Only the Best can create the Best

Only the best can create the best and experience makes the difference. At PK Valves, we have continuously developed designs, technology, and our people for over 50 years, so we are among the very best in the industry today. PK Valves - your reliable business partner now and in the future!
All of our passion and energies have been committed to the development and supply of high-quality valves and related services for more than 60 years, and during that time we have taken a leading role in the advancement of design, technology, and service. In the rapidly changing world of today and tomorrow, PK Valve will step up to the challenges and lead our industry.

We are responsible for the quality and impact of our products and services on the industrial community and on our environment. As we continue to serve industries such as traditional power generation, nuclear power, oil & gas, shipbuilding, aeronautics, aerospace, marine industries, and others, we will remain committed and disciplined in meeting our responsibilities while leading our industry.

President
Hern-Gun Park
Management Policy

On the basis of "Bee on Reliability" as a fundamental management philosophy, all employees at PK Valve Co., Ltd. respect human life and worker's health before all production activities, provide satisfactory products and services that meet the requirements of customers by means of management activities in harmony with environment and continuing technological development and quality innovations, and further make every effort to fulfill our social responsibilities and obligations with the realization of human happiness as our top priority, including the policies specified below.

- Recognize the Safety, health, Environment & Quality (SH&EQ) management as key factors in accomplishing our continuous stability and growth. We also comply with all legal and regulatory requirements, other applicable requirements as agreed with internal regulations that relate to safety, health, environment, and quality issues.
- Improve and upgrade management system continuously through process improvement and technological development so that all the factors impeding safety, health, environment, and quality activities can be minimized.
- Establish and implement the management objectives and targets to accomplish our SH&EQ management policy and review and improve the existing stability of the management policy and system.
- Give careful consideration to safety, health, environment, and quality over the whole process ranging from product development, design, production, vending, and disposal.
- Make every effort to prevent accident by taking precautions to eliminate harmful and dangerous factors involving safety, health, and environment activities, and where an accident occurs, take a proper measure to minimize the damage.
- Do our best to even customer's trouble and to grow by grasping accurately the quality requirements of customer and furnishing the best quality products that always satisfy customer's expectations and requests.
- Continuously give training to all PK Valve employees and other representatives who perform safety, health, environment, and quality related activities to improve awareness and induce active participation.

Quality Approval

1. ASME (U.S.A) | May 2008
2. ASME (U.K) | May 2008
5. OHSAS 18001 | BVQI (Korea Valley Quality International) Management System | Nov. 2008
6. KEPIC (Korea Electric Power Industry Code) | Apr. 1994
7. OQMS (Quality of Management System) | Jul. 2001
9. API (American Petroleum Institute) 500 | Nov. 2004
11. DN (Det Norske Veritas) Steel Casting | Feb. 1993
12. LR ( Lloyd's Register of Shipping) Steel Casting | Oct. 1993
13. NK (Nippon Kaiji Kyokai) Steel Casting | Nov. 1993
15. NED (New Excellent Product) | Jan. 2008
**Company History**

- Established Busan Pohang Ind. Co., Ltd. in Busan, Korea (1946)
- Obtained "K" mark for Cast Steel & Machine Valves / 11 items (1971)
- Removed all facilities and factory to Changwon Industrial Complex (Current Location) (1974)
- Expanded laboratory to installing SPECTROMETER and other equipment (1979)
- Approved Fire Duct Ball Valves by AMTECH / API 607 (1987)
- Developed Pressure Seal Type Valves for high pressure and high temperature (1988)
- Obtained Type Approval of Fire Safe Ball Valves by DNV (1988)
- Listed as a manufacturer for installation of nuclear power plant at KEPCO (1988)
- Listed as a manufacturer for installation of nuclear power plant at KEPIC (1989)
- Listed as a manufacturer for installation of thermal & hydroelectric power plant at KEPCO (1992)
- Listed as a manufacturer for installation of nuclear power plant at KEPCO / ANJII, Motor Operated Valve (1993)
- Developed Bellow Seats Gate Valve & globe valve (1996)
- Developed Stainless Steel Ball Valve (1996)
- Developed Valve Fitting Check Valve (1996)
- Developed Low Fugitive Emission Test (1997)
- Obtained Quality Assurance Certification by KEMCO (1998)
- Obtained EM mark for high pressure Metal Seat Tilting Check Valve (1999)
- Developed Super Duplex Stainless Steel Valves for casting (2000)
- Developed Triple Offset Butterfly Valve (2001)

**Valve Identification**

- CRV (Cryogenic Gate valves)
- GCV (Cryogenic Globe valves)
- CCR (Cryogenic Check valves)
- CBF (Cryogenic Butterfly valves)

- PSB (Pressure Seal Bonnet Gate valves)
- PGV (Pressure Seal Bonnet Globe valves)
- PCH (Pressure Seal Bonnet Check valves)
- PTV (Pressure Seal Bonnet Tilting Check valves)
- PVC (Pressure Seal Bonnet Y-Globe valves)
- PAV (Pressure Seal Bonnet Angle Globe valves)

- EFV (Ellbow valve & Gate valves)
- BGL (Bellows seal Globe valves)
- LFP (Low Fugitive emission Valves)

- QTV (Triple Offset Butterfly valves)
- DDB (Double Offset Butterfly valves)
- FBA (Forged Ball valves)

- CTV (Cryogenic Control Valves)
- HCV (Hydraulic Operated Valves)

- CSV (Cryogenic Stop Gate Valves)
- GLV (Bellows seal Globe valves)
- CIV (Bellows seal Check valves)
- THV (Bellows seal Tilting Check valves)
- YGL (Bellows seal Y-Globe valves)
- AVG (Bellows seal Angle Globe valve)

- SSV (Stainless steel Gate valves)
- SSL (Stainless steel Globe valves)
- SCH (Stainless steel Check valves)

- Others: PGO (Parallel Globe Gate valves)
- NRV (Non Return Valves/Bypass check valves)
- TCV (Thrust Control Globe valves)
- SLV (Slurry Valves)
- KPV (Kite Gate Valves)
- LCV (Lift Check valves)
- ETC

**Accessories**

- Chain wheel
- Belt gear
- Rotary gear
- Balance valve
- By-pass valve
- Diaphragm
- Unit switch
- Lube loading
- Extension stem
- Others
CRYOGENIC SERVICE VALVES
Cryogenic valves are specially engineered and designed for piping systems used in the storage and transport of liquefied gases such as LNG and liquid nitrogen and oxygen. The main structural feature of these valves is an extended bonnet with an enclosed vapor chamber to isolate packing from the cryogenic fluid and thereby allow packing to function properly. PK Valve Cryogenic designs and liquid nitrogen testing facilities go much further to assure proven performance in this most demanding application.

PRODUCTION RANGE

<table>
<thead>
<tr>
<th>Type</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>150</td>
</tr>
<tr>
<td>CGT</td>
<td>2&quot;-60&quot;</td>
</tr>
<tr>
<td>CGL</td>
<td>3&quot;-24&quot;</td>
</tr>
<tr>
<td>CCH</td>
<td>2&quot;-48&quot;</td>
</tr>
<tr>
<td>CBF</td>
<td>3&quot;-48&quot;</td>
</tr>
</tbody>
</table>

TABLE OF LIQUEFIED GASSES

<table>
<thead>
<tr>
<th>Type</th>
<th>Boiling Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural Gas, LNG</td>
<td>-270°C -168°C</td>
</tr>
<tr>
<td>Methane, CH4</td>
<td>-158°C -162°C</td>
</tr>
<tr>
<td>Oxygen, O2</td>
<td>-296°C -183°C</td>
</tr>
<tr>
<td>Argon, Ar</td>
<td>-183°C -186°C</td>
</tr>
<tr>
<td>Carbon Dioxide, CO2</td>
<td>-314°C -192°C</td>
</tr>
<tr>
<td>Nitrogen, N2</td>
<td>-230°C -196°C</td>
</tr>
<tr>
<td>Hydrogen, H2</td>
<td>-423°C -253°C</td>
</tr>
<tr>
<td>Helium, He</td>
<td>-452°C -260°C</td>
</tr>
</tbody>
</table>

PRODUCTION MATERIALS
ASTM: A351-CFR, CF8M, CF3, CF3M or Equivalent
PRESSURE SEAL BONNET VALVES

Pressure seal bonnet valves are designed to utilize pressure inside the line and valve to increase sealing forces at the bonnet seal. Thus, as line pressure increases, sealing forces also increase to assure performance in high temperature and high pressure applications.

PRODUCTION RANGE

<table>
<thead>
<tr>
<th>Type</th>
<th>Class 500</th>
<th>900</th>
<th>1500</th>
<th>2500</th>
</tr>
</thead>
<tbody>
<tr>
<td>PGT</td>
<td>2&quot;-40&quot;</td>
<td>2&quot;-48&quot;</td>
<td>2&quot;-48&quot;</td>
<td>2&quot;-48&quot;</td>
</tr>
<tr>
<td>PGL</td>
<td>2&quot;-24&quot;</td>
<td>3&quot;-24&quot;</td>
<td>3&quot;-24&quot;</td>
<td>3&quot;-24&quot;</td>
</tr>
<tr>
<td>PCH</td>
<td>2&quot;-24&quot;</td>
<td>2&quot;-42&quot;</td>
<td>2&quot;-42&quot;</td>
<td>2&quot;-42&quot;</td>
</tr>
<tr>
<td>PTC</td>
<td>2&quot;-24&quot;</td>
<td>2&quot;-42&quot;</td>
<td>2&quot;-42&quot;</td>
<td>2&quot;-42&quot;</td>
</tr>
<tr>
<td>PYG</td>
<td>2&quot;-24&quot;</td>
<td>2&quot;-24&quot;</td>
<td>2&quot;-24&quot;</td>
<td>2&quot;-24&quot;</td>
</tr>
<tr>
<td>PAG</td>
<td>2&quot;-24&quot;</td>
<td>3&quot;-24&quot;</td>
<td>3&quot;-24&quot;</td>
<td>3&quot;-24&quot;</td>
</tr>
</tbody>
</table>

PRODUCTION MATERIALS

Carbon Steel: ASTM A216-WCB or Equivalent
Alloy Steel: ASTM A217-WCB, WCD, C9, C12, C12A, ASTM A182-F91 or Equivalent
Stainless Steel: ASTM A351-CF8, CF8M, CF3, CF3M, C7M or Equivalent
Duplex Stainless Steel: ASTM A956-1A, 2A, 4A, 8A or Equivalent
Special Alloy Steel: Inconel 625, Incoloy 825, Hastelloy C, Monel
ASME SA designation material (e.g. ASME SA217-WCB)
EFV BGT, BGL, LFV

ENVIRONMENT FRIENDLY VALVES
BELLOW SEAL VALVES

Even though traditional packing systems have been improved greatly in recent years, bellows seal valves offer an extra measure of protection where needed.
Bellows seal valve designs utilize traditional packing systems plus bellows assemblies to prevent contact between line media and packing, thereby providing proven failsafe alternatives where required by regulatory or sound process engineering requirements.

PRODUCTION RANGE

<table>
<thead>
<tr>
<th>Class Type</th>
<th>150</th>
<th>300</th>
<th>600</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGT</td>
<td>2&quot;-24&quot;</td>
<td>2½&quot;-24&quot;</td>
<td>2½&quot;-12&quot;</td>
</tr>
<tr>
<td>BGL</td>
<td>1½&quot;-28&quot;</td>
<td>1½&quot;-24&quot;</td>
<td>2½&quot;-12&quot;</td>
</tr>
<tr>
<td>LFV</td>
<td>ALL SIZE &amp; CLASS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PRODUCTION MATERIALS

Bellows Set: 321SS(Bellow) + 316SS(Holder)
Carbon Steel: ASTM A216-WCB or Equivalent
Stainless Steel: ASTM A351-CF8, CF8M, CF3, CF3M or Equivalent
ASME SA designation material (e.g. ASME SA351-CF8M)

LOW FUGITIVE EMISSION VALVE

Low Fugitive emission Valve (LFV) is designed and manufactured to ensure leakage of less than 100 ppm of volatile organic compounds.
PK Valve has established the test facilities and made its own procedures with Emission Defence Packing (EDP) for fugitive emission test. By using the test facilities and procedures, room temperature cycle and thermal cycle testing have been performed, establishing critical design parameters necessary to achieve low fugitive emissions.
PRODUCTION RANGE

<table>
<thead>
<tr>
<th>Type</th>
<th>150</th>
<th>300</th>
<th>500</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOB</td>
<td>3&quot;-9&quot;</td>
<td>3&quot;-12&quot;</td>
<td>3&quot;-48&quot;</td>
</tr>
<tr>
<td>DOB</td>
<td>3&quot;-144&quot;</td>
<td>3&quot;-144&quot;</td>
<td></td>
</tr>
<tr>
<td>FBA</td>
<td>1/2&quot;-4&quot;</td>
<td>1/2&quot;-4&quot;</td>
<td>1/2&quot;-4&quot;</td>
</tr>
</tbody>
</table>

PRODUCTION MATERIALS
Carbon Steel : ASTM A216-WCB or Equivalent
Alloy Steel : ASTM A217-WCB, WCB, C5, C12, C12A,
ASTM A182-F91 or Equivalent
Stainless Steel : ASTM A351-CF8, CF8M, CF3, CF3M, CN7M or Equivalent
Duplex Stainless Steel : ASTM A995-1A, 2A, 4A, 5A or Equivalent
Special Alloy Steel : Inconel 625, Incoloy 825, Hastelloy C, Monel, AL-BRONZE
ASME SA designation materials (e.g. ASME SA217-WCB)

QTV TOB, DOB, FBA

QUARTER TURN VALVES
Quarter turn valves offer quick opening and closing features by providing for closure elements that cycle by a simple turn of stems from 0 to 90 degrees. Valves of this design, including butterfly, ball, and plug valves are very well adapted to installation of power actuators to minimize labor and maximize safety in plant environments.

TRIPLE OFFSET BUTTERFLY VALVES
Triple offset, metal seated butterfly valves provide bi-directional and bubble tight shut-off with the unique geometry of the triple offset design: (1) Stems are offset from seat rings; (2) seat centerslines are offset from pipe centerlines; and (3) conical axes are offset from valve centerlines. The third offset completely eliminates contact between discs and seats until the full closed position is reached, thereby eliminating rubbing action and wear.
CTV MOV, AOV, HOV

AIR OPERATED VALVES
Pneumatic actuators powered by air pressure can be used to operate valves. Pneumatic actuators can be double acting (signal must be provided to cause any movement in either direction) or single acting (signal is used to open or close and springs or other devices are used to automatically return). These actuators normally operate valves much faster than motors and are often used on control valves and in emergency shutdown and other applications.

MOTOR OPERATED VALVE
Motor operated valves are operated by electric motors controlled by signals coming from adjacent or remote locations. Position or torque controlled limit switches are normally used to automatically stop motors when valves reach full open or closed positions. Operators or conditions may also stop motors in mid-cycle. Motor operators are often used on large size or high pressure valves or when safety conditions, difficult accessibility, or plant automation dictate their use.
CAST STEEL VALVES
PRODUCTION RANGE

<table>
<thead>
<tr>
<th>Class Type</th>
<th>150</th>
<th>300</th>
<th>600</th>
<th>900</th>
<th>1500</th>
</tr>
</thead>
<tbody>
<tr>
<td>GTV</td>
<td>2&quot;-4&quot;</td>
<td>2&quot;-4&quot;</td>
<td>2&quot;-4&quot;</td>
<td>2&quot;-4&quot;</td>
<td>2&quot;-4&quot;</td>
</tr>
<tr>
<td>GLV</td>
<td>2&quot;-2&quot;</td>
<td>2&quot;-2&quot;</td>
<td>2&quot;-2&quot;</td>
<td>2&quot;-2&quot;</td>
<td>2&quot;-2&quot;</td>
</tr>
<tr>
<td>CHV</td>
<td>2&quot;-6&quot;</td>
<td>2&quot;-6&quot;</td>
<td>2&quot;-6&quot;</td>
<td>2&quot;-6&quot;</td>
<td>2&quot;-6&quot;</td>
</tr>
<tr>
<td>TCH</td>
<td>2&quot;-8&quot;</td>
<td>2&quot;-8&quot;</td>
<td>2&quot;-8&quot;</td>
<td>2&quot;-8&quot;</td>
<td>2&quot;-8&quot;</td>
</tr>
<tr>
<td>YGL</td>
<td>2&quot;-4&quot;</td>
<td>2&quot;-4&quot;</td>
<td>2&quot;-4&quot;</td>
<td>2&quot;-4&quot;</td>
<td>2&quot;-4&quot;</td>
</tr>
<tr>
<td>AGL</td>
<td>2&quot;-4&quot;</td>
<td>2&quot;-4&quot;</td>
<td>2&quot;-4&quot;</td>
<td>2&quot;-4&quot;</td>
<td>2&quot;-4&quot;</td>
</tr>
</tbody>
</table>

PRODUCTION MATERIALS

- Carbon Steel: ASTM A216-WCB or Equivalent
- Alloy Steel: ASTM A217-WCB, WCD, C5, C12, C12A or Equivalent
- Stainless Steel: ASTM A351-CF8, CF8M, CF3, CF3M, CM7M, or Equivalent
- Duplex Stainless Steel: ASTM A995-1A, 2A, 4A, 6A or Equivalent
- Special Alloy Steel: Inconel 625, Incoloy 800, Hastelloy C, Monel, AL-BRONZE
- ASME SA designation material (e.g. ASME SA217-WCB)
**SSV SGT, SGL, SCH**

**Stainless Steel Valves Production Range**

<table>
<thead>
<tr>
<th>Class Type</th>
<th>150</th>
<th>300</th>
</tr>
</thead>
<tbody>
<tr>
<td>SGT</td>
<td>1/2&quot;-24&quot;</td>
<td>1-1/2&quot;-18&quot;</td>
</tr>
<tr>
<td>SGL</td>
<td>1/2&quot;-12&quot;</td>
<td>1-1/2&quot;-12&quot;</td>
</tr>
<tr>
<td>SCH</td>
<td>1/2&quot;-16&quot;</td>
<td>1-1/2&quot;-12&quot;</td>
</tr>
</tbody>
</table>

Stainless steel valves are designed and manufactured by ASME B16.34 (API603)

**Production Materials**

Stainless Steel: ASTM A351-CF8, CF8M, CF3, CF3M, CF8C, CF10, CN7M, CK20 or Equivalent

**Others** PSG, NRV, TCG, SLV, KGV, LCH
PK Valve offers a wide variety of service solutions for field needs and valve maintenance requirements for PK Valves and other brands as well. From automation needs to trouble-shooting and valve repair and maintenance, PK Valve will apply its considerable knowledge and experience through the discipline of its ISO quality system to provide guaranteed and reliable solutions.
Verification

PK Valve is qualified to perform verification activities of various kinds for nuclear power stations, including QME-1 required for the main equipment in those facilities. In addition, PK Valve maintains a "self-verification" facility capable of performing active tests including qualification tests for valves.

PK Valve maintains R&D activities at its technology research center. Staffed by over 30 full-time specialists, this center provides the thrust for development of new capabilities and products, design verifications, special applications, efficiency improvements, quality initiatives, and other projects and services that keep PK Valve at the leading edge of the industrial valve industry.
Pattern

PK Valve maintains in-house pattern making facilities and staffs for building new patterns of metal, resin, and wood, and for maintaining the more than thirty four thousand patterns used in the PK Valve foundries. The quality of ultimate castings depends on pattern design and technology, and PK Valve’s long experience in pattern making and foundry operation enable it to optimize casting plans and foundry equipment.

Casting

Casting quality is fundamental to reliability and performance, and PK Valve’s decades long experience in design, pattern making, and foundry operation set it apart from the competition. All its on-site foundries, PK produces only valve castings and has done so for decades. This experience, together with routine, on-site application of extensive NDE (e.g., RT, MT, and PT) for demanding customers, has enabled PK Valve to rise above the ordinary by applying the discipline of continuous improvement in casting quality for a wide range of sizes, classes, and materials.

MAJOR EQUIPMENT
- Induction Furnace 0.3, 1 and 3 Ton
- VRH Molding Line
- Continuous Flow Mixer
- Shell Molding Machine
- Heat Treatment Furnace and Quenching Bath
- Shot Blast
- MIG, TIG, ARC, Weld Machine
- C, A, 8
- Others
Machining

PK Valve produces and machines more than 300,000 valves per year of a very broad range of types, sizes, pressure classes, and materials. Supported by more than 100 skilled engineers, PK Valve’s experience and modern machining technology assure high quality and consistency.

Major Equipment
- 2 Way Boring Machine
- Horizontal Boring Machine
- Lathe
- Heavy Duty Face Lathe
- Universal Milling Machine
- Machining Center
- Milling Machine
- Planer
- Shaper
- Slotting Machine
- Surface Grinding Machine
- Lapping Machine
- Multi Drilling Machine
- Radial Drilling Machine
- Spot Filling Machine
- Tig Welding Machine
- Mig Welding Machine
- CNC Boring Machine
- Paint Shop
- Others

Test & Inspection

PK Valve has established and continuously improves ISO 9001 certified internal inspection processes at all levels, from R&D and design through pattern and casting production, NDE, machining, assembly, testing, inspection, documentation, packaging, and shipping. 100% of PK Valves are subject to these internal processes, and many are also inspected by third-party inspectors.
Applications

- POWER PLANT (NUCLEAR, THERMAL, WIND, OTHERS)
- LNG INDUSTRIES (RECEIVING TERMINAL, CARRIER)
- FPSO (LNG, OIL)
- PLATFORM & OFFSHORE PLANT
- OIL & GAS PLANT
- CHEMICAL & PETROCHEMICAL PLANT
- CRUDE OIL & CHEMICAL TANKER
- CLEAN & PURITY INDUSTRIES
- ENERGY & ENVIRONMENTAL PLANT
- AUTOMATIC & CONTROL PROCESS
- AEROSPACE & SEMICONDUCTOR INDUSTRIES
- DESALINATION PLANT
- HRS & DESULFURIZATION PLANT
- LOCAL HEAT & BOILER PLANT
- INDUSTRIAL PROCESS PLANT
- PIPELINE & CONSTRUCTION PLANT

Missions

For our Customers
Harmony of labor and capital
Sustaining the reputation of the PK brand
Innovative research and leading technology
Maximizing potential in cooperation with customer

For the Future
Pioneering spirit
Sustainable growth and expansion
Financial and organizational stability
Leadership in the valve industry

WARRANTY
PK Valve offers a standard warranty period of one (1) year. This period commences from the date of delivery to the original purchaser. Each product will be free from defects in material and workmanship. Any defect caused from inappropriate installation, improper maintenance, or purchaser’s excessive misuse will not be subject to warranty.

Purchaser shall give notice to PK Valve within any defect may be found on the products. PK Valve may elect which remedy or combination of remedies to provide in its sole discretion.

The standard and limitation of warranty may be modified upon agreement between both parties, PK Valve and purchaser.

This catalog is for reference only. All information contained within this catalog is subject to change without notice.