

Cryogenic Heat Exchanger and System Engineering **Global Leader**



**‘World Class Company’
with Heat Transfer Technology**

- Company Name DongHwa Entec Co.,Ltd.
- CEO Kim Dong Kun
- Company Size Mid-sized Businesses
- Type of Business Manufacturing industry(2011)
- Establishment Dec.1980



Noksan Office and Factory



Hwajeon Office and Factory



R&D Center

Since its foundation in 1980, DongHwa Entec has been specializing in manufacturing a wide range of heat-exchangers, from marine heat-exchanger repairing service to heat-exchangers for power-generation and plant industry. Currently, we are heading into new arena of special heat-exchanger for LNG liquefaction & gasification plant. Besides domestic market, we also successfully diversified overseas business in Southeast Asia, Middle-East and Europe. Subsequently, we generated more than 80% of sales in abroad, and today we have become the leading heat-exchanger manufacturer in Korea. We keep the slogan “Once be customer, always be customer” in our mind. In a preparation for our future success, DongHwa Entec places top priority on “customer” as an external determinant. We will exert ourselves to fulfill customer’s “needs”, touch customer’s heart and keep in tune with customer throughout manufacturing, delivery and follow-up service of all products.

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▶ LNG System & Cryogenic Heat Exchanger



DH-FGSS

Fuel Gas Supply System for MEGI / XDF / DFDE

The fuel gas supply system (DH-FGSS) is a gas-propelled ship's fuel supply system. It is a system that makes LNG and BOG within the ship's tank into a proper engine fuel supply. The fuel gas supply system consists of an LNG fuel tank, an LNG pumping system, a BOG compressing system, an LNG heating system, a BOG heating (cooling) system, a heating medium circulation system, a bunkering system, and a venting system. We supply the system through system engineering that is optimized for project characteristics including small and large ships, high pressure and low-pressure engines.



HP FGSS

Fuel gas supply system for ME-GI engine.



LP FGSS

Fuel gas supply system for X-DF & DFDE, DF GENSET (FG Heater & Separator are optional equipment of engines)



Glycol Water Heating System for FGSS

Supply heat source for vaporizers and fuel gas heater



PFHE

Plate Fin Heat Exchanger

PFHE (plate fin heat exchanger) is a core piece of equipment in the cryogenic process and the oil and gas industry, and it is manufactured with aluminum, stainless steel, and inconel. It is a special type of heat exchanger used for the multi stream process based on high temperature accessibility, and the high concentration compared to volume.

We are supplying highly reliable products through the optimized manufacturing process alongside the performance predicting technology, structure, and reliability analysis technology.

Advantages

- Compactness- Space and weight savings
- High pressure capability of over 100 bar
- Variable Temperature Service & close temperature approach
- Multiple process stream into a single unit



PCHE

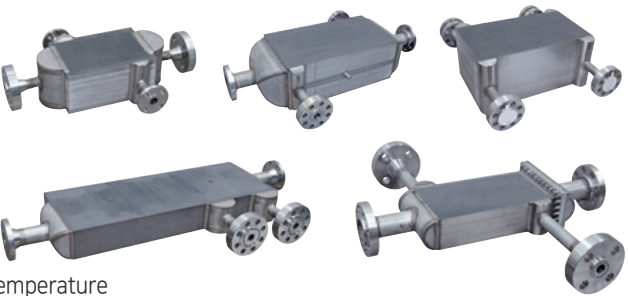
Printed Circuit Heat Exchanger

The PCHE (printed circuit heat exchanger) is a product that bonds basic materials using an interfacial diffusion phenomenon caused from the surface between basic materials at high temperatures and a pressure and vacuum environment. Although the heat exchange type is similar to the plate type, the structure of the plates maintains the mechanical properties of the basic material means it can be used at a high temperature, an ultralow temperature, and in a high-pressure environment.

As a compact heat exchanger, it is used as to reliquify an LNG carrier's BOG (cryogenic), high pressure vaporizer, and compressor cooler. For onshore use, the equipment is used for waste heat recovery, reforming hydrogen fuel cells, SCO2 power generation, and hydrogen charging stations. We are supplying a high quality H2 pre cooler (700bar) for hydrogen stations.

Advantages

- Compact Size**
 - Small Footprint, Small Light
- Excellent performance**
 - High Heat Duty, Low Pressure Drop
- Long Service Life**
 - High Durability, Easy Maintenance
- Extreme Environments**
 - Cryogenic Service, High Pressure, High Temperature



DH-Reli

BOG Reliquefaction System with N2 reverse Brayton cycle

BOG Re-liquefaction system is the process to re-liquefy the BOG for LNG carrier to treat the boil off gas and control LNG cargo tank pressure especially during laden voyage.

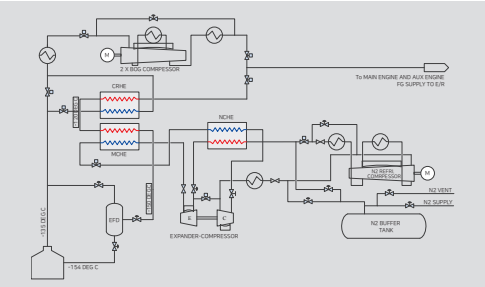
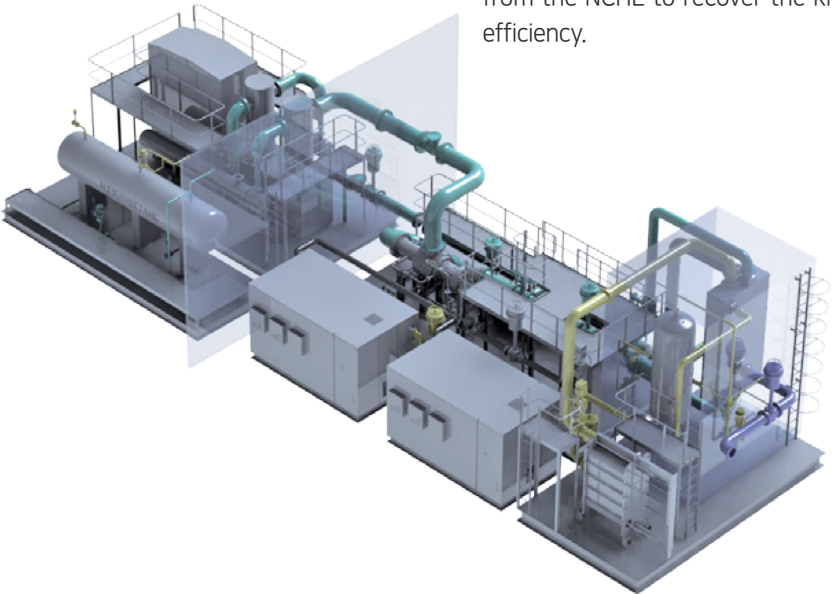
The process has a reverse Brayton cycle using the Nitrogen as refrigerant, which will be used for re-liquefying BOG.

During the voyage, the BOG compressor will pressurize the BOG to required pressure to supply BOG as FG to the main engine.

As per the pressure control scheme of LNG tank, some amount of FG will be recycled to the re-liquefaction system to be re-liquefied by exchanging with the N2 refrigerant cold heat. The N2 refri. Compressor will pressurize and recirculate N2 through the NCHE and MCHE to get BOG sub-cooled temperature.

The compressed N2 which is pre-cooled by NCHE will be expanded by the expander compressor and the cold NCHE for precooling of pressurized N2 prior to the expander.

The shaft connected compressor of expander will boost the pressure of returned N2 from the NCHE to recover the kinematic energy of expander increasing the process efficiency.



- Pilot plant - Development of 2ton/day BOG re-liquefaction
- Development of BOG treatment system of LNG fuel tank for gas propulsion ship
- Optimization of BOG processing system process for LNG
- Compact size with high density heat exchanger
- Automatic Control System

LNG System & Cryogenic Heat Exchanger