



Green Energy Solutions



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SupplyLine

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> 1980

Renamed to Pan-Korea Metal Ind.

> 1974

Moved to Changwon Industrial Complex

> 1946

Established Busan Pokum .Ind



> 1994

Established R&BD Center

> 1988

Registered as selected localization company
of Cryogenic Valve at KOGAS

> 1985

Developed Cryogenic Valve



Korea's First and Largest Industrial Valve Specialized Manufacturer, PK Valve & Engineering Co.,Ltd.



> 2006

NEP Certification for Cryogenic Metal Seated Butterfly Valve
 Changed company name to **PK Valve**

> 2002

Developed Cryogenic Butterfly Valve
 Cryogenic valve supply started to KOGAS

> 2000

1st Valve Academy launched

> 2022

Changed company name to **PK Valve & Engineering**
Controls the Flow

> 2021

Expansion of cryogenic valve factory

> 2017

Cryogenic Butterfly valves supply started to LNGC

> 2012

Awarded 100 Million Dollar Export Tower

About Us



Digitalization

PK VALVE&ENGINEERING has already achieved digitalization of data on orders, production process, and quality control for the past 20 years through the establishment of an ERP system, and now PK VALVE&ENGINEERING is preparing to digitize the development process and results. By accumulating data on the development process, we will dramatically reduce trial and error and provide solutions that satisfy customers within a short delivery



Demonstration

PK VALVE&ENGINEERING is starting a performance verification demonstration business for products that are not regulated by codes and standards. By applying data sensing technology and data collection technology to design and manufacture new products, we are accumulating technologies that can accurately reflect customer requirements by implementing actual use environments.



Diversification

PKVALVE & ENGINEERING is striving to diversify its products by developing various products that can be used in extreme conditions such as ultra-low temperature, ultra-high temperature, ultra-large size, and ultra-high pressure through digitalization and demonstration.

Certificates

➤ Marine Classification



➤ Nuclear



➤ SHEQ & Product



Cryogenic Valves

PK VALVE&ENGINEERING started research & development of cryogenic service valves in cooperation with KIMM (Korea Institute of Machinery and Material) under Korea Government in 1983s. Due to high stability requirement for Cryogenic service valves, it requires many restrictions for material selection and extend bonnet length selection. By considering the selection of material and optimized extension bonnet length determination to keep the temperature close to ambient of gland packing, PK VALVE&ENGINEERING completed the development at 1985 and has been supplying to oversea and domestic customers for cryogenic industries including LNG liquefaction plant, receiving terminal and other gas plants for production, transportation and storage of liquefied gases such as oxygen, nitrogen, natural gas, hydrogen or helium. These optimized lengths for different sizes are then subjected to thermal analysis using finite element method for evaluate the temperature at the gland packing area. The thermal analysis is done using ANSYS software. Along with material selection and optimized extension length PK VALVE&ENGINEERING has improved assembly, production and management method to keep the capability and quality.

> Characteristic of Cryogenic Valve

✓
Packing protected from cryogenic temperatures

✓
Anti Inner Pressure Build-Up by Bleed hole on the Disc of Gate Valve or Ball Valve

✓
Stable sealing by Bi-directional sealing design

✓
Quick and easy maintenance due to side entry design

✓
Prevent leakage and ensure long life through double & triple eccentric design



Cryogenic Top Entry Ball Valve



Cryogenic Butterfly Valve

» Controls the flow

> Manufacturing Item

| Type | Class | 150 | 300 | 600 | 900 | 1500 | 2500 |
|-----------|-------------|------|------|------|------|------|------|
| Gate | | 2~56 | 2~48 | 2~36 | 2~24 | 2~16 | 2~8 |
| Globe | | 2~30 | 2~30 | 2~30 | 2~14 | 2~10 | 2~8 |
| Check | Swing | 2~36 | 2~36 | 2~36 | 2~24 | 2~16 | 2~8 |
| | Dual | 2~36 | 2~36 | 2~12 | 2~6 | 2~6 | - |
| | Axial | 2~36 | 2~36 | 2~36 | 2~32 | - | - |
| Ball | Floating | ½~6 | ½~6 | ½~4 | ½~2 | ½~2 | - |
| | Trunnion | 8~24 | 8~24 | 6~24 | 3~24 | 3~24 | - |
| | DBB(2 Ball) | ½~6 | ½~6 | ½~4 | ½~2 | ½~2 | - |
| Butterfly | | 4~48 | 4~24 | *UD | - | - | - |

*UD : Under Development



LH₂ Valves



PK VALVE&ENGINEERING has been supplying cryogenic(-196°C) valves for 40 years based on technology and know-how, and based on this, we provide valve solutions optimized for liquefied hydrogen(-253°C) and liquefied helium(-269°C) environments. We provide verification test service by establishing a test device capable of testing valve performance at the temperature of liquefied hydrogen (-253°C), and supply the highest quality and reliable products.



LH₂ Check Valve (2")



LH₂ Globe Valve (2")



LH₂ Emergency Shutoff Valve (2")



LH₂ Globe Valve (3")

>>> Controls the flow

> Characteristic of LH₂ Valve

✓

Designed with our unique design that enables high-vacuum insulation and maintenance outside the cold box

✓

Provide Globe Valve, Check Valve (Lift Type), Emergency Shut-Off Valve

✓

Provide various operation options (manual, gear, MOV, POV)

✓

Block external leakage by applying bellows seal and gland packing

✓

Application of thermal barrier structure that BOG(Boil-Off Gas) that may occur inside the valve

> Specification

| Type | Specification |
|---------------------|-----------------------------------------------------------------------------------|
| Operating Temp. | -253°C (-269°C) to +80°C |
| Service Fluids | LH ₂ , LHe, LNG, LO ₂ |
| Valve Type | Globe, Check Valve |
| Material | 304L, 316L Stainless Steel |
| Valve Size | ½" ~ 10" |
| Valve Rating (ASME) | Class 150 to 300 |
| End Connections | Butt welding According to ASME B16.25 |
| Operation | Manual, Gear, Motor, pneumatic |
| Cryogenic Extension | As per MSS SP-134, BS 6364, ISO 28921-1 |
| Stem Sealing | Bellows & Gland Packing |
| Seat Material | Metal (Body) / PCTFE (Disc) |
| | Metal (Body) / Metal (Disc) |
| Flow Characteristic | Linear or On/Off |
| Special | Position Indicator |
| | Thermal Barrier |
| | Vacuum jacketed with M.L.I or Non jacketed |
| | Suitable for Cold Box |
| | Outside screw and yoke Type Easy maintenance |
| | Degreasing & Cleaning |
| | Full Penetration Weld applied on extension joint (Available Radiographic Testing) |

Gas Valve Unit (GVU)

A device that controls gas in engines, generators, and boilers in ships that use natural gas as fuel. The Gas Valve Unit (GVU) represents the interface between the engine and the fuel gas supply system. It ensures safe isolation of the engine during shutdown and maintenance.

> Function of gas valve unit

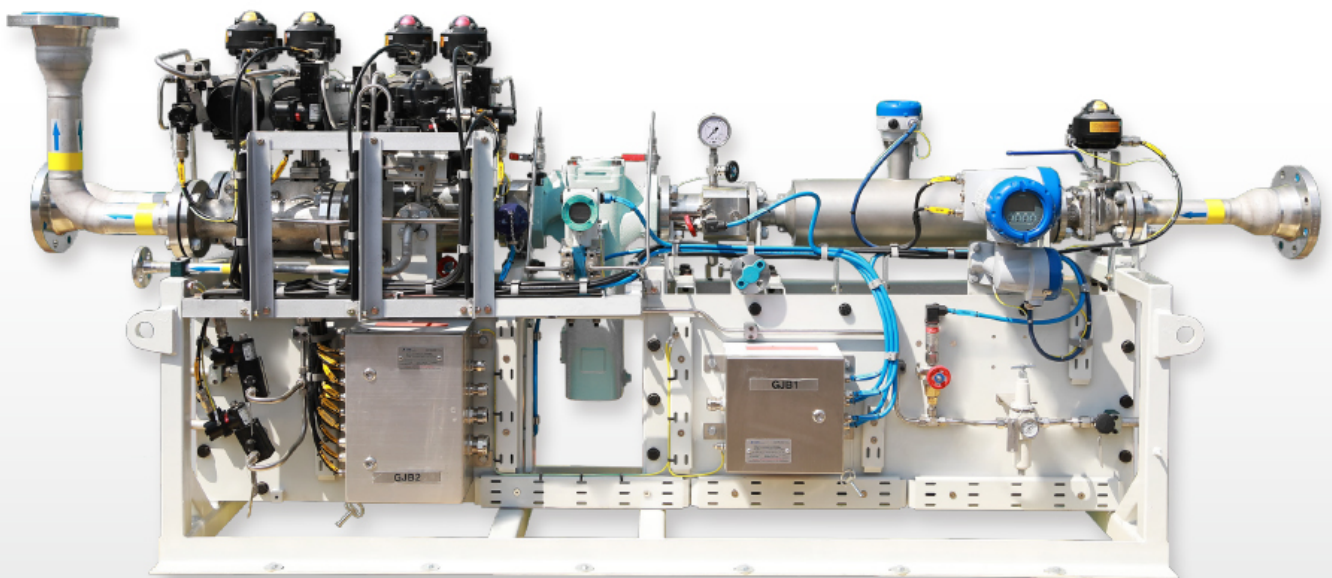
Leakage test before engine start

Supplying the gas by engine control system

Purging with nitrogen before maintenance service

Quick stop at the end of DF operation mode

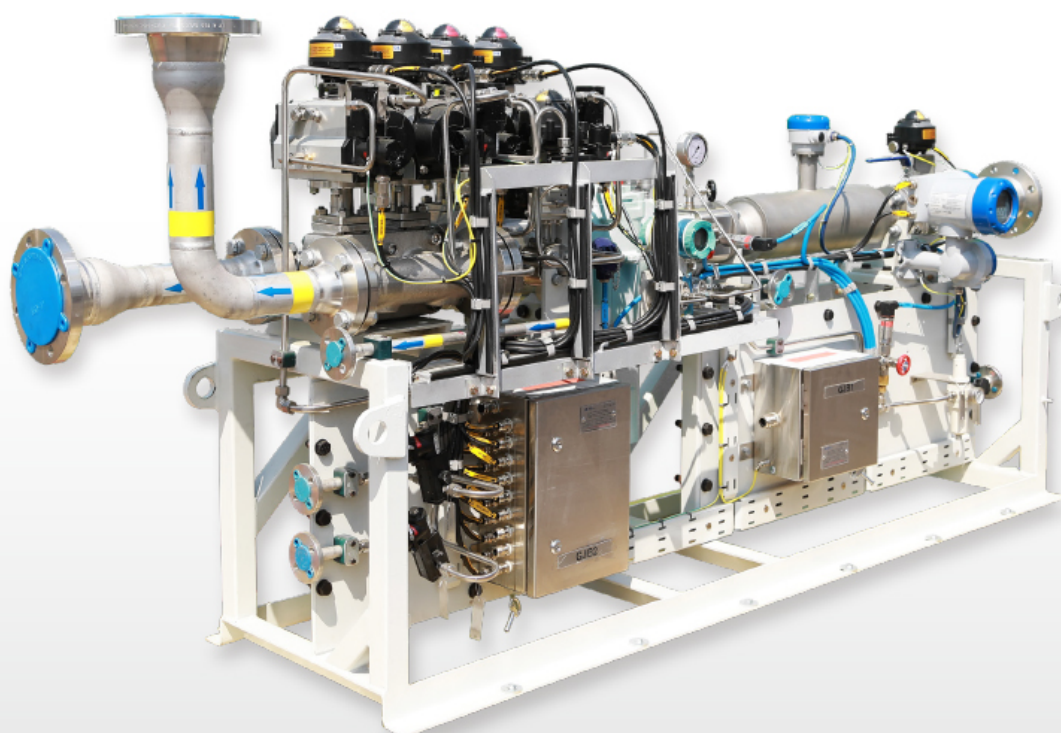
Quick stop in case of an emergency mode



» Controls the flow

> Specification

| Item | Specification |
|-------------------------|------------------------------------------|
| GVU Type | Vertical / Horizontal / Enclosure / Open |
| Pipe Connection | DN 50 ~ DN 100 |
| Valve Type | Ball Valves, Axial Valves |
| Design Pressure | 16 bar |
| Service Media | Gas |
| Media Temperature | -25 ~ 60°C |
| Ambient Temperature | 0 ~ 60°C |
| Ex Classification | ATEX, IECEx |
| Compressed Air Pressure | 5 ~ 9bar |
| Options | Flowmeter, Filter |



Supply Reference - LNG Carrier



| No. | Area | Owner/Client | PROJECT NAME | TYPE OF VESSEL | VESSEL QTY | SHIP YARD | CLASS | ENGINE | TANK | ACTUATOR MAKER/AREA |
|-----|----------|-----------------------------------|---------------------------------------------|------------------|------------|-----------|---------|--------|-------|---------------------|
| 1 | CHINA | CMES | DSIC 175K LNGC G175K-1 | LNGC | 4 | DSIC | LR+CCS | | | EMERSON |
| 2 | CHINA | CNOOC / MOL | H1880A SERIES 174K LNGC | LNGC | 6 | H2S | ABS+CCS | X-DF | NO96 | KSB |
| 3 | CHINA | COSCO SHIPPING CO., LTD. / K-LINE | H1892A SERIES 174K LNGC | LNGC | 2 | H2S | ABS+CCS | X-DF | NO96 | KSB |
| 4 | CHINA | COSCO SHIPPING CO., LTD. / MOL | H1831A SERIES 174K LNGC | LNGC | 6 | H2S | ABS+CCS | X-DF | NO96 | KSB |
| 5 | CHINA | CSSC SHIPPING CO., LTD. / MOL | H1827A SERIES 174K LNGC | LNGC | 2 | H2S | LR+CCS | X-DF | NO96 | KSB |
| 6 | DENMARK | CELSIUS SHIPPING | 2459 SERIES 180K LNGC | LNGC | 8 | SHI | LR | X-DF | MKIII | KSB |
| 7 | GREECE | ALPHAGAS | #8105 SERIES 174K LNGC | LNGC | 3 | HSHI | DNV | X-DF | MKIII | EMERSON |
| 8 | GREECE | MARANGAS | SN2425 SERIES 174K LNGC | LNGC | 3 | SHI | BV | X-DF | MKIII | KSB |
| 9 | GREECE | MARANGAS | 2528 SERIES 174K LNGC | LNGC | 11 | DSME | ABS | ME-GI | NO96 | KSB |
| 10 | GREECE | TMS CARDIFF GAS | 2635 SERIES 174K LNGC | LNGC | 2 | SHI | ABS | ME-GA | MKIII | SCANA |
| 11 | JAPAN | MOL | QATAR GAS 1790 SERIES 174K LNGC | LNGC | 4 | H2S | ABS+CCS | X-DF | NO96 | KSB |
| 12 | JAPAN | NYK | 2580 SERIES 174K LNGC | LNGC | 4 | SHI | DNV | X-DF | MKIII | EMERSON |
| 13 | JAPAN | NYK / C-LNG | QATAR GAS 1797 SERIES 174K LNGC | LNGC | 2 | H2S | ABS+CCS | X-DF | NO96 | KSB |
| 14 | KOREA | H-LINE SHIPPING CO., LTD. | #8025 SERIES H-LINE SHIPPING 174K LNGC | LNGC | 4 | HSHI | ABS | X-DF | MKIII | EMERSON |
| 15 | KOREA | H-LINE SHIPPING CO., LTD. | EXXONMOBIL 2607 SERIES 174K LNGC | LNGC | 4 | SHI | LR+KR | ME-GA | MKIII | EMERSON |
| 16 | KOREA | HYUNDAI GLOVIS | 8170 HYUNDAI GLOVIS 174K LNGC | LNGC | 1 | HSHI | DNV-KR | X-DF | MKIII | EMERSON |
| 17 | KOREA | HYUNDAI LNG SHIPPING | H2521 SERIES HYUNDAI LNG 174K LNGC | LNGC | 2 | DSME | KR | ME-GI | NO96 | KSB |
| 18 | KOREA | HYUNDAI LNG SHIPPING | #2451 SERIES HYUNDAI 174K LNG CARRIER | LNGC | 2 | DSME | KR | ME-GI | NO96 | EMERSON |
| 19 | KOREA | KC(H-LINE, SK, PAN OCEAN) | QATAR GAS 2546 SERIES 174K LNGC | LNGC | 11 | DSME | BV-KR | ME-GA | NO96 | TBD |
| 20 | KOREA | KC(H-LINE, SK, PAN OCEAN) | QATAR GAS 2611 SERIES 174K LNGC | LNGC | 4 | SHI | ABS | ME-GA | MKIII | KSB |
| 21 | KOREA | KOREA SM LINE | SN2233 SERIES KOGAS 7.5K LNGC | LNGC | 2 | SHI | KR | | | EMERSON |
| 22 | KOREA | KOREA SM LINE | #3185 SERIES KSL 174K LNGC(SHELL) | LNGC | 4 | HHI | KR | X-DF | MKIII | EMERSON |
| 23 | KOREA | PAN OCEAN | #3221 SERIES PAN OCEAN 174K LNGC(SHELL) | LNGC | 4 | HHI | DNV-KR | X-DF | MKIII | EMERSON |
| 24 | KOREA | PAN OCEAN | SN2426 PAN OCEAN 174K LNGC | LNGC | 1 | SHI | ABS | X-DF | MKIII | KSB |
| 25 | MALAYSIA | MISC | SN2364 SERIES MISC 174K LNGC | LNGC | 2 | SHI | ABS | X-DF | MKIII | KSB |
| 26 | NORWAY | KNUTSEN | #8091 SERIES KNUTSEN 174K LNGC(SHELL) | LNGC | 9 | HSHI | LR | X-DF | MKIII | EMERSON |
| 27 | RUSSIA | SOVCOMFLOT | #8006 SERIES SOVCOMFLOT 174K LNGC | LNGC | 3 | HSHI | BV | X-DF | MKIII | EMERSON |
| 28 | RUSSIA | SOVCOMFLOT | SN2366 SERIES ARCTIC LNG-2 ICEBREAKING LNGC | ICEBREAKING LNGC | 15 | SHI | BV | X-DF | MKIII | ROTORK/PLEIGER |
| 29 | TURKEY | Pardus Energy Limited(BOTAS) | #2945 Pardus Energy Limited 170K FSRU | FSRU | 1 | HHI | BV | DFDE | MKIII | EMERSON |
| 30 | UK | JP MORGAN | #3187 SERIES JP MORGAN 174K LNGC(SHELL) | LNGC | 1 | HHI | DNV | X-DF | MKIII | EMERSON |
| 31 | UK | JP MORGAN | SN2592 SERIES 174K LNGC | LNGC | 6 | SHI | ABS | ME-GA | MKIII | SCANA |
| 32 | UK | JP MORGAN | 2596 SERIES QATAR GAS 174K LNGC | LNGC | 14 | SHI | ABS | ME-GA | MKIII | SCANA |

Supply Reference - LNG Terminal



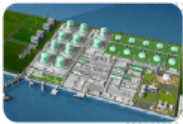
Manzanillo LNG Terminal / Mexico

- EPC / END USER : SAMSUNG ENG / CFE
- Delivery : 2010
- Cryogenic Gate, Globe, Check, Butterfly V/V



PANAMA LNG Terminal / PANAMA

- EPC / END USER : POSCO E&C / AES
- Delivery : 2017
- Cryogenic Gate, Globe, Check, Butterfly V/V



Incheon LNG Terminal 3

- 2001 ~ 2013
- Gate, Globe, Check, Butterfly, Ball V/V
- Class 150 ~ 900, 1360 EA



SamChuck LNG Terminal

- 2013 ~ ongoing
- Gate, Globe, Check, Butterfly
- Class 150 ~ 900, 846 EA



Ogishima LNG Terminal / Japan

- EPC / END USER : IHI Corp / Tokyo Gas
- Cryogenic Gate, Globe, Check



PyengTaek LNG Terminal

- 2004 ~ 2012
- Gate, Globe, Check, Butterfly, Ball V/V
- Class 150 ~ 1500, 1652 EA



Tongyeong LNG Terminal

- 2001 ~ 2012
- Gate, Globe, Check, Butterfly, Ball V/V
- Class 150 ~ 900, 1599 EA



SOMA LNG Terminal II / Japan

- EPC / END USER : IHI Corp / JAPEX
- Delivery : 2017
- Cryogenic Gate, Globe, Check V/V



Boryeong LNG Terminal

- 2015 ~ 2018
- Gate, Globe, Check, Butterfly, Ball V/V
- Class 150 ~ 300, 66 EA



Gwangyang LNG Terminal3

- 2005 ~ 2010
- Globe, Check, Butterfly
- Class 150 ~ 900, 31 EA



Negishi LNG Terminal / Japan

- EPC / END USER : Chiyoda Corp / Tokyo Gas
- Cryogenic Gate, Globe, Check



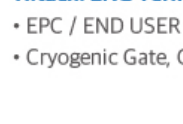
Jeju LNG Terminal

- 2018
- Globe, Check, Butterfly V/V
- Class 150 ~ 600, 213 EA



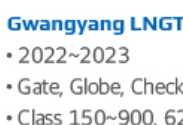
Gwangyang LNG Terminal4

- 2021~2022
- Gate, Globe, Check, Butterfly, Ball V/V
- Class 150~900, 251EA



Hitachi LNG Terminal / Japan

- EPC / END USER : Chiyoda Corp / Tokyo Gas
- Cryogenic Gate, Globe, Check



Gwangyang LNG Terminal6

- 2022~2023
- Gate, Globe, Check, Butterfly V/V
- Class 150~900, 62EA

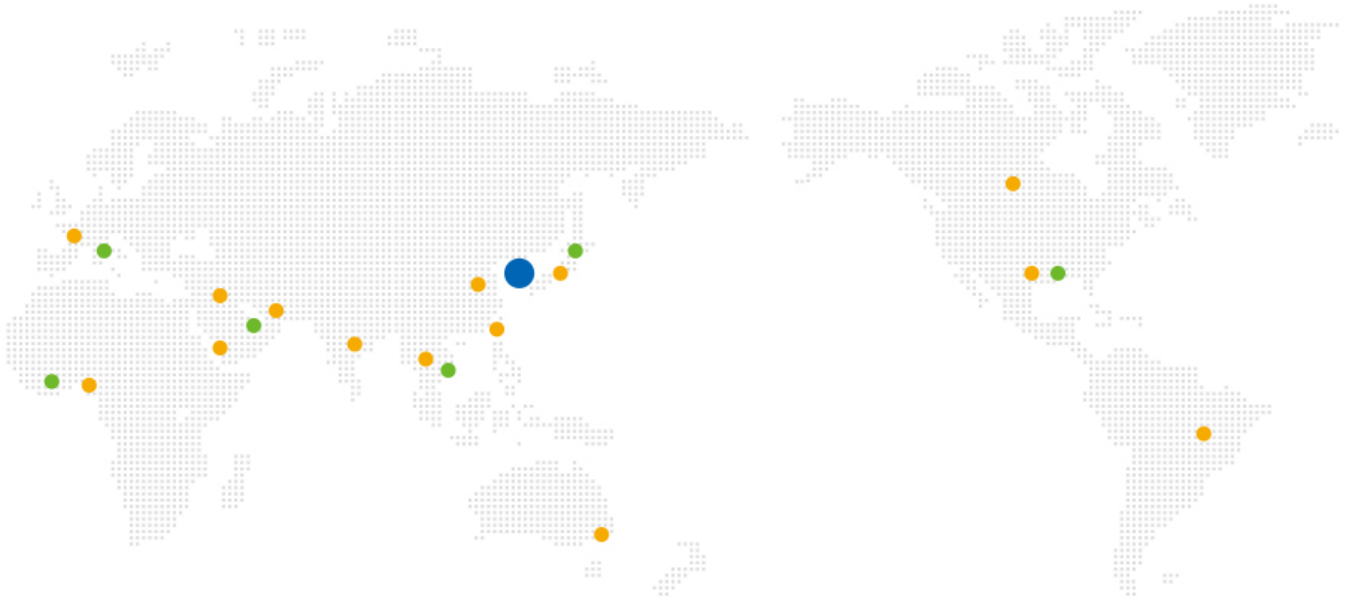
Customers Care

> Global Network

● Head Office

● Representatives

● After-Sales Representatives



> Valve Medic

After consultation with the customers, our engineers visit the customers and provide customized training and consulting to solve the problems faced by the customers. We respond to customer problems together, such as valve troubleshooting, maintenance method training, valve specification review.



> AEO

On April 30, 2023, AEO certification (KR AEO 3123007) was obtained from the Korea Customs Service. AEO certification is a system that certifies export safety management companies that meet the international standards of the World Customs Organization for trade safety and facilitation.



Training & Education

> Engineer Training



Training Service for Engineers came from Middle East Fuji LLC.



Training Service for Engineers came from Marine Systems & Solutions



> Valve Academy

PK VALVE&ENGINEERING is the only valve manufacture in the world that has been running the “Valve Academy” program since 2000 to strengthen communication with customers. It was first held free courses for valve agency employees in terms of valve job training, and it was opened to general customers in 2005 at the request of major customers. In 2023, the “18th Valve Academy” was held to expand communication with customers.



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