3/H F. A. D x 30kg/cmG
Emer. air compressor			
F. O. purifier	atuomatic, self-	4	4200L/H, based on 700cStat50°C
L. O. purifier	automatic, self-	1	5900L/H, based on SAE#30at40°C
G/E L. O. purifier	automatic, self-	1	900L/H, based on SAE#30 at40°C

Nautical Instrument

Mag. compass	1 x wet type standard	Loran	1x Loran-C receiver
Gyro compass	2 x electric control type	Log	1x single axis type
Auto pilot	1 x adaptive autopilot	Echo sounder	Min. depth 0.3m
Radar	2set of rasterscan type	NNSS	
ARPA & RADAR		Load. computer	1 x off-line type
D. finder	1xradio direction finder	soft. maker	

Wireless Instrument

Radio tele.	1set of radio station	VHF tele.	2xVHF radio telepho
		Mari. satte.	1xstandard-C equip.

Aux. Boiler & Exh. Gas Economizer

Aux. boiler	automatic, forced draft, heavy fuel oil burning,
Type & No.	marine boiler with rotary cup type x 1set
Press. x Temp.	6kg/cm2g x 60deg. c
Evaporation	4500 kg/h
Exh. gas econo	forced circulating, surface extended water tube
Type & No.	type with steam drum x 1set
Press. x Temp.	6kg/cm2g x 60deg. c
Evaporation	4500 kg/h

Electric Generator

Generator Type No. & Capacity	Prime Mover Type No. & Capacity
marine design, IP44 enclosure	4-stroke, trunk piston, in-line type
brushless type	
2000kw x 720rpm x 3sets	2930ps x 720rpm x 3sets
emergency generator	emergency generator
marine design, IP23 enclosure	4-stroke, trunk piston type
brushless type	
200kw x 1800rpm x 1set	300ps x 1800rpm x 1set

Heat Exchanger & Miscellaneous

Item	Type	No.	
Main L. O. cooler	stainless ste.	1	2924000kcal/h
Main F. W. cooler	titanium plate	2	12108200kcal/h
Main F. O. heater	S&T, surface ex	2	100 - 150°C
Diesel G. F. W. cooler			
Boiler F. O. heater	maker's std	1	
Aux. condenser			
Purif. L. O. heater	S&T, surface ex	1	55 - 98°C
M. start. air vessel			
A. start. air vessel			
A-C blender			
Fresh W. generator	M/E jacket hea	1	36ton/day
Bilge separator			
Incinerator			
Sewage treat. device			

Tank

Item	NO x CAP. (cub. M)
F. O. settl. /serv.	1 x 100m3, 1 x 50m3, 1 x 50m3
D. O. settl. /serv.	1set x 23m3
L. O. drain/settl. /stor.	1x1, 1x64.5, 1x100
Cyl. O. storage	1set x 120m3

Control

Cont. Rm locat.	2nd deck
Main engine	electro pneumatic type
Aux. engine	

Trial Result

Beaufort No.		Sea cond.	sunny
df x dmid x da x Cb	4.52x6.5x8.72x0.569		
Displacement	34940	I/D (%)	

Eng. load	Speed	PS	rpm
50	22.735	27570	87.56
75	25.405	42184	100.2
85	26.002	47335	104.23
100	26.746	55543	109.7

Maneuvering Trial Result

Turning	advance	954.7	<4.5xL
	tact. dia.	1165.8	<5.0xL
Initial turning	10/10 deg		<2.5xL
Stopping ability			<15.0xL
Course keeping (Yaw check)	10/10 deg. 1st over.	3.6	
	2nd over.	4	
	20/20 deg. 1st over.	8	<25 deg.

Kind of ship	4300teu container carrier
Intend. cargo	container
Nav. area	
Class	LR
Route	
Builder	H. H. I.
Owner	Aktieselskabet Dampskibsselskab
Nationality	Denmark

Keel laid	Launched	Delivered
95-06-21	95-09-30	95-11-30

Principal Dimension (M)

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△ at d2		
Cb / Cp		
Cw		
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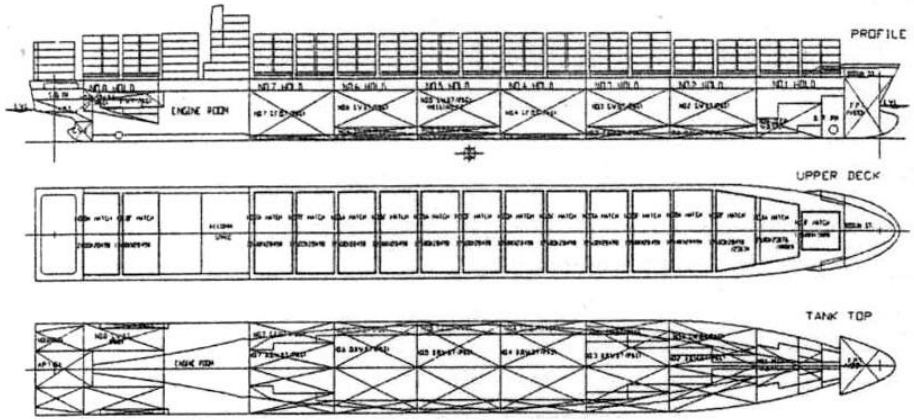
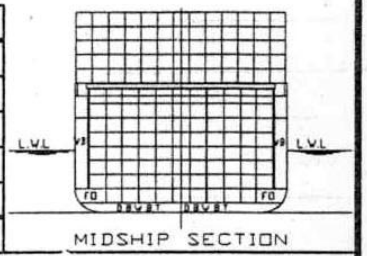
Length Aft	8.58 +	7.8
Tween Deck Height		

Light Weight Data

LWT	MT.
KG	LCG
Net Steel wt (HT.%)	MT.

Special Regulation





International Tonnage		Speed at d. (des.)	
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NT	29707	Endurance	20000 NM
Rudder		F.O. consump.	147.5 t/day
Af/A		P.T.O	BHP
Area, Area / (Lxd)	65.0, 1.88%	Complement	
Type x No.	semi-balanced type x 1set		28 + 6

Capacity

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W.B. (hold)		In hld. (TEU)	2116	TEU	11x8 (RxT)	Slop TK.	
		Total (TEU)	4322	TEU		Hold volume	
F.O	6109.6	Reefer Cont.	180 + 120	FEU	(deck + hold)	Flood. hld. No	
D.O	416.2	Dang. cargo hld				Car	
L.O	439.3	Lane length				Truck	
F.W	319.2	Car deck area				Trailer	

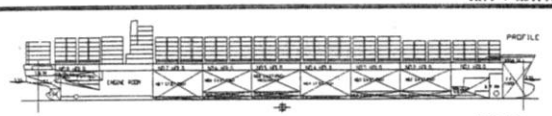
Cargo Handling (hatch size, cover type, cargo pump, car ramp, cargo gear, etc.)

Size of hatch: No. 1f 12480 x 12820
No. 1a 12480 x 22792/18100
No. 2f 12480 x 28050/23358
No. 2a, 3f, 3a, 4f, 4a, 5f, 5a, 6f, 6a, 7f, 7a, 8f, 8a 12480 x 23550
type: steel pontoon, non-sequential operation type
tightness: No. 1f, 1a, 2f and 2a : weathertight
Others : non-tight, but 3-faces of side panels to have packing
cleating: manual quick acting cleat between panel and hatch coaming top plate

NAME	DRAGOR MAERSK

Unit : Metric

Kind of ship	4300teu container carrier
Intend. cargo	container
Nav. area	
Class	LR
Route	



NAME	DRAGOR MAERSK

Unit : Metric

Main engine			
Type & No.	HYUNDAI-B&W 10K90MC-C		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	58600 x 104	58600 x 104	49810 x 98.5
F. O. C. rate (10, 200kcal/kg)	123.4 g/PS. hr at NCR		

Aux. Boiler & Exh. Gas Economizer	
Aux. boiler	automatic, forced draft, heavy fuel oil burning,
Type & No.	marine boiler with rotary cup type x 1set
Press. x Temp.	6kg/cm2g x 60deg. c
Evaporation	4500 kg/h

Anchor & Cable

Equip. No.	4090
Anchor	2xstockless JIS type, 12300kg/ea
Anchor chain	87mm Dia. x 715m
Moor. rope	deltaflex offshore type rope
	64mm dia. x 200m x 10sets

Deck Machinery & Miscel. Fitting

Steer. gear	1xelec-hydr, 2-ram-four cylinde
Windlass	2set x separate type combined
	with the mooring winch
Moor. winch	4set x 20ton x 15m/min
Capstan	
Hoist	
Ref mach. Air cond. Chamber	

Life Saving

Life boat	2 x fiberglass enclosed type
Rescue boat	life boat at portside in common
Life raft	4 x 15persons, 1 x 6persons
Boat devit	hinged gravity type
Boat winch	fixed electric motor

Fire fighting

Detector	
Cargo hold	Co2, sea water
Mach. room	Co2, Sea Water, port. fire. ext.
Accommo.	Sea Water, port. fire. extingu.
Em. F. pump	elec-motor, vert. centrifugal

Ventilation Fan

Cargo hold	axial flow type
Accommo.	axial flow type

Tank Heating

F. O. T.	steam heat. steel pipe:50mm
	heating area ratio:0.06m2/m3

Piping

W. B. pipe & Valve cont.	250mm above:ERW S 38(12.7mm)
	200mm below:STPG 38E(sch. 80)
	remote controlled valves
W. B. pump	500m3/h x 25mTH x 2sets
Bilge pipe	STPG 38E, sch. 80
F. O. pipe	STPG 38E, sch. 40
Heat. pipe	STPG 38S, sch. 80

Painting

Outside Shell	Bottom	T. E., V. T., S. P. C.
	Boottop	T. E., P. Urethane
	Top side	I. Z. S., E., P. Urethane
W. B. T	T. E.	
Cargo hld	tank top : I. Z. S., E. tie, E. fin.	
	others : I. Z. S.	

Accommodation

Area. No. of DK	1813 m2, 8 tiers
Cabin	moulded plastic. shelf inside
Toilet	wall mount
Public Space	msss and smoking rm, duty mess rm, gymnasium, library, conference rm

Elev. Sw. pool	Elev. :2nd - F dk, pool:E dk
Ref. chamber	meat : 25m3, veg. : 29m3

Others

Capstan
Hoist
Ref mach. Air cond. Chamber
Life Saving
Life boat 2 x fiberglass enclosed type
Rescue boat life boat at portside in common
Life raft 4 x 15persons, 1 x 6persons
Boat devit hinged gravity type
Boat winch fixed electric motor
Tank Heating
F. O. T. steam heat. steel pipe:50mm
heating area ratio:0.06m2/m3
Piping
W. B. pipe & Valve cont. 250mm above:ERW S 38(12.7mm)
200mm below:STPG 38E(sch. 80)
remote controlled valves
W. B. pump 500m3/h x 25mTH x 2sets
Bilge pipe STPG 38E, sch. 80
F. O. pipe STPG 38E, sch. 40
Heat. pipe STPG 38S, sch. 80
Public Space msss and smoking rm, duty mess rm
gymnasium, library, conference r
Elev. Sw. pool Elev. :2nd - F dk, pool:E dk
Ref. chamber meat : 25m3, veg. : 29m3
Others

L. O. purifier	automatic, self-	1	5900L/H, based on SAE#30at40°C	
G/E L. O. purifier	automatic, self-	1	900L/H, based on SAE#30 at40°C	

Nautical Instrument			
Mag. compass	1 x wet type standard	Loran	1x Loran-C receiver
Gyro compass	2 x electric control type	Log	1x single axis type
Auto pilot	1 x adaptive autopilot	Echo sounder	Min. depth 0.3m
Radar	2set of rasterscan type	NNSS	
ARPA & RADAR		Load. computer soft. maker	1 x off-line type
D. finder	1xradio direction finder		

Wireless Instrument			
Radio tele.	1set of radio station	VHF tele.	2xVHF radio telepho
		Mari. satte.	1xstandard-C equip.

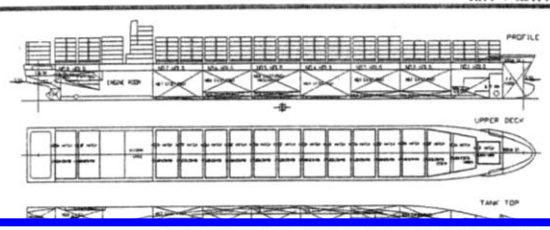
Displacement		I/D(S)	
Eng. load	Speed	PS	rpm
50	22.735	27570	87.56
75	25.405	42184	100.2
85	26.002	47335	104.23
100	26.746	55543	109.7

Maneuvering Trial Result			
Turning	advance	954.7	<4.5xL
	tact. dia.	1165.8	<5.0xL
Initial turning	10/10 deg		<2.5xL
Stopping ability			<15.0xL
Course keeping (Yaw check)	10/10 deg. 1st over.	3.6	
	2nd over.	4	
	20/20 deg. 1st over.	8	<25 deg.

NAME	DRAGOR MAERSK

Unit : Metric

Kind of ship	4300teu container carrier	
Intend. cargo	container	
Nav. area		
Class	LR	
Route		
Builder	H. H. I.	
Owner	Aktieselskabet Dampskibsselskab	
Nationality	Denmark	
Keel laid	Launched	Delivered
95-06-21	95-09-30	95-11-30



NAME	DRAGOR MAERSK

Unit : Metric

Main engine			
Type & No.	HYUNDAI-B&W 10K90MC-C		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	58600 x 104	58600 x 104	49810 x 98.5
F. O. C. rate (10, 200kcal/kg)	123.4	g/PS. hr at NCR	
Type of balancer			
Reduction Gear			
Type & No.			
Shaft output	M. C. R.	PS x	rpm

Aux. Boiler & Exh. Gas Economizer	
Aux. boiler	automatic, forced draft, heavy fuel oil burning,
Type & No.	marine boiler with rotary cup type x 1set
Press. x Temp.	6kg/cm2g x 60deg. c
Evaporation	4500 kg/h
Exh. gas econo	forced circulating, surface extended water tube
Type & No.	type with steam drum x 1set
Press. x Temp.	6kg/cm2g x 60deg. c
Evaporation	4500 kg/h
Electric Generator	

Main engine			
Type & No.	HYUNDAI-B&W 10K90MC-C		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	58600 x 104	58600 x 104	49810 x 98.5
F. O. C. rate (10, 200kcal/kg)	123.4	g/PS. hr at NCR	
Type of balancer			
Reduction Gear			
Type & No.			
Shaft output	M. C. R.	PS x	rpm
x Revol.	N. C. R	PS x	rpm
Shafting			
	Inter. shaft.		Prop. shaft.
No.			
Dia.	mm		mm
Length	mm		mm
Propeller			
Type & No.	fixed type x 1set		
blade NO.	6		
Dia. x pitch (0.7R)	7800 mm x	7986.2	mm
Exp. area ratio			
Material	NI, AL, BR		

Aux. Boiler & Exh. Gas Economizer	
Aux. boiler	automatic, forced draft, heavy fuel oil burning,
Type & No.	marine boiler with rotary cup type x 1set
Press. x Temp.	6kg/cm2g x 60deg. c
Evaporation	4500 kg/h
Exh. gas econo	forced circulating, surface extended water tube
Type & No.	type with steam drum x 1set
Press. x Temp.	6kg/cm2g x 60deg. c
Evaporation	4500 kg/h
Electric Generator	
Generator Type No. & Capacity	Prime Mover Type No. & Capacity
marine design, IP44 enclosure	4-stroke, trunk piston, in-line type
brushless type	
2000kw x 720rpm x 3sets	2930ps x 720rpm x 3sets
emergency generator	emergency generator
marine design, IP23 enclosure	4-stroke, trunk piston type
brushless type	
200kw x 1800rpm x 1set	300ps x 1800rpm x 1set

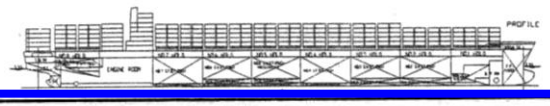
Capstan		Tank heating			
Hoist		F. O. T.	steam heat. steel pipe:50mm	Public	msss and smoking rm, duty mess rm
			heating area ratio:0.06m2/m3	Space	gymnasium, library, conference r
Ref mach.	Air cond. Chamber	Piping		Elev. Sw. pool	Elev. :2nd - F dk, pool:E dk
		W. B. pipe &	250mm above:ERW S 38(12.7mm) 200mm below:STPG 38E(sch. 80)	Ref. chamber	meat : 25m3, veg. : 29m3
Life Saving		Valve cont.	remote controlled valves	Others	
Life boat	2 x fiberglass enclosed type	W. B. pump	500m3/h x 25mTH x 2sets		
Rescue boat	life boat at portside in common	Bilge pipe	STPG 38E, sch. 80		
Life raft	4 x 15persons, 1 x 6persons	F. O. pipe	STPG 38E, sch. 40		
Boat devit	hinged gravity type	Heat. pipe	STPG 38S, sch. 80		
Boat winch	fixed electric motor				

L. O. purifier							
G/E L. O. purifier	automatic, self-	1	900L/H, based on SAE#30 at40°C				
Nautical Instrument				Eng. load	Speed	PS	rpm
Mag. compass	1 x wet type standard	Loran	1x Loran-C receiver	50	22.735	27570	87.56
Gyro compass	2 x electric control type	Log	1x single axis type	75	25.405	42184	100.2
Auto pilot	1 x adaptive autopilot	Echo sounder	Min. depth 0.3m	85	26.002	47335	104.23
Radar	2set of rasterscan type	NNSS		100	26.746	55543	109.7
ARPA & RADAR		Load. computer	1 x off-line type	**Maneuvering Trial Result**			
D. finder	1xradio direction finder	soft. maker		Turning	advance	954.7	<4.5xL
Wireless Instrument					tact. dia.	1165.8	<5.0xL
Radio tele.	1set of radio station	VHF tele.	2xVHF radio telepho	Initial turning	10/10 deg		<2.5xL
		Mari. satte.	1xstandard-C equip.	Stopping ability			<15.0xL
				Course keeping (Yaw check)	10/10 deg. 1st over.	3.6	
					2nd over.	4	
					20/20 deg. 1st over.	8	<25 deg.

NAME	DRAGOR MAERSK

Unit : Metric

Kind of ship	4300teu container carrier
Intend. cargo	container
Nav. area	
Class	LR



NAME	DRAGOR MAERSK

Unit : Metric

Main engine			
Type & No.	HYUNDAI-B&W 10K90MC-C		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	58600 x 104	58600 x 104	49810 x 98.5

Aux. Boiler & Exh. Gas Economizer	
Aux. boiler	automatic, forced draft, heavy fuel oil burning,
Type & No.	marine boiler with rotary cup type x 1set
Press. x Temp.	6kg/cm2g x 60deg. c
Evaporation	4500 kg/h

Auxiliary Machinery

Item	Type	No.	Capacity
Sea water cooling P.	M. D. V. C.	3	940m3/h x 20mTH
Fresh water cooling P.	M. D. V. C.	3	780m3/h x 25mTH
Main lub. oil pump	M. D. C. deepwell	2	1020m3/h x 45mTH
F. O. burning pump			
Boiler feed water pump	M. D. H. C.	2	8. 6m3/h x 100mTH
Hot water circ. pump	M. D. H. C.	1	2m3 x 5mTH
Forced draft fan			
Heel pump			
Sea W. service pump			
Fire & G. S. pump			
Bilge, fire & service P.	M. D. V. C.	2	310/90m3/h x 30/90mTH
Bilge pump	M. D. H. piston	1	5m3/h x 3. 5kg/cm2g
Fresh water pump			
F. O. trnasfer pump	M. D. H. G.	1	50m3/h x 3kg/cm2g
D. O. transfer pump	M. D. H. G.	1	50m3/h x 3kg/cm2g
L. O. transfer pump	M. D. H. G.	1	15m3/h x 6kg/cm2g
Vent. fan (supply)			
Main air compressor	M. D., 2stage	4	375m3/H F. A. D x 30kg/cmG
Emer. air compressor			

Heat Exchanger & Miscellaneous

Item	Type	No.	
Main L. O. cooler	stainless ste.	1	2924000kcal/h
Main F. W. cooler	titanium plate	2	12108200kcal/h
Main F. O. heater	S&T, surface ex	2	100 - 150°C
Diesel G. F. W. cooler			
Boiler F. O. heater	maker's std	1	
Aux. condenser			
Purif. L. O. heater	S&T, surface ex	1	55 - 98°C
M. start. air vessel			
A. start. air vessel			
A-C blender			
Fresh W. generator	M/E jacket hea	1	36ton/day
Bilge separator			
Incinerator			
Sewage treat. device			

Tank

Item	NO x CAP. (cub. M)
F. O. settl. /serv.	1 x 100m3, 1 x 50m3, 1 x 50m3
D. O. settl. /serv.	1set x 23m3
L. O. drain/settl. /stor.	1x1, 1x64. 5, 1x100
Cyl. O. storage	1set x 120m3

Control

Cont. Rm locat.	2nd deck
Main engine	electro pneumatic type
Aux. engine	

Ref mach.	Air cond.	
	Chamber	

Life Saving	
Life boat	2 x fiberglass enclosed type
Rescue boat	life boat at portside in common
Life raft	4 x 15persons, 1 x 6persons
Boat devit	hinged gravity type
Boat winch	fixed electric motor

Piping		
W. B. pipe & Valve cont.	250mm above: ERW S 38 (12. 7mm)	
	200mm below: STPG 38E (sch. 80)	
	remote controlled valves	
W. B. pump	500m3/h x 25mTH x 2sets	
Bilge pipe	STPG 38E, sch. 80	
F. O. pipe	STPG 38E, sch. 40	
Heat. pipe	STPG 38S, sch. 80	

Elev. Sw. pool	Elev. : 2nd - F dk, pool: E dk
Ref. chamber	meat : 25m3, veg. : 29m3
Others	

Gyro compass	2 x electric control type	Log	1x single axis type
Auto pilot	1 x adaptive autopilot	Echo sounder	Min. depth 0. 3m
Radar	2set of rasterscan type	NNSS	
ARPA & RADAR		Load. computer	1 x off-line type
D. finder	1xradio direction finder	soft. maker	

Wireless Instrument			
Radio tele.	1set of radio station	VHF tele.	2xVHF radio telepho
		Mari. satte.	1xstandard-C equip.

85	26. 002	47335	104. 23
100	26. 746	55543	109. 7

Maneuvering Trial Result				
Turning	advance	954. 7		<4. 5xL
	tact. dia.	1165. 8		<5. 0xL
Initial turning	10/10 deg			<2. 5xL
Stopping ability				<15. 0xL
Course keeping (Yaw check)	10/10 deg.	1st over.	3. 6	
		2nd over.	4	
	20/20 deg.	1st over.	8	<25 deg.

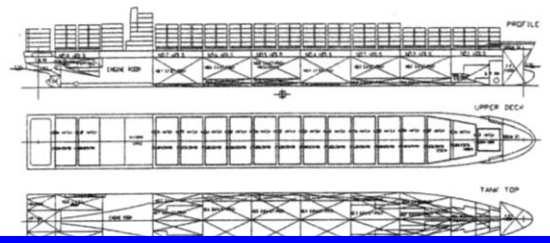
NAME	DRAGOR MAERSK

Unit : Metric

Kind of ship	4300teu container carrier
Intend. cargo	container
Nav. area	
Class	LR
Route	
Builder	H. H. I.
Owner	Aktieselskabet Dampskibsselskab
Nationality	Denmark

Keel laid	Launched	Delivered
95-06-21	95-09-30	95-11-30

Principal Dimension (M)



NAME	DRAGOR MAERSK

Unit : Metric

Main engine

Type & No.	HYUNDAI-B&W 10K90MC-C		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	58600 x 104	58600 x 104	49810 x 98.5
F. O. C. rate (10, 200kcal/kg)	123.4 g/PS. hr at NCR		
Type of balancer			

Reduction Gear

Type & No.			
Shaft output	M. C. R.	PS x	rpm
x Revol.	N. C. R	PS x	rpm

Shafting

Aux. Boiler & Exh. Gas Economizer

Aux. boiler	automatic, forced draft, heavy fuel oil burning,
Type & No.	marine boiler with rotary cup type x 1set
Press. x Temp.	6kg/cm2g x 60deg. c
Evaporation	4500 kg/h
Exh. gas econo	forced circulating, surface extended water tube
Type & No.	type with steam drum x 1set
Press. x Temp.	6kg/cm2g x 60deg. c
Evaporation	4500 kg/h

Electric Generator

Generator	Prime Mover
Type No. & Capacity	Type No. & Capacity

F. O. purifier	atuomatic, self-	4	4200L/H, based on 700cStat50°C
L. O. purifier	automatic, self-	1	5900L/H, based on SAE#30at40°C
G/E L. O. purifier	automatic, self-	1	900L/H, based on SAE#30 at40°C

Nautical Instrument

Mag. compass	1 x wet type standard	Loran	1x Loran-C receiver
Gyro compass	2 x electric control type	Log	1x single axis type
Auto pilot	1 x adaptive autopilot	Echo sounder	Min. depth 0.3m
Radar	2set of rasterscan type	NNSS	
ARPA & RADAR		Load. computer	1 x off-line type
D. finder	1xradio direction finder	soft. maker	

Wireless Instrument

Radio tele.	1set of radio station	VHF tele.	2xVHF radio telepho
		Mari. satte.	1xstandard-C equip.

Trial Result

Beaufort No.		Sea cond.	sunny
df x dmid x da x Cb		4.52x6.5x8.72x0.569	
Displacement	34940	I/D(%)	

Eng. load	Speed	PS	rpm
50	22.735	27570	87.56
75	25.405	42184	100.2
85	26.002	47335	104.23
100	26.746	55543	109.7

Maneuvering Trial Result

Turning	advance	954.7		<4.5xL
	tact. dia.	1165.8		<5.0xL
Initial turning	10/10 deg			<2.5xL
Stopping ability				<15.0xL
Course keeping (Yaw check)	10/10 deg.	1st over.	3.6	
		2nd over.	4	
	20/20 deg.	1st over.	8	<25 deg.

Moor. rope	deltaflex offshore type rope	Accomo.	Sea Water, port. fire. extingu.
	64mm dia. x 200m x 10sets	Em. F. pump	elec-motor, vert. centrifugal

Deck Machinery & Miscel. Fitting

Steer. gear	1xelec-hydr, 2-ram-four cylinde
Windlass	2set x separate type combined
	with the mooring winch
Moor. winch	4set x 20ton x 15m/min
Capstan	
Hoist	

Ref mach.	Air cond. Chamber	

Life Saving

Life boat	2 x fiberglass enclosed type
Rescue boat	life boat at portside in common
Life raft	4 x 15persons, 1 x 6persons
Boat devit	hinged gravity type
Boat winch	fixed electric motor

Ventilation Fan

Cargo hold	axial flow type	W. B. T	T. E.
Accomo.	axial flow type	Cargo hld	tank top : I. Z. S., E. tie, E. fin.

Tank Heating

F. O. T.	steam heat. steel pipe:50mm
	heating area ratio:0.06m2/m3

Piping

W. B. pipe & Valve cont.	250mm above:ERW S 38(12.7mm)	Elev. Sw. pool	Elev. :2nd - F dk, pool:E dk
	200mm below:STPG 38E(sch. 80)	Ref. chamber	meat : 25m3, veg. : 29m3
	remote controlled valves		
W. B. pump	500m3/h x 25mTH x 2sets		
Bilge pipe	STPG 38E, sch. 80		
F. O. pipe	STPG 38E, sch. 40		
Heat. pipe	STPG 38S, sch. 80		

Accommodation

Area. No. of DK	1813 m2, 8 tiers		
Cabin	moulded plastic. shelf inside		
Toilet	wall mount		
Public Space	msss and smoking rm, duty mess rm		
	gymnasium, library, conference r		

Others

Cont. Rm locat.	2nd deck		
Main engine	electro pneumatic type		
Aux. engine			
Main air compressor	M. D., 2stage	4	375m3/H F. A. D x 30kg/cmG
Emer. air compressor			

Trial Result

Beaufort No.		Sea cond.	sunny
df x dmid x da x Cb		4.52x6.5x8.72x0.569	
Displacement	34940	I/D(%)	

Eng. load	Speed	PS	rpm
50	22.735	27570	87.56
75	25.405	42184	100.2
85	26.002	47335	104.23
100	26.746	55543	109.7

Nautical Instrument

Mag. compass	1 x wet type standard	Loran	1x Loran-C receiver
Gyro compass	2 x electric control type	Log	1x single axis type
Auto pilot	1 x adaptive autopilot	Echo sounder	Min. depth 0.3m
Radar	2set of rasterscan type	NNSS	
ARPA & RADAR		Load. computer	1 x off-line type
D. finder	1xradio direction finder	soft. maker	

Wireless Instrument

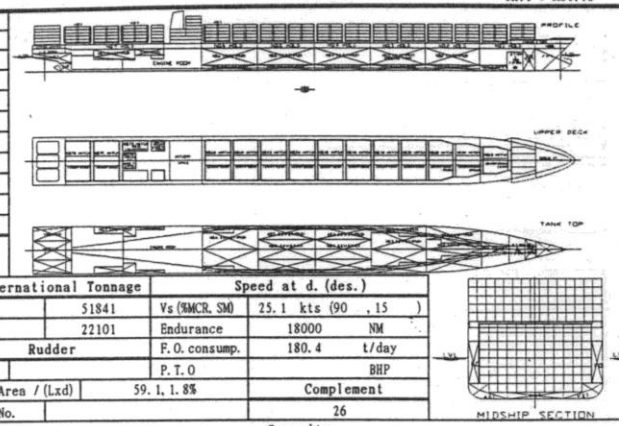
Radio tele.	1set of radio station	VHF tele.	2xVHF radio telepho
		Mari. satte.	1xstandard-C equip.

Container Carrier "Hyundai Fedral“ Outlined Specification

NAME HYUNDAI FEDRAL

Unit : Metric

Kind of ship	4400teu container carrier		
Intend. cargo	container		
Nav. area			
Class	KR, LR		
Route			
Builder	H. H. I.		
Owner	Hyundai Mer. Mar. Co LTD		
Nationality	PANAMA		
Keel laid	Launched	Delivered	
93-12-15	94-03-20	94-05-02	



Principal Dimension (M)

LOA	275						
LBP	263						
Bmld	37.1						
Dmld	21.7						
dmld (d1, des.)	12.5						
dext (d2, sum.)	13.6						
DWT at d1	52210.6						
DWT at d2	61086						
△ at d2							
Cb	Cp						
Cw							
LCB (%LBP)	(%)						
L/B	L/D	7.09	12.12				
B/D	B/d	1.71	2.968				
Camber	350						
Sheer (F. A)							
Length	Fore	11.675	+				
	Hold	211.975					
	Mach. Rm	26.05					
	Aft	13.3	+				
Tween Deck Height							

International Tonnage

GT	51841	Vs (%MCR, SM)	25.1 kts (90 , 15)
NT	22101	Endurance	18000 NM

Rudder

Af/A		F. O. consump.	180.4 t/day
		P. T. O	BHP
Area , Area / (Lxd)	59.1, 1.8%	Complement	
Type x No.		26	

Capacity

W. B	16976.4	On DK. (TEU)	2399	TEU 15x5	(RxT)	C. O. TK.	
W. B. (hold)		In hld. (TEU)	2012	TEU 12x8	(RxT)	Slop TK.	
		Total (TEU)	4411	TEU		Hold volume	
F. O	6827.3	Reefer Cont.		TEU		Flood. hld. No	
D. O	697.4	Dang. cargo hld				Car	
L. O	455.4	Lane length				Truck	
F. W	458.1	Car deck area				Trailer	

Light Weight Data

LWT		MT.	
KG	LCG		
Net Steel wt (HT. %)		MT.	

Special Regulation

Cargo Handling (hatch size, cover type, cargo pump, car ramp, cargo gear, etc.)

NO. 1A, 1B 12.6x20.86/15.4, NO. 2A 12.6x26/20.86, NO. 2B 12.6x31.28/26
NO. 3A, 3B, 4A, 4B, 5A, 5B, 6A, 6B, 7C, 7D 12.6x31.28 NO. 7A 6.4x7.94 (P&S)
NO. 7B 6.4x13.4 (C)
type: Non-tight, steel pontoon type hatch cover (weathertight steel pontoon type for hold NO. 1 and 2)
cleat: Non-cleat for hold NO. 3, 4, 5, 6, 7
Manual heavy bolt type cleat for hold NO. 1 and 2 for heavy sea water between hatch panel and hatch coaming top plate

Anchor & Cable

Equip. No.	4347
Anchor	2xstckless, high hold power ty
Anchor chain	1xflash butt welded stud link.
Moor. rope	atlas rope 60mm Dia x200m x14m

Deck Machinery & Miscel. Fitting

Steer. gear	1xelec-hydr, 2ram-4cylinder ty.
Windlass	2x separate type
Moor. winch	20ton x 15m/min x8sets
	split type
Capstan	1 x elec. motor, 1ton x 15m/min
Hoist	
Ref mach. Air cond. Chamber	

Life Saving

Life boat	2xfiberglass enclosed type
Rescue boat	
Life raft	4set x 15person, 1set x6 person
Boat devit	hinged gravity type
Boat winch	

Fire fighting

Detector	ion, thermal type
Cargo hold	Co2, Sea W., fixed water spray
Mach. room	Co2, Sea W., porta. fire exting.
Accommo.	sea water, porta. fire exting.
Em. F. pump	elec. motor, vert. centrifu. typ

Ventilation Fan

Cargo hold	Axial flow type
Accommo.	elec. motor driven centrifugal or axial ventilation

Tank Heating

F. O. T.	steam heating
	heating area ratio 0.04m2/m3

Piping

W. B. pipe & Valve cont.	250mm above, ERW steel (erws38 12.7 mm THK Galv.
W. B. pump	
Bilge pipe	ERW steel (JIS STPG 38E) sch40
F. O. pipe	ERW steel (JIS STPG 38E) sch40
Heat. pipe	SMLS steel (JIS STPG38S) sch80

Painting

Outside Shell	Bottom	tar epoxy A/C, vinly ta
	Boot top	sealer, S. P. C. A/F
	Top side	ant-abras. paint, epoxy
W. B. T	tar epoxy	
Cargo hld	bleached tar epoxy	

Accommodation

Area. No. of DK	1896
Cabin	moulded platstic, shelf insi
Toilet	wall mount
Public Space	mess Rm, lounge, wheelhouse&chart , radio Rm, contr-Rm, Gym. Hosp., rec Rm, conf-Rm, shipper-deck office
Elev. Sw. pool	
Ref. chamber	scupper with shphon type

Others

NAME HYUNDAI FEDRAL

Unit : Metric

Main engine

Type & No.	Hyundai-B&W 12K 90MC-C		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	x	67080x104	60370x100.4
F. O. C. rate (10, 200kcal/kg)	g/PS. hr at NCR		
	with or without booster		
Type of balancer			

Reduction Gear

Type & No.		
Shaft output x Revol.	M. C. R.	PS x rpm
	N. C. R	PS x rpm

Shafting

	Inter. shaft.	Prop. shaft.
No.		
Dia.	mm	mm
Length	mm	mm

Propeller

Type & No.			
blade NO.	6		
Dia. x pitch (0.7R)	8200 mm x	8161.1 mm	
Exp. area ratio			
Material	nichel aluminium bronze (grade Cu3)		

Aux. Boiler & Exh. Gas Economizer

Aux. boiler Type & No.	automatic, forced draft, heavy fuel oil burning, cylinderical type marine boiler with rotary cup
Press. x Temp.	type burner x 1set x7kg/cm2 x 60°C x 5800kg/h
Evaporation	
Exh. gas econo Type & No.	forced circulating, finned or pinned tube type 1set x 7kg/cm2 x 60°C x 3800kg/h
Press. x Temp.	
Evaporation	

Electric Generator

Generator Type No. & Capacity	Prime Mover Type No. & Capacity
marine design 1P 44enclosure brushless x 2set x (1750kw x 720rpm)	diesel engine: 4-stroke, trunk piston, in-line type x 2set x (2550ps x 720rpm)
2set x (1550kw x 720rpm)	2set x (2270ps x720rpm)
marine design 1P23 enclosure brushless x 1set	4-stroke trunk piston in-line type

Auxiliary Machinery

Item	Type	No.	M3/h x m x kw x rpm
Sea water cooling P.	M. D. V. C	3	1200m3/h x 20mTH
Fresh water cooling P.	M. D. V. C	3	1000m3/h x 25mTH
Lub. oil pump	M. D. C. Deep well	2	1100m3/h x 45mTH
F. O. burning pump			
Feed water pump	M. D. H. C.	2	9m3/h x 110mTH
Boiler W. circ. pump	M. D. H. C.	2	33m3/h x 40mTH
Forced draft fan			
Heel pump			
Sea W. service pump			
Fire & G. S. pump			
Fire, bilge & ballast P.	M. D. V. C.	2	500m3/h x 25kg/cm2G
Bilge pump	M. D. piston	1	10m3/h x 3kg/cm2G
Fresh water pump			
F. O. trnasfer pump	M. D. H. G.	1	60m3 x 3kg/cm2G
L. O. transfer pump	M. D. H. G.	1	10m3/h x 3kg/cm2G
Vent. fan (supply)			
Main air compressor	M. D., 2-stage	2	390m3/h F. A. D. 30kg/cm2G
Emer. air compressor	DED., 2-stage	1	4.5m3/h F. A. D. 30kg/cm2G
F. O. purifier	self-cleaning,	4	4400L/H (based on 700cStat50°C
L. O. purifier	self-cleaning,	2	4200L/H (based on SAE#30at40°C
D. O. purifier	self-cleaning,	1	2200L/H (based on 13cSt at40°C

Heat Exchanger & Miscellaneous

Item	Type	No.	Cap.
Main L. O. cooler	plate	2	1728600kcal/h
Main F. W. cooler	plate	2	14015000kcal/h
Main F. O. heater	S&T surface ex	2	100-150°C
Diesel G. F. W. cooler			
Boiler F. O. heater		2	
Aux. condenser			
Purif. L. O. heater	S&T surface ex	2	45 - 85°C
M. start. air vessel			
A. start. air vessel			
A-C blender			
Fresh W. generator	M/E jacket. hea	1	40ton/day
Bilge separator	gravity&filter	1	10m3/h
Incinerator	sludge. burning	1	500000kcal/h
Sewage treat. device			

Tank

Item	NO x CAP. (cub. M)
F. O. settl. /serv.	1set x 170m3, 1set x 170m3
D. O. settl. /serv.	1set x 15m3, 1set x 15m3
L. O. drain/settl. /stor.	1set x 66.5m3, 1set x 70m3
Cyl. O. storage	2set x 29m3

Control

Cont. Rm locat.	
Main engine	
Aux. engine	

Trial Result

Beaufort No.		Sea cond.	
df x dmid x da x Cb			
Displacement			t/D(%)
Eng. load	Speed	PS	rpm

Nautical Instrument

Mag. compass	1x transmitting type	Loran	
Gyro compass	2set of gyro compass	Log	1xdpler, 1xspd. trans
Auto pilot	1 set	Echo sounder	1set with transducr
Radar	2set x rasterscan type	NNSS	
ARPA & RADAR		Load. computer	1set
D. finder	1set of radio detec. findr	soft. maker	

Wireless Instrument

Radio tele.	1 x transmitter, 1xreceivr	VHF tele.	1 set
	1 x automatic keying unit	Mari. satte.	1 set
	1 x auto alarm receiver		
	1 x watch keeping receivr		

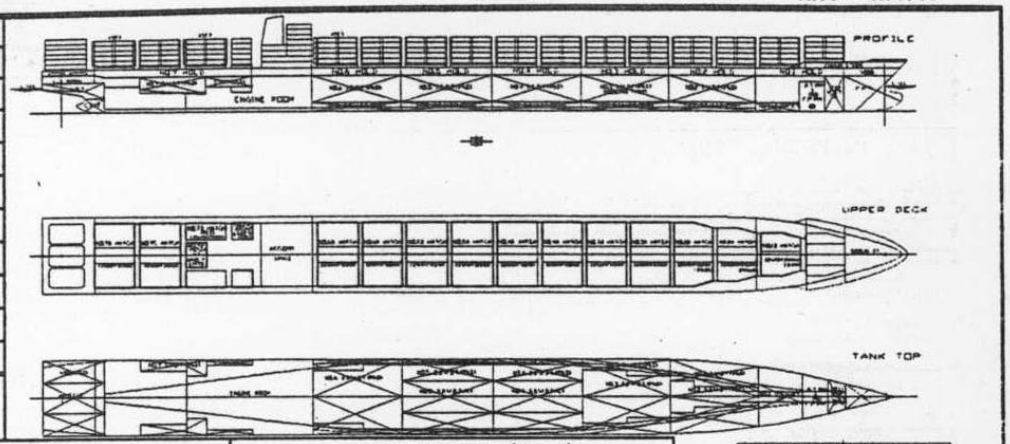
Maneuvering Trial Result

Turning	advance	949.6m	<4.5xL
	tact. dia.	1209.4m	<5.0xL
Initial turning	10/10 deg		<2.5xL
Stopping ability		3522.1m	<15.0xL
Course keeping (Yaw check)	10/10 deg.	1st over.	
		2nd over.	
	20/20 deg.	1st over.	<25 deg.

Unit : Metric

Kind of ship	4400teu container carrier
Intend. cargo	container
Nav. area	
Class	KR, LR
Route	
Builder	H. H. I.
Owner	Hyundai Mer. Mar. Co LTD
Nationality	PANAMA

Keel laid	Launched	Delivered
93-12-15	94-03-20	94-05-02



Principal Dimension (M)

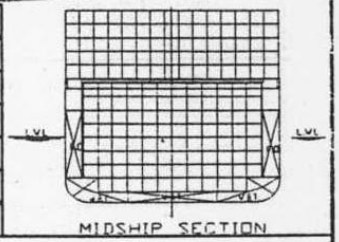
LOA	275
LBP	263
Bmld	37.1
Dmld	21.7
dmld (d1, des.)	12.5
dext (d2, sum.)	13.6
DWT at d1	52210.6
DWT at d2	61086
△ at d2	
Cb / Cp	
Cw	
LCB (%LBP)	(%)
L/B / L/D	7.09 / 12.12
B/D / B/d	1.71 / 2.968
Camber	350
Sheer (F. A)	
Length: Fore	11.675 +
Length: Hold	211.975
Length: Mach. Rm	26.05
Length: Aft	13.3 +
Tween Deck Height	

International Tonnage

GT	51841
NT	22101
Rudder	
Af/A	
Area , Area / (Lxd)	59.1, 1.8%
Type x No.	

Speed at d. (des.)

Vs (%MCR, SM)	25.1 kts (90 , 15)
Endurance	18000 NM
F. O. consump.	180.4 t/day
P. T. O	BHP
Complement	26



Capacity

W. B	16976.4	On DK. (TEU)	2399 TEU 15x5 (RxT)	C. O. TK.	
W. B. (hold)		In hld. (TEU)	2012 TEU 12x8 (RxT)	Slop TK.	
		Total (TEU)	4411 TEU	Hold volume	
F. O	6827.3	Reefer Cont.	TEU	Flood. hld. No	
D. O	697.4	Dang. cargo hld		Car	
L. O	455.4	Lane length		Truck	
F. W	458.1	Car deck area		Trailer	

Light Weight Data

LWT		MT.
KG	LCG	
Net Steel wt (HT. %)		MT.

Special Regulation

Cargo Handling (hatch size, cover type, cargo pump, car ramp, cargo gear, etc.)

NO. 1A, 1B 12.6x20.86/15.4, NO. 2A 12.6x26/20.86, NO. 2B 12.6x31.28/26

NO. 3A, 3B, 4A, 4B, 5A, 5B, 6A, 6B, 7C, 7D 12.6x31.28 NO. 7A 6.4x7.94 (P&S)

NO. 7B 6.4x13.4 (C)

type: Non-tight, steel pontoon type hatch cover (weathertight steel pontoon type for hold NO. 1 and 2)

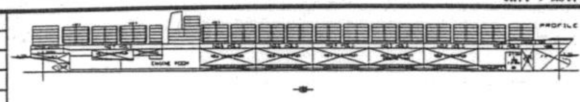
cleat: Non-cleat for hold NO. 3, 4, 5, 6, 7

Manual heavy bolt type cleat for hold NO. 1 and 2 for heavy sea water between hatch panel and hatch coaming top plate

NAME	HYUNDAI FEDRAL

Unit : Metric

Kind of ship	4400teu container carrier
Intend. cargo	container
Nav. area	
Class	KR, LR
Route	



NAME	HYUNDAI FEDRAL

Unit : Metric

Main engine				Aux. Boiler & Exh. Gas Economizer	
Type & No.	Hyundai-B&W 12K 90MC-C			Aux. boiler	automatic, forced draft, heavy fuel oil burning,
Output (BHP) xRPM	M. C. R.	D. M. C. R	N. C. R	Type & No.	cylinderical type marine boiler with rotary cup
	x	67080x104	60370x100. 4	Press. x Temp.	type burner x 1set x7kg/cm2 x 60°C x 5800kg/h

Anchor & Cable

Equip. No.	4347
Anchor	2xstckless, high hold power ty
Anchor chain	1xflash butt welded stud link.
Moor. rope	atlas rope 60mm Dia x200m x14m

Deck Machinery & Miscel. Fitting

Steer. gear	1xelec-hydr, 2ram-4cylinder ty.
Windlass	2x separate type
Moor. winch	20ton x 15m/min x8sets
	split type
Capstan	1 x elec. motor, 1ton x 15m/min
Hoist	
Ref mach. Air cond.	
Ref mach. Chamber	

Life Saving

Life boat	2xfiberglass enclosed type
Rescue boat	
Life raft	4set x 15person, 1set x6 person
Boat devit	hinged gravity type
Boat winch	

Fire fighting

Detector	ion, thermal type
Cargo hold	Co2, Sea W., fixed water spray
Mach. room	Co2, Sea W., porta. fire exting.
Accommo.	sea water, porta. fire exting.
Em. F. pump	elec. motor, vert. centrifu. typ

Ventilation Fan

Cargo hold	Axial flow type
Accommo.	elec. motor driven centrifugal
	or axial ventilation

Tank Heating

F. O. T.	steam heating
	heating area ratio 0. 04m2/m3

Piping

W. B. pipe & Valve cont.	250mm above, ERW steel (erws38
	12. 7 mm THK Galv.
W. B. pump	
Bilge pipe	ERW steel (JIS STPG 38E) sch40
F. O. pipe	ERW steel (JIS STPG 38E) sch40
Heat. pipe	SMLS steel (JIS STPG38S) sch80

Painting

Outside Shell	Bottom	tar epoxy A/C, vinly tar-
	Boot top	sealer, S. P. C. A/F
	Top side	ant-abras. paint, epoxy f.
W. B. T	tar epoxy	
Cargo hld	bleached tar epoxy	

Accommodation

Area. No. of DK	1896
Cabin	moulded platstic, shelf inside
Toilet	wall mount
Public Space	mess Rm. lounge, wheelhouse&chart sp
	, radio Rm. contr-Rm. Gym. Hosp., rec-
	Rm. conf-Rm. shipper-deck office
Elev. Sw. pool	
Ref. chamber	scupper with shphon type

Others

Moor. winch	20ton x 15m/min x8sets		or axial ventilation	Toilet	wall mount
	split type	Tank Heating			
Capstan	1 x elec. motor, 1ton x 15m/min	F. O. T.	steam heating	Public Space	mess Rm. lounge, wheelhouse&chart
Hoist			heating area ratio 0. 04m2/m3		, radio Rm. contr-Rm. Gym. Hosp., rec
					Rm. conf-Rm. shipper-deck office
Ref Air cond.		Piping		Elev. Sw. pool	
mach. Chamber		W. B. pipe & Valve cont.	250mm above, ERW steel (erws38	Ref. chamber	scupper with shphon type
			12. 7 mm THK Galv.	Others	
Life Saving					
Life boat	2xfiberglass enclosed type	W. B. pump			
Rescue boat		Bilge pipe	ERW steel (JIS STPG 38E) sch40		
Life raft	4set x 15person, 1set x6 person	F. O. pipe	ERW steel (JIS STPG 38E) sch40		
Boat devit	hinged gravity type	Heat. pipe	SMLS steel (JIS STPG38S) sch80		
Boat winch					

F. O. purifier	self-cleaning,	4	4400L/H (based on 700cSt at50°C
L. O. purifier	self-cleaning,	2	4200L/H (based on SAE#30at40°C
D. O. purifier	self-cleaning,	1	2200L/H (based on 13cSt at40°C

Nautical Instrument

Mag. compass	1x transmitting type	Loran	
Gyro compass	2set of gyro compass	Log	1xdpler, 1xspd. trans
Auto pilot	1 set	Echo sounder	1set with transducr
Radar	2set x rasterscan type	NNSS	
ARPA & RADAR		Load. computer	1set
D. finder	1set of radio detec. findr	soft. maker	

Wireless Instrument

Radio tele.	1 x transmitter, 1xreceivr	VHF tele.	1 set
	1 x automatic keying unit	Mari. satte.	1 set
	1 x auto alarm receiver		
	1 x watch keeping receivr		

Displacement		I/D (%)	
Eng. load	Speed	PS	rpm

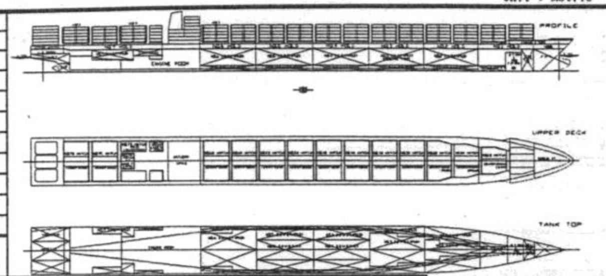
Maneuvering Trial Result

Turning	advance	949. 6m	<4. 5xL
	tact. dia.	1209. 4m	<5. 0xL
Initial turning	10/10 deg		<2. 5xL
Stopping ability		3522. 1m	<15. 0xL
Course keeping (Yaw check)	10/10 deg. 1st over.		
	2nd over.		
	20/20 deg. 1st over.		<25 deg.

NAME	HYUNDAI FEDRAL

Unit : Metric

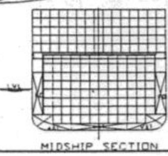
Kind of ship	4400teu container carrier	
Intend. cargo	container	
Nav. area		
Class	KR, LR	
Route		
Builder	H.H.I.	
Owner	Hyundai Mer. Mar. Co LTD	
Nationality	PANAMA	
Keel laid	Launched	Delivered
93-12-15	94-03-20	94-05-02



Principal Dimension (M)

LOA	275	
LBP	263	
Bmld	37.1	
Dmld	21.7	
dmld (d1, des.)	12.5	
dext (d2, sum.)	13.6	
DWT at d1	52210.6	
DWT at d2	61086	
△ at d2		
Cb / Cp		
Cw		

International Tonnage		Speed at d. (des.)	
GT	51841	Vs (%MCR, SM)	25.1 kts (90 , 15)
NT	22101	Endurance	18000 NM
Rudder		F.O. consump.	180.4 t/day
Af/A		P.T.O	BHP
Area , Area / (Lxd)	59.1, 1.8%	Complement	
Type x No.			26



Capacity

W.B	16976.4	On DK. (TEU)	2399 TEU 15x5 (RxT)	C.O.TK.
W.B (hold)		In hld (TEU)	2012 TEU 12x8 (RxT)	Slop TK

NAME	HYUNDAI FEDRAL

Unit : Metric

Main engine			
Type & No.	Hyundai-B&W 12K 90MC-C		
Output (BHP) xRPM	M.C.R.	D.M.C.R	N.C.R
	x	67080x104	60370x100.4
F.O.C. rate (10,200kcal/kg)	g/PS.hr at NCR		
	with or without booster		
Type of balancer			
Reduction Gear			
Type & No.			
Shaft output x Revol.	M.C.R.	PS x	rpm
	N.C.R	PS x	rpm
Shafting			
	Inter. shaft.	Prop. shaft.	
No.			
Dia.	mm	mm	
Length	mm	mm	
Propeller			
Type & No.			
blade NO.	6		
Dia. x pitch (0.7R)	8200 mm x	8161.1 mm	
Exp. area ratio			
Material	nichel aluminium bronze (grade Cu3)		

Aux. Boiler & Exh. Gas Economizer	
Aux. boiler	automatic, forced draft, heavy fuel oil burning,
Type & No.	cylinderical type marine boiler with rotary cup
Press. x Temp.	type burner x 1set x7kg/cm2 x 60°C x 5800kg/h
Evaporation	
Exh. gas econo	forced circulating, finned or pinned tube type
Type & No.	1set x 7kg/cm2 x 60°C x 3800kg/h
Press. x Temp.	
Evaporation	

Electric Generator	
Generator Type No. & Capacity	Prime Mover Type No. & Capacity
marine design IP 44enclosure	diesel engine:4-stroke, trunk
brushless x 2set x (1750kw x	piston, in-line type x 2set x
720rpm)	(2550ps x 720rpm)
2set x (1550kw x 720rpm)	2set x (2270ps x720rpm)
marine design IP23 enclosure	4-stroke trunk piston in-line type
brushless x 1set	

Main engine			
Type & No.	Hyundai-B&W 12K 90MC-C		
Output (BHP) xRPM	M.C.R.	D.M.C.R	N.C.R
	x	67080x104	60370x100.4
F.O.C. rate (10,200kcal/kg)	g/PS.hr at NCR		
	with or without booster		
Type of balancer			
Reduction Gear			
Type & No.			
Shaft output x Revol.	M.C.R.	PS x	rpm
	N.C.R	PS x	rpm
Shafting			
	Inter. shaft.	Prop. shaft.	
No.			
Dia.	mm	mm	
Length	mm	mm	
Propeller			
Type & No.			
blade NO.	6		
Dia. x pitch (0.7R)	8200 mm x	8161.1 mm	
Exp. area ratio			
Material	nichel aluminium bronze (grade Cu3)		

Aux. Boiler & Exh. Gas Economizer	
Aux. boiler	automatic, forced draft, heavy fuel oil burning,
Type & No.	cylinderical type marine boiler with rotary cup
Press. x Temp.	type burner x 1set x7kg/cm2 x 60°C x 5800kg/h
Evaporation	
Exh. gas econo	forced circulating, finned or pinned tube type
Type & No.	1set x 7kg/cm2 x 60°C x 3800kg/h
Press. x Temp.	
Evaporation	

Electric Generator	
Generator Type No. & Capacity	Prime Mover Type No. & Capacity
marine design IP 44enclosure	diesel engine:4-stroke, trunk
brushless x 2set x (1750kw x	piston, in-line type x 2set x
720rpm)	(2550ps x 720rpm)
2set x (1550kw x 720rpm)	2set x (2270ps x720rpm)
marine design IP23 enclosure	4-stroke trunk piston in-line type
brushless x 1set	

NAME | HYUNDAI FEDRAL

Unit : Metric

Auxiliary Machinery

Item	Type	No.	M3/h x m x kw x rpm
Sea water cooling P.	M. D. V. C	3	1200m3/h x 20mTH
Fresh water cooling P.	M. D. V. C	3	1000m3/h x 25mTH
Lub. oil pump	M. D. C. Deep well	2	1100m3/h x 45mTH
F. O. burning pump			
Feed water pump	M. D. H. C.	2	9m3/h x 110mTH
Boiler W. circ. pump	M. D. H. C.	2	33m3/h x 40mTH
Forced draft fan			
Heel pump			
Sea W. service pump			
Fire & G. S. pump			
Fire, bilge & ballast P.	M. D. V. C.	2	500m3/h x 25kg/cm2G
Bilge pump	M. D. piston	1	10m3/h x 3kg/cm2G
Fresh water pump			
F. O. trnasfer pump	M. D. H. G.	1	60m3 x 3kg/cm2G
L. O. transfer pump	M. D. H. G.	1	10m3/h x 3kg/cm2G
Vent. fan (supply)			
Main air compressor	M. D., 2-stage	2	390m3/h F. A. D. 30kg/cm2G
Emer. air compressor	DED., 2-stage	1	4. 5m3/h F. A. D. 30kg/cm2G
F. O. purifier	self-cleaning,	4	4400L/H (based on 700cSt at 50°C
L. O. purifier	self-cleaning,	2	4200L/H (based on SAE#30 at 40°C
D. O. purifier	self-cleaning,	1	2200L/H (based on 13cSt at 40°C

Heat Exchanger & Miscellaneous

Item	Type	No.	Cap.
Main L. O. cooler	plate	2	1728600kcal/h
Main F. W. cooler	plate	2	14015000kcal/h
Main F. O. heater	S&T surface ex	2	100-150°C
Diesel G. F. W. cooler			
Boiler F. O. heater		2	
Aux. condenser			
Purif. L. O. heater	S&T surface ex	2	45 - 85°C
M. start. air vessel			
A. start. air vessel			
A-C blender			
Fresh W. generator	M/E jacket. hea	1	40ton/day
Bilge separator	gravity&filter	1	10m3/h
Incinerator	sludge. burning	1	500000kcal/h
Sewage treat. device			

Tank

Item	NO x CAP. (cub. M)
F. O. settl. /serv.	1set x 170m3, 1set x 170m3
D. O. settl. /serv.	1set x 15m3, 1set x 15m3
L. O. drain/settl. /stor.	1set x 66. 5m3, 1set x 70m3
Cyl. O. storage	2set x 29m3

Control

Cont. Rm locat.	
Main engine	
Aux. engine	

Trial Result

Beaufort No.		Sea cond.	
df x dmid x da x Cb			
Displacement		I/D(%)	
Eng. load	Speed	PS	rpm

NAME | HYUNDAI FEDRAL

Unit : Metric

Aux Boiler & Exh. Gas Economizer

Life raft	4set x 13person, 1set x6 person		
Boat devit	hinged gravity type	Heat. pipe	SMLS steel (JIS STPG38S) sch80
Boat winch			

1 x automatic keying unit	Mart. satte.	1 set	Course keeping (Yaw check)	10/10 deg.	1st over.	
1 x auto alarm receiver					2nd over.	
1 x watch keeping receivr				20/20 deg.	1st over.	<25 deg.

NAME	HYUNDAI FEDRAL

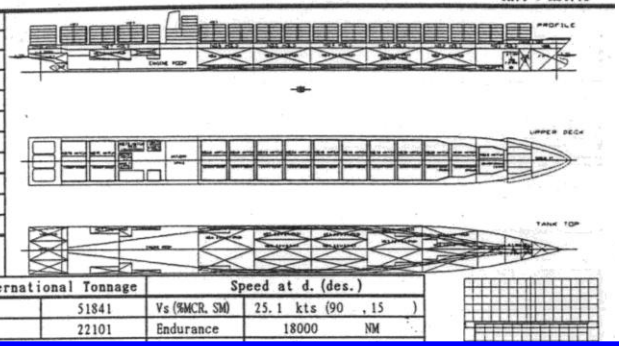
Unit : Metric

Kind of ship	4400teu container carrier
Intend. cargo	container
Nav. area	
Class	KR, LR
Route	
Builder	H. H. I.
Owner	Hyundai Mer. Mar. Co LTD
Nationality	PANAMA
Keel laid	Launched / Delivered
93-12-15	94-03-20 / 94-05-02

Principal Dimension (M)

LOA	275
LBP	263
Bmld	37.1
Dmld	21.7
dmld (d1. des.)	12.5

International Tonnage		Speed at d. (des.)	
GT	51841	Vs (%MCR, SM)	25.1 kts (90 , 15)
NT	22101	Endurance	18000 NM



NAME	HYUNDAI FEDRAL

Unit : Metric

Main engine

Type & No.	Hyundai-B&W 12K 90MC-C		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	x	67080x104	60370x100. 4
F. O. C. rate (10, 200kcal/kg)	g/PS. hr at NCR		
	with or without booster		
Type of balancer			

Reduction Gear

Type & No.		
Shaft output	M. C. R.	PS x rpm
x Revol.	N. C. R	PS x rpm

Shafting

	Inter. shaft.	Prop. shaft.
No.		
Dia.	mm	mm
Length	mm	mm

Aux. Boiler & Exh. Gas Economizer

Aux. boiler	automatic, forced draft, heavy fuel oil burning,
Type & No.	cylinderical type marine boiler with rotary cup
Press. x Temp.	type burner x 1set x7kg/cm2 x 60°C x 5800kg/h
Evaporation	
Exh. gas econo	forced circulating, finned or pinned tube type
Type & No.	1set x 7kg/cm2 x 60°C x 3800kg/h
Press. x Temp.	
Evaporation	

Electric Generator

Generator Type No. & Capacity	Prime Mover Type No. & Capacity
marine design IP 44enclosure brushless x 2set x (1750kw x 720rpm)	diesel engine:4-stroke, trunk piston, in-line type x 2set x (2550ps x 720rpm)
2set x (1550kw x 720rpm)	2set x (2270ps x720rpm)

Nautical Instrument

Mag. compass	1x transmitting type	Loran	
Gyro compass	2set of gyro compass	Log	1xdpler, 1xspd. trans
Auto pilot	1 set	Echo sounder	1set with transducr
Radar	2set x rasterscan type	NNSS	
ARPA & RADAR		Load. computer	1set
D. finder	1set of radio detec. findr	soft. maker	

Wireless Instrument

Radio tele.	1 x transmitter, 1xreceivr	VHF tele.	1 set
	1 x automatic keying unit	Mari. satte.	1 set
	1 x auto alarm receiver		
	1 x watch keeping receivr		

Maneuvering Trial Result

Turning	advance	949. 6m	<4. 5xL
	tact. dia.	1209. 4m	<5. 0xL
Initial turning	10/10 deg		<2. 5xL
Stopping ability		3522. 1m	<15. 0xL
Course keeping (Yaw check)	10/10 deg.	1st over.	
		2nd over.	
	20/20 deg.	1st over.	<25 deg.

Anchor & Cable

Equip. No.	4347
Anchor	2xstckless, high hold power ty
Anchor chain	1xflash butt welded stud link.
Moor. rope	atlas rope 60mm Dia x200m x14m

Deck Machinery & Miscel. Fitting

Steer. gear	1xelec-hydr, 2ram-4cylinder ty.
Windlass	2x separate type
Moor. winch	20ton x 15m/min x8sets
	split type
Capstan	1 x elec. motor, 1ton x 15m/min
Hoist	
Ref mach. Air cond. Chamber	

Life Saving

Life boat	2xfiberglass enclosed type
Rescue boat	
Life raft	4set x 15person, 1set x6 person
Boat devit	hinged gravity type
Boat winch	

Fire fighting

Detector	ion. thermal type	
Cargo hold	Co2, Sea W., fixed water spray	
Mach. room	Co2, Sea W., porta. fire exting.	
Accomo.	sea water, porta. fire exting.	
Em. F. pump	elec. motor, vert. centrifu. typ	

Ventilation Fan

Cargo hold	Axial flow type
Accomo.	elec. motor driven centrifugal or axial ventilation

Tank Heating

F. O. T.	steam heating
	heating area ratio 0. 04m2/m3

Piping

W. B. pipe & Valve cont.	250mm above, ERW steel (erws38 12. 7 mm THK Galv.
W. B. pump	
Bilge pipe	ERW steel (JIS STPG 38E) sch40
F. O. pipe	ERW steel (JIS STPG 38E) sch40
Heat. pipe	SMLS steel (JIS STPG38S) sch80

Painting

Outside Shell	Bottom	tar epoxy A/C, vinly ta
	Boot top	sealer, S. P. C. A/F
	Top side	ant-abras. paint, epoxy
W. B. T	tar epoxy	
Cargo hld	bleached tar epoxy	

Accommodation

Area. No. of DK	1896
Cabin	moulded platstic, shelf insi
Toilet	wall mount
Public Space	mess Rm, lounge, wheelhouse&chart , radio Rm, contr-Rm, Gym. Hosp., rec Rm, conf-Rm, shipper-deck office
Elev. Sw. pool	
Ref. chamber	scupper with shphon type

Others

Fresh water pump				Item	No x Cap. (Cub. M)
F. O. trnasfer pump	M. D. H. G.	1	60m3 x 3kg/cm2G	F. O. settl. /serv.	1set x 170m3, 1set x 170m3
				D. O. settl. /serv.	1set x 15m3, 1set x 15m3
L. O. transfer pump	M. D. H. G.	1	10m3/h x 3kg/cm2G	L. O. drain/settl. /stor.	1set x 66. 5m3, 1set x 70m3
				Cyl. O. storage	2set x 29m3
Vent. fan (supply)				**Control**	
				Cont. Rm locat.	
Main air compressor	M. D., 2-stage	2	390m3/h F. A. D. 30kg/cm2G	Main engine	
Emer. air compressor	DED., 2-stage	1	4. 5m3/h F. A. D. 30kg/cm2G	Aux. engine	
				Trial Result	
				Beaufort No.	Sea cond.
F. O. purifier	self-cleaning,	4	4400L/H (based on 700cStat50°C	df x dmid x da x Cb	
L. O. purifier	self-cleaning,	2	4200L/H (based on SAE#30at40°C	Displacement	I/D(%)
D. O. purifier	self-cleaning	1	2200L/H (based on 13cSt at40°C	Eng. load	Speed PS rpm

Nautical Instrument

Mag. compass	1x transmitting type	Loran	
Gyro compass	2set of gyro compass	Log	1xdpler, 1xspd. trans
Auto pilot	1 set	Echo sounder	1set with transducr
Radar	2set x rasterscan type	NNSS	
ARPA & RADAR		Load. computer	1set
D. finder	1set of radio detec. findr	soft. maker	

Wireless Instrument

Radio tele.	1 x transmitter, 1xreceivr	VHF tele.	1 set
	1 x automatic keying unit	Mari. satte.	1 set
	1 x auto alarm receiver		
	1 x watch keeping receivr		

Maneuvering Trial Result

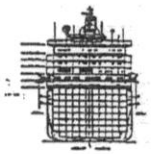
Turning	advance	94
	tact. dia.	120
Initial turning	10/10 deg	
Stopping ability		352
Course keeping (Yaw check)	10/10 deg.	1st over.
		2nd over.
	20/20 deg.	1st over.

Container Carrier "Hamburg Express" Outlined Specification

H.NO.1097 | Name | M/V "HAMBURG EXPRESS"

Unit : Metric

Kind of ship	CONTAINER VESSEL
Intend.cargo	20',40'CONT.& BULK CARGO IN NO.3 HOLD
Nav.area	OCEAN GOING
Class	Germanischer Lloyd
Route	FAR EAST & EUROPE
Builder	SAMSUNG HEAVY IND.
Owner	HAPAG-LLOYD AKTIENGESELLSCHAFT
Nationality	GERMANY
Keel laid	Launched / Delivered
1994.01.25	1994.09.15 / 1994.12.15



Principal Dimension (M)

LOA	294.00						
LBP	281.60						
Bmld	32.25	International Tonnage		Speed at d.(des.)			
Dmld	21.40	GT	54000	Vs(%MCR,SM)	23.0 kts (90% , %)		
dmld(d1,des.)	12.021	NT	23499	Endurance	24000 NM		
dext(d2,sum.)	13.521	Rudder		F.O.consump.	121.0g/PS.HR		
DWT at d1	55600	Af/A	0.26	P.T.O	BHP		
DWT at d2	67686	Area , Area /(Lxd)	72.0	Complement			
△ at d2		Type x No.	SEMI-SPADE X 1	26 P			
Cb : Cp		Capacity					
Cw : Cm		W.B 16738	On DK.(TEU)	TEU (RxT)	C.O.TK.		
LCB(%LBP)	-1.8 %	W.B.(hold)	In hld.(TEU)	TEU (RxT)	Slop TK.	255	
L/B : L/D	8.73 / 13.159		Total(TEU)	4422 TEU	Hold volume		
B/D : B/d	1.507 / 2.683	F.O 7362	Reefer Cont.	452 TEU	Flood.hld.No		
Camber		D.O 355	Dang.cargo hld		Car		
Sheer(F.A)	0.4M(:ON F'CLE DK)	L.O 426	Lane length		Truck		
Length: Fore	16.650 M	F.W 288	Car deck area		Trailer		
Length: Hold	235.440 M						
Length: Mach.Rm	25.760 M						
Length: Aft	16.150 M						
Tween Deck Height	17.66 M (2ND DK) / 17.00 M (f'BD DK:E/R 3RD DK)						

Cargo Handling(hatch size,cover type, cargo pump, car ramp, cargo gear, etc.)

Light Weight Data

LWT	MT.		
KG / LCG			
Net Steel wt(HT.%)	MT. (%)		

Special Regulation

- SBG 1984 - ILO CONVENTION
- DSV - ICLL 1966 - ISO 2631,4867 ETC.
- SOLAS 1974 / 78,83 -INTER.TONN.MEAS
- MARPOL 1973 / 78 -IMO NOISE A.343/A.468

Anchor & Cable

Equip.No.	4197
Anchor	13.5T X 2SETS('SPEK'TYPE)
Anchor chain	φ87×687.5 m(:K3 GRADE)
Moor.rope	φ60 X 220M X 10 LINES

Deck Machinery & Miscel. Fitting

Steer.gear	3840 KN.M X 1, RAM TYPE
Windlass	36.7T X 9M/MIN X 2 SETS
Bow Thruster	2500 kw X C.P.P X 1SETS
Moor.winch	20T X 28/ 10.5/ 21M/MIN
Anti-Suction Tunnel	1500φ X 4.25 A/B X FR.355-2818mm
PROVISION CRANE	9T X 10M /2.5M(:2SETS)
E/R CRANE	8T X 1 SETS
Ref Air cond. mach Chamber	

Life Saving

Life boat	TOTALLY ENCLOSED, 34P
Rescue boat	
Life raft	20P X 2, 16P X 2, 6P X 1
Boat devit	GRAVITY,TO HANDLE A FREE FALL
Boat winch	EL.HYD. DRIVEN

Fire fighting

Detector		
Cargo hold	CO_2	
Mach.room	CO_2	
Accomm o.		
Em.F.pump		

Ventilation Fan

Steer.Gear.rm	8000 M³/H

Tank Heating

F.O.T.	HEATING COIL 1491 m
	(STEAM)
	NO.2,3 & 6(P&S),OVERFLOW TK(S)

Piping

W.B.pipe & Valve cont.	300A X GRP : MAIN
	250A&80AXSTPG38 SCH.40E BRANCH
	V/V CONTROL : SUS 304F
W.B.pump	
Bilge pipe	125A X GRP,50A X STPG38,40E
F.O.pipe	250A X STPG38 SCH.40E
Heat.pipe	50A X STPG38 SCH.80S

Painting

Outside Shell	Bottom	EPOXY A/AX3,V/TX1,SPC A/FX1
	Boot top	" " "
	Top side	" ,POLYURE THANEX2
W.B.T		COAL TAR EPOXY X 1
Cargo hld		EPOXY HB X 1

Accommodation

Area,No.of DK	2300 M² / 7 DECK
Cabin	27
Toilet	24
Public Space	OWNER'S RM.OF REPRESENTATION
	COMMUNICATION CENTER,TV RM.
	APPENTICE/TRAINEE DAY RM.
Elev. Sw.pool	600KG X 1,IN DOOR TYPE
Ref.chamber	70 M³
FOOD LIFT	
	2 DEEP FREEZ RM.
	2 VEG. RM.
	1 HANDLING RM.

H.NO.1097 | Name | M/V "HAMBURG EXPRESS"

Unit : Metric

Main engine

Type & No.	MAN B&W-LICENSEE 9K90MC X 1		
	M.C.R.	D.M.C.R	N.C.R
Output(BHP)xRPM	49640 X 96	x	44676 X 90
F.O.C.rate(10,200kcal/kg)	121 g/PS.hr at NCR		
Type of balancer			
Reduction Gear			
Type & No.			
Shaft output	M.C.R.	PS x rpm	
x Revol.	N.C.R	PS x rpm	

Shafting

	Inter. shaft.	Prop. shaft.
No.	2	1
Dia.	φ685	φ835
Length	12873/12900mm	10782mm

Propeller

Type & No.	F.P.P X 1, FEYLESS TYPE
blade NO.	6
Dia. x pitch(0.7R)	8.250 M X 8.548 M
Exp. area ratio	0.7950
Material	NI-AL X BRONZE

Aux.Boiler & Exh. Gas Economizer

Aux. boiler Type & No.	AR4C X 1 SET
Press.x Temp.	WORKING P:8 BAR X 60° C :FEED WATER
Evaporation	7 TON/H
Exh.gas econo Type & No.	AQ - 2
Press.x Temp.	WORKING P:8 BAR X 90° C :FEED WATER
Evaporation	5 TON/H

Electric Generator

Generator Type No. & Capacity	Prime Mover Type No. & Capacity
2200KW X 2SETS X 600RPM	
FEW - 75A - 12	8DL32,2SETS,2200KW X 600RPM
1650KW X 2 SETS X 600RPM	"
FEW - 60C - 12	6DL32,2SETS,1650KW X 600RPM
EM'CY GENERATOR :	
350KW X 1SET X 1800 RPM	

Auxiliary Machinery

Item	Type	No.	M3/h x m x kw x rpm
PURIFIER	OSB 35 - 01	4	4700 L/Hr
M/E L.O PURIFIER PUMP	OSB 35 - 02	2	6900 L/Hr
A/E L.O PURIFIER PUMP	OSA - 20	2	4750 L/Hr
MAIN C.S.W P/P	PGFA - E500G	1	3000 X 5MTH
LOW TEMP.F.W.PUMP	FBWV - 450	2	1850 X 25MTH
HARBOUR USE C.S.W.PUMP	NIM 200 - 250	1	550 X 17MTH
HARBOUR USE L.T.F.W.P/P	NIM 150 - 250	1	450 X 20MTH
BALLAST PUMP	NIM 200 - 315	2	600 X 25MTH
FIRE & G.S PUMP	NIM 125 - 400	1	90/250 X 80/20MTH
BOIL.FEED.W.MAKE UP P/P	ANS 40/1	1	5 X 15MTH
AUX.BOIL.F/W PUMP	L 25/4	2	8.8 X 120MTH
EXH.GAS BOILER F/W PUMP	L 25/4	2	6.6 X 130MTH
F.W.GENERATOR EJEC.P/P	NIM 65 - 315	1	80 X 38MTH
HOT W.CIRE. PUMP	NB 25-160	2	4 X 10MTH
F.W HYDRO PHORE UNIT	AOV 223/W2	1	TK:2.0M3,P/P:5M3/Hr
H.F.O TRANS. P/P	L3 MG 125/210	1	100 X 5 BAR
D.O TRANS. P/P	L3 MG 125/210	1	100 X 5 BAR
H.F.O PUR.BOOST. P/P	L3 MF 45/90	3	4.7 X 4 BAR
M/E L.O PUR.BOOST. P/P	L3 MF 52/85	2	6.9 X 4 BAR
M/E,A/E F.O SUPPLY PUMP	L3 MF 60/120	2	11.0 X 5 BAR
M/E F.O BOOSTER PUMP	L3 F 70/140	2	16.4 X 6 BAR
M/E CAMSHAFT L.O PUMP	L3 MF 70/140	2	17.3 X 4 BAR
L.O TRANS PUMP	L3 MF 60/96	1	10 X 3 BAR
MAIN AIR COMPRESSOR	WP150L	6	180 X 30 K
WORKING AIR COMPRESSOR	WP295L	1	360 X 8K
MAIN AIR RECEIVER	VERT	2	13 M³ X 30K
CONTROL AIR DRYER	DOM 100	1	150 NM³/HR
F.W. GENERATOR	RXT20	1	30 TON/DAY
OILY W.SEPARATOR	TF10	1	10 (:15RPM)
E/R SUPPLY FAN	N8L5	6	95000 X 55MMAQ.

Heat Exchanger & Miscellaneous

Item	Type	No.	Cap.
MAIN L.O COOLER	PLATE	1	808 M³/H
PORT USE F.W COOLER	PLATE	1	450 M³/H
M/E JACKET C.F.W COOLER	PLATE	1	251 M³/H
SCOOP COOLER	SCOOP	1	2150000 Kcal/H
DUMP CONDENSER	SHELL & TUBE	1	4 M³/H
M/E CAMSHAFT L.O COOLER	"	1	17.6 M³/H
DRAIN COOLER	"	1	7.3 M³/H
FEED W.SAMPLING COOLER	"	1	0.25 M³/H
M/E F.O HEATER	"	2	16.7 M³/H
A/E F.O HEATER	"	1	6.6 M³/H
A/E F.O HEATER	ELECTRIC	1	6.6 M³/H
A/E L.O PURIF.HEATER	SHELL & TUBE	2	1.75 M³/H
M/E JACK.F.W PREHEATER	SHELL & TUBE	1	25 M³/H
H.F.O PURIF.HEATER	SHELL & TUBE	4	4.7 M³/H
MAIN L.O PURIF.HEATER	SHELL & TUBE	2	6.9 M³/H

TANK

Item	No. × Cap. (cub.m)
F.O.settl./serv.	2EA X 371.4 / 1EA X 89.4
D.O.settl./serv.	1EA X 73.4 / 1EA X 35.3
L.O.drain/settl./stor.	2EA X 108.5/1EA X 66.2/1EA X 30.5
Cyl.O.storage	2EA X 127.7

Control

Cont.Rm locat.	1ST SUPERSTRUCTURE DK & ENG.CONT.RM
Main engine	BRIDGE REMOTE & AUTO
Aux.engine	E/R,& LOCAL

Trial Result

Beaufort No.	2	Sea cond.	BALLAST TRIAL
df x dmid x da x Cb			
Displacement		1/D(%)	53.24%
Eng. load	Speed	PS	rpm
%			
%			
%			

Nautical Instrument

Mag.compass	REFLECTA 1	Loran	LR 771
Gyro compass	STANDARD 4/12	Log	ATLAS DOLOG 23
Auto pilot	NAUTOPILOT 4	Echo sounder	ATLAS ECHOGRAPH 481
Radar	ATLAS 7600 AC/TM	NNSS	RS S100
ARPA & RADAR	ATLAS 8600 ARPA	Load.computer	PS Q 16S
D.finder	GPE 277.3	soft. maker	RS 4000CC

Wireless Instrument

Radio tele.	T 9	VHF tele.	RT 2047
	T 905	Mari.satte.	ARIES 3

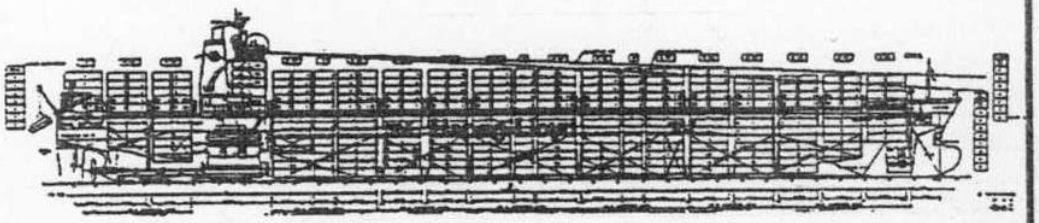
Maneuvering Trial Result

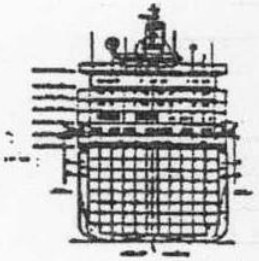
Turning	advance		<4.5xL
	tact.dia.		<5.0xL
Initial turning	10/10 deg		<2.5xL
Stopping ability			<15.0xL
Course keeping (Yaw check)	10/10 deg	1st over.	
		2nd over.	
	20/20 deg	1st over.	<25 deg.

H.NO.109

Kind of ship	CONTAINER
Intend.cargo	20',40'CONT.& BULK
Nav.area	OCEAN
Class	Germanisch
Route	FAR EAST
Builder	SAMSUNG H
Owner	HAPAG-LLOYD AKT
Nationality	GERM
Keel laid	Launched
1994.01.25	1994.09.15
Principal Dimension	
LOA	294.00
LBP	281.60
Bmld	32.25
Dmld	21.40
dmld(dl,des.)	12.021
dext(d2,sum.)	13.521
DWT at dl	55600
DWT at d2	67686
△ at d2	
Cb ¦ Cp	
Cw ¦ Cm	
LCB(%LBP)	-1.8 %
L/B ¦ L/D	8.73 ¦ 13.
B/D ¦ B/d	1.507 ¦ 2.6
Camber	
Sheer(F.A)	0.4M(:ON F'CLE
Len- gth Fore	16.650 M
Len- gth Hold	235.440 M
Len- gth Mach.Rm	25.760 M
Len- gth Aft	16.150 M
Tween Deck Height	17.66 M (
	17.00 M (
Light Weight D	
LWT	
KG ¦ LCG	
Net Steel wt(HT.%)	
Special Regu	
- SBG 1984	
- DSV - ICLL 1966	
- SOLAS 1974 / 78.83	
- MARPOL 1973 / 78	
Anchor & Cable	
Equip.No.	4197
Anchor	13.5T X 2SETS
Anchor chain	φ87×687.5
Moor.rope	φ60 X 220M
Deck Machinery & Miscel	
Steer.gear	3840 KN.M X
Windlass	36.7T X 9M/M
Bow Thruster	2500 kw X C.
Moor.winch	20T X 28/ 1C
Anti-Suction Tunnel	1500φ X 4.25 A/B X
PROVISION CRANE	9T X 10M /2.5
E/R CRANE	8T X 1 SETS
Ref Air cond. mach Chamber	
Life Saving	
Life boat	TOTALLY EN
Rescue boat	
Life raft	20P X 2, 16P
Boat devit	GRAVITY,TO HAN
Boat winch	EL.HYD.

Kind of ship	CONTAINER VESSEL	
Intend.cargo	20',40'CONT.& BULK CARGO IN NO.3 HOLD	
Nav.area	OCEAN GOING	
Class	Germanischer Lloyd	
Route	FAR EAST & EUROPE	
Builder	SAMSUNG HEAVY IND.	
Owner	HAPAG-LLOYD AKTIENGESELLSCHAFT	
Nationality	GERMANY	
Keel laid	Launched	Delivered
1994.01.25	1994.09.15	1994.12.15





Principal Dimension (M)		
LOA	294.00	
LBP	281.60	
Bmld	32.25	
Dmld	21.40	
dmld(dl,des.)	12.021	
dext(d2,sum.)	13.521	
DWT at dl	55600	
DWT at d2	67686	
△ at d2		
Cb ¦ Cp		
Cw ¦ Cm		
LCB(%LBP)	-1.8 %	
L/B ¦ L/D	8.73	13.159
B/D ¦ B/d	1.507	2.683
Camber		
Sheer(F.A)	0.4M(:ON F'CLE DK)	
Length Fore	16.650 M	
Length Hold	235.440 M	
Length Mach.Rm	25.760 M	
Length Aft	16.150 M	
Tween Deck Height	17.66 M (2ND DK)	
	17.00 M (f'BD DK:E/R 3RD DK)	

International Tonnage		Speed at d.(des.)	
GT	54000	Vs(%MCR,SM)	23.0 kts (90% , %)
NT	23499	Endurance	24000 NM
Rudder		F.O.consump.	121.0g/PS.HR
Af/A	0.26	P.T.0	BHP
Area , Area /(Lxd)	72.0		Complement
Type x No.	SEMI-SPADE X 1		26 P

Capacity					
W.B	16738	On DK.(TEU)	TEU (RxT)	C.O.TK.	
W.B.(hold)		In hld.(TEU)	TEU (RxT)	Slop TK.	255
		Total(TEU)	4422 TEU	Hold volume	
F.O	7362	Reefer Cont.	452 TEU	Flood.hld.No	
D.O	355	Dang.cargo hld		Car	
L.O	426	Lane length		Truck	
F.W	288	Car deck area		Trailer	

Cargo Handling(hatch size,cover type, cargo pump, car ramp, cargo gear, etc.)

Light Weight Data		
LWT	MT.	
KG ¦ LCG		
Net Steel wt(HT.%)	MT. (%)	

Special Regulation	
- SBG 1984	- ILO CONVENTION
- DSV - ICLL 1966	- ISO 2631,4867 ETC.
- SOLAS 1974 / 78.83	-INTER.TONN.MEAS
- MARPOL 1973 / 78	-IMO NOISE A.343/A.468

Anchor & Cable

Equip.No.	4197
Anchor	13.5T X 2SETS("SPEK"TYPE)
Anchor chain	φ87×687.5 m(;K3 GRADE)
Moor.rope	φ60 X 220M X 10 LINES

Deck Machinery & Miscel. Fitting

Steer.gear	3840 KN.M X 1, RAM TYPE
Windlass	36.7T X 9M/MIN X 2 SETS
Bow Thruster	2500 kw X C.P.P X 1SETS
Moor.winch	20T X 28/ 10.5/ 21M/MIN
Anti-Suction Tunnel	1500φ X 4.25 A/B X FR.355-2818mm
PROVISION CRANE	9T X 10M /2.5M(;2SETS)
E/R CRANE	8T X 1 SETS
Ref Air cond.	
mach Chamber	

Life Saving

Life boat	TOTALLY ENCLOSED, 34P
Rescue boat	
Life raft	20P X 2, 16P X 2, 6P X 1
Boat devit	GRAVITY,TO HANDLE A FREE FALL
Boat winch	EL.HYD. DRIVEN

Fire fighting

Detector	
Cargo hold	CO_2
Mach.room	CO_2
Accommo.	
Em.F.pump	

Ventilation Fan

Steer.Gear.rm	8000 M^3/H

Tank Heating

F.O.T.	HEATING COIL 1491 m
	(STEAM)
	NO.2,3 & 6(P&S),OVERFLOW TK(S)

Piping

W.B.pipe & Valve cont.	300A X GRP : MAIN
	250A&80AXSTPG38 SCH.40E BRANCH
	V/V CONTROL : SUS 304F
W.B.pump	
Bilge pipe	125A X GRP,50A X STPG38,40E
F.O.pipe	250A X STPG38 SCH.40E
Heat.pipe	50A X STPG38 SCH.80S

Painting

Outside Shell	Bottom	EPOXY A/AX3,V/TX1,SPC A/FX1
	Boot top	" " "
	Top side	" ,POLYURE THANEX2
W.B.T	COAL TAR EPOXY X 1	
Cargo hld	EPOXY HB X 1	

Accommodation

Area.No.of DK	2300 M^2 /7 DECK
Cabin	27
Toilet	24
Public Space	OWNER'S RM.OF REPRESENTATION
	COMMUNICATION CENTER.TV RM.
	APPENTICE/TRAINEE DAY RM.
Elev. Sw.pool	600KG X 1,IN DOOR TYPE
Ref.chamber	70 M^3
FOOD LIFT	
2 DEEP FREEZ RM.	
2 VEG. RM.	
1 HANDLING RM.	

L.O TRANS PUMP	L3 MF 60/96	1	10 X 3 BAR
MAIN AIR COMPRESSOR	WP150L	6	180 X 30 K
WORKING AIR COMPRESSOR	WP295L	1	360 X 8K
MAIN AIR RECEIVER	VERT	2	13 M^3 X 30K
CONTROL AIR DRYER	DOM 100	1	150 NM^3/HR
F.W. GENERATOR	RXT20	1	30 TON/DAY
OILY W.SEPARATOR	TF10	1	10 (;15RPM)
E/R SUPPLY FAN	N8L5	6	95000 X 55MMAQ.

Nautical Instrument			
Mag.compass	REFLECTA 1	Loran	LR 771
Gyro compass	STANDARD 4/12	Log	ATLAS DOLOG 23
Auto pilot	NAUTOPILOT 4	Echo sounder	ATLAS ECHOGRAPH 481
Radar	ATLAS 7600 AC/TM	NNSS	RS S100
ARPA & RADAR	ATLAS 8600 ARPA	Load.computer	PS Q 16S
D.finder	GPE 277.3	soft. maker	RS 4000CC
Wireless Instrument			
Radio tele.	T 9	VHF tele.	RT 2047
	T 905	Mari.satte.	ARIES 3

Cont.RM locat.	1ST SUPERSTRUCTURE DK & ENG.CONT.RM
Main engine	BRIDGE REMOTE & AUTO
Aux.engine	E/R,& LOCAL

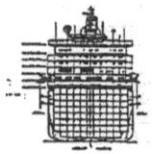
Trial Result					
Beaufort No.	2	Sea cond.		BALLAST TRIAL	
df x dmid x da x Cb					
Displacement			I/D(%)	53.24%	
Eng. load	Speed		PS		rpm
%					
%					
%					

Maneuvering Trial Result			
Turning	advance		<4.5xL
	tact.dia.		<5.0xL
Initial turning	10/10 deg		<2.5xL
Stopping ability			<15.0xL
Course keeping (Yaw check)	10/10 deg	1st over.	
		2nd over.	
	20/20 deg	1st over.	<25 deg.

H.NO.1097	Name	M/V "HAMBURG EXPRESS"

Unit : Metric

Kind of ship	CONTAINER VESSEL								
Intend.cargo	20',40'CONT.& BULK CARGO IN NO.3 HOLD								
Nav.area	OCEAN GOING								
Class	Germanischer Lloyd								
Route	FAR EAST & EUROPE								
Builder	SAMSUNG HEAVY IND.								
Owner	HAPAG-LLOYD AKTIENGESELLSCHAFT								
Nationality	GERMANY								
Keel laid	Launched	Delivered							
1994.01.25	1994.09.15	1994.12.15							
Principal Dimension (M)			International Tonnage		Speed at d.(des.)				
LOA	294.00		GT	54000	Vs(%MCR,SM)	23.0 kts (90% , %)			
LBP	281.60		NT	23499	Endurance	24000 NM			
Bmld	32.25		Rudder		F.O.consump.	121.0g/PS.HR			
Dmld	21.40		Af/A	0.26	P.T.O	BHP			
dmld(d1,des.)	12.021		Area , Area /(Lxd)	72.0	Complement				
dext(d2,sum.)	13.521		Type x No.	SEMI-SPADE X 1	26 P				
DWT at d1	55600		Capacity						
DWT at d2	67686		W.B	16738	On DK.(TEU)	TEU (RxT)	C.O.TK.		
△ at d2			W.B.(hold)		In hld.(TEU)	TEU (RxT)	Slop TK.	255	
Cb : Cp					Total(TEU)	4422 TEU	Hold volume		
Cw : Cm									
LCB(%LBP)	-1.8 %								



H.NO.1097	Name	M/V "HAMBURG EXPRESS"

Unit : Metric

Main engine				Aux.Boiler & Exh. Gas Economizer	
Type & No.	MAN B&W-LICENSEE 9K90MC X 1			Aux. boiler	AR4C X 1 SET
	M.C.R.	D.M.C.R	N.C.R	Type & No.	
Output(BHP)xRPM	49640 X 96	x	44676 X 90	Press.x Temp.	WORKING P:8 BAR X 60° C ;FEED WATER
F.O.C.rate(10,200kcal/kg)	121 g/PS.hr at NCR			Evaporation	7 TON/H
				Exh.gas econo	AQ - 2
Type of balancer				Type & No.	
Reduction Gear				Press.x Temp.	WORKING P:8 BAR X 90° C ;FEED WATER
Type & No.				Evaporation	5 TON/H
Shaft output	M.C.R.	PS x	rpm	Electric Generator	
x Revol.	N.C.R	PS x	rpm	Generator Type No. & Capacity	Prime Mover Type No. & Capacity
Shafting					
	Inter. shaft.	Prop. shaft.		2200KW X 2SETS X 600RPM	
No.	2	1		FEW - 75A - 12	8DL32,2SETS,2200KW X 600RPM
Dia.	φ685	φ835		1650KW X 2 SETS X 600RPM	"
Length	12873/12900mm	10782mm		FEW - 60C - 12	6DL32,2SETS,1650KW X 600RPM
Propeller				EM'CY GENERATOR :	
Type & No.	F.P.P X 1, FEYLESS TYPE			350KW X 1SET X 1800 RPM	
blade NO.	6				
Dia. x pitch(0.7R)	8.250 M X 8.548 M				
Exp. area ratio	0.7950				
Material	NI-AL X BRONZE				

Item	Type	No.	M3/h x m x kw x rpm	Item	Type	No.	Cap.

Main engine				Aux.Boiler & Exh. Gas Economizer	
Type & No.	MAN B&W-LICENSEE 9K90MC X 1			Aux. boiler	AR4C X 1 SET
	M.C.R.	D.M.C.R	N.C.R	Type & No.	
Output(BHP)xRPM	49640 X 96	x	44676 X 90	Press.x Temp.	WORKING P:8 BAR X 60° C ;FEED WATER
F.O.C.rate(10,200kcal/kg)	121 g/PS.hr at NCR			Evaporation	7 TON/H
				Exh.gas econo	AQ - 2
Type of balancer				Type & No.	
Reduction Gear				Press.x Temp.	WORKING P:8 BAR X 90° C ;FEED WATER
Type & No.				Evaporation	5 TON/H
Shaft output	M.C.R.	PS x	rpm	Electric Generator	
x Revol.	N.C.R	PS x	rpm	Generator Type No. & Capacity	Prime Mover Type No. & Capacity
Shafting					
	Inter. shaft.	Prop. shaft.		2200KW X 2SETS X 600RPM	
No.	2	1		FEW - 75A - 12	8DL32,2SETS,2200KW X 600RPM
Dia.	φ685	φ835		1650KW X 2 SETS X 600RPM	"
Length	12873/12900mm	10782mm		FEW - 60C - 12	6DL32,2SETS,1650KW X 600RPM
Propeller				EM'CY GENERATOR :	
Type & No.	F.P.P X 1, FEYLESS TYPE			350KW X 1SET X 1800 RPM	
blade NO.	6				
Dia. x pitch(0.7R)	8.250 M X 8.548 M				
Exp. area ratio	0.7950				
Material	NI-AL X BRONZE				

H.NO. 1097 | Name | M/V "HAMBURG EXPRESS"

Auxiliary Machinery

Item	Type	No.	M3/h x m x kw x rpm
PURIFIER	OSB 35 - 01	4	4700 L/Hr
M/E L.O PURIFIER PUMP	OSB 35 - 02	2	6900 L/Hr
A/E L.O PURIFIER PUMP	OSA - 20	2	4750 L/Hr
MAIN C.S.W P/P	PGFA - E500G	1	3000 X 5MTH
LOW TEMP.F.W.PUMP	FBWV - 450	2	1850 X 25MTH
HARBOUR USE C.S.W.PUMP	NIM 200 - 250	1	550 X 17MTH
HARBOUR USE L.T.F.W.P/P	NIM 150 - 250	1	450 X 20MTH
BALLAST PUMP	NIM 200 - 315	2	600 X 25MTH
FIRE & G.S PUMP	NIM 125 - 400	1	90/250 X 80/20MTH
BOIL.FEED.W.MAKE UP P/P	ANS 40/1	1	5 X 15MTH
AUX.BOIL.F/W PUMP	L 25/4	2	8.8 X 120MTH
EXH.GAS BOILER F/W PUMP	L 25/4	2	6.6 X 130MTH
F.W.GENERATOR EJEC.P/P	NIM 65 - 315	1	80 X 38MTH
HOT W.CIRE. PUMP	NB 25-160	2	4 X 10MTH
F.W HYDRO PHORE UNIT	AOV 223/W2	1	TK:2.0M3,P/P:5M3/Hr
H.F.O TRANS. P/P	L3 MG 125/210	1	100 X 5 BAR
D.O TRANS. P/P	L3 MG 125/210	1	100 X 5 BAR
H.F.O PUR.BOOST. P/P	L3 MF 45/90	3	4.7 X 4 BAR
M/E L.O PUR.BOOST. P/P	L3 MF 52/85	2	6.9 X 4 BAR
M/E,A/E F.O SUPPLY PUMP	L3 MF 60/120	2	11.0 X 5 BAR
M/E F.O BOOSTER PUMP	L3 F 70/140	2	16.4 X 6 BAR
M/E CAMSHAFT L.O PUMP	L3 MF 70/140	2	17.3 X 4 BAR
L.O TRANS PUMP	L3 MF 60/96	1	10 X 3 BAR
MAIN AIR COMPRESSOR	WP150L	6	180 X 30 K
WORKING AIR COMPRESSOR	WP295L	1	360 X 8K
MAIN AIR RECEIVER	VERT	2	13 M^3 X 30K
CONTROL AIR DRYER	DOM 100	1	150 NM^3/HR
F.W. GENERATOR	RXT20	1	30 TON/DAY
OILY W.SEPARATOR	TF10	1	10 (;15RPM)
E/R SUPPLY FAN	N8L5	6	95000 X 55MMAQ.

Heat Exchanger & Miscellaneous

Item	Type	No.	Cap.
MAIN L.O COOLER	PLATE	1	808 M^3/H
PORT USE F.W COOLER	PLATE	1	450 M^3/H
M/E JACKET C.F.W COOLER	PLATE	1	251 M^3/H
SCOOP COOLER	SCOOP	1	2150000 Kcal/H
DUMP CONDENSER	SHELL & TUBE	1	4 M^3/H
M/E CAMSHAFT L.O COOLER	"	1	17.6 M^3/H
DRAIN COOLER	"	1	7.3 M^3/H
FEED W.SAMPLING COOLER	"	1	0.25 M^3/H
M/E F.O HEATER	"	2	16.7 M^3/H
A/E F.O HEATER	"	1	6.6 M^3/H
A/E F.O HEATER	ELECTRIC	1	6.6 M^3/H
A/E L.O PURIF.HEATER	SHELL & TUBE	2	1.75 M^3/H
M/E JACK.F.W PREHEATER	SHELL & TUBE	1	25 M^3/H
H.F.O PURIF.HEATER	SHELL & TUBE	4	4.7 M^3/H
MAIN L.O PURIF.HEATER	SHELL & TUBE	2	6.9 M^3/H

TANK

Item	No. × Cap. (cub.m)
F.O.settl./serv.	2EA X 371.4 / 1EA X 89.4
D.O.settl./serv.	1EA X 73.4 / 1EA X 35.3
L.O.drain/settl./stor.	2EA X 108.5/1EA X 66.2/1EA X 30.5
Cyl.O.storage	2EA X 127.7

Control

Cont.Rm locat.	1ST SUPERSTRUCTURE DK & ENG.CONT.RM
Main engine	BRIDGE REMOTE & AUTO
Aux.engine	E/R,& LOCAL

Trial Result

Beaufort No.	2	Sea cond.	BALLAST TRIAL
df x dmid x da x Cb			
Displacement		I/D(%)	53.24%
Eng. load	Speed	PS	rpm

Boat devit	GRAVITY,TO HANDLE A FREE FALL	Heat.pipe	50A X STPG38 SCH.80S		
Boat winch	EL.HYD. DRIVEN				

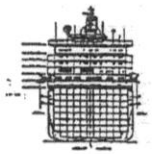
(Yaw check)

	2nd over.	
20/20 deg	1st over.	<25 deg.

H.NO.1097	Name	M/V "HAMBURG EXPRESS"

Unit : Metric

Kind of ship	CONTAINER VESSEL
Intend.cargo	20',40'CONT.& BULK CARGO IN NO.3 HOLD
Nav.area	OCEAN GOING
Class	Germanischer Lloyd
Route	FAR EAST & EUROPE
Builder	SAMSUNG HEAVY IND.
Owner	HAPAG-LLOYD AKTIENGESELLSCHAFT
Nationality	GERMANY
Keel laid	Launched / Delivered
1994.01.25	1994.09.15 / 1994.12.15



Principal Dimension (M)					
LOA	294.00				
LBP	281.60				
Bmld	32.25	International Tonnage		Speed at d.(des.)	
Dmld	21.40	GT	54000	Vs(%MCR,SM)	23.0 kts (90% , %)
dmld(d1,des.)	12.021	NT	23499	Endurance	24000 NM
dext(d2,sum.)	13.521	Rudder		F.O.consump.	121.0g/PS.HR
DWT at d1	55600	Af/A	0.26	P.T.O	BHP
DWT at d2	67686	Area	Area /(Lxd) 72.0		Complement

H.NO.1097	Name	M/V "HAMBURG EXPRESS"

Unit : Metric

Main engine				Aux.Boiler & Exh. Gas Economizer	
Type & No.	MAN B&W-LICENSEE 9K90MC X 1			Aux. boiler	AR4C X 1 SET
	M.C.R.	D.M.C.R	N.C.R	Type & No.	
Output(BHP)xRPM	49640 X 96	x	44676 X 90	Press.x Temp.	WORKING P:8 BAR X 60° C ;FEED WATER
F.O.C.rate(10,200kcal/kg)	121 g/PS.hr at NCR			Evaporation	7 TON/H
				Exh.gas econo	AQ - 2
Type of balancer				Type & No.	
Reduction Gear				Press.x Temp.	WORKING P:8 BAR X 90° C ;FEED WATER
Type & No.				Evaporation	5 TON/H
Shaft output M.C.R.	PS x rpm			Electric Generator	
x Revol. N.C.R	PS x rpm			Generator Type No. & Capacity	Prime Mover Type No. & Capacity
Shafting					
	Inter. shaft.	Prop. shaft.		2200KW X 2SETS X 600RPM	
No.	2	1		FEW - 75A - 12	8DL32.2SETS.2200KW X 600RPM
Dia.	φ685	φ835		1650KW X 2 SETS X 600RPM	
Length	12873/12900mm	10782mm		FEW - 60C - 12	6DL32.2SETS.1650KW X 600RPM
Propeller				EM'CY GENERATOR :	
Type & No.	F.P.P X 1, FEYLESS TYPE			350KW X 1SET X 1800 RPM	
blade NO.	6				

Nautical Instrument				%			
Mag.compass	REFLECTA 1	Loran	LR 771	%			
Gyro compass	STANDARD 4/12	Log	ATLAS DOLOG 23	%			
Auto pilot	NAUTOPILOT 4	Echo sounder	ATLAS ECHOGRAPH 481	%			
Radar	ATLAS 7600 AC/TM	NNSS	RS S100	Maneuvering Trial Result			
ARPA & RADAR	ATLAS 8600 ARPA	Load.computer	PS Q 16S	Turning	advance		<4.5xL
D.finder	GPE 277.3	soft. maker	RS 4000CC		tact.dia.		<5.0xL
Wireless Instrument				Initial turning	10/10 deg		<2.5xL
Radio tele.	T 9	VHF tele.	RT 2047	Stopping ability			<15.0xL
	T 905	Mari.satte.	ARIES 3	Course keeping (Yaw check)	10/10 deg	1st over.	
						2nd over.	
					20/20 deg	1st over.	<25 deg.

Anchor	13.5T X 2SETS(*SPEK*TYPE)	Cargo hold	CO_2	Shell	Boot top	" "	
Anchor chain	φ87×687.5 m(;K3 GRADE)	Mach.room	CO_2		Top side	" ,POLYURE THANEX2	
Moor.rope	φ60 X 220M X 10 LINES	Accomo.		W.B.T	COAL TAR EPOXY X 1		
		Em.F.pump		Cargo hld	EPOXY HB X 1		
Deck Machinery & Miscel. Fitting		Ventilation Fan		Accommodation			
Steer.gear	3840 KN.M X 1, RAM TYPE	Steer.Gear.rm	8000 M^3/H				
Windlass	36.7T X 9M/MIN X 2 SETS			Area.No.of DK	2300 M^2 /7 DECK		
Bow Thruster	2500 kw X C.P.P X 1SETS			Cabin	27		
Moor.winch	20T X 28/ 10.5/ 21M/MIN			Toilet	24		
Anti-Suction Tunnel	1500φ X 4.25 A/B X FR.355-2818mm	Tank Heating					
PROVISION CRANE	9T X 10M /2.5M(;2SETS)	F.O.T.	HEATING COIL 1491 m	Public	OWNER'S RM.OF REPRESENTATION		
E/R CRANE	8T X 1 SETS		(STEAM)	Space	COMMUNICATION CENTER.TV RM.		
			NO.2,3 & 6(P&S),OVERFLOW TK(S)		APPENTICE/TRAINEE DAY RM.		
Ref Air cond.		Piping		Elev. Sw.pool	600KG X 1.IN DOOR TYPE		
mach Chamber		W.B.pipe	300A X GRP : MAIN	Ref.chamber	70 M^3		
		&	250A&80AXSTPG38 SCH.40E BRANCH	FOOD LIFT			
Life Saving		Valve cont.	V/V CONTROL : SUS 304F	2 DEEP FREEZ RM.			
Life boat	TOTALLY ENCLOSED, 34P	W.B.pump		2 VEG. RM.			
Rescue boat		Bilge pipe	125A X GRP,50A X STPG38,40E	1 HANDLING RM.			
Life raft	20P X 2, 16P X 2, 6P X 1	F.O.pipe	250A X STPG38 SCH.40E				
Boat devit	GRAVITY,TO HANDLE A FREE FALL	Heat.pipe	50A X STPG38 SCH.80S				
Boat winch	EL.HYD. DRIVEN						

M/E CAMSHAFT L.O PUMP	L3 MF 70/140	2	17.3 X 4 BAR	Control			
L.O TRANS PUMP	L3 MF 60/96	1	10 X 3 BAR	Cont.Rm locat.	1ST SUPERSTRUCTURE DK & ENG.CONT.RM		
MAIN AIR COMPRESSOR	WP150L	6	180 X 30 K	Main engine	BRIDGE REMOTE & AUTO		
WORKING AIR COMPRESSOR	WP295L	1	360 X 8K	Aux.engine	E/R.& LOCAL		
MAIN AIR RECEIVER	VERT	2	13 M^3 X 30K				
CONTROL AIR DRYER	DOM 100	1	150 NM^3/HR	Trial Result			
F.W. GENERATOR	RXT20	1	30 TON/DAY	Beaufort No.	2	Sea cond.	BALLAST TRIAL
OILY W.SEPARATOR	TF10	1	10 (;15RPM)	df x dmid x da x Cb			
E/R SUPPLY FAN	N8L5	6	95000 X 55MMAQ.	Displacement		I/D(%)	53.24%
				Ram load	Speed	PS	rpm

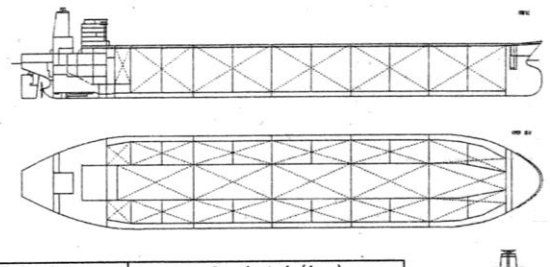
Nautical Instrument				%			
Mag.compass	REFLECTA 1	Loran	LR 771	%			
Gyro compass	STANDARD 4/12	Log	ATLAS DOLOG 23	%			
Auto pilot	NAUTOPILOT 4	Echo sounder	ATLAS ECHOGRAPH 481	%			
Radar	ATLAS 7600 AC/TM	NNSS	RS S100	Maneuvering Trial Result			
ARPA & RADAR	ATLAS 8600 ARPA	Load.computer	PS Q 16S	Turning	advance		<4.5xL
D.finder	GPE 277.3	soft. maker	RS 4000CC		tact.dia.		<5.0xL
Wireless Instrument				Initial turning	10/10 deg		<2.5xL
Radio tele.	T 9	VHF tele.	RT 2047	Stopping ability			
	T 905	Mari.satte.	ARIES 3	Course keeping (Yaw check)	10/10 deg	1st over.	
						2nd over.	
					20/20 deg	1st over.	

Crude Oil Carrier "Hyundai Star" Outlined Specification

NAME HUYNDAI STAR

Unit : Metric

Kind of ship	281k Cruid Oil Carrier		
Intend. cargo	Cruide Oil		
Nav. area	Ocean Going		
Class	LR + KR		
Route			
Builder	HHI		
Owner	HMMC		
Nationality	Panama		
Keel laid	Launched	Delivered	
95-06-28	95-10-07	95-12-09	



Principal Dimension (M)

LOA	331
LBP	314
Bmld	58
Dmld	30.3
dmld (d1, des.)	20.6
dext (d2, sum.)	20.6
DWT at d1	281074
DWT at d2	281074
△ at d2	316156
Cb / Cp	
Cw	
LCB (%LBP)	11.653 (3.71 %)
L/B / L/D	5.41 / 10.36
B/D / B/d	1.91 / 2.82
Camber	1.5
Sheer (F. A)	Nil
Length Fore	12.6 + 10
Length Hold	249.1
Length Mach. Rm	38.7
Length Aft	6.2 + 13.6
Tween Deck Height	

International Tonnage			
GT	151592		
NT	103291		

Rudder			
Type x No.	semi-balanced		
Area , Area / (Lxd)	120m2, 1.86%		
Af/A			

Speed at d. (des.)			
Vs (%MCR, SM)	15.05 kts	90 ,	15)
Endurance	26000	NM	
F. O. consump.	83	t/day	
P. T. O	-	BHP	
Complement			
30P			

Capacity

W. B	108763	On DK. (TEU)	TEU	C. O. TK.	320, 391
W. B. (hold)		In hld. (TEU)	TEU	Slop TK.	11350
	17379	Total (TEU)	TEU	Hold volume	331, 741
F. O	7318	Reefer Cont.	TEU	Flood. hld. No	No. 4 C. C. O. T
D. O	478	Dang. cargo hld		Car	
L. O	336	Lane length		Truck	
F. W	649	Car deck area		Trailer	

Light Weight Data

LWT		MT.	
KG	LCG		
Net Steel wt (HT. %)		MT.	

Cargo Handling (hatch size, cover type, cargo pump, car ramp, cargo gear, etc.)

cargo pump : 3sets
type : vertical centriugal single stage
capacity : 5000m3/h x 150mTH

cargo gear : 20MT x 2set
10m/min , 360degree

Special Regulation

SOLAS 1991

Anchor & Cable

Equip. No.	6996
Anchor	H. H. P x 2sets x 21500kg/set
Anchor chain	ϕ114mm x 770m
Moor. rope	ϕ42mm x 275m x 20sets
Windlass	EH 62T x 9/15 m/min x 2
Moor. winch	EH 30T x 15 m/min x 8
Capstan	
Hoist	
Ref Air cond. mach. Chamber	

Deck Machinery & Miscel. Fitting

Steer. gear	FE21-560-T050 560T/M x 1

Life Saving

Life boat	frp type 2sets x 32p
Rescue boat	life boat 와 겸용
Life raft	20p x 2 , 15P x 2 , 6p x 1set
Boat devit	gravity , hinged type x 2sets
Boat winch	EL-motor driven x 2sets

Fire fighting

Detector	ion or thermal type		
Cargo hold	foam , S. W		
Mach. room	Co2, S. W. P. R. E.		
Accommo.	S. W. P. R. E.		
Em. F. pump			

Ventilation Fan

Cargo hold	marine use axial tbue type
Accommo.	E. M. P. centrifugal axil
	ventilation fan

Tank Heating

F. O. T.	steel, 0. 04m2/m3

Piping

W. B. pipe & Valve cont.	two main
	remote control
W. B. pump	3000m3/h x 2set
Bilge pipe	
F. O. pipe	
Heat. pipe	

Painting

Outside Shell	Bottom	T. E x2, V. T. x1, S. P. C. x2
	Boot top	T. E x2, V. T. x1, S. P. C. x2
	Top side	A. B. E. x2, E. F. x2
W. B. T		T. E x2
Cargo hld		-

Accommodation

Area. No. of DK	18004m2 , 6tiers
Cabin	
Toilet	p/o above: P/T, others: S. P/T
Public Space	officers' dining room
	crew's mess room

Elev. Sw. pool	equiped
Ref. chamber	90m3

Others

NAME HYUNDAI STAR

Unit : Metric

Main engine

Type & No.	HUNDAI - SULZER 7RTA84T		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	36960 x 74	31800 x 70	28620 x 67.6
F. O. C. rate (10, 200kcal/kg)	121.7 g/PS. hr at DMCR		
	without booster		
Type of balancer			

Reduction Gear

Type & No.		
Shaft output x Revol.	M. C. R.	PS x rpm
	N. C. R	PS x rpm

Shafting

	Inter. shaft.	Prop. shaft.
No.	ONE	ONE
Dia.	635 mm	775 mm
Length	9400 mm	10390 mm

Propeller

Type & No.	balades solid, Aerofoil, keyless x 1
blade NO.	4
Dia. x pitch (0. 7R)	9900 mm x 7334. 2 mm
Exp. area ratio	
Material	NI-AL-BZ

Aux. Boiler & Exh. Gas Economizer

Aux. boiler	automatic , forced draft
Type & No.	two
Press. x Temp.	16 , 60 centigrade
Evaporation	45000 kg/h
Exh. gas econo	forced circulating, water tube type
Type & No.	one
Press. x Temp.	6, 60centigrade
Evaporation	2000kg/h

Electric Generator

Generator Type No. & Capacity	Prime Mover Type No. & Capacity
D/G, three, 940kw	in-line, three, 1380PS
E/G, one, 250kw	in-line, one, 380PS

Auxiliary Machinery

Item	Type	No.	m3/h x mTH
Sea water cooling P.	M. D. V. C.	3	500 x 20, 1100 x 9
Fresh water cooling P.	M. D. V. C.	3	475 x 25
Lub. oil pump	M. D. C.	2	545 x 40
F. O. burning pump			
Feed water pump			
Boiler W. circ. pump	M. D. H. C.	2	16 x 40
Forced draft fan			
Heel pump			
Sea W. service pump			
Fire & G. S. pump	M. D. V. C.	1	130 x 90 , 30 x 90
Fire, bilge & ballast P.	M. D. H. G.	1	
Bilge pump			
Fresh water pump	M. D. V. C.	1	
F. O. trnasfer pump	M. D. H. G.	1	50 x 4
L. O. transfer pump	M. D. H. G.	1	10 x 4
Vent. fan (supply)			
Main air compressor	M. D.	2	372 x 30
Emer. air compressor	M. D.	1	150 x 30
F. O. purifier	automatic self	2	4700L/H
L. O. purifier	automatic self	2	4000L/H , 3400L/H
D. O purifier			

Nautical Instrument

Mag. compass	1set x wet type	Loran	one
Gyro compass	AC440V, 3PH	Log	-
Auto pilot	AC440V, 60Hz	Echo sounder	AC220V, 1PH, 60Hz
Radar	AC440V, 3PH, 60Hz	NNSS	
ARPA & RADAR		Load. computer	Hyundai
D. finder	AC220V, 1PH, 60Hz	soft. maker	MECA

Wireless Instrument

Radio tele.	1set	VHF tele.	JHS-31
	JSS-710	Mari. satte.	JUE-75A

Heat Exchanger & Miscellaneous

Item	Type	No.	Cap.
Main L. O. cooler	S. S. P.	1	1828360kcal/h
Main F. W. cooler	Titanium	2	6424880kcal/h
Main F. O. heater	S&T	2	100 - 150°C
Diesel G. F. W. cooler			
Boiler F. O. heater			
Aux. condenser			
Purif. L. O. heater	S&T	1	45 - 85°C
M. start. air vessel			
A. start. air vessel			
A-C blender			
Fresh W. generator			
Bilge separator	gravity	1	5m3/h
Incinerator		1	500000kcal/h
Sewage treat. device	biological	1	

Tank

Item	NO x CAP. (cub. M)
F. O. settl. /serv.	1set x 158m3, 1set x 142m3
D. O. settl. /serv.	1set x 33m3, 1set x 22m3
L. O. drain/settl. /stor.	1 x 1m3, 1 x 57m3, 1 x 57m3
Cyl. O. storage	1 x 57m3

Control

Cont. Rm locat.	E/R 3rd deck
Main engine	
Aux. engine	

Trial Result

Beaufort No.		Sea cond.	moderate
df x dmid x da x Cb	20.6 x 20.6 x 20.6		
Displacement	315745	1/D (%)	159.0%

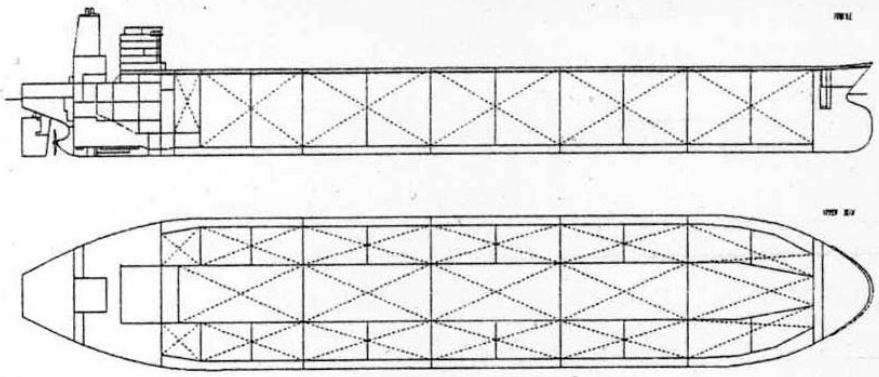
Eng. load	Speed (kts)	BHP	rpm
50%	13. 29	16354	57. 84
75%	14. 86	24151	65. 7
90%	15. 880	28718	69. 82
100%	15. 86	31946	71. 87

Maneuvering Trial Result

Turning	advance	783m (2. 49 x L)	<4. 5xL
	tact. dia.	903m (2. 88 x L)	<5. 0xL
Initial turning	10/10 deg		<2. 5xL
Stopping ability		4649m (14. 8 x L)	<15. 0xL
Course keeping (Yaw check)	10/10 deg.	1st over.	
		2nd over.	
	20/20 deg.	1st over.	8 deg <25 deg.

Kind of ship	281k Cruid Oil Carrier
Intend. cargo	Cruide Oil
Nav. area	Ocean Going
Class	LR + KR
Route	
Builder	HHI
Owner	HMMC
Nationality	Panama

Keel laid	Launched	Delivered
95-06-28	95-10-07	95-12-09



Principal Dimension (M)

LOA	331		
LBP	314		
Bmld	58		
Dmld	30.3		
dmld (d1, des.)	20.6		
dext (d2, sum.)	20.6		
DWT at d1	281074		
DWT at d2	281074		
△ at d2	316156		
Cb	Cp		
Cw			
LCB (%LBP)	11.653 (3.71 %)		
L/B	L/D	5.41	10.36
B/D	B/d	1.91	2.82
Camber	1.5		
Sheer (F.A)	Nil		
Len-gth	Fore	12.6 + 10	
	Hold	249.1	
	Mach. Rm	38.7	
	Aft	6.2 + 13.6	
Tween Deck Height			

International Tonnage

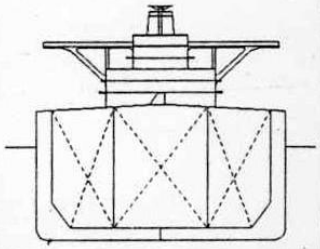
GT	151592
NT	103291

Rudder

Type x No.	semi-balanced :
Area , Area / (Lxd)	120m2, 1.86%
Af/A	

Speed at d. (des.)

Vs (%MCR, SM)	15.05 kts 90 , 15)
Endurance	26000 NM
F.O. consump.	83 t/day
P.T.O	- BHP
Complement	30P



Capacity

W.B	108763	On DK. (TEU)	TEU	C.O.TK.	320, 391
W.B. (hold)	17379	In hld. (TEU)	TEU	Slop TK.	11350
		Total (TEU)	TEU	Hold volume	331, 741
F.O	7318	Reefer Cont.	TEU	Flood. hld. No	No. 4 C.C.O.T
D.O	478	Dang. cargo hld		Car	
L.O	336	Lane length		Truck	
F.W	649	Car deck area		Trailer	

Light Weight Data

LWT		MT.
KG	LCG	
Net Steel wt (HT.%)		MT.

Special Regulation

SOLAS 1991

Cargo Handling (hatch size, cover type, cargo pump, car ramp, cargo gear, etc.)

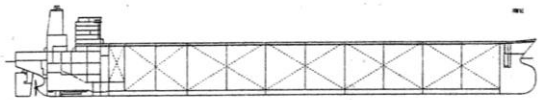
cargo pump : 3sets
type : vertical centriugal single stage
capacity : 5000m3/h x 150mTH

cargo gear : 20MT x 2set
10m/min , 360degree

NAME	HUYNDAI STAR

Unit : Metric

Kind of ship	281k Cruid Oil Carrier
Intend. cargo	Cruide Oil
Nav. area	Ocean Going
Class	LR + KR
Route	



NAME	HYUNDAI STAR

Unit : Metric

Main engine			
Type & No.	HUNDAI - SULZER 7RTA84T		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	36960 x 74	31800 x 70	28620 x 67.6
F. O. C. rate (10, 200kcal/kg)	121.7 g/PS.hr at DMCR		
	without booster		

Aux. Boiler & Exh. Gas Economizer	
Aux. boiler	automatic , forced draft
Type & No.	two
Press. x Temp.	16 , 60 centigrade
Evaporation	45000 kg/h
Exh. gas econo	forced circulating, water tube type

Anchor & Cable	
Equip. No.	6996
Anchor	H. H. P x 2sets x 21500kg/set
Anchor chain	ϕ 114mm x 770m
Moor. rope	ϕ 42mm x 275m x 20sets

Deck Machinery & Miscel. Fitting	
Steer. gear	FE21-560-TO50 560T/M x 1
Windlass	EH 62T x 9/15 m/min x 2
Moor. winch	EH 30T x 15 m/min x 8
Capstan	
Hoist	
Ref mach. Air cond.	
Ref mach. Chamber	

Life Saving	
Life boat	frp type 2sets x 32p
Rescue boat	life boat 와 겸용
Life raft	20p x 2 , 15P x 2 , 6p x 1set
Boat devit	gravity , hinged type x 2sets
Boat winch	EL-motor driven x 2sets

Fire fighting	
Detector	ion or thermal type
Cargo hold	foam , S. W
Mach. room	Co2, S. W, P. R. E.
Accommo.	S. W, P. R. E.
Em. F. pump	

Ventilation Fan	
Cargo hold	marine use axial tbue type
Accommo.	E. M. P. centrifugal axil ventilation fan

Tank Heating	
F. O. T.	steel, 0.04m2/m3

Piping	
W. B. pipe & Valve cont.	two main / remote control
W. B. pump	3000m3/h x 2set
Bilge pipe	
F. O. pipe	
Heat. pipe	

Painting		
Outside Shell	Bottom	T. E. x2, V. T. x1, S. P. C. x2
	Boot top	T. E. x2, V. T. x1, S. P. C. x2
	Top side	A. B. E. x2, E. F. x2
W. B. T		T. E x2
Cargo hld		-

Accommodation	
Area. No. of DK	18004m2 , 6tiers
Cabin	
Toilet	p/o&above:P/T, others:S. P/T
Public Space	officers' dining room
	crew's mess room
Elev. Sw. pool	equiped
Ref. chamber	90m3

Others

Moor. winch	EH 30T x 15 m/min x 8
Capstan	
Hoist	
Ref mach. Air cond.	
Ref mach. Chamber	

Life Saving	
Life boat	frp type 2sets x 32p
Rescue boat	life boat 와 겸용
Life raft	20p x 2 , 15P x 2 , 6p x 1set
Boat devit	gravity , hinged type x 2sets
Boat winch	EL-motor driven x 2sets

Tank Heating	
F. O. T.	steel, 0.04m2/m3

Piping	
W. B. pipe & Valve cont.	two main / remote control
W. B. pump	3000m3/h x 2set
Bilge pipe	
F. O. pipe	
Heat. pipe	

Public Space	officers' dining room / crew's mess room
Elev. Sw. pool	equiped
Ref. chamber	90m3
Others	

D. O. purifier	

Nautical Instrument			
Mag. compass	1set x wet type	Loran	one
Gyro compass	AC440V, 3PH	Log	-
Auto pilot	AC440V, 60Hz	Echo sounder	AC220V, 1PH, 60Hz
Radar	AC440V, 3PH, 60Hz	NNSS	
ARPA & RADAR		Load. computer	Hyundai
D. finder	AC220V, 1PH, 60Hz	soft. maker	MECA

Wireless Instrument			
Radio tele.	1set	VHF tele.	JHS-31
	JSS-710	Mari. satte.	JUE-75A

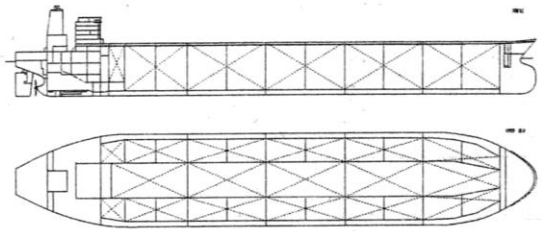
Eng. load	Speed (kts)	BHP	rpm
50%	13.29	16354	57.84
75%	14.86	24151	65.7
90%	15.880	28718	69.82
100%	15.86	31946	71.87

Maneuvering Trial Result			
Turning	advance	783m (2.49 x L)	<4.5xL
	tact. dia.	903m (2.88 x L)	<5.0xL
Initial turning	10/10 deg		<2.5xL
Stopping ability		4649m (14.8 x L)	<15.0xL
Course keeping (Yaw check)	10/10 deg.	1st over.	
		2nd over.	
	20/20 deg.	1st over. 8 deg	<25 deg.

NAME	HUYNDAI STAR

Unit : Metric

Kind of ship	281k Cruid Oil Carrier
Intend. cargo	Cruide Oil
Nav. area	Ocean Going
Class	LR + KR
Route	
Builder	HHI
Owner	HMMC
Nationality	Panama
Keel laid	Launched / Delivered
95-06-28	95-10-07 / 95-12-09



Principal Dimension (M)	
LOA	331
LBP	314
Bmld	58
Dmld	30.3

International Tonnage		Speed at d. (des.)	
GT	151592	Vs (MCR, SM)	15.05 kts 90 . 15)

Main engine			
Type & No.	HUNDAI - SULZER 7RTA84T		
	M.C.R.	D.M.C.R	N.C.R
Output (BHP) xRPM	36960 x 74	31800 x 70	28620 x 67.6
F.O.C. rate (10, 200kcal/kg)	121.7 g/PS.hr at DMCR		
	without booster		
Type of balancer			

Reduction Gear		
Type & No.		
Shaft output x Revol.	M.C.R.	PS x rpm
	N.C.R	PS x rpm

Shafting	Inter. shaft.	Prop. shaft.
No.	ONE	ONE
Dia.	635 mm	775 mm
Length	9400 mm	10390 mm

Propeller	
Type & No.	balades solid, Aerofoil, keyless x 1
blade NO.	4
Dia. x pitch (0.7R)	9900 mm x 7334.2 mm
Exp. area ratio	
Material	NI-AL-BZ

Aux. Boiler & Exh. Gas Economizer	
Aux. boiler	automatic , forced draft
Type & No.	two
Press. x Temp.	16 , 60 centigrade
Evaporation	45000 kg/h
Exh. gas econo	forced circulating, water tube type
Type & No.	one
Press. x Temp.	6, 60centigrade
Evaporation	2000kg/h

Electric Generator	
Generator Type No. & Capacity	Prime Mover Type No. & Capacity
D/G, three, 940kw	in-line, three, 1380PS
E/G, one, 250kw	in-line, one, 380PS

mach. Chamber		W.B.pipe & Valve cont.	two main / remote control	Ref. chamber	90m3
				Others	

Life Saving	
Life boat	frp type 2sets x 32p
Rescue boat	life boat 와 겸용
Life raft	20p x 2 , 15P x 2 , 6p x 1set
Boat devit	gravity , hinged type x 2sets
Boat winch	EL-motor driven x 2sets

W.B.pump	3000m3/h x 2set
Bilge pipe	
F.O.pipe	
Heat.pipe	

Radar	AC440V, 3PH, 60Hz	NNSS	
ARPA & RADAR		Load. computer soft. maker	Hyundai MECA
D. finder	AC220V, 1PH, 60Hz		

Wireless Instrument			
Radio tele.	1set	VHF tele.	JHS-31
	JSS-710	Mari. satte.	JUE-75A

Maneuvering Trial Result				
Turning	advance	783m (2.49 x L)		<4.5xL
	tact. dia.	903m (2.88 x L)		<5.0xL
Initial turning	10/10 deg			<2.5xL
Stopping ability		4649m (14.8 x L)		<15.0xL
Course keeping (Yaw check)	10/10 deg.	1st over.		
		2nd over.		
	20/20 deg.	1st over.	8 deg	<25 deg.

NAME	HYUNDAI STAR

Unit : Metric

Main engine			
Type & No.	HUNDAI - SULZER 7RTA84T		
	M.C.R.	D.M.C.R	N.C.R
Output (BHP) xRPM	36960 x 74	31800 x 70	28620 x 67.6
F.O.C. rate (10, 200kcal/kg)	121.7 g/PS.hr at DMCR		
	without booster		
Type of balancer			

Reduction Gear		
Type & No.		
Shaft output x Revol.	M.C.R.	PS x rpm
	N.C.R	PS x rpm

Shafting	Inter. shaft.	Prop. shaft.
No.	ONE	ONE
Dia.	635 mm	775 mm

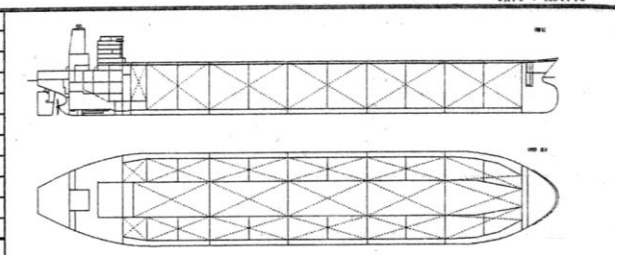
Aux. Boiler & Exh. Gas Economizer	
Aux. boiler	automatic , forced draft
Type & No.	two
Press. x Temp.	16 , 60 centigrade
Evaporation	45000 kg/h
Exh. gas econo	forced circulating, water tube type
Type & No.	one
Press. x Temp.	6, 60centigrade
Evaporation	2000kg/h

Electric Generator	
Generator Type No. & Capacity	Prime Mover Type No. & Capacity
D/G, three, 940kw	in-line, three, 1380PS
E/G, one, 250kw	in-line, one, 380PS

NAME	HUYNDAI STAR

Unit : Metric

Kind of ship	281k Cruid Oil Carrier	
Intend. cargo	Cruide Oil	
Nav. area	Ocean Going	
Class	LR + KR	
Route		
Builder	HHI	
Owner	HMMC	
Nationality	Panama	
Keel laid	Launched	Delivered
95-06-28	95-10-07	95-12-09
Principal Dimension (M)		
LOA	331	



NAME HYUNDAI STAR

Unit : Metric

Main engine			
Type & No.	HUNDAI - SULZER 7RTA84T		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	36960 x 74	31800 x 70	28620 x 67.6
F. O. C. rate (10, 200kcal/kg)	121.7 g/PS.hr at DMCR		
	without booster		
Type of balancer			
Reduction Gear			
Type & No.			
Shaft output x Revol.	M. C. R.	PS x rpm	
	N. C. R	PS x rpm	
Shafting			
	Inter. shaft	Prop. shaft.	

Aux. Boiler & Exh. Gas Economizer	
Aux. boiler	automatic , forced draft
Type & No.	two
Press. x Temp.	16 , 60 centigrade
Evaporation	45000 kg/h
Exh. gas econo	forced circulating, water tube type
Type & No.	one
Press. x Temp.	6, 60centigrade
Evaporation	2000kg/h
Electric Generator	
Generator Type No. & Capacity	Prime Mover Type No. & Capacity
D/G, three, 940kw	in-line, three, 1380PS

Auxiliary Machinery

Item	Type	No.	m3/h x mTH
Sea water cooling P.	M. D. V. C.	3	500 x 20, 1100 x 9
Fresh water cooling P.	M. D. V. C.	3	475 x 25
Lub. oil pump	M. D. C.	2	545 x 40
F. O. burning pump			
Feed water pump			
Boiler W. circ. pump	M. D. H. C.	2	16 x 40
Forced draft fan			
Heel pump			
Sea W. service pump			
Fire & G. S. pump	M. D. V. C.	1	130 x 90 , 30 x 90
Fire, bilge & ballast P.	M. D. H. G.	1	
Bilge pump			

Heat Exchanger & Miscellaneous

Item	Type	No.	Cap.
Main L. O. cooler	S. S. P.	1	1828360kcal/h
Main F. W. cooler	Titanium	2	6424880kcal/h
Main F. O. heater	S&T	2	100 - 150°C
Diesel G. F. W. cooler			
Boiler F. O. heater			
Aux. condenser			
Purif. L. O. heater	S&T	1	45 - 85°C
M. start. air vessel			
A. start. air vessel			
A-C blender			
Fresh W. generator			
Bilge separator	gravity	1	5m3/h
Incinerator		1	500000kcal/h
Sewage treat. device	biological	1	

Main air compressor	M. D.	2	372 x 30
Emer. air compressor	M. D.	1	150 x 30
F. O. purifier	automatic self	2	4700L/H
L. O. purifier	automatic self	2	4000L/H , 3400L/H
D. O. purifier			

Moor. rope	φ42mm x 275m x 20sets		
Deck Machinery & Miscel. Fitting			
Steer. gear	FE21-560-T050 560T/M x 1		
Windlass	EH 62T x 9/15 m/min x 2		
Moor. winch	EH 30T x 15 m/min x 8		
Capstan			
Hoist			
Ref mach. Air cond. Chamber			
Life Saving			
Life boat	frp type 2sets x 32p		
Rescue boat	life boat 와 겸용		
Life raft	20p x 2 , 15P x 2 , 6p x 1set		
Boat devit	gravity , hinged type x 2sets		
Boat winch	EL-motor driven x 2sets		

Accomo.	S. W, P. R. E.	W. B. T	T. E x2
Em. F. pump		Cargo hld	-
Ventilation Fan			
Cargo hold	marine use axial tbue type	**Accommodation**	
		Area. No. of DK	18004m2 , 6tiers
Accomo.	E. M. P. centrifugal axil	Cabin	
	ventilation fan	Toilet	p/o&above:P/T, others:S. P/T
Tank Heating			
F. O. T.	steel, 0.04m2/m3	Public Space	officers' dining room
			crew's mess room
Piping		Elev. Sw. pool	equiped
W. B. pipe & Valve cont.	two main	Ref. chamber	90m3
	remote control	**Others**	
W. B. pump	3000m3/h x 2set		
Bilge pipe			
F. O. pipe			
Heat. pipe			

Main engine			
Aux. engine			

Nautical Instrument			
Mag. compass	1set x wet type	Loran	one
Gyro compass	AC440V, 3PH	Log	-
Auto pilot	AC440V, 60Hz	Echo sounder	AC220V, 1PH, 60Hz
Radar	AC440V, 3PH, 60Hz	NNSS	
ARPA & RADAR		Load. computer	Hyundai
D. finder	AC220V, 1PH, 60Hz	soft. maker	MECA
Wireless Instrument			
Radio tele.	1set	VHF tele.	JHS-31
	JSS-710	Mari. satte.	JUE-75A

Trial Result

Beaufort No.		Sea cond.	moderate
df x dmid x da x Cb		20.6 x 20.6 x 20.6	
Displacement	315745	I/D(%)	159.0%
Eng. load	Speed (kts)	BHP	rpm
50%	13.29	16354	57.84
75%	14.86	24151	65.7
90%	15.880	28718	69.82
100%	15.86	31946	71.87

Maneuvering Trial Result

Turning	advance	783m (2.49 x L)	<4.5xL
	tact. dia.	903m (2.88 x L)	<5.0xL
Initial turning	10/10 deg		<2.5xL
Stopping ability		4649m (14.8 x L)	<15.0xL
Course keeping (Yaw check)	10/10 deg.	1st over.	
		2nd over.	
	20/20 deg.	1st over.	8 deg <25 deg.

NAME	HUYNDAI STAR

Unit : Metric

Kind of ship	281k Cruid Oil Carrier

Bilge pump			
Fresh water pump	M. D. V. C.	1	
F. O. trnasfer pump	M. D. H. G.	1	50 x 4
L. O. transfer pump	M. D. H. G.	1	10 x 4
Vent. fan (supply)			
Main air compressor	M. D.	2	372 x 30
Emer. air compressor	M. D.	1	150 x 30
F. O. purifier	automatic self	2	4700L/H
L. O. purifier	automatic self	2	4000L/H , 3400L/H
D. O. purifier			

Nautical Instrument

Mag. compass	1set x wet type	Loran	one
Gyro compass	AC440V, 3PH	Log	-
Auto pilot	AC440V, 60Hz	Echo sounder	AC220V, 1PH, 60Hz
Radar	AC440V, 3PH, 60Hz	NNSS	
ARPA & RADAR		Load. computer	Hyundai
D. finder	AC220V, 1PH, 60Hz	soft. maker	MECA

Wireless Instrument

Radio tele.	1set	VHF tele.	JHS-31
	JSS-710	Mari. satte.	JUE-75A

NAME	HYUNDAI STAR

Unit : Metric

Main engine		Aux. Boiler & Exh. Gas Economizer	
	HYUNDAI - SULZER 7RTA84T	Aux. boiler	automatic forced draft

Tank

Item	NO x CAP. (cub. M)
F. O. settl. /serv.	1set x 158m3, 1set x 142m3
D. O. settl. /serv.	1set x 33m3, 1set x 22m3
L. O. drain/settl. /stor.	1 x 1m3, 1 x 57m3, 1 x 57m3
Cyl. O. storage	1 x 57m3

Control

Cont. Rm locat.	E/R 3rd deck
Main engine	
Aux. engine	

Trial Result

Beaufort No.		Sea cond.	moderate
df x dmid x da x Cb		20.6 x 20.6 x 20.6	
Displacement	315745	I/D (%)	159.0%

Eng. load	Speed (kts)	BHP	rpm
50%	13.29	16354	57.84
75%	14.86	24151	65.7
90%	15.880	28718	69.82
100%	15.86	31946	71.87

Maneuvering Trial Result

Turning	advance	783m (2.49 x L)		<4.5xL
	tact. dia.	903m (2.88 x L)		<5.0xL
Initial turning	10/10 deg			<2.5xL
Stopping ability		4649m (14.8 x L)		<15.0xL
Course keeping (Yaw check)	10/10 deg.	1st over.		
		2nd over.		
	20/20 deg.	1st over.	8 deg	<25 deg.

Capstan				Space	crew's mess room
Hoist					
Ref mach.	Air cond.	Piping		Elev. Sw. pool	equiped
	Chamber	W. B. pipe & Valve cont.	two main	Ref. chamber	90m3
			remote control	Others	
Life Saving		W. B. pump	3000m3/h x 2set		
Life boat	frp type 2sets x 32p	Bilge pipe			
Rescue boat	life boat 와 겸용	F. O. pipe			
Life raft	20p x 2 , 15P x 2 , 6p x 1set	Heat. pipe			
Boat devit	gravity , hinged type x 2sets				
Boat winch	EL-motor driven x 2sets				

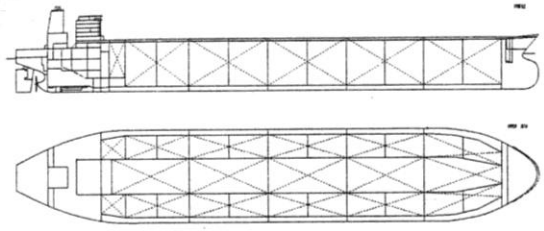
Mag. compass	1set x wet type	Loran	one	75%	14.86	24151	65.7
Gyro compass	AC440V, 3PH	Log	-	90%	15.880	28718	69.82
Auto pilot	AC440V, 60Hz	Echo sounder	AC220V, 1PH, 60Hz	100%	15.86	31946	71.87
Radar	AC440V, 3PH, 60Hz	NNSS		Maneuvering Trial Result			
ARPA & RADAR		Load. computer	Hyundai	Turning	advance	783m (2.	
D. finder	AC220V, 1PH, 60Hz	soft. maker	MECA		tact. dia.	903m (2.	
Wireless Instrument				Initial turning	10/10 deg		
Radio tele.	1set	VHF tele.	JHS-31	Stopping ability		4649m (14	
	JSS-710	Mari. satte.	JUE-75A	Course keeping (Yaw check)	10/10 deg.	1st over.	
						2nd over.	
					20/20 deg.	1st over.	

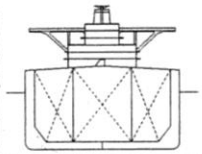
Crude Oil Carrier "Crown Unity" Outlined Specification

NAME	CROWN UNITY

Unit : Metric

Kind of ship	300k Cruid Oil Carrier	
Intend. cargo	Cruide Oil	
Nav. area	Ocean Going	
Class	LR	
Route		
Builder	HHI	
Owner	MOC	
Nationality	Panama	
Keel laid	Launched	Delivered
95-02-28	95-06-24	96-01-20





Principal Dimension (M)

LOA	331						
LBP	314						
Bmld	58						
Dmld	31						
dmld (d1, des.)	22.2						
dext (d2, sum.)	22.2						
DWT at d1	300482						
DWT at d2	300482						
△ at d2	342998						
Cb	Cp						
Cw							
LCB (%LBP)	10.845 (3.45 %)						
L/B	L/D	5.41	10.13				
B/D	B/d	1.87	2.61				
Camber	1.5						
Sheer (F.A)	Nil						
Length: Fore	13.2 + 10						
Length: Hold	248.5						
Length: Mach. Rm	38.7						
Length: Aft	6.2 + 13.6						
Tween Deck Height	30&67						

International Tonnage		Speed at d. (des.)	
GT	156807	Vs (%MCR, SM)	14.65 kts 90 , 15)
NT	105528	Endurance	26500 NM-
Rudder		F.O. consump.	87.6 t/day
Type x No.	semi-balanced :	P.T.O	- BHP
Area , Area / (Lxd)	126.3m2, 1.81%	Complement	
Af/A		31P	

Capacity

W.B	102999	On DK. (TEU)	TEU	C.O.TK.	338, 302
W.B. (hold)		In hld. (TEU)	TEU	Slop TK.	6794
	31984	Total (TEU)	TEU	Hold volume	345, 096
F.O	7860	Reefer Cont.	TEU	Flood. hld. No	No. 3 C.C.O.T
D.O	464	Dang. cargo hld		Car	
L.O	256	Lane length		Truck	
F.W	570	Car deck area		Trailer	

Light Weight Data

LWT		MT.	
KG	LCG		
Net Steel wt (HT. %)		MT.	

Special Regulation

SOLAS 1991
A320
GMPSS

Cargo Handling (hatch size, cover type, cargo pump, car ramp, cargo gear, etc.)

cargo pump : 3sets
type : vertical centriugal single stage
capacity : 5000m3/h x 145mTH

COW pump : 1set
type : inertial centrifugal single stage
capacity : 3000m3/h x 150mTH

cargo gear : 20MT x 2set
15m/min , 360degree

Anchor & Cable

Equip. No.	7150
Anchor	H.H.P x 2sets x 21500kg/set
Anchor chain	φ114mm x 770m
Moor. rope	φ42mm x 275m x 20sets

Deck Machinery & Miscel. Fitting

Steer. gear	DF-530 502T-M x 1
Windlass	EH 62T x 9m/min x 2
Moor. winch	EH 30T x 15 m/min x 8
Capstan	
Hoist	
Ref mach. Air cond. Chamber	

Life Saving

Life boat	frp type 33p x 2sets
Rescue boat	life boat 와 겸용
Life raft	20p x 4 , 6p x 1set
Boat devit	gravity , hinged type x 2sets
Boat winch	EL-motor driven x 2sets

Fire fighting

Detector	ion or thermal type
Cargo hold	foam , S.W
Mach. room	Co2, S.W, P.R.E.
Accommo.	S.W, P.R.E.
Em. F. pump	

Ventilation Fan

Cargo hold	marine use axial tbue type
Accommo.	E.M.D. centrifugal
	axial ventilation fan

Tank Heating

F.O.T.	steel, 0.04m2/m3

Piping

W.B. pipe & Valve cont.	one main
	remote control
W.B. pump	2500m3/h x 2set
Bilge pipe	
F.O. pipe	
Heat. pipe	

Painting

Outside Shell	Bottom	T.E. x2, V.T. x2, S.P.C. x3
	Boot top	T.E. x2, V.T. x1, S.P.C. x3
	Top side	E.P. x2, E.F. x2
W.B.T		T.E x2
Cargo hld		-

Accommodation

Area. No. of DK	2000m2 , 7tiers
Cabin	
Toilet	P/O&above: P/T, others: S.P/T
Public Space	officers' dining room
	crew's mess room
Elev. Sw. pool	equiped
Ref. chamber	90m3

Others

NAME	CROWN UNITY

Unit : Metric

Main engine

Type & No.	HUNDAI - B&W 7S80MC		
	M.C.R.	D.M.C.R	N.C.R
Output (BHP) xRPM	34650 x 79	33290 x 78	29960 x 75.3
F.O.C. rate (10, 200kcal/kg)	121.8 g/PS.hr at NCR		
	without booster		
Type of balancer			

Reduction Gear

Type & No.			
Shaft output x Revol.	M.C.R.	PS x	rpm
	N.C.R	PS x	rpm

Shafting

	Inter. shaft.	Prop. shaft.
No.	ONE	ONE
Dia.	625 mm	9320 mm
Length	790 mm	10258 mm

Propeller

Type & No.	balades solid, Aerofoil, keyless x 1
blade NO.	4
Dia. x pitch (0.7R)	9500 mm x 6761.8 mm
Exp. area ratio	0.462
Material	NI-AL-BZ

Auxiliary Machinery

Item	Type	No.	m3/h x mTH
Sea water cooling P.	M.D.V.C.	2	870 x 20
Fresh water cooling P.	M.D.V.C.	2	193 x 25
Lub. oil pump	M.D.C.	2	516 x 4.5
F.O. burning pump			
Feed water pump			
Boiler W. circ. pump	M.D.H.C.	2	20 x 40
Forced draft fan			
Heel pump			
Sea W. service pump			
Fire & G.S. pump			
Fire, bilge & ballast P.			
Bilge pump			
Fresh water pump	M.D.V.C.	1	
F.O. trnasfer pump	M.D.H.G.	1	50 x 4
L.O. transfer pump	M.D.H.G.	1	10 x 4
Vent. fan (supply)			
Main air compressor	M.D.	2	295 x 30
Emer. air compressor	M.D.	1	100 x 30
	M.D.	1	4.5 x 30
F.O. purifier	automatic self	2	5100L/H
L.O. purifier	automatic self	1	4000L/H
D.O. purifier	automatic self	1	4000L/H

Nautical Instrument

Mag. compass	1set x STANDARD type	Loran	one
Gyro compass	AC440V, 3PH	Log	-
Auto pilot	AC440V, 66Hz	Echo sounder	AC115V, 1PH, 60Hz
Radar	AC440V, 3PH, 60Hz	NNSS	
ARPA & RADAR		Load. computer	Hyundai
D. finder	AC115V, 1PH, 60Hz	soft. maker	MECA

Wireless Instrument

Radio tele.	1set	VHF tele.	JHS-31
	JSS-710	Mari. satte.	JUE-75A

Aux. Boiler & Exh. Gas Economizer

Aux. boiler	CPH type , fully automatic forced draft
Type & No.	two
Press. x Temp.	16 , 50 centigrade
Evaporation	45000 kg/h
Exh. gas econo	forced circulating, finned tube type
Type & No.	one
Press. x Temp.	6, 50centigrade
Evaporation	2500kg/h

Electric Generator

Generator Type No. & Capacity	Prime Mover Type No. & Capacity
D/G, three, 850kw	in-link, three, 1240PS
E/G, one, 70kw	in-link, one, 260PS

Heat Exchanger & Miscellaneous

Item	Type	No.	Cap.
Main L.O. cooler	S&T	1	1548000kcal/h
Main F.W. cooler	S&T	1	3182000kcal/h
Main F.O. heater	S&T	2	100 ~ 150°C
Diesel G.F.W. cooler			
Boiler F.O. heater		2	
Aux. condenser			
Purif. L.O. heater		1	
M. start. air vessel			
A. start. air vessel			
A-C blender			
Fresh W. generator			
Bilge separator	gravity	1	5m3/h
Incinerator		1	500000kcal/h
Sewage treat. device	biological	1	

Tank

Item	NO x CAP. (cub. M)
F.O. settl./serv.	1set x 167m3, 1set x 151m3
D.O. settl./serv.	1set x 26m3, 1set x 26m3
L.O. drain/settl./stor.	1 x 1m3, 1 x 46m3, 1 x 46m3
Cyl. O. storage	2 x 46m3

Control

Cont. Rm locat.	E/R 3rd deck
Main engine	
Aux. engine	

Trial Result

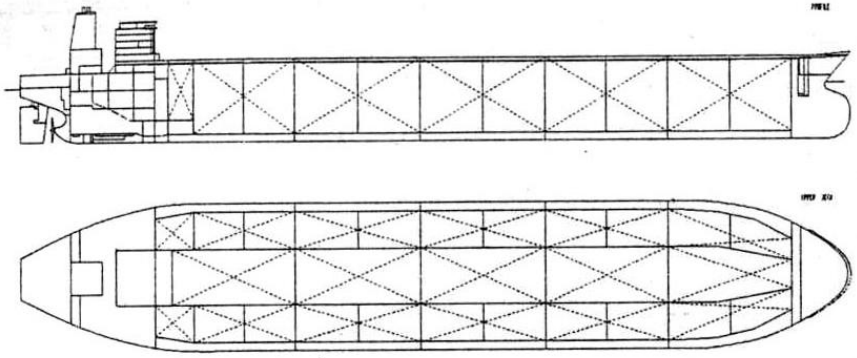
Beaufort No.		Sea cond.	smooth
df x dmid x da x Cb	22.22 x 22.22 x 22.22 x ~~0.8258~~		
Displacement	342998	I/D (%)	178.0%

Eng. load	Speed (kts)	BHP	rpm
50%	12.45	17008	64.29
75%	14.64	25000	73.5
90%	15.240	30211	78.22
100%	15.75	32658	80.7

Maneuvering Trial Result

Turning	advance	875m (2.76 x L)	<4.5xL
	tact. dia.	950m (3.03 x L)	<5.0xL
Initial turning	10/10 deg		<2.5xL
Stopping ability		5179m (16.49 x L)	<15.0xL
Course keeping (Yaw check)	10/10 deg.	1st over. 21 deg.	
		2nd over. 41 deg.	
	20/20 deg.	1st over. 39 deg.	<25 deg.

Kind of ship	300k Cruid Oil Carrier
Intend. cargo	Cruide Oil
Nav. area	Ocean Going
Class	LR
Route	
Builder	HHI
Owner	MOC
Nationality	Panama
Keel laid	Launched / Delivered
95-02-28	95-06-24 / 96-01-20



Principal Dimension (M)

LOA	331		
LBP	314		
Bmld	58		
Dmld	31		
dmld (d1, des.)	22.2		
dext (d2, sum.)	22.2		
DWT at d1	300482		
DWT at d2	300482		
△ at d2	342998		
Cb	Cp		
Cw			
LCB (%LBP)	10.845 (3.45 %)		
L/B	L/D	5.41	10.13
B/D	B/d	1.87	2.61
Camber	1.5		
Sheer (F.A)	Nil		
Length: Fore	13.2 + 10		
Length: Hold	248.5		
Length: Mach. Rm	38.7		
Length: Aft	6.2 + 13.6		
Tween Deck Height	30&67		

International Tonnage

GT	156807
NT	105528

Rudder

Type x No.	semi-balanced x
Area , Area / (Lxd)	126.3m2, 1.81%
Af/A	

Speed at d. (des.)

Vs (%MCR, SM)	14.65 kts 90 , 15)
Endurance	26500 NM
F.O. consump.	87.6 t/day
P.T.O	- BHP

Complement

31P

Capacity

W.B	102999	On DK. (TEU)	TEU	C.O.TK.	338,302
W.B. (hold)	31984	In hld. (TEU)	TEU	Slop TK.	6794
F.O	7860	Total (TEU)	TEU	Hold volume	345,096
D.O	464	Reefer Cont.	TEU	Flood. hld. No	No.3 C.C.O.T
L.O	256	Dang. cargo hld		Car	
F.W	570	Lane length		Truck	
		Car deck area		Trailer	

Light Weight Data

LWT	MT.
KG / LCG	
Net Steel wt (HT.%)	MT.

Special Regulation

SOLAS 1991
A320
GMPSS

Cargo Handling (hatch size, cover type, cargo pump, car ramp, cargo gear, etc.)

cargo pump : 3sets
type : vertical centriugal single stage
capacity : 5000m3/h x 145mTH

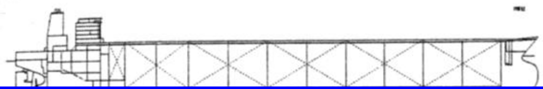
COW pump : 1set
type : inertial centrifugal single stage
capacity : 3000m3/h x 150mTH

cargo gear : 20MT x 2set
15m/min , 360degree

NAME	CROWN UNITY

Unit : Metric

Kind of ship	300k Cruid Oil Carrier
Intend. cargo	Cruide Oil
Nav. area	Ocean Going
Class	LR



Anchor & Cable

Equip. No.	7150
Anchor	H. H. P x 2sets x 21500kg/set
Anchor chain	ф 114mm x 770m
Moor. rope	ф 42mm x 275m x 20sets

Deck Machinery & Miscel. Fitting

Steer. gear	DF-530 502T-M x 1
Windlass	EH 62T x 9m/min x 2
Moor. winch	EH 30T x 15 m/min x 8
Capstan	
Hoist	
Ref mach. Air cond.	
Ref mach. Chamber	

Life Saving

Life boat	frp type 33p x 2sets
Rescue boat	life boat 와 겸용
Life raft	20p x 4 , 6p x 1set
Boat devit	gravity , hinged type x 2sets
Boat winch	EL-motor driven x 2sets

Fire fighting

Detector	ion or thermal type
Cargo hold	foam , S. W
Mach. room	Co2, S. W, P. R. E.
Accommo.	S. W, P. R. E.
Em. F. pump	

Ventilation Fan

Cargo hold	marine use axial tbue type
Accommo.	E. M. D. centrifugal
	axial ventilation fan

Tank Heating

F. O. T.	steel, 0. 04m2/m3

Piping

W. B. pipe & Valve cont.	one main
	remote control
W. B. pump	2500m3/h x 2set
Bilge pipe	
F. O. pipe	
Heat. pipe	

Painting

Outside Shell	Bottom	T. E. x2, V. T. x2, S. P. C. x3
	Boot top	T. E. x2, V. T. x1, S. P. C. x3
	Top side	E. P. x2, E. F. x2
W. B. T	T. E x2	
Cargo hld	-	

Accommodation

Area. No. of DK	2000m2 , 7tiers
Cabin	
Toilet	P/O&above:P/T, others:S. P/T
Public Space	officers' dining room
	crew's mess room
Elev. Sw. pool	equiped
Ref. chamber	90m3

Others

Moor. winch	EH 30T x 15 m/min x 8	Tank Heating			
		F. O. T.	steel, 0. 04m2/m3	Public Space	officers' dining room
Capstan					crew's mess room
Hoist		Piping		Elev. Sw. pool	equiped
Ref Air cond.		W. B. pipe & Valve cont.	one main	Ref. chamber	90m3
mach. Chamber				Others	
Life Saving			remote control		
Life boat	frp type 33p x 2sets	W. B. pump	2500m3/h x 2set		
Rescue boat	life boat 와 겸용	Bilge pipe			
Life raft	20p x 4 , 6p x 1set	F. O. pipe			
Boat devit	gravity , hinged type x 2sets	Heat. pipe			
Boat winch	EL-motor driven x 2sets				

NAME	CROWN UNITY

Unit : Metric

Main engine			
Type & No.	HUNDAI - B&W 7S80MC		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	34650 x 79	33290 x 78	29960 x 75. 3
F. O. C. rate (10, 200kcal/kg)	121. 8	g/PS. hr at NCR	

Aux. Boiler & Exh. Gas Economizer	
Aux. boiler	CPH type , fully automatic forced draft
Type & No.	two
Press. x Temp.	16 , 50 centigrade
Evaporation	45000 kg/h

L. O. purifier	automatic self	1	4000L/H
D. O. purifier	automatic self	1	4000L/H

Nautical Instrument

Mag. compass	1set x STANDARD type	Loran	one
Gyro compass	AC440V, 3PH	Log	-
Auto pilot	AC440V, 66Hz	Echo sounder	AC115V, 1PH, 60Hz
Radar	AC440V, 3PH, 60Hz	NNSS	
ARPA & RADAR		Load. computer	Hyundai
D. finder	AC115V, 1PH, 60Hz	soft. maker	MECA

Wireless Instrument

Radio tele.	1set	VHF tele.	JHS-31
	JSS-710	Mari. satte.	JUE-75A

Displacement	342998	T/D (%)	178. 0%
Eng. load	Speed (kts)	BHP	rpm
50%	12. 45	17008	64. 29
75%	14. 64	25000	73. 5
90%	15. 240	30211	78. 22
100%	15. 75	32658	80. 7

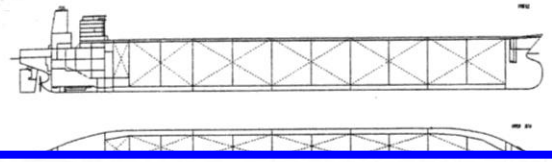
Maneuvering Trial Result

Turning	advance	875m (2. 76 x L)		<4. 5xL
	tact. dia.	950m (3. 03 x L)		<5. 0xL
Initial turning	10/10 deg			<2. 5xL
Stopping ability		5179m (16. 49 x L)		<15. 0xL
Course keeping (Yaw check)	10/10 deg.	1st over.	21 deg.	
		2nd over.	41 deg.	
	20/20 deg.	1st over.	39 deg.	<25 deg.

NAME	CROWN UNITY

Unit : Metric

Kind of ship	300k Cruid Oil Carrier
Intend. cargo	Cruide Oil
Nav. area	Ocean Going
Class	LR
Route	
Builder	HHI
Owner	MOC
Nationality	Panama



Main engine

Type & No.	HUNDAI - B&W 7S80MC		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	34650 x 79	33290 x 78	29960 x 75.3
F. O. C. rate (10, 200kcal/kg)	121.8 g/PS. hr at NCR		
	without booster		
Type of balancer			

Reduction Gear

Type & No.		
Shaft output x Revol.	M. C. R.	PS x rpm
	N. C. R	PS x rpm

Shafting

	Inter. shaft.	Prop. shaft.
No.	ONE	ONE
Dia.	625 mm	9320 mm
Length	790 mm	10258 mm

Propeller

Type & No.	balades solid, Aerofoil, keyless x 1
blade NO.	4
Dia. x pitch (0.7R)	9500 mm x 6761.8 mm
Exp. area ratio	0.462
Material	NI-AL-BZ

Aux. Boiler & Exh. Gas Economizer

Aux. boiler	CPH type , fully automatic forced draft
Type & No.	two
Press. x Temp.	16 , 50 centigrade
Evaporation	45000 kg/h
Exh. gas econo	forced circulating, finned tube type
Type & No.	one
Press. x Temp.	6, 50centigrade
Evaporation	2500kg/h

Electric Generator

Generator Type No. & Capacity	Prime Mover Type No. & Capacity
D/G, three, 850kw	in-link, three, 1240PS
E/G, one, 70kw	in-link, one, 260PS

		axial ventilation fan	
Moor. winch	EH 30T x 15 m/min x 8	Tank Heating	
		F. O. T.	steel, 0.04m2/m3
Capstan			
Hoist			
Ref Air cond.		Piping	
mach. Chamber		W. B. pipe & Valve cont.	one main
			remote control
Life Saving		W. B. pump	2500m3/h x 2set
Life boat	frp type 33p x 2sets	Bilge pipe	
Rescue boat	life boat 와 겸용	F. O. pipe	
Life raft	20p x 4 , 6p x 1set	Heat. pipe	
Boat devit	gravity , hinged type x 2sets		
Boat winch	EL-motor driven x 2sets		

Toilet	P/O&above:P/T, others:S. P/T		
Public Space	officers'dining room		
	crew's mess room		
Elev. Sw. pool	equiped		
Ref. chamber	90m3		
Others			

F. O. purifier	automatic self	2	4000L/H		
L. O. purifier	automatic self	1	4000L/H		
D. O. purifier	automatic self	1	4000L/H		

Nautical Instrument			
Mag. compass	1set x STANDARD type	Loran	one
Gyro compass	AC440V, 3PH	Log	-
Auto pilot	AC440V, 66Hz	Echo sounder	AC115V, 1PH, 60Hz
Radar	AC440V, 3PH, 60Hz	NNSS	
ARPA & RADAR		Load. computer	Hyundai
D. finder	AC115V, 1PH, 60Hz	soft. maker	MECA
Wireless Instrument			
Radio tele.	1set	VHF tele.	JHS-31
	JSS-710	Mari. satte.	JUE-75A

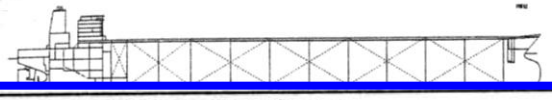
Displacement	342998		I/D (%)	178.0%
Eng. load	Speed (kts)		BHP	rpm
50%	12.45		17008	64.29
75%	14.64		25000	73.5
90%	15.240		30211	78.22
100%	15.75		32658	80.7

Maneuvering Trial Result				
Turning	advance	875m (2.76 x L)		<4.5xL
	tact. dia.	950m (3.03 x L)		<5.0xL
Initial turning	10/10 deg			<2.5xL
Stopping ability		5179m (16.49 x L)		<15.0xL
Course keeping (Yaw check)	10/10 deg.	1st over.	21 deg.	
		2nd over.	41 deg.	
	20/20 deg.	1st over.	39 deg.	<25 deg.

NAME	CROWN UNITY

Unit : Metric

Kind of ship	300k Cruid Oil Carrier
Intend. cargo	Cruide Oil
Nav. area	Ocean Going
Class	LR



Main engine				Aux. Boiler & Exh. Gas Economizer	
Type & No.	HUNDAI - B&W 7S80MC			Aux. boiler	CPH type , fully automatic forced draft
	M. C. R.	D. M. C. R	N. C. R	Type & No.	two
Output (BHP) xRPM	34650 x 79	33290 x 78	29960 x 75.3	Press. x Temp.	16 , 50 centigrade
F. O. C. rate (10,200kcal/kg)	121.8 g/PS.hr at NCR			Evaporation	45000 kg/h

Auxiliary Machinery

Item	Type	No.	m3/h x mTH
Sea water cooling P.	M. D. V. C.	2	870 x 20
Fresh water cooling P.	M. D. V. C.	2	193 x 25
Lub. oil pump	M. D. C.	2	516 x 4.5
F. O. burning pump			
Feed water pump			
Boiler W. circ. pump	M. D. H. C.	2	20 x 40
Forced draft fan			
Heel pump			
Sea W. service pump			
Fire & G. S. pump			
Fire, bilge & ballast P.			
Bilge pump			
Fresh water pump	M. D. V. C.	1	
F. O. trnasfer pump	M. D. H. G.	1	50 x 4
L. O. transfer pump	M. D. H. G.	1	10 x 4
Vent. fan (supply)			
Main air compressor	M. D.	2	295 x 30
Emer. air compressor	M. D.	1	100 x 30
	M. D.	1	4.5 x 30

Heat Exchanger & Miscellaneous

Item	Type	No.	Cap.
Main L. O. cooler	S&T	1	1548000kcal/h
Main F. W. cooler	S&T	1	3182000kcal/h
Main F. O. heater	S&T	2	100 - 150°C
Diesel G. F. W. cooler			
Boiler F. O. heater		2	
Aux. condenser			
Purif. L. O. heater		1	
M. start. air vessel			
A. start. air vessel			
A-C blender			
Fresh W. generator			
Bilge separator	gravity	1	5m3/h
Incinerator		1	500000kcal/h
Sewage treat. device	biological	1	

Tank

Item	NO x CAP. (cub. M)
F. O. settl. /serv.	1set x 167m3, 1set x 151m3
D. O. settl. /serv.	1set x 26m3, 1set x 26m3
L. O. drain/settl. /stor.	1 x 1m3, 1 x 46m3, 1 x 46m3
Cyl. O. storage	2 x 46m3

Control

Cont. Rm locat.	E/R 3rd deck
Main engine	
Aux. engine	

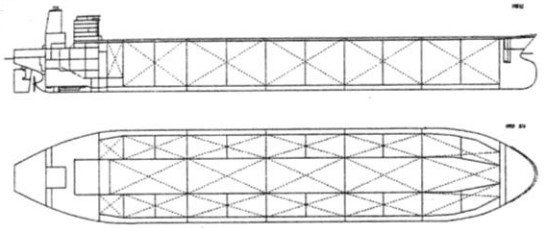
mach. Chamber		W. B. pipe & Valve cont.	one main	Ref. chamber	90m3
			remote control	Others	
Life Saving		W. B. pump	2500m3/h x 2set		
Life boat	frp type 33p x 2sets	Bilge pipe			
Rescue boat	life boat 와 겸용	F. O. pipe			
Life raft	20p x 4 , 6p x 1set	Heat. pipe			
Boat devit	gravity , hinged type x 2sets				
Boat winch	EL-motor driven x 2sets				

Radar	AC440V, 3PH, 60Hz	NNSS		Maneuvering Trial Result			
ARPA & RADAR		Load. computer	Hyundai	Turning	advance	875m (2.76 x L)	<4.5xL
D. finder	AC115V, 1PH, 60Hz	soft. maker	MECA		tact. dia.	950m (3.03 x L)	<5.0xL
Wireless Instrument				Initial turning	10/10 deg		<2.5xL
Radio tele.	1set	VHF tele.	JHS-31	Stopping ability		5179m (16.49 x L)	<15.0xL
	JSS-710	Mari. satte.	JUE-75A	Course keeping (Yaw check)	10/10 deg.	1st over. 21 deg.	
						2nd over. 41 deg.	
					20/20 deg.	1st over. 39 deg.	<25 deg.

NAME	CROWN UNITY

Unit : Metric

Kind of ship	300k Cruid Oil Carrier	
Intend. cargo	Cruide Oil	
Nav. area	Ocean Going	
Class	LR	
Route		
Builder	HHI	
Owner	MOC	
Nationality	Panama	
Keel laid	Launched	Delivered
95-02-28	95-06-24	96-01-20
Principal Dimension (M)		
LOA	331	



NAME	CROWN UNITY

Unit : Metric

Main engine			
Type & No.	HUNDAI - B&W 7S80MC		
	M. C. R.	D. M. C. R	N. C. R
Output (BHP) xRPM	34650 x 79	33290 x 78	29960 x 75.3
F. O. C. rate (10, 200kcal/kg)	121.8 g/PS.hr at NCR without booster		
Type of balancer			
Reduction Gear			
Type & No.			
Shaft output x Revol.	M. C. R.	PS x	rpm
	N. C. R	PS x	rpm
Shafting			

Aux. Boiler & Exh. Gas Economizer	
Aux. boiler	CPH type , fully automatic forced draft
Type & No.	two
Press. x Temp.	16 , 50 centigrade
Evaporation	45000 kg/h
Exh. gas econo	forced circulating, finned tube type
Type & No.	one
Press. x Temp.	6, 50centigrade
Evaporation	2500kg/h
Electric Generator	
Generator Type No. & Capacity	Prime Mover Type No. & Capacity
D/G three 850kw	in-link three 1240PS

F. O. purifier	automatic self	2	5100L/H
L. O. purifier	automatic self	1	4000L/H
D. O. purifier	automatic self	1	4000L/H

Nautical Instrument			
Mag. compass	1set x STANDARD type	Loran	one
Gyro compass	AC440V, 3PH	Log	-
Auto pilot	AC440V, 66Hz	Echo sounder	AC115V, 1PH, 60Hz
Radar	AC440V, 3PH, 60Hz	NNSS	
ARPA & RADAR		Load. computer	Hyundai
D. finder	AC115V, 1PH, 60Hz	soft. maker	MECA

Wireless Instrument			
Radio tele.	1set	VHF tele.	JHS-31
	JSS-710	Mari. satte.	JUE-75A

Trial Result				
Beaufort No.		Sea cond.	smooth	
df x dmid x da x Cb		22.22 x 22.22 x 22.22 x ~~0.8258~~		
Displacement	342998		I/D (%)	178.0%
Eng. load	Speed (kts)	BHP	rpm	
50%	12.45	17008	64.29	
75%	14.64	25000	73.5	
90%	15.240	30211	78.22	
100%	15.75	32658	80.7	

Maneuvering Trial Result				
Turning	advance	875m (2.76 x L)		<4.5xL
	tact. dia.	950m (3.03 x L)		<5.0xL
Initial turning	10/10 deg			<2.5xL
Stopping ability		5179m (16.49 x L)		<15.0xL
Course keeping (Yaw check)	10/10 deg.	1st over.	21 deg.	
		2nd over.	41 deg.	
	20/20 deg.	1st over.	39 deg.	<25 deg.

Deck Machinery & Miscel. Fitting	
Steer. gear	DF-530 502T-M x 1
Windlass	EH 62T x 9m/min x 2
Moor. winch	EH 30T x 15 m/min x 8
Capstan	
Hoist	
Ref mach. Air cond. Chamber	
Life Saving	
Life boat	frp type 33p x 2sets
Rescue boat	life boat 와 겸용
Life raft	20p x 4 , 6p x 1set
Boat devit	gravity , hinged type x 2sets
Boat winch	EL-motor driven x 2sets

Em. F. pump		Cargo hld	-
Ventilation Fan			
Cargo hold	marine use axial tbue type		
Accommo.	E. M. D. centrifugal axial ventilation fan		
Tank Heating			
F. O. T.	steel, 0.04m2/m3		
Piping			
W. B. pipe & Valve cont.	one main remote control		
W. B. pump	2500m3/h x 2set		
Bilge pipe			
F. O. pipe			
Heat. pipe			

Accommodation	
Area. No. of DK	2000m2 , 7tiers
Cabin	
Toilet	P/O&above: P/T, others: S. P/T
Public Space	officers' dining room
	crew's mess room
Elev. Sw. pool	equiped
Ref. chamber	90m3
Others	

Main air compressor	M. D.	2	295 x 30
Emer. air compressor	M. D.	1	100 x 30
	M. D.	1	4.5 x 30

Main engine
Aux. engine

F. O. purifier	automatic self	2	5100L/H
L. O. purifier	automatic self	1	4000L/H
D. O. purifier	automatic self	1	4000L/H

Nautical Instrument			
Mag. compass	1set x STANDARD type	Loran	one
Gyro compass	AC440V, 3PH	Log	-
Auto pilot	AC440V, 66Hz	Echo sounder	AC115V, 1PH, 60Hz
Radar	AC440V, 3PH, 60Hz	NNSS	
ARPA & RADAR		Load. computer	Hyundai
D. finder	AC115V, 1PH, 60Hz	soft. maker	MECA

Wireless Instrument			
Radio tele.	1set	VHF tele.	JHS-31
	JSS-710	Mari. satte.	JUE-75A

Trial Result				
Beaufort No.		Sea cond.	smooth	
df x dmid x da x Cb		22.22 x 22.22 x 22.22 x ~~0.8258~~		
Displacement	342998		I/D (%)	178.0%
Eng. load	Speed (kts)	BHP	rpm	
50%	12.45	17008	64.29	
75%	14.64	25000	73.5	
90%	15.240	30211	78.22	
100%	15.75	32658	80.7	

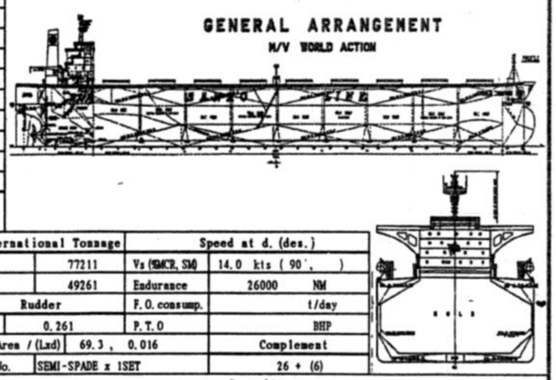
Maneuvering Trial Result			
Turning	advance	875m (2.	
	tact. dia.	950m (3.	
Initial turning	10/10 deg		
Stopping ability		5179m (1	
Course keeping (Yaw check)	10/10 deg.	1st over.	
		2nd over.	
	20/20 deg.	1st over.	

Bulk Carrier
"World Action"
Outlined Specification

Name	WORLD ACTION

Unit : Metric

Kind of ship	BULK CARRIER	
Intend. cargo	COAL, ORE	
Nav. area	OCEAN GOING	
Class	DNV	
Route	WORLD-WIDE SERVICE	
Builder	DHI	
Owner	WORLD-WIDE	
Nationality	HONGKONG	
Keel laid	Launched	Delivered
94. 2. 7	94. 5. 21	94. 7. 29



Principal Dimension (M)

LOA	274.000	
LBP	264.000	
Bmld	45.000	
Dmld	23.200	
dmld (d1, des.)	16.900	
dext (d2, sum.)	16.900	
DWT at d1	150790	
DWT at d2	150790	
△ at d2		
Cb / Cp	0.8235	
Cw	0.8999	
LCB (%LBP)	8.481	(3.21 %)
L/B / L/D	5.967	11.379
B/D / B/d	1.940	2.663
Camber	0.800	
Sheer (F. A)	0.0 / 0.0	
Length – Fore	11.28 + 6.0	
Length – Hold	216.72	
Length – Mach. Rm	24.80	
Length – Aft	11.20 + 4.00	
Tween Deck Height		

International Tonnage

GT	77211
NT	49261

Rudder

Af/A	0.261
Area, Area / (Lxd)	69.3, 0.016
Type x No.	SEMI-SPADE x 1SET

Speed at d. (des.)

Vs (%MCR, SM)	14.0 kts (90',)
Endurance	26000 NM
F.O. consump.	t/day
P.T.O	BHP
Complement	26 + (6)

Capacity

W.B	48361	On DK. (TEU)	TEU (RxT)	C.O. TK.	
W.B. (hold)		In hld. (TEU)	TEU (RxT)	Slop TK.	
	19215	Total (TEU)	TEU	Hold volume	169379
F.O	3962	Reefer Cont.	TEU	Flood. hld. No	NO. 4 HOLD
D.O	278	Dang. cargo hld		Car	
L.O	168	Lane length		Truck	
F.W	395	Car deck area		Trailer	

Cargo Handling (hatch size, cover type, cargo pump, car ramp, cargo gear, etc.)

(HATCH COVER)
NO. 1 : 13.76 x 15.30 M
NO. 2 - 9 : 13.76 x 20.40 M
TYPE : WEATHER TIGHT SIDE ROLLING (CHAIN DRIVEN TYPE)

Light Weight Data

LWT		MT.
KG	LCG	
Net Steel wt (HT. %)		MT. (%)

Special Regulation

HKMD
ICLL, 1966
SOLAS, 1974 (1978) 1981, 1983, 1989, 1990 AND 1988 AMEND
MARPOL 1973 (ANNEX 1&V), PROTOCOL 1978

Anchor & Cable

Equip. No.	5276.7
Anchor	JIS x 2SET x 1600KG/ST
Anchor chain	97mm x 742.5M GRADE3
Moor. rope	14SET x 36mm x 250M

Fire fighting

Detector	
Cargo hold	S.W
Mach. room	CO2, S.W, PORTABLE
Accomo.	S.W, PORTABLE
Em. F. pump	FOAM

Painting

Outside Shell	Bottom	
	Boot top	
	Top side	
W.B.T	2 x BISCONHB-200 x 250MC	
Cargo hld	2 x BISCONHB-200 x 250MC	

Deck Machinery & Miscel. Fitting

Steer. gear	ELEC-HYD, 2RAM-4CYL, 207TON
Windlass	2SET x 45/20T x 9/15M/MIN
Moor. winch	6SET x 20T x 15M/MIN
Capstan	
Hoist	
Ref mach. – Air cond.	1SET x 154066 KCAL/H
Ref mach. – Chamber	2SET x 440V x 3PH x 60HZ

Ventilation Fan

Cargo hold	
Accomo.	

Accommodation

Area, No. of DK	1460M2, 6TIER
Cabin	27 EA
Toilet	31 EA
Public Space	HOSPITAL, TALLY OFFICE, GYMNASIUM, B.C RM, DK OFFICE, MESS RM, RECREA. RM, CONFER. RM
Elev. Sw. pool	
Ref. chamber	MEAT, FISH, VEGET, ROBBY

Others

Tank Heating

F.O.T.	

Piping

W.B. pipe & Valve coat.	125A, STPG370 ERW SCH80
	400A, STPG370 ERW 12.7T
W.B. pump	VERT. CENT. 2500M3/Hx30MWC
Bilge pipe	50/250A, STPG370ERW SCH. 40
F.O. pipe	50A, STPG370 SCH40-E
Heat. pipe	25/50A STPG38 SCH. 40-S

Life Saving

Life boat	2SET x 30P
Rescue boat	COMBINED WITH L/B
Life raft	4SET x 15P, 1SET x 6P
Boat devit	HINGED GRAVITY x 2SET
Boat winch	EL. MOTOR DRIVEN x 2SET

Name	WORLD ACTION

Unit : Metric

Main engine

Type & No.	B&W 5S70MC		
	M.C.R.	D.M.C.R	N.C.R
Output (BHP) x RPM	19100 x 91.0	16500 X 80.0	14850 X 77.2
F.O.C. rate (10,200kcal/kg)	g/PS.hr at NCR		
	without booster		
Type of balancer			

Reduction Gear

Type & No.		
Shaft output x Revol.	M.C.R.	PS x rpm
	N.C.R	PS x rpm

Shafting

	Inter. shaft	Prop. shaft
No.	1	1
Dia.	500 mm	610 mm
Length	8248 mm	8400 mm

Propeller

Type & No.	FIXED PITCH PROPELLER
blade NO.	4
Dia. x pitch (0.7R)	8400 mm x 6015 mm
Exp. area ratio	0.420
Material	NI-AL-BRONZE

Aux. Boiler & Exh. Gas Economizer

Aux. boiler	VERTICAL OIL FIRED
Type & No.	1SET
Press. x Temp.	6KG/CM2
Evaporation	2000KG/H
Exh. gas econo	FORCED CIRCULATING
Type & No.	1SET
Press. x Temp.	6KG/CM2
Evaporation	1600KG/H

Electric Generator

Generator Type No. & Capacity	Prime Mover Type No. & Capacity
WATER TO AIR COOLING	4-STROKE, TR-PISTON
750KVA, 962A	3SET x 900BHP
440VAC, 3PH, 60HZ	

Auxiliary Machinery

Item	Type	No.	M3/h x m x kw x rpm
Sea water cooling P.	VERT. CENTRI	1	550M3/H x 20MTH
Fresh water cooling P.	VERT. CENTRI	2	96M3/H x 25MTH
Lub. oil pump	CENTRIFUGAL	2	305M3/H x 4.2KG/CM2
F.O. burning pump	HORIZONTAL GEAR	2	6.5M3/H x 6KG/CM2
Feed water pump	HORIZ. CENTRI	2	4M3/H x 110MTH
Boiler W. circ. pump	HORIZ. CENTRI	2	19M3/H x 40MTH
Forced draft fan			
Heel pump			
Sea W. service pump			
Fire & G.S. pump	VERT. CENTRI		(BILGE PUMP)
Fire, bilge & ballast P.			
Bilge pump	VERT. CENTRI	2	210/360M3/H x 90/30MWC
Fresh water pump	CENTRIFUGAL	2	5M3/H x 50MTH
F.O. transfer pump	HORIZONTAL GEAR	1	25M3/H x 3KG/CM2
D.O. transfer pump	HORIZONTAL GEAR	1	5M3/H x 3KG/CM2
L.O. transfer pump	HORIZONTAL GEAR	1	5M3/H x 3KG/CM2
Vent. fan (supply)	VERT. AXIAL FLOW	4	800M3/MIN x 40MMAQ
Main air compressor	FW COOLED PIST	1	215M3/H x 30KG/CM2
Emer. air compressor	AIR COOLED PIST	1	8.5M3/H x 7KG/CM2
F.O. purifier	CENTRIFUGAL	2	2900L/H 600CST AT 50oC
L.O. purifier	CENTRIFUGAL	2	2200L/H
D.O. purifier			

Heat Exchanger & Miscellaneous

Item	Type	No.	Cap.
Main L.O. cooler	HORIZ. TUBUL	1	791200KCAL/H
Main F.W. cooler	HORIZ. TUBUL	1	1573800KCAL/H
Main F.O. heater	HORIZ. TUBUL	2	1477713KCAL/H
Diesel G.F.W. cooler	HORIZ. TUBUL	2	399000KCAL/H
Boiler F.O. heater			
Aux. condenser	SHELL & TUBE	1	1001760KCAL/H
Purif. L.O. heater	HORIZ. TUBUL	2	40095KCAL/H
M. start. air vessel	VERT. CYLINDE	2	7M3 x 30KG/CM2
A. start. air vessel	VERT. CYLINDE	1	1M3 x 7KG/CM2
A-C blender			
Fresh W. generator	M/E WASTE	1	30T/DAY AT NCR
Bilge separator	AUTO OIL DISCH	1	5M3/H
Incinerator	SOLID & OIL	1	300000KCAL/H
Sewage treat. device	VACUUM	1	6M3

Tank

Item	NO x CAP. (cub. M)
F.O. settl./serv.	1 x 53.6 / 1 x 53.6
D.O. settl./serv.	1 x 10.7 / 1 x 10.7
L.O. drain/settl./stor.	EACH 1EA 31.9 / 24.1 / 32.2
Cyl. O. storage	1 x 68.0

Control

Cont. Rm locat.	ENGINE ROOM
Main engine	CONTROL ROOM
Aux. engine	MACHINERY SIDE

Trial Result

Beaufort No.		Sea cond.	
df x dmid x da x Cb			
Displacement		I/D (%)	
Eng. load	Speed	PS	rpm

Nautical Instrument

Mag. compass	GILLIE SR3 x 1SET	Loran	JNA-761 x 1SET
Gyro compass	TG-5000 x 1SET	Log	TOKIMEC TD-501 x 1
Auto pilot	PR-8457-L x 1SET	Echo sounder	JEE-570S x 1SET
Radar	X-BAND, S-BAND	NNSS	
ARPA & RADAR	COMBINED S-BAND x 1SET	Load. computer	LOCAS
D. finder	JLD-10 x 1SET	soft. maker	(OFF-LINE)

Wireless Instrument

Radio tele.	JSS-720 x 1SET	VHF tele.	JHS-31 x 1SET
		Mari. satte.	JUE-45AMII x 1SET

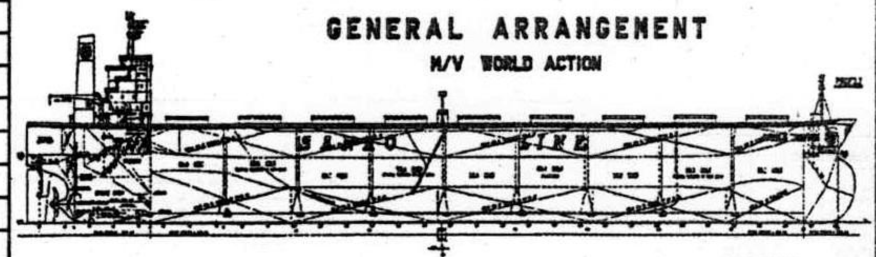
Maneuvering Trial Result

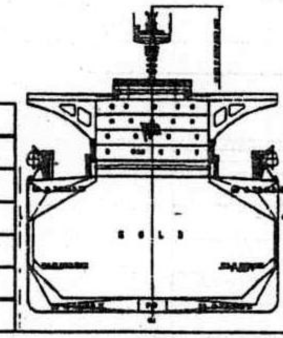
Turning	advance	2.8 x L		<4.5xL
	tact. dia.	2.6 x L		<5.0xL
Initial turning	10/10 deg			<2.5xL
Stopping ability		22.8 x L		<15.0xL
Course keeping (Yaw check)	10/10 deg.	1st over.	7	
		2nd over.	18	
	20/20 deg.	1st over.		<25 deg.

Name	WOR

Unit : Metric

GENERAL ARRANGEMENT
M/V WORLD ACTION





Kind of ship	BULK CARRIER		
Intend. cargo	COAL, ORE		
Nav. area	OCEAN GOING		
Class	DNV		
Route	WORLD-WIDE SERVICE		
Builder	DHI		
Owner	WORLD-WIDE		
Nationality	HONGKONG		
Keel laid	Launched	Delivered	
94. 2. 7	94. 5. 21	94. 7. 29	

Principal Dimension (M)			
LOA		274.000	
LBP		264.000	
Bmld		45.000	
Dmld		23.200	
dmld (d1, des.)		16.900	
dext (d2, sum.)		16.900	
DWT at d1		150790	
DWT at d2		150790	
△ at d2			
Cb	Cp		0.8235
Cw		0.8999	
LCB (%LBP)		8.481	(3.21 %)
L/B	L/D	5.967	11.379
B/D	B/d	1.940	2.663
Camber		0.800	
Sheer (F. A)		0.0 / 0.0	
Len-gth	Fore	11.28	+ 6.0
	Hold	216.72	
	Mach. Rm	24.80	
	Aft	11.20	+ 4.00
Tween Deck Height			

International Tonnage		Speed at d. (des.)	
GT	77211	Vs (%MCR, SM)	14.0 kts (90',)
NT	49261	Endurance	26000 NM
Rudder		F.O. consump.	t/day
Af/A	0.261	P.T.O	BHP
Area, Area / (Lxd)	69.3, 0.016	Complement	
Type x No.	SEMI-SPADE x 1SET		26 + (6)

Capacity					
W.B	48361	On DK (TEU)	TEU (RxT)	C.O.TK	
W.B. (hold)		In hld. (TEU)	TEU (RxT)	Slop TK	
	19215	Total (TEU)	TEU	Hold volume	169379
F.O	3962	Reefer Cont.	TEU	Flood. hld. No	NO. 4 HOLD
D.O	278	Dang. cargo hld		Car	
L.O	168	Lane length		Truck	
F.W	395	Car deck area		Trailer	

Light Weight Data			
LWT			MT.
KG	LCG		
Net Steel wt (HT. %)		MT. (	%)

Cargo Handling (hatch size, cover type, cargo pump, car ramp, cargo gear, etc.)

(HATCH COVER)
NO. 1 : 13.76 x 15.30 M
NO. 2 - 9 : 13.76 x 20.40 M
TYPE : WEATHER TIGHT SIDE ROLLING (CHAIN DRIVEN TYPE)

Special Regulation

HKMD
ICLL, 1966
SOLAS, 1974 (1978) 1981, 1983, 1989, 1990 AND 1988 AMEND
MARPOL 1973 (ANNEX I&V), PROTOCOL 1978

Anchor & Cable			Fire f
Equip. No.	5276.7	Detector	
Anchor	JIS x 2SET x 1600KG/ST	Cargo hold	S.W
Anchor chain	97mm x 742.5M GRADE3	Mach. room	CO2, S.W
Moor. rope	14SET x 36mm x 250M	Accommo.	S.W, POR
		Em. F. pump	FOAM
Deck Machinery & Miscel. Fitting			Ventila
Steer. gear	ELEC-HYD, 2RAM-4CYL, 207TON	Cargo hold	
Windlass	2SET x 45/20T x 9/15M/MIN		
		Accommo.	
Moor. winch	6SET x 20T x 15M/MIN		
			Tank
Capstan		F.O.T.	
Hoist			
Ref mach. Air cond.	1SET x 154066 KCAL/H		Pip
Ref mach. Chamber	2SET x 440V x 3PH x 60HZ	W.B. pipe & Valve cont.	125A, STP
			400A, STP
Life Saving			
Life boat	2SET x 30P	W.B. pump	VERT. CE
Rescue boat	COMBINED WITH L/B	Bilge pipe	50/250A,
Life raft	4SET x 15P, 1SET x 6P	F.O. pipe	50A, STP
Boat devit	HINGED GRAVITY x 2SET	Heat. pipe	25/50A S
Boat winch	EL. MOTOR DRIVEN x 2SET		

Anchor & Cable		Fire fighting		Painting		
Equip. No.	5276. 7	Detector		Outside Shell	Bottom	
Anchor	JIS x 2SET x 1600KG/ST	Cargo hold	S. W		Boot top	
Anchor chain	97mm x 742. 5M GRADE3	Mach. room	CO2, S. W, PORTABLE		Top side	
Moor. rope	14SET x 36mm x 250M	Accommo.	S. W, PORTABLE	W. B. T	2 x BISCONHB-200 x 250MC	
		Em. F. pump	FOAM	Cargo hld	2 x BISCONHB-200 x 250MC	
Deck Machinery & Miscel. Fitting		Ventilation Fan				
Steer. gear	ELEC-HYD, 2RAM-4CYL, 207TON	Cargo hold		Accommodation		
Windlass	2SET x 45/20T x 9/15M/MIN			Area. No. of DK	1460M2, 6TIER	
		Accommo.		Cabin	27 EA	
Moor. winch	6SET x 20T x 15M/MIN			Toilet	31 EA	
		Tank Heating				
Capstan		F. O. T.		Public Space	HOSPITAL, TALLY OFFICE, GYMNASIUM,	
Hoist					B. C RM, DK OFFICE, MESS RM,	
					RECREA. RM, CONFER. RM	
Ref mach. Air cond.	1SET x 154066 KCAL/H	Piping		Elev. Sw. pool		
Ref mach. Chamber	2SET x 440V x 3PH x 60HZ	W. B. pipe & Valve cont.	125A, STPG370 ERW SCH80	Ref. chamber	MEAT, FISH, VEGET, ROBBY	
			400A, STPG370 ERW 12. 7T	Others		
Life Saving						
Life boat	2SET x 30P	W. B. pump	VERT. CENT. 2500M3/Hx30MWC			
Rescue boat	COMBINED WITH L/B	Bilge pipe	50/250A, STPG370ERW SCH. 40			
Life raft	4SET x 15P, 1SET x 6P	F. O. pipe	50A, STPG370 SCH40-E			
Boat devit	HINGED GRAVITY x 2SET	Heat. pipe	25/50A STPG38 SCH. 40-S			
Boat winch	EL. MOTOR DRIVEN x 2SET					

Moor. winch	6SET x 20T x 15M/MIN			Toilet	31 EA		
		Tank Heating					
Capstan		F. O. T.		Public Space	HOSPITAL, TALLY OFFICE, GYMNASIUM,		
Hoist					B. C RM, DK OFFICE, MESS RM,		
					RECREA. RM, CONFER. RM		
Ref mach. Air cond.	1SET x 154066 KCAL/H	Piping		Elev. Sw. pool			
Ref mach. Chamber	2SET x 440V x 3PH x 60HZ	W. B. pipe & Valve cont.	125A, STPG370 ERW SCH80	Ref. chamber	MEAT, FISH, VEGET, ROBBY		
			400A, STPG370 ERW 12. 7T	Others			
Life Saving							
Life boat	2SET x 30P	W. B. pump	VERT. CENT. 2500M3/Hx30MWC				
Rescue boat	COMBINED WITH L/B	Bilge pipe	50/250A, STPG370ERW SCH. 40				
Life raft	4SET x 15P, 1SET x 6P	F. O. pipe	50A, STPG370 SCH40-E				
Boat devit	HINGED GRAVITY x 2SET	Heat. pipe	25/50A STPG38 SCH. 40-S				
Boat winch	EL. MOTOR DRIVEN x 2SET						

L. O. purifier	CENTRIFUGAL	2	2200L/H ,	Displacement		I/D(%)	
D. O. purifier				Eng. load	Speed	PS	rpm
Nautical Instrument							
Mag. compass	GILLIE SR3 x 1SET	Loran	JNA-761 x 1SET				
Gyro compass	TG-5000 x 1SET	Log	TOKIMEC TD-501 x 1				
Auto pilot	PR-8457-L x 1SET	Echo sounder	JEE-570S x 1SET				
Radar	X-BAND, S-BAND	NNSS					
ARPA & RADAR	COMBINED S-BAND x 1SET	Load. computer	LOCAS	Maneuvering Trial Result			
D. finder	JLD-10 x 1SET	soft. maker	(OFF-LINE)	Turning	advance	2. 8 x L	<4. 5xL
Wireless Instrument					tact. dia.	2. 6 x L	<5. 0xL
Radio tele.	JSS-720 x 1SET	VHF tele.	JHS-31 x 1SET	Initial turning	10/10 deg		<2. 5xL
		Mari. satte.	JUE-45AM11 x 1SET	Stopping ability		22. 8 x L	<15. 0xL
				Course keeping (Yaw check)	10/10 deg.	1st over. 7	
						2nd over. 18	
					20/20 deg.	1st over.	<25 deg.

Name	WORLD ACTION

Unit : Metric

Kind of ship	BULK CARRIER
Intend. cargo	COAL, ORE
Nav. area	OCEAN GOING
Class	DNV
Route	WORLD-WIDE SERVICE
Builder	DHI
Owner	WORLD-WIDE
Nationality	HONGKONG

Keel laid	Launched	Delivered
94. 2. 7	94. 5. 21	94. 7. 29

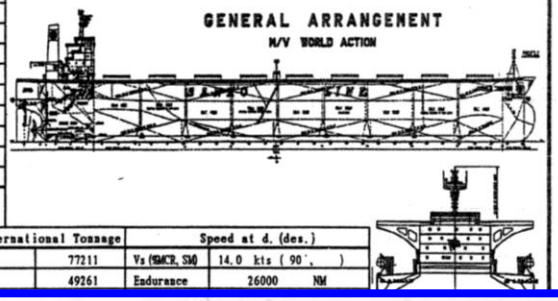
Principal Dimension (M)	
LOA	274.000
LBP	264.000
Bmld	45.000
Dmld	23.200
dmld (dl. des.)	16.900

International Tonnage		
GT	77211	
NT	49261	

Speed at d. (des.)		
Vs (MCR, SM)	14.0 kts (90',)	
Endurance	26000	NM

GENERAL ARRANGEMENT

N/V WORLD ACTION



Name	WORLD ACTION

Main engine			
Type & No.	B&W 5S70MC		
	M.C.R.	D.M.C.R	N.C.R
Output (BHP) xRPM	19100 x 91.0	16500 X 80.0	14850 X 77.2
F.O.C. rate (10, 200kcal/kg)	g/PS.hr at NCR		
	without booster		
Type of balancer			

Reduction Gear		
Type & No.		
Shaft output x Revol.	M.C.R.	PS x rpm
	N.C.R	PS x rpm

Shafting		
	Inter. shaft.	Prop. shaft.
No.	1	1
Dia.	500 mm	610 mm
Length	8248 mm	8400 mm

Aux. Boiler & Exh. Gas Economizer	
Aux. boiler	VERTICAL OIL FIRED
Type & No.	1SET
Press. x Temp.	6KG/CM2
Evaporation	2000KG/H
Exh. gas econo	FORCED CIRCULATING
Type & No.	1SET
Press. x Temp.	6KG/CM2
Evaporation	1600KG/H

Electric Generator	
Generator Type No. & Capacity	Prime Mover Type No. & Capacity
WATER TO AIR COOLING	4-STROKE, TR-PISTON
750KVA, 962A	3SET x 900BHP
440VAC, 3PH, 60HZ	

Propeller	
Type & No.	FIXED PITCH PROPELLER
blade NO.	4
Dia. x pitch (0.7R)	8400 mm x 6015 mm
Exp. area ratio	0.420
Material	NI-AL-BRONZE

Boat winch	EL MOTOR DRIVEN x 2SET					20/20 deg.	1st over.	<25 deg.

Auxiliary Machinery

Item	Type	No.	M3/h x m x kw x rpm
Sea water cooling P.	VERT. CENTRI	1	550M3/H x 20MTH
Fresh water cooling P.	VERT. CENTRI	2	96M3/H x 25MTH
Lub. oil pump	CENTRIFUGAL	2	305M3/H x 4.2KG/CM2
F.O. burning pump	HORIZONTAL GEAR	2	6.5M3/H x 6KG/CM2
Feed water pump	HORIZ. CENTRI	2	4M3/H x 110MTH
Boiler W. circ. pump	HORIZ. CENTRI	2	19M3/H x 40MTH
Forced draft fan			
Heel pump			
Sea W. service pump			
Fire & G.S. pump	VERT. CENTRI		(BILGE PUMP)
Fire, bilge & ballast P.			
Bilge pump	VERT. CENTRI	2	210/360M3/H x 90/30MWC
Fresh water pump	CENTRIFUGAL	2	5M3/H x 50MTH
F.O. trnasfer pump	HORIZONTAL GEAR	1	25M3/H x 3KG/CM2
D.O. trnasfer pump	HORIZONTAL GEAR	1	5M3/H x 3KG/CM2
L.O. transfer pump	HORIZONTAL GEAR	1	5M3/H x 3KG/CM2
Vent. fan (supply)	VERT. AXIAL FLOW	4	800M3/MIN x 40MMAQ
Main air compressor	FW COOLED PIST	1	215M3/H x 30KG/CM2
Emer. air compressor	AIR COOLED PIST	1	8.5M3/H x 7KG/CM2
F.O. purifier	CENTRIFUGAL	2	2900L/H 600CST AT 50oC
L.O. purifier	CENTRIFUGAL	2	2200L/H ,
D.O. purifier			

Heat Exchanger & Miscellaneous

Item	Type	No.	Cap.
Main L.O. cooler	HORIZ. TUBUL	1	791200KCAL/H
Main F.W. cooler	HORIZ. TUBUL	1	1573800KCAL/H
Main F.O. heater	HORIZ. TUBUL	2	1477713KCAL/H
Diesel G.F.W. cooler	HORIZ. TUBUL	2	399000KCAL/H
Boiler F.O. heater			
Aux. condenser	SHELL & TUBE	1	1001760KCAL/H
Purif. L.O. heater	HORIZ. TUBUL	2	40095KCAL/H
M. start. air vessel	VERT. CYLINDE	2	7M3 x 30KG/CM2
A. start. air vessel	VERT. CYLINDE	1	1M3 x 7KG/CM2
A-C blender			
Fresh W. generator	M/E WASTE	1	30T/DAY AT NCR
Bilge separator	AUTO OIL DISCH	1	5M3/H
Incinerator	SOLID & OIL	1	300000KCAL/H
Sewage treat. device	VACUUM	1	6M3

Tank

Item	NO x CAP. (cub. M)
F.O. settl./serv.	1 x 53.6 / 1 x 53.6
D.O. settl./serv.	1 x 10.7 / 1 x 10.7
L.O. drain/settl./stor.	EACH 1EA 31.9 / 24.1 / 32.2
Cyl. O. storage	1 x 68.0

Control

Cont. Rm locat.	ENGINE ROOM
Main engine	CONTROL ROOM
Aux. engine	MACHINERY SIDE

Trial Result

Beaufort No.		Sea cond.	
df x dmid x da x Cb			
Displacement		I/D (%)	
Eng. load	Speed	PS	rpm

Name	WORLD ACTION

Unit : Metric

Kind of ship	BULK CARRIER
Intend. cargo	COAL, ORE
Nav. area	OCEAN GOING
Class	DNV
Route	WORLD-WIDE SERVICE
Builder	DHI
Owner	WORLD-WIDE
Nationality	HONGKONG

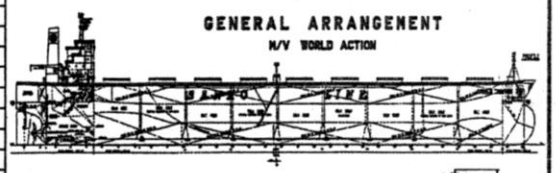
Keel laid	Launched	Delivered
94. 2. 7	94. 5. 21	94. 7. 29

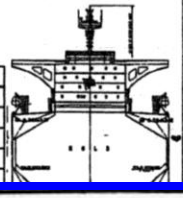
Principal Dimension (M)

LOA	274.000				
LBP	264.000				
Bmld	45.000	International Tonnage		Speed at d. (des.)	
Dmld	23.200	GT	77211	Vs (%MCR, SM)	14.0 kts (90',)
dmld (d1, des.)	16.900	NT	49261	Endurance	26000 NM
dext (d2, sum.)	16.900	Rudder		F.O. consump.	t/day
DWT at d1	150790	Af/A	0.261	P.T.O	BHP
DWT at d2	150790	Area Area /(Lwd)	69.3 0.016	Complement	

GENERAL ARRANGEMENT

M/V WORLD ACTION





Name	WORLD ACTION

Unit : Metric

Main engine

Type & No.	B&W 5S70MC		
	M.C.R.	D.M.C.R	N.C.R
Output (BHP) xRPM	19100 x 91.0	16500 X 80.0	14850 X 77.2
F.O.C. rate (10, 200kcal/kg)	g/PS.hr at NCR		
	without booster		
Type of balancer			

Reduction Gear

Type & No.		
Shaft output	M.C.R.	PS x rpm
x Revol.	N.C.R	PS x rpm

Shafting

	Inter. shaft.	Prop. shaft.
No.	1	1
Dia.	500 mm	610 mm
Length	8248 mm	8400 mm

Propeller

Type & No.	FIXED PITCH PROPELLER

Aux. Boiler & Exh. Gas Economizer

Aux. boiler	VERTICAL OIL FIRED
Type & No.	1SET
Press. x Temp.	6KG/CM2
Evaporation	2000KG/H
Exh. gas econo	FORCED CIRCULATING
Type & No.	1SET
Press. x Temp.	6KG/CM2
Evaporation	1600KG/H

Electric Generator

Generator	Prime Mover
Type No. & Capacity	Type No. & Capacity
WATER TO AIR COOLING	4-STROKE, TR-PISTON
750KVA, 962A	3SET x 900BHP
440VAC, 3PH, 60HZ	

Nautical Instrument

Mag. compass	GILLIE SR3 x 1SET	Loran	JNA-761 x 1SET
Gyro compass	TG-5000 x 1SET	Log	TOKIMEC TD-501 x 1
Auto pilot	PR-8457-L x 1SET	Echo sounder	JEE-570S x 1SET
Radar	X-BAND, S-BAND	NNSS	
ARPA & RADAR	COMBINED S-BAND x 1SET	Load. computer	LOCAS
D. finder	JLD-10 x 1SET	soft. maker	(OFF-LINE)

Wireless Instrument

Radio tele.	JSS-720 x 1SET	VHF tele.	JHS-31 x 1SET
		Mari. satte.	JUE-45AMII x 1SET

Maneuvering Trial Result

Turning	advance	2.8 x L	<4.5xL
	tact. dia.	2.6 x L	<5.0xL
Initial turning	10/10 deg		<2.5xL
Stopping ability		22.8 x L	<15.0xL
Course keeping (Yaw check)	10/10 deg.	1st over. 7	
		2nd over. 18	
	20/20 deg.	1st over.	<25 deg.

Moor. rope	14SET x 36mm x 250M	Accomo.	S.W. PORTABLE	W.B.T	2 x BISCONHB-200 x 250MC
		Em. F. pump	FOAM	Cargo hld	2 x BISCONHB-200 x 250MC

Deck Machinery & Miscel. Fitting

Steer. gear	ELEC-HYD, 2RAM-4CYL, 207TON
Windlass	2SET x 45/20T x 9/15M/MIN
Moor. winch	6SET x 20T x 15M/MIN
Capstan	
Hoist	
Ref Air cond.	1SET x 154066 KCAL/H
mach. Chamber	2SET x 440V x 3PH x 60HZ

Life Saving

Life boat	2SET x 30P
Rescue boat	COMBINED WITH L/B
Life raft	4SET x 15P, 1SET x 6P
Boat devit	HINGED GRAVITY x 2SET
Boat winch	EL. MOTOR DRIVEN x 2SET

Ventilation Fan

		Accommodation	
Cargo hold		Area. No. of DK	1460M2, 6TIER
Accomo.		Cabin	27 EA
		Toilet	31 EA

Tank Heating

F.O.T.		Public Space	HOSPITAL, TALLY OFFICE, GYMNASIUM, B.C RM, DK OFFICE, MESS RM, RECREA. RM, CONFER. RM

Piping

W.B. pipe & Valve cont.	125A, STPG370 ERW SCH80	Elev. Sw. pool	
	400A, STPG370 ERW 12.7T	Ref. chamber	MEAT, FISH, VEGET, ROBBY
W.B. pump	VERT. CENT. 2500M3/Hx30MWC	Others	
Bilge pipe	50/250A, STPG370ERW SCH. 40		
F.O. pipe	50A, STPG370 SCH40-E		
Heat. pipe	25/50A STPG38 SCH. 40-S		

Main air compressor	FW COOLED PIST	1	215M3/H x 30KG/CM2	Cont. Rm locat.	ENGINE ROOM
Emer. air compressor	AIR COOLED PIST	1	8.5M3/H x 7KG/CM2	Main engine	CONTROL ROOM
				Aux. engine	MACHINERY SIDE
F.O. purifier	CENTRIFUGAL	2	2900L/H 600CST AT 50oC	Trial Result	
L.O. purifier	CENTRIFUGAL	2	2200L/H ,	Beaufort No.	Sea cond.
D.O. purifier				df x dmid x da x Cb	
				Displacement	l/D(%)
				Eng. load	Speed PS rpm

Nautical Instrument

Mag. compass	GILLIE SR3 x 1SET	Loran	JNA-761 x 1SET
Gyro compass	TG-5000 x 1SET	Log	TOKIMEC TD-501 x 1
Auto pilot	PR-8457-L x 1SET	Echo sounder	JEE-570S x 1SET
Radar	X-BAND, S-BAND	NNSS	
ARPA & RADAR	COMBINED S-BAND x 1SET	Load. computer	LOCAS
D. finder	JLD-10 x 1SET	soft. maker	(OFF-LINE)

Wireless Instrument

Radio tele.	JSS-720 x 1SET	VHF tele.	JHS-31 x 1SET
		Mari. satte.	JUE-45AMII x 1SET

Maneuvering Trial Result

Turning	advance	2.8 x L
	tact. dia.	2.6 x L
Initial turning	10/10 deg	
Stopping ability		22.8 x
Course keeping (Yaw check)	10/10 deg.	1st over.
		2nd over.
	20/20 deg.	1st over.

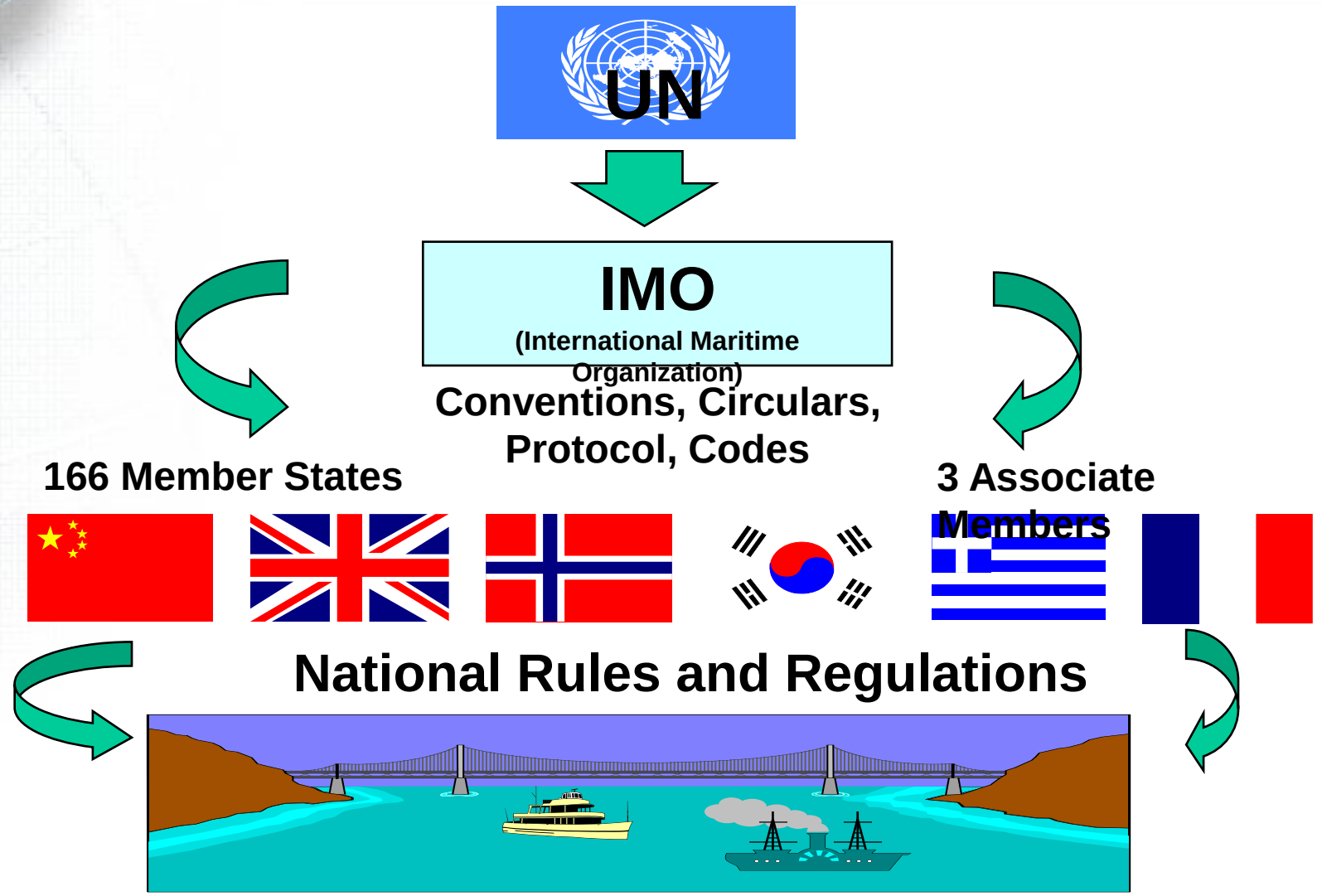
선박 개념 설계의 순서

1. 선주 요구 조건(owner's requirements)
2. 유사 실적선 자료 조사
3. 관련 rules & regulation 검토
4. 주요 치수 선정
   - 배수량 추정 -
5. 경하 중량(lightweight) 추정
6. 저항 및 마력 추정/주기관 선정
   - 저항 성능 추정, 프로펠러 주요 치수 선정 -
7. 화물창 용적(cargo capacity) 추정
8. 건현(freeboard) 계산
9. 복원 성능(stability) 추정
10. 개략 일반 배치(Sketch G/A 작성)
11. 개략 선형 및 선박 제 계산
12. 견적 물량 및 견적가 산정
13. Technical documents 작성

3. 관련 Rules & Regulation 검토

- Internationa Maritime Organizations(IMO)
  - International Labour Organizations (ILO)
  - Regional Organizations (EU,…)
  - Administrations (Flag, Port)
  - Classification Societies
  - Internationa Standard Organizations (ISO)

Rules and Regulations - IMO



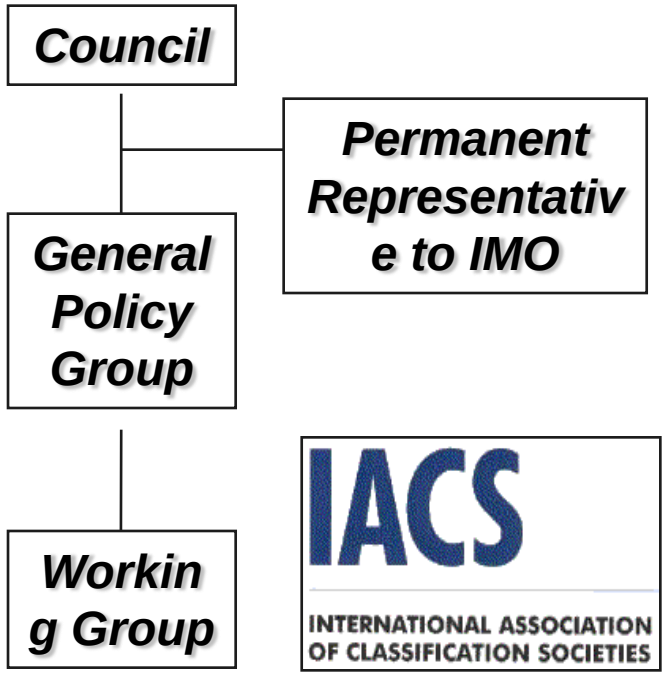
Rules and Regulations – IMO Instruments

- Conventions
  - SOLAS / MARPOL / ICLL / COLREG / ITC / AFS / BWM ……
- Protocols
  - MARPOL Protocol 1997 / ICLL Protocol 1988
- Codes
  - ISM / LSA / IBC / IMDG / IGC / BCH / BC / GC ……
- Resolutions
  - Assembly / MSC / MEPC
- Circulars
  - MSC / MEPC / Sub-committees ……

Rules & Regulations – IACS

- 10 Members
  - ABS (American Bureau of Shipping)
  - DNV (Det Norske Veritas)
  - LR (Lloyd's Register)
  - BV (Bureau Veritas)
  - GL (Germanischer Lloyd)
  - KR (Korean Register of Shipping)
  - RINA (Registro Italiano Navale)
  - NK (Nippon Kaiji Kyokai)
  - RRS (Russian Maritime Register of Shipping)
  - CCS (China Classification Society)

a. 관련 rules & regulation 검토



- 2 Associate Members
  - CRS (Croatian Register of Shipping)
  - IRS (Indian Register of Shipping)