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Steps towards the Future

HI AIR KOREA makes the future with the challenge to a new world and unswerving R & D efforts. You shall be assured of our efforts for the world-highest precision and quality.

Foreword

Dear Sirs,

We are pleased to introduce our company - HI AIR KOREA -and our products to you.

HI AIR KOREA is the leading supplier of offshore and marine applications, and at our headquarters located in Gimhae, South Korea, we are manufacturing air handling units (AHU), refrigerating system for AHU and provision plants, ventilating equipment, packaged air conditioners as well as spiral ducts based on a long list of accomplishments in the global HVAC business.

Today,-and since the establishment of HI AIR KOREA in 1988-, our management and dedicated staff concentrate all their efforts on identifying the problem, develop solutions with the total picture in mind, and participate with our customers to ensure top-class HVAC systems including world-wide after sales service.

We hope having raised your interest, and should be pleased to give you all our attention in solving your HVAC problem whatsoever. Please do not hesitate to contact HI AIR KOREA!

> Sincerely yours, HI AIR KOREA Co.,Ltd.

C. B. Vern Marine

K. B. Kim / Chairman

Foreword 2

Synopsis 6

History of Company 7

Facilities 7

Products 9

Air Conditioning Systems 10

Refrigeration Plant 11

Air Terminal Devices 13

Packaged A/C 14

Ventilation Fans 16

MGO Cooling System 20

Spiral Duct 21

Research & Development 24

Our Strategy 26

ENGE forwards the JUTUIC!

Contents

New Opportunities

Get Them from HI AIR KOREA Co., Ltd. freely













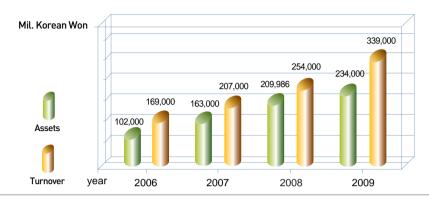
Company profile

Accumulated Capital KRW 123,231 Mil.

Employee

Office Staff (30 persons), Tech. Engineer (440 person), Production (1,030 persons) Total (1,500 persons)

Financial Development



History of company

1988. 09 HI-PRES Korea Co., Ltd. established as a joint-venture for marine A/C & Vent.Fan business.

05 Moved & Expanded the factories to present area.(Gyeongnam Gimhae)

1998. 06 Start of Spiral duct business.

1999. 12 Acquired ISO 9001 Certificate from Korean Register of Shipping.

2003. 01 Start of Packaged Air Conditioner business.

10 Start of HVAC business for Power Generation Plant.

2006. 07 Company name changed to HI AIR KOREA Co., Ltd.

2007. 02 Start of Fire Damper business.



Main Factory (A/C & Prov. Ref. plant, Ventilation Fan, Air Handling Units, Fire Damper) Land (120,000m²), Factory & Office etc. (49,000m²)

Main Business List

Central Air Handiling Units : HKA-04SO, 05SO, 06SO, 07SO,08SO,09SO,010SO

HKA-06SN, 07SN, 08SN

Refrigerating Plant - Air conditioning: Types MCU 24~116

- Provision Store : Types MCU 3~5

- Chiller Units

Axial Flow Fans : AWA 300~2000, AKA 500~2000, ACA 500~2000

MNA 500~1800, MXA 500~1800, HCA 300~1800

Fire Damper: CDR 300~2000 (Manual & Pneumatic types)

CDSQ (Manual & Pneumatic types)

2nd Factory (Packaged A/C & HVAC Accessory) Land (16,000m²), Factory & Office etc.(8,000m²)

Main Business List

: HKR-S, T, A, R, W, E : CLC 250~1000, CHC 400~1000

: HIP-03W,05W, 08W, 10W, 15W, 20W (Water Cooled type) HIP-03A, 05A, 08A, 10A, 15A, 20A (Air Cooled type) : HIP-03, 05, 08, 10, 15, 20

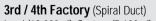












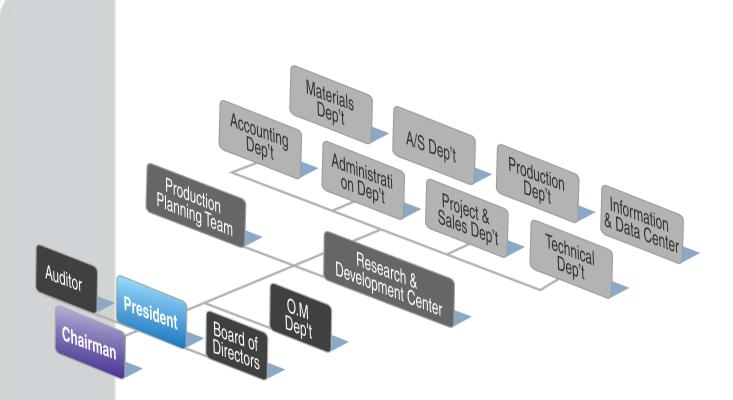
Land (12,000m²), Factory (5,600m²), Office etc.(200m²) -3rd Factory Land (16,000m²), Factory & Office etc.(11,000m²) -4th Factory

Main Business List

: Diameter (Thickness)

R80 ~ R315 (0.5 ~ 1.0 t) -3rd Factory R200 ~ R1600 (1.0 ~ 1.6 t) -4th Factory

Organization



Challenge for World Wide!

HI AIR KOREA new vision consist of development of new technique and research.



Products

HI AIR KOREA air conditioning plants of high pressure, high velocity systems were developed and designed in the early fifties, pioneering for providing stable, optimum climatic conditions for passengers and crew on board plenty of the ships sailing the seven seas. The marine installations include giant super tankers, container ships, offshore project, FPSO, Ro-Ro vessels, naval vessels and advanced passenger ferries. Air Conditioning Air Terminal Refrigeration Plant Devices MGO Cooling Packaged A/C Ventilation Fans System Spot Cooler & Fire Damper Dehumidifier

HI AIR KOREA Co.,Ltd. 08 | 09

Air Conditioning Systems



Air Handling Unit Type HKA

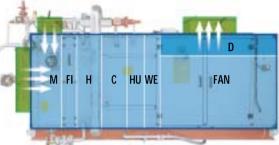
HI AIRKOREA air handling unit can establish SINGLE-PIPE AC System, TWIN-PIPE AC system and RE-HEAT AC System (electric reheater or hot water reheater) with the combination of different types of cabin units.

The HKA unit is built up on a sturdy bedframe made of steel and will include all sections required to suit very individual specification. It is manufactured in eleven sizes with air capacities ranging from 0.53 to 13.61m3/s.

HI AIR KOREA air handing unit type HKA is specially designed for marine installations for air conditioning. Each section is designed as a modular system and consists of a rigid framework made of square pipes with specially assembled corners. The sections are made of galvalume*1 and internally well insulated.

Equipment such as fan, motor and filter mat can be simply removed from its section through inspection doors fitted to ensure easy maintenance.

water eliminator drops onto drip pan and drains out through drain pipe. The unit can be hooked up by means of eye-plates mounted in each corner of the bed frame. Each component comprising air handling unit is high quality equipment designed for marine application.



Filter section Cooling section Water elimination section Distribution section



Refrigeration Plant

Compressor is open or semi-hermetic receprocating type. The cooling capacity of open type ranges from 80kW to 830kW The cooling capacity of semi-hermetic type ranges from 80kW to 300kW. Also, screw compressor is available. The automatic unloading system regulates the compressor capacity by connecting or disconnecting the cylinders in pairs. The capacity regulation is done by solenoid valves mounted on the compressor. The solenoid valves are activated by suction pressure.

Condenser is of horizontal shell & tube type. The refrigerant vapors in shell side are condensed by seawater or fresh water in tube side. The condenser has one special

feature that the refrigerant vapors from cooler pass through the tubes located at lower part of the condenser, so the condenser acts as a liquid separator & sub-cooler by exchanging the heat between cold refrigerant vapors coming from the cooler and the hot condensed refrigerant from the compressor. The cooling water tubes are made of copper for fresh waer service, and Cu/Ni(90/10) for seawater service to prevent corrosion.

Safety pressure control

- Pressure switch for capacity regulation
- Low / High pressure control switch - Oil differential pressure control switch

For Air Conditioning **System**

Refrigerating technology has been an indispensable precondition in the constant improvement of living conditions on board. Without this it would not be possible to provide a balanced and healthy environment in comfortable living quarters with a controlled and pleasant climate.

Depending on size, operating conditions and general arrangement of the air conditioning system, various system layouts are available : From the plain ones consisting of one condensing unit operating one air cooler, to the more complex solutions of combined liquid chiller units operating a number of air coolers. In the latter case a highly advanced microprocessor or PLC based regulation and control system is available

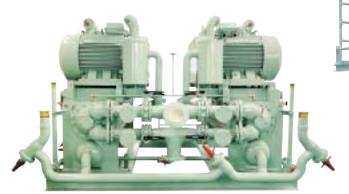
A solenoid valve is placed in the refrigerant liquid line before cooler and a duct thermostat is placed in the return air supply duct. When the duct thermostat reaches the "set point", it will give a signal to the solenoid valve to shut off the liquid refrigerant to the cooler, then the low-pressure control switch will make the compressor stop.

Refrigeration Cycle



Condensing unit type MCU

Each unit is built up on a sturdy bed frame and composed of compressor block, electric motor, oil separator, condenser and drier, etc. Full complement of operating and fail-safe controls and devices, to protect against extreme operating conditions and breakdown of machinery, renders automatic operation, including automatic capacity regulation to minimize operating





Refrigeration Plant

Compressor is open or semi-hermetic receprocating type. The cooling capacity ranges from 3.0kw to 16.5kW

Condenser is a horizontal shell & tube type. The refrigerant vapors in shell side are condensed by seawater or fresh water in tube side. The cooling water tubes are made of copper for fresh water service, and Cu/Ni(90/10) for seawater service to prevent corrosion.

Safety pressure control

- Low pressure control switch
- High pressure control switch
- Oil differential pressure control switch

Controlle

The refrigerating system for provision stores can also be supplied with a microprocessor based regulation and control system substituting the traditional electric controls with the following functions;

- Temperature monitoring and regulation
- Automatic defrosting
- Automatic start / stop of compressor
- Indication of malfunctions.





two condensing units, one operating on both the chilled and the freezing rooms, and one as stand-by. However, in some cases a system with three condensing units, one operating on the chilled rooms, another on the freezing rooms and a third as stand-by, will be more reliable. Room temperatures, plant operation and defrosting cycles are controlled automatically. The control and regulation system can be supplied either as traditional electric controls or as the microprocessor.

The unit is built up on a sturdy bed frame and composed of compressor block, electric motor, oil separator, condenser and drier, etc.

Design and Execution

The design of the factory-assembled units is specially adopted to marine conditions, requiring a minimum of space, field design and installation work in accordance with the shipyards' demands. Components on special marine execution guarantee a long life cycle and low maintenance costs. The units are manufactured and supplied in accordance with the rules of the leading classification societies.



Cabin Units

HI AIR KOREA cabin units are specially designed for the supply of conditioned air to ship's accommodation via the spiral duct air pipe system. For each type of HI AIR KOREA system (Single-pipe, Twin-pipe, Re-heat), there is a comprehensive range of cabin units comprising units for bulkhead mounting or ceiling suspension, units supplying the conditioned air through a grill, a ceiling diffuser or a punkah louver.

HI AIRKOREA cabin units are made in sizes to suit the ventilation requirements as well as the

heating and cooling loads. All units have an air volume control device by means of which the air flow delivered can be varied from nil to a predetermined maximum. Besides, units intended for Twin-pipe and Re-heat installation provide individual temperature control, independent of the air flow control.

In the design of the units, special attention has been devoted to sound attenuation, and in relation to the ambient sound levels occurring in ship's accommodation, very satisfactory sound levels have been achieved.

Heating Medium		Cabin Unit	
	Туре		
	RE- HEAT	TWIN- PIPE	SINGLE- PIPE
Steam			
Electric	X		
Water	X		

HI AIR KOREA system	Cabin unit designation	Location of cabin units	Air supply device
SINGLE-PIPE Manual control	MS types	Ceiling	Diffuser Grill Push-pull louver
TWIN-PIPE Manual control	MT types	Ceiling	Diffuser Grill
TWIN-PIPE Auto. control	AKV type	Ceiling	Diffuser
RE-HEAT	RS types & NAV types	Ceiling	Diffuser Grill

Packaged Air Conditioner

PACKAGED AIR CONDITIONER

Marine use packaged type air conditioner is designed in consideration of special conditions on board ship. These units are executed in a highquality finish and specially designed for placing in both accommodation areas and technical spaces







Fan coil unit

The compressors are of hermetic reciprocationg type. They are fitted with heating elements and an internal suction accumulator for long-life running.

A cleanable shell-and-tube type condenser with Cu/Ni(90/10) anti-corrosive tube is used for sea water.

Evaporator

A Cu/Al coil treated with epoxy to resist the saline air is standard.

A washable flat filter is placed in front of the evaporator.

A direct coupled centrifugal fan with motor is provided. Mounted fans can ensure an extra low noise level and no vibration.

Protection Control

A thermostat with its sensor placed in the air flow ensures the correct temperature, which is adjusted on the small panel at the front of the unit. The electric panel includes automatic circuit breakers. The compressor safety equipment includes HP/LP switches, a solenoid valve in liquid line, filter drier and liquid refrigerant sight glass as well as fittings to plug in pressure gauges.

Refrigerants

R-404A, R-407C, R-22, R-134A, and R-507.

The steel casing coated with synthetic resin powder is built on a rigid steel frame. The casing is thermally insulated to prevent condensation.

Optional Equipment

- Pleum chamber
- fresh air intake damper
- return air intake for a duct connection
- flexible connections and counter flanges for air intake and oulet
- stainless steel casing
- Cu/Cu cooling coil
- electric heating coil
- automatic seawater valves
- Pressure gauges
- electronic temperature control with LCD display

DECK UNIT

The Deck Unit comprises of 4 models with cooling capacities ranging from 75,000 to 146,000 kcal/h. Thus, a large capacity of different versions is

The Deck Unit is specially designed for marine installations for air conditioning. Deck Unit is a flexible and compact system for combination of air handling components into complete units.



SPOT COOLER / DEHUMIDIFIER

Spot cooler prevents Heat Stroke (Heat cramps, Thermal fatigue, etc) that occurs during high temperature, high humidity and windless working site. It is used to cool down the work places during summer season and

the high indoor temperature working sites.

Dehumidifier control humidity and temperature in a paint shop. It creates perfect conditions for the painting jobs inside the paint shop. There are three types of dehumidifiers; dry type dehumidifier, composite pro-cooler type dehumidifier and composite pre/after cooler type dehumidifier, composite pre-cooler type dehumidifier and composite pre/after cooler type dehumidifier. Dehumidifiers can be customized based on customer's requirements and satisfaction.



USAGE

- Welding and painting works in factory
- Welding and painting works in tank
- Construction site
- Exhibition hall





Ventilation Fans

Axial Flow Fans

Axial flow fans are widely used for marine and offshore installations. They are manufactured in various designs according to the specific requirements for the intended installation and application. The axial flow fans can be produced from 10 m³/min to 3,000 m³/min with static pressure from 10 mmAg to 100 mmAg. The nominal diameter of the axial flow fans are available from 300 mm to 2,000 mm.



AWA Rigid type Axial fan

For direct installation in duct systems. Supplied with an impeller with adjustable pitch marine grade aluminum alloy blades, direct coupled to a motor. The fan housing and flanges are in heavy plate in accordance with the requirement of international classification society.

AKA Swing-out type Axial fan

For direct installation in duct systems. Supplied with an impeler with adjustable pitch marine grade aluminum alloy blades direct coupled to a motor, and easy access for motor servicing. The fan housing & flanges in heavy plate.



PVA Propeller type Axial Fan

For direct exhaust through wall or bulkhead, relatively in small capacity with low pressure drop.



For direct supply or exhaust at duct end, for instance, in engine rooms requiring a high rate of air changes.

ACA

MNA

Bifurcated type Axial fan, New

With explosion-proof fan arrangement for upward discharge and explosion-proof motor outside the air flow. Suitable for exhaust of pump-rooms in tankers and in offshore installations where an explosive atmosphere is likely to occur. Approved by "Lloyds Register of Shipping", "Det Norske Veritas" and all other classification societies for installation in "IMO Class A Division". Installed duct's end.



MWC/MKC

Bifurcated+Rigid type Mixed fan Bifurcated+Swing-out type Mixed fan

With spark-proof fan arrangement for upward discharge and explosion-proof motor outside the air flow. Approved by "Lloyds Register of Shipping", "Det Norske Veritas" and all other classification societies for installation in "IMO Class A Division". Installed between duct and duct.



HCA Mushroom type Axial fan

Combined explosion-proof axial flow fan and weather hood with explosion-proof motor placed above the hood. Suitable for supply air for pump-rooms in tankers and in offshore installations where an explosive atmosphere is

likely to occur. Approved by: "Lloyds Register of Shipping" and all other classification societies for installation in "IMO Class A Divisions".



Ventilation Fans / Fire Damper

Centrifugal Fans

Centrifugal type fans are light-weight, compact and high pressure fans with high efficiency designed for universal installation. They are therefore well suited for marine or industrial ventilation and air conditioning system where economic operation and a low sound are important factors. The impeller is made of broad, backward curved blades.

TTF

Centrifugal type turbo fan

Type TTF, turbo fan is available diameter from 280 mm to 1400 mm. Backward curved blades are coupled directly or by v-belt.





CLC/CHC

Chamber type Centrifugal-Low/High pressure fan

Type CLC is available in nine standard sizes with impeller diameters from 250 mm to 1000 mm, and type CHC in seven sizes with impeller diameters from 400 mm to 1000 mm. Type CHC is designed for higher speeds and higher pressures than type CLC.



CDR Round type Closing Damper

Manual & Pneumatic operated types are available. And Single Blade and Multi Blade types are available.



CDSQ Square type Closing Damper

Manual & Pneumatic operated types are available.

Fan House

Fan house is made of FRP or steel plate with painting and internally sound insulated with mineral wool, covered with perforated sea water resistant SUS plate. Hinged door and davit installed for easy maintenance of fan & electric motor.





Fire Damper

Fire damper are type-approved class A and H for use in offshore and marine ventilation system. HAK fire damper can be supplied to suit rectangular or circular ducts. HAK dampers are used to prevent the spread of fire within the ventilation ductwork. All fire dampers have a fusible link and spring return failsafe actuator. When the blades are in the open position, the device does not cause significant pressure loss or flow disturbance.

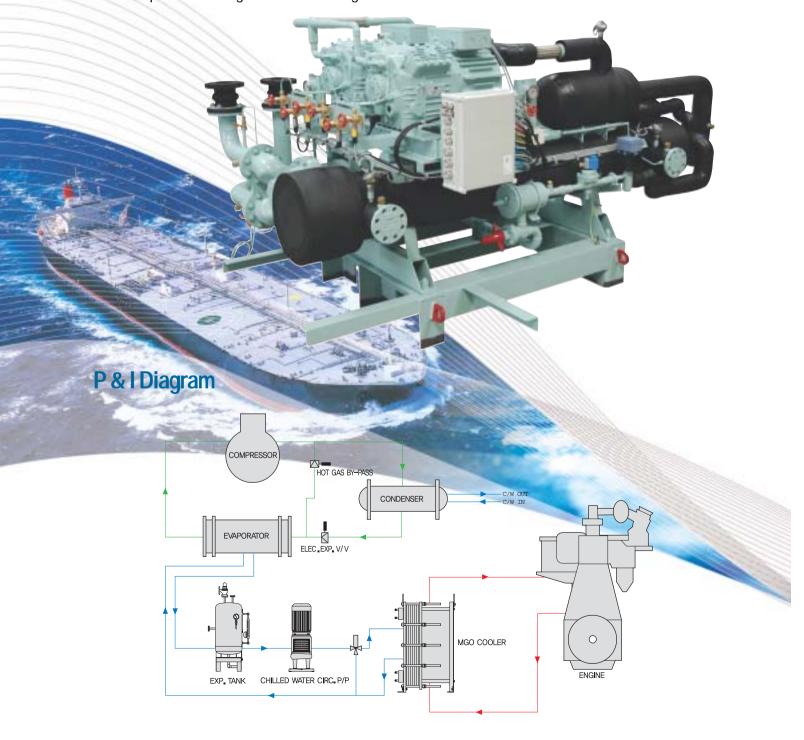


MGO Cooling System

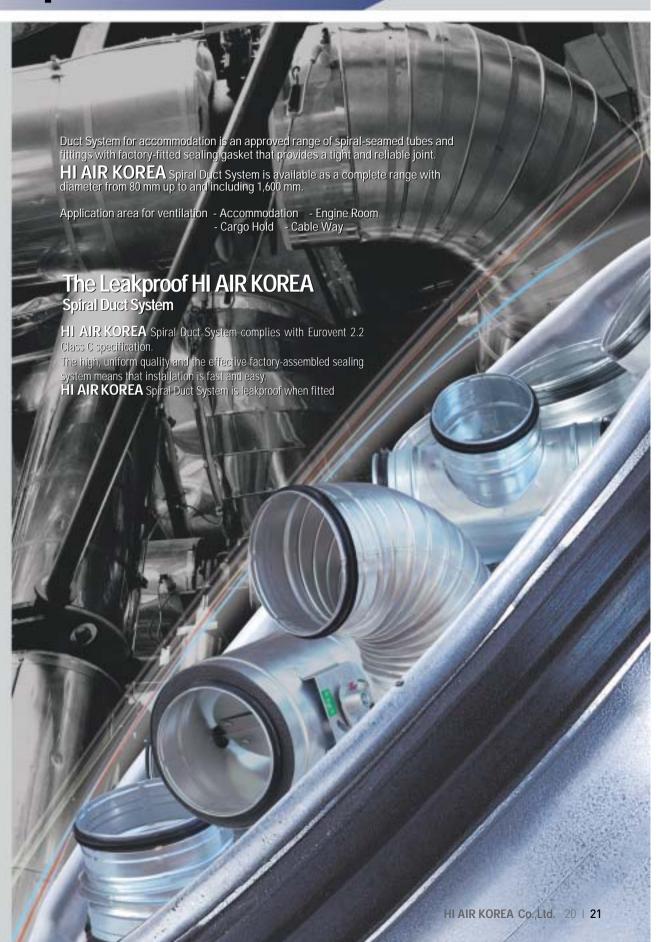
"With all the experiences gathered from the past HVAC projects, HI AIR KOREA has acquired the skills to develop a high technology solution that will perfectly satisfy the process of Fuel Oil Cooling System. With the MGO Cooling System HI AIR KOREA assures the reliability and durabilty."

Advantage of HI AIR KOREA MGO COOLING SYSTEM

- It easily controls the temperature and viscosity being transmitted by PLC.
- Hot gas by-pass system is able to control using a lower load.
- The evaporator is designed without leakage.



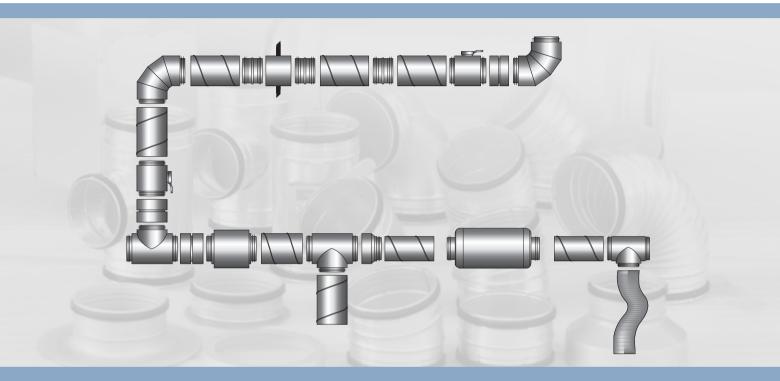
Spiral DUCT







Full Assembly of Spiral Ducts



Benefits of the system

- Fast and easy installation
- Adjustable twisting and fine adjustment involve no risk of leakage.
 Environmentally friendly as it is fitted without sealant which contains solvents.
- Can be installed in all kinds of weather.
- Temperature resistant from -30°C to +100°C
- Sealing minimises the risk of leakage in the event of damage.
- Withstands negative and positive pressure up to 3000 Pa
- Internal and external production control.
- Aesthetic design an advantage for visible installation
- Unilume steel consists of aluminum(55% in weight ratio but 80% in surface volume ratio), zinc(43.4% in weight ratio), and silicone(1.6% in weight ratio) so it has both aluminum-unique corrosion-resistance and heat resistance and zinc-unique "galvanic behavior". As outdoor exposure test(for 13years), Unilume is at least 3-4 times superior to galvanized steel.



Products & Application









Global Network

HI AIR KOREA is always on the move.

With subsidiaries and an extensive network of qualified service agents around the globe, we are always in the centre of events and take pride in being at the forefront of marine refrigeration technology.

The YORK Refrigeration network is tied together with HI AIR KOREA through common goals. Quality, high standards, strict technological requirements and service are guidelines in our everyday work. That is what we believe in and how we act.



Main Customer List

Hyundai Heavy Industries Co., Ltd. (HHI) | Hyundai Samho Heavy Industries Co., Ltd. (HSHI) | Hyundai Mipo Dock Yard (HMD)

Daewoo Shipbuilding & Marine Engineering Co., Ltd. (DSME) | Samsung Heavy Industries Co., Ltd. (SHI) | STX Shipbuilding Co., Ltd. (STX)

Hanjin Heavy Industries Co., Ltd. (HHIC) | SLS Shipbuilding Co., Ltd. | Sekwang Heavy Industries Co. Ltd. | Samho Shipbuilding Co., Ltd. Sungdong Shipbuilding & Marine Engineering Co., Ltd. | Daesun Shipbuilding & Engineering Co., Ltd. | SPP Shipbuilding Co., Ltd. |

Daehan Shipbuilding Co., Ltd. | 21st Century Shipbuilding Co., Ltd. | CSBC Corporation, Taiwan | Qing Dao Hyundai Shipyard | Wenchong Shipyard Zhoushan Jinhaiwan Shipyard | Hudong Shipyard | Hudong Zhonghua Shipbuilding Co., Ltd. | Zhejiang Shipbuilding Co., Ltd. | Nantong Minde shipyard Dayang Shipbuilding Co., Ltd. | Guangzhou Shipyard International (GSI) | Jiangdong Shipyard | Jinling Shipyard | New Times Shipyard Cheng Xi Shipyard | Shanghai Shipyard | Mitsubishi Heavy Industries Co. Ltd. (MHI) | Tsuneishi Corporation (THI) | IHI Marine United Inc.

Shin Kurushima Dockyard Co., Ltd. | Sumitomo Heavy Industries Marine & Engineering Co., Ltd. | Toyohashi Shipyard Limited | Cochin Shipyard Limited | Hindustan Shipyard Limited | Bharati Shipyard Limited | Tebma Shipyard Limited | Larsen & Toubro Limited | P.T Pal Indonesia | Pha Rung Shipyard Bach Dang Shipyard | Nam Trieu Shipyard | Ben Kien Shipyard | Lilama Shipyard | Iran Shipbuilding & Offshore Industries Complex Co. (ISOICO)

Dungquat Shipbuilding Industry Company | Hai Long Shipyard | Herma Shipyard | Rongcheng Shenfei Shipbuilding Co., Ltd. | Sainty Marine Corp. Ltd. Shanghai Waigaoqiao Shipyard | Tianjin Xingang Shipyard | Tsuji Heavy Industry | Wuchang Shipyard | Yangzijiang Shipyard | Pipavav shipyard

New Zealand

Total Commitment

York Refrigeration (SABROE A/S) is our partner within operation and maintenance of refrigeration plants. Our expertise is based on almost 100 years experience and more than 15,000 ships served by YORK Refrigeration equipment.

Based on this, it is safe to say that we have truly mastered the art of refrigeration. This is also why we can offer professional service on not only YORK Refrigeration plants, but on all other types of refrigeration plants

HI AIR KOREA is your royal sparring partner in all respects - Total commitment is a natural part of our work.