

QUBLOCK®

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9 Qualified blocking solutions for critical applications



Special Valves

- Check
- Tank Bottom
- Gate
- Globe
- Butterfly



QUBLOCK®

Qublock Technology

A variety of Qublock products have been specially designed and manufactured with accurate data, plenty of experience, know-how, and super-precision machining to satisfy your needs.

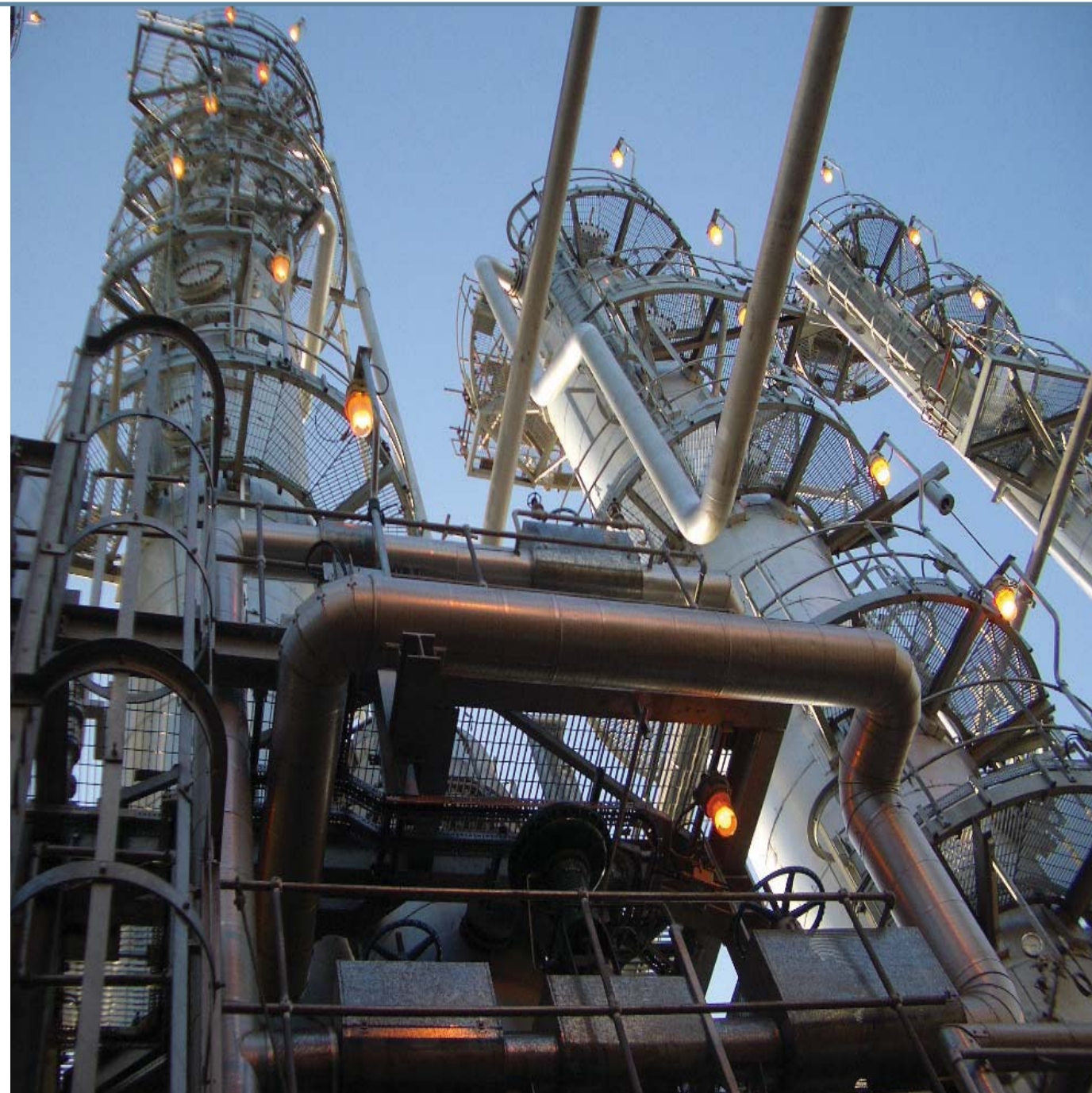
No matter what your conditions and troubles are, Qublock technology will provide a clear solution.

Introduction

As a specialist for the extreme, Qublock designs and manufactures custom-made solutions as well as standard products with innovative and advanced technology for perfect flow control, ease of operation, simple in-line maintenance, and long service life. Based on our dedicated experience in the global valve industry, Qublock focuses on severe applications requiring solutions to high-pressure, high-temperature, high-cavitation, corrosive, and erosive situations with a tight shutoff and low emission.

Qublock provides products of outstanding quality based on the know-how its engineers have gained through years of experiences and study.

As a leader in valve technology, Qublock prolongs life cycles and provides excellent valve performance to support new energy industries; these industries include oil and gas, chemical, and power plants, as well as industries dealing in PTA, polysilicon, and coal gasification.



Exotic Material

Qublock has a wide range of extraordinary skills and experience to handle exotic alloys such as titanium, Hastelloy, Inconel, Incolloy Monel, and zirconium to meet customer needs. Selecting and blending of materials, handling of the machine, and assembling parts are key processes for obtaining a complete product. Qublock specializes in managing the core processes for valve manufacturing to produce high-quality products.

Perfect Block Solution

Qublock is ready to offer the optimum block solution for your plant to minimize your losses. Qublock's products realize a zero leakage mechanism based on API 598 that utilizes a perfect block solution and meets ISO 15848 packing emission regulations. Qublock's perfect block solution shows a significant increase in performance compared to previous isolation concepts, especially for processes with high temperature, pressure, corrosion, and erosion conditions, and maintains zero leakage with a metal seat structure. The technology to realize a perfect block solution focuses on combining hard facing treatment skill, a material blending technique, and an independent design concept.

Integrated Quality Control System

Qublock has a great interest in protecting our environment and maintains the best product quality. We constantly try to develop and contribute to eco-environmental quality management and strictly observe all operation procedure standards for design, assembly, and testing. We meet the standards set out in environment regulations for valves and are ceaselessly trying to research and develop technologies to protect the Earth.

Tailor-Made Design

Customized design is Qublock's basic concept and pride. To solve problems in a customer's operation process, we focus on the customer's demands and consult with them closely.

This is why we are a solution partner for customers and can install the most appropriate valves for your pipes.





Coal to Gas / Liquid

Coal gasification is the process of producing coal gas, a type of syngas—a mixture of carbon monoxide (CO) and hydrogen (H₂) gas—from coal. IGCC is a high-efficiency electric power generation system for this process. Recently, it has attracted attention from the viewpoint of the low CO₂ exhaust achievable with CCS.

Related Fluid Coal Powder, Coal Slurry, Oxygen, Sour Water, H₂, CO₂, Synthetic Gas
Valve Material F51-Duplex, Inconel, Incolloy, Monel, SUS316, SUS316L, WCB



Polysilicon

Polycrystalline silicon, also called “Polysilicon,” is a material consisting of small silicon crystals. It is different from single-crystal silicon, used in electronics and solar cells, and from amorphous silicon, used in thin-film devices and solar cells.

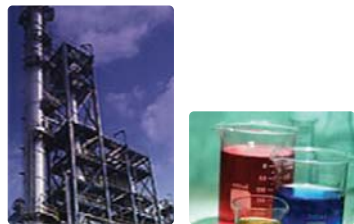
Related Fluid TCS, DCS, CVD, STC, H₂, Hydrochloric Acid, Si, PH
Valve Material Incolloy800HT, SUS316, SUS316L, F51-Duplex



PTA (Purified Terephthalic Acid)

PTA is the main raw material used for making polyester fibers, PET fibers (raw material used for making plastic bottles), PET films, and so on. The base materials acetic acid and terephthalic acid are highly corrosive even after the slurry process. Hence, the titanium valve that regulates the flow of PTA needs to have strong erosion resistance.

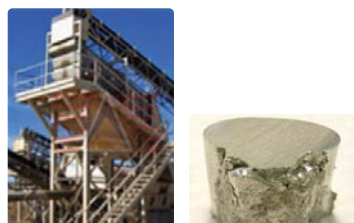
Related Fluid Xylene, TA Slurry, CTA, PTA Slurry, Catalyst, Bromine, N₂, Acetic Acid
Valve Material Titanium, Hastelloy, F51-Duplex, SUS316, SUS316L



Acetic Acid

Acetic acid is the base material for paints, adhesion bonds, and vinyl acetate. Usually, a Hastelloy or Zirconium valve is used for regulating the flow of acetic acid in order to meet the requirement of strong corrosion resistance.

Related Fluid Methanol, CO, Oxygen, NaOH, Acetic Acid, Aldehyde, Ethylene
Valve Material Hastelloy, Zirconium, Titanium, SUS316L



Nickel Mining

Nickel is the base material of corrosion-inhibiting and corrosion-resistant materials such as stainless steel and inconel. The fluid condition is very crucial because of the high pressure, slurry, and use of strong sulfuric acid. The valves used by these mines have special specifications and requirements.

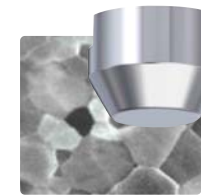
Related Fluid Mixed Sulfide, Sulfuric Acid, Nickel Cobalt, Copper Sulfide, Hydrogen Sulfide
Valve Material Titanium (F12), F51-Duplex, SUS316L, SUS304L



High Performance Resin

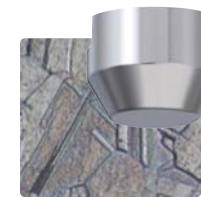
It is improved performance resin such as Impact resistance, heat resistance, and processability. It is using catalyst slurry/powder on the polymerize process. And high-frequency operation is required. It is very severe conditions to the valves. Qublock can provide to achieve a long life and stable performance by the super-fine roundness of the metal seated ball valves, you can greatly reduce the maintenance cost.

Related Fluid Catalyst Slurry, Powder, Pellet, N₂, H₂, Propylene
Valve Material SUS316, F51-Duplex, Hastelloy, Titanium, Zirconium



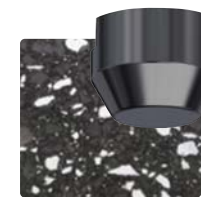
Titanium-Reactive Materials

The most noted chemical property of titanium is its excellent resistance to corrosion; it is almost as resistant as platinum and is capable of withstanding attacks by dilute sulfuric acid and hydrochloric acid as well as chlorine gas, chloride solutions, and most organic acids. However, it is soluble in concentrated acids. Titanium is one of the few elements that burns in pure nitrogen gas, reacting at 800°C (1,470°F) to form titanium nitride, which causes embrittlement.



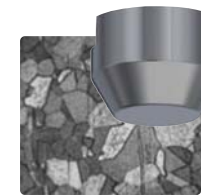
Hastelloy-Nickel-Based Superalloy

Hastelloy is a registered trademark name of Haynes International Inc. The primary function of the Hastelloy super alloys is that of effective survival under high-temperature, high-stress service in moderately to severely corrosive and/or erosion-prone environments where more common and less expensive iron-based alloys would fail. Some such environments include the pressure vessels of some nuclear reactors, chemical reactors, distillation equipment, and pipes and valves used in the chemical industry.



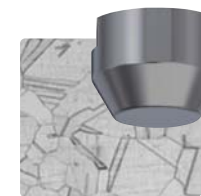
Zirconium-Reactive Materials

Because of its excellent resistance to corrosion, zirconium is often used as an alloying agent in materials that are exposed to corrosive agents, such as surgical appliances, explosive primers, vacuum tube getters, and filaments. An important use of zirconium is for nuclear-reactor fuel cladding; this is possible because of its low neutron-capture cross section and high corrosion resistance.



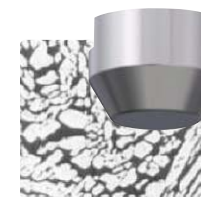
Monel-Nickel Copper Alloy

Monel is a trademark of Special Metals Corporation for a series of nickel alloys, primarily composed of nickel (up to 67%) and copper with some iron and other trace elements. Compared to steel, Monel is very difficult to machine as it work-hardens very quickly. It needs to be turned and worked at slow speeds and low feed rates. It is resistant to corrosion and acids, and some alloys can withstand a fire in pure oxygen. Monel is commonly used in applications with highly corrosive conditions.



Inconel-Nickel Iron/Chromium-Based Alloy

Inconel is a registered trademark of Special Metals Corporation that refers to a family of austenitic nickel-chromium-based superalloys. Inconel alloys are typically used in high-temperature applications. Inconel alloys are oxidation- and corrosion-resistant materials that are well suited for service in extreme environments. When heated, Inconel forms a thick, stable and passivating oxide layer that protects the surface from further attack. Inconel’s high-temperature strength is achieved through processes such as solid solution strengthening or precipitation strengthening, depending on the alloy.



Other Available Materials

All types of materials such as Duplex, Super Duplex, Alloy 20, Low/High Carbon steel, and Incolloy are available depending on the customer’s requirements.

Check Valves

	Straight	Lift	Dual Plate	Swing
Rating	Class 150 to 2500 JIS 10K to 63K	Class 150 to 1500 JIS 10K to 63K	Class 150 to 300 JIS 10K to 20K	Class 150 to 1500 JIS 10K to 63K
Size	1/2" to 3"	1/2" to 1-1/2"	2" to 24"	2" to 16"
Temperature	550°C, 1022°F			
Leakage Rate	API 598			
Basic Design Code	API 594			
Materials	Titanium, Hastelloy, Inconel, Monel, Zirconium and other exotic materials			
Hard Facing	Hard Chrome Plating, Nickel Alloy Overlay, Carbonized Tungsten, Titanium Oxide, Stellite#6			
Seat Leakage	API 598			
Body Shell Test	API 598			

Purpose

The QC series check valve is also known as an upstream, non-return, backpressure, or one-way valve; it is installed in support of automatic shutdown valves and safety devices. The main purpose is to prevent and protect the backflow medium against the consequences of unintended reverse flow. Check valves are two-port valves, meaning they have two openings in the body: one for fluid to enter and the other for fluid to leave. There are various types of QC check valves: straight, dual plate, lift, and swing. These are used in a wide variety of applications and provide high-integrity first-line defense in the event of an accident or in conjunction with safety devices; the important feature is the cracking pressure, which is the minimum upstream pressure at which the valve will operate.



Straight Type

Spring Selection

A wide spring range ensures an optimum selection in accordance with the fluid conditions such as high pressure, high temperature, extreme corrosion, and slurry. This allows the valve to prevent chattering with the seat under severe conditions.

Small Space and Free Installation Position

Qublock straight check valves have a compact design that requires less installation space than other types of check valves. Furthermore, the valve is flexible in that it can be installed in either the vertical or horizontal position against a pipeline.

High-Pressure Range Ability

Qublock straight check valves have a wide pressure range with a massive forging body and can withstand up to 2500 lb, starting from 150 lb. The QC series check valve can facilitate the safe operation of plants under high-pressure conditions.

Reversible and Renewable Seat

The reversible and renewable seat allows easy maintenance, low plant operating cost and effort, and long life cycle against harsh environments. The seat is easily reversible without any special tool requirements for renewed use.

Port Arrangement

The port number and shape are designed in accordance with the fluid condition. Qublock proposes and suggests the optimum design for the calculated velocity, flow rate, pressure, and other factors.

Anti-Slacken Nut

The nuts to tighten the seat are double-structured nuts. This is known as the "safety design" because it prevents chattering or flow vibration. In addition, the special swage locking design provides a benefit of durable operation under high temperature and pressure conditions.

Various Connection Types

The QC series check valve consists of various connection types, including all flange finishes: raised face, plain face, ring joint, weld end, and socket type. All requirements are available upon request.

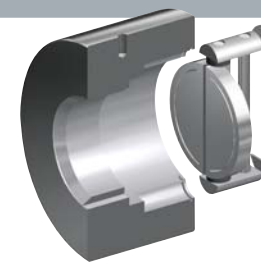
Double Seal Structure

An advantage unique to Qublock straight check valves, the double seal design is applied to all parts where emission is possible with both soft and metal seals. This design ensures intrinsic fire-safe performance and low emission as well as easy maintenance.

Dual Plate Type

Long-Leg Spring

The long leg spring action allows plates to open and close smoothly without seat scrubbing. This allows valves to be easily opened by low pressure.



Retainer-Less Design

The QC series dual plate check valve has either a retainer-less design or screwed body plug, which allows zero emission. This design eliminates the potential leak path to the atmosphere. In addition, its design not only enables the valve to be disassembled quickly without the use of force or special tools but also makes it easy to do maintenance work.

Hinge Support Sleeve

The specially designed hinge support sleeve offers reduced friction and self-arrangement plates. Stable sealing performance and long life duration are also achieved through the hinge support sleeve.

Spring Selection

The component that makes this design possible is the spring, which was designed for minimum opening pressure. It prevents chattering with plates. Qublock provide the optimum material of the spring for corrosion resistance.

Low Pressure Loss

When fully opened, the disc and pin are behind the pillar of body. This provides low pressure loss and keeps the flow rate high.

Compact Design

The QC series dual check valve can be designed to have a short wafer-type body. Customized face-to-face dimensions are also available.

Installation Position

This valve can be installed in any position. This advantage and the valve's reliable performance are due to the optimal spring force, which is selected depending on the position. The spring torque is decided depending on the dual plate position and plate material. In the elbow or pump discharge location, more care is paid to the influence of the flow rate on the valve plates to maintain the balance.



Lift Type

Long Range and Self-Arrangement Disc

The QC series lift check valve has a good reputation with its stable seat performance and the extended long life owing to its long-range structure and self-arrangement disc. This design makes it more durable and safer to operate at a job site.

Short Lift and Wide Opening

The QC series lift check valve requires only a relatively short lift to obtain full valve opening. This also prevents the disc from chattering and reduces vibration and noise during operation.

Rugged and Compact Design

The QC series is composed of a few rugged and compact parts; the parts can maintain performance over the long term with low risk of trouble occurring; in addition, maintenance is easy with little effort.

Backpressure Hole

The backpressure hole on the disc provides a conclusive pressure seal force between the disc and seat.

Spring Option

If the valve needs to open and close at the required operating pressure, a specially designed spring can be incorporated to the back of the disc as well. This spring option provides reliable valve performance under the desired conditions.

Swing Type

Integral Seat Type

The hard faced integral seat provides a more stable and robust valve performance under any harsh conditions such as high temperature, pressure, slurry, and erosion.



High Strength of Hinge Pin

By incorporating the high strength of a heat-treated hinge pin with hard facing based on the optimum material, Qublock swing check valves ensure more reliable operation and a long life cycle.

Lock Nut and Pin

The nut connecting the disc and hinge is applied by a special swage locking design; the lock pin passes through the nut. This structure can resist chattering or flow vibration.

Wide Flow Rate

QC series swing check valves are designed to allow a large flow rate when the valve is fully open. This design offers a large stable flow while minimizing pressure loss.

Maintenance Available on Piping

QC series valves can be maintained while installed on a pipe. Critical parts such as the disc and hinge pin can be replaced after removing the top cover from the body without shutting down the pipeline and removing the entire swing check valve. Therefore, maintenance time and effort is greatly reduced.

Tank Bottom Valves

Rating	Class 150 to 1500, JIS 10K to 63K
Size	1" to 16"
Temperature	550°C, 1022°F
Type	In-Side Disc, Out-Side Disc, Ram
Basic Design Code	ASME B16.5, ASME B16.34
Materials	Titanium, Hastelloy and other exotic materials
Hard facing	Stellite #6, #12, T-Ni
Seat Leakage	API 598
Flow direction	Uni-direction
Body Shell Test	API 598
Operators	Manual, Motorized, Pneumatic, Hydraulic
Option	Full Jacket, Semi Jacket, Double Gland Packing with Lantern Ring, Buffing Inside Port

Purpose

Tank bottom valves are typically used for on-off bottom drain tank application, where flushing or fluid transfer is necessary. The compact and lightweight design is ideal for in-line maintenance under the tank. QT series valves are available in various materials, to suit the customer's needs and processes. The bodies and trim can be supplied in Hastelloy, Inconel, nickel, or titanium. Tank bottom valves are commonly used in pharmaceutical and fine chemical processes to drain or take samples from vessels or reactors.

Fugitive Emissions-ISO15848

The latest international fugitive emission standard ISO15848 was applied to the QT series to minimize the level of emission. A two-stage seal structure with soft and metal seals ensures low emission outside. The metal seal supports the soft sealing gasket to maximize the intended reduction in emission.

Buffing Inner Surface

The mirror-buffed finish allows smooth fluid flow and reduces the remaining fluid; it is available as an option depending on the fluid conditions. By using a mirror-buffing finish to polish the surface, a smooth fluid flow can be achieved; this is especially useful for high-viscosity conditions.

Crust Breaking

Ram type : The inside of the valve body is cleaned by each ram stroke, which can optionally clear the crust or scales around the vessel outlet. Self-crust breaking prevents slurry from accumulating on the surface to minimize any malfunctions. In addition, fluid drainage is easy because the inner surface is maintained by the self-crust breaking.

Disc type : Crust formation is automatically removed when the disc is moved to the open position. This advantage prevents fluid contamination through accumulated fluid on the valve body or reactor and tank.

Dead Space Free

Drain valves are designed to ensure complete drainage from the vessel and from the valve itself. The QT series' dead space free design prevents slurry or particle accumulation.

Quick Stroke Time

The short stroke design is one of the advantages of the tank bottom (disc type) valve. Because of the short stroke length between the disc and valve body, the required space for stroking is less. The full open and close valve positions can be quickly obtained to allow fast drainage of a reactor, tank, or pipeline.

Fast Drainage Capability

An unimpeded flow bore is ideal for quick-drain reactors, tanks, and pipelines. A structure in which fluid flows without resistance is helpful for releasing fluid from reactors, tanks, and pipes.



Three Types of Design

Various designs for the flush tank bottom valve are available.

Outside Disc : Rising Disc Type (Opening into the tank)

Inside Disc : Lowering Disc Type (Opening into the valve)

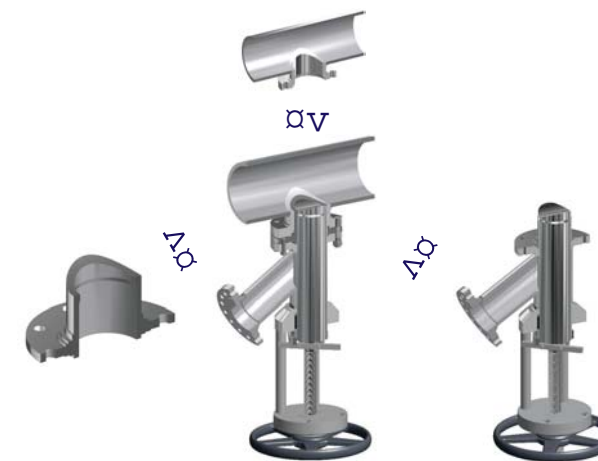
Ram : Piston Disc Type (Opening into the valve)

The advantage of the disc type is its short stroke for opening/closing operations, which means smaller, lighter, and faster valve automation packages can be used to provide less stress on the tank bottom.

Ram piston valves have full-bore unimpeded flow and are more suitable for vessels that need to be drained or flushed quickly; the valve is suitable for high-viscosity processes such as polymer application.

Separated Seat Structure

The QT series seat can be removed because it is bolted to the piping pad and body. This advantage facilitates easy maintenance, thus reducing the cost incurred because of extra work that would be reduced. Further, the seat can also be replaced.



Tailor-Made Valve Connection

The QT series connection between a tank or pipe and the tank bottom valve is designed in accordance with customer requirements.

Outlet Port Arrangement

The outlet port degree can be arranged to be 45°, 60°, or 90°. The outlet port's angle is selected according to the type of fluid or coefficient of viscosity.

Customized Design

The QT series was designed to match the exact specifications of a vessel, reactor, or tank in accordance with customer requirements. The material and instrumentation can also be customized to specific plant demands.

Large Indicator

The large indicator shows the correct valve position even from a distance for safety work by an operator. It has the advantage of allowing easy recognition if a valve is open or closed, especially when users can see farther distances with the naked eye.

Anti-Twist Pillar

Four thick pillars were specially designed to prevent valve twisting by the operating force. This design allows safety operation by the operator and plant to prevent exotic fluids from flowing out accidentally.

Compact Design

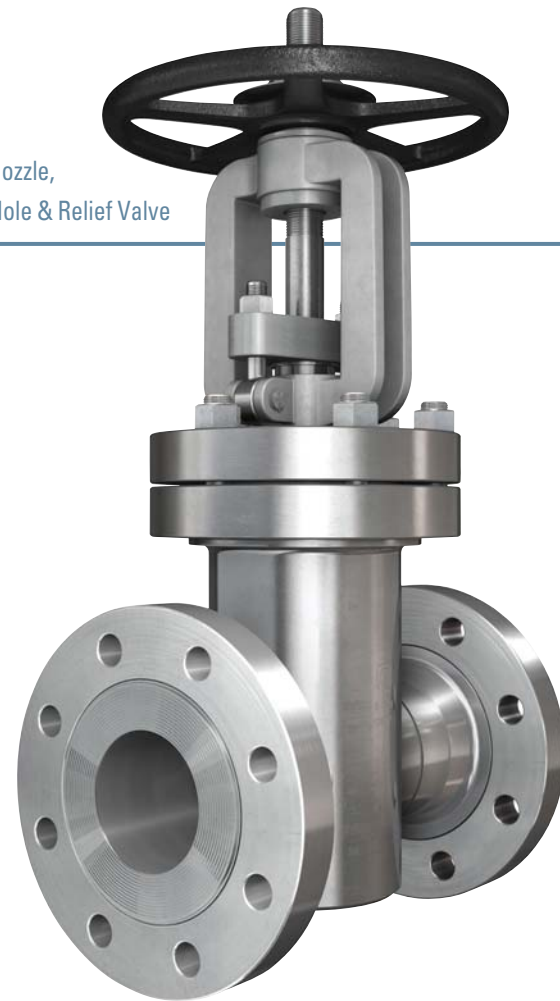
The valve's compact lightweight design is ideal for in-line maintenance under a tank, to provide less stress on the tank. The compact design valve is suitable for when installation space is limited or weight is a concern.

Jacket Type

In the Qublock design, placing the jacket part at the gland packing prevents fluid fixation in the stuffing box. A full jacket type is available.

Gate Valves

Rating	Class 150 to 2500, JIS 10K to 63K
Size	1/4" to 60"
Temperature	550°C, 1022°F
Type	Bolted Bonnet, Pressure Bonnet, Solid Disc, Free Disc, Back Seat
Basic Design Code	API 600, API602, ASMEB16.5, ASME B16.10, ASME B16.34, ISO5752
Materials	Titanium, Hastelloy, Inconel, Incolloy, Monel, Zirconium and other exotic materials
Hard Facing	Stellite #6, #12, T-Ni, Bronizing
Seat Leakage	API 598
Flow Direction	Bi-Direction
Fire Safe	Fire safe certification, API 607 6th Edition
Body Shell Test	API 598
Operators	Manual, Motorized, Pneumatic, Hydraulic
Option	Full Jacket, Semi Jacket, Bellows Seal, Purge Nozzle, Double Gland Packing with Lantern Ring, Vent Hole & Relief Valve



Purpose

In processes where tight shutoff and reliability are required under high densities, the gate valve shows the best performance with its fluid control function, which can cut or block high-density or high viscosity fluid. A gate valve opens by lifting a wedge.

The distinct feature of a gate valve is that the sealing surfaces between the gate and seats are planar when the gate valve is opened. The flow path is enlarged in a highly nonlinear manner with respect to the percentage of the valve being opened.

Typical gate valves are designed to be fully opened or closed. When fully open, the gate valve has no obstruction in the flow path, which results in very low friction loss.

Self-Alignment Disc

The self-alignment of the disc structure offers a stable seal performance and long life cycle, even for processes with high pressure and temperature.

Flexible Wedge Type

A flexible wedge (which is the wetted part) with a low center stem wedge contact is ground and lapped to a mirror finish and tightly guided to prevent dragging and seat damage. The hard faced wedge and seat offer complete contact and erosion protection. Stellite #6, #12, Titan, and Boronizing hard faced wedges are also available.

Double Seal Structure

A unique advantage of the QS series, the double-seal design is applied to all parts where emission is possible with both soft and

metal seals. This design ensures intrinsic fire-safe performance, low emission, and easy maintenance.

- **Fire safety** - In case of fire, the double sealing mechanism prevents leakage that may occur in the niches of the valve and ensures that fluid is kept inside.
- **Low emission** - The two stages of the seal structure ensure low emission to the outside. The metal seal supports the soft sealing gasket to maximize the intended reduction in emission.

- **Easy maintenance** - Torque to fasten the body bolt is easily managed when assembling the valve body with a soft sealing gasket. In the double seal structure, a metal seal design is considered with the level of compression of the soft sealing gasket. This design offers simple maintenance in that torque to assemble the body during maintenance is not needed to be controlled.

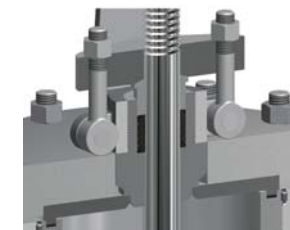


Robust Packing Retainer

In emergency cases such as emission leakage from gland packing, a strong force can be supplied to tighten the bolt for gland packing. A strong packing retainer can transmit the strong force to gland packing and thus limit leakage.

Exotic Materials

A wide variety of materials according to ASTM are available for both forging and casting. Qublock's material blending know-how using such materials as titanium, Hastelloy, and zirconium provide confidence that the customer will be satisfied, even for large plants and severe process conditions. Upon customer request, the QS series can be designed using various materials to withstand high temperatures of up to 550 °C (1022 °F) and high pressures of up to 420 bar (6100 psi).



Cost-Effective Design

QS series gate valves provide a cost-effective solution by incorporating two different materials for the wetted parts and non-wetted parts while providing excellent isolation to meet the harsh requirements for application in any industry.

Stainless Steel Bolts and Nuts

All bolts and nuts used outside the body are made of stainless steel material or something harder. In chemical plants, corrosion resistance against the external atmosphere is considered for maintaining performance over a long period of time while preventing rust.

Heavy-Duty Handwheel

Reliable valve operation is critically important as the QG series valves are generally used for critical services. Qublock has designed a heavy-duty handwheel as a standard for stable and rugged valve performance.

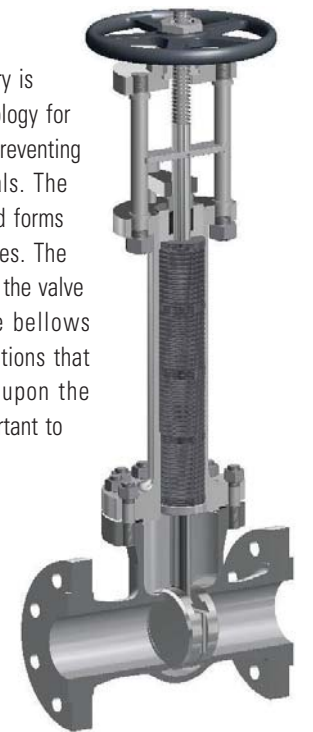
Alternative Gland Packing

Leakage from the valve gland or stuffing box is normally a concern for the maintenance or plant engineer. The Qublock stem sealing structure is specially designed to meet the latest international standard ISO 15848 for fugitive emission. With a packing mechanism to ensure low emission, the QS series valves are designed to apply emission packing.

- **Double gland packing** - Two sets of graphite gland packing is applied to increase sealing performance.
- **Lantern ring with injection port** - Lantern ring is inserted between two gland packings to inject gas inside for perfect isolation on the gland packing part and check for leaks.
- **Live loading** - Live loading spring ensures emission prevention. Tightly fastened studs and nuts provide an effective way to establish and maintain a controlled amount of stress on the packing set.

Bellows Seal Performance

Today, the chemical process industry is gearing itself towards safer technology for better environmental protection by preventing the leakage of any toxic chemicals. The bellows is a critical component and forms the heart of the bellows seal valves. The bellows cartridge is welded to both the valve bonnet and the valve stem. The bellows cartridge has a number of convolutions that compress or expand depending upon the movement of valve stem. It is important to properly install the valve bodies.



Sour Service

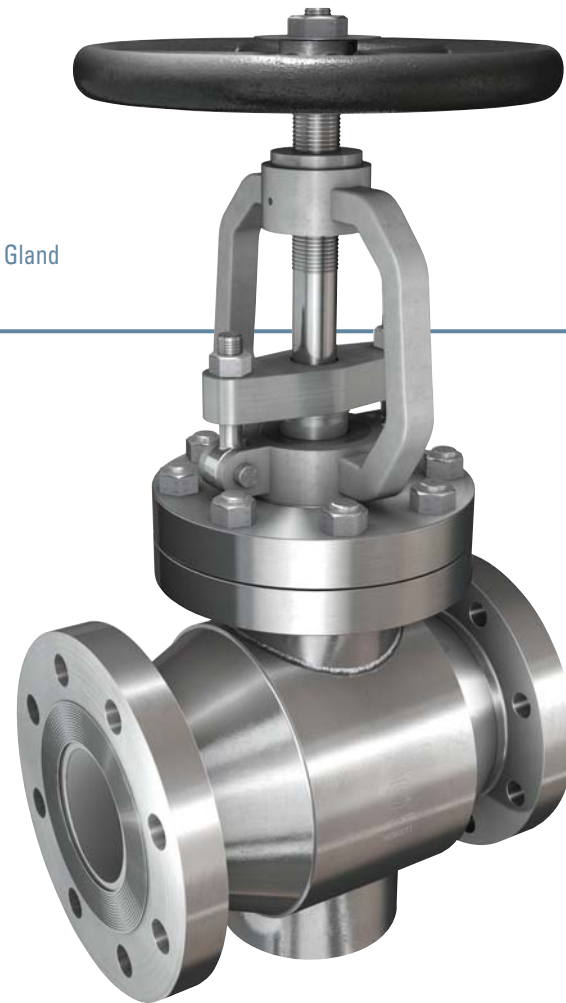
As plant capacities have increased and process conditions have become more severe, the demand for sour service has increased. The product materials applied by Qublock are managed according to international NACE regulations NACE MR0175 and MR0103 on request.

Purging Function

A purge nozzle is used for preventing clogging or residue. Various types of air-purging nozzles can be provided upon customer demand and applied to the bottom, neck, or elsewhere, as per the customer's specifications. It offers various functions, such as anti-toxic gas emission, accumulated particle cleaning, and combustion gas drainage.

Globe Valves

Rating	Class 150# to 2500# , JIS 10K to 63K
Size	1/4" to 24"
Temperature	550°C, 1022°F
Leakage Rate	Class VI, API598
Type	Bolted Bonnet, Pressure Bonnet, Solid Disc, Free Disc, Back Seat
Basic Design Code	API609, ASMEÄB16.5, ASME B 16.10, ASME B16.34, ISO5752, MSS-SP68
Materials	Titanium, Hastelloy, Inconel, Incolloy, Monel, Zirconium and other exotic materials
Hard Facing	Stellite #6, #12, T-Ni, HCr
Seat leakage	ANSI Class VI, API 598
Flow Direction	Uni-Direction
Fire Safe	Fire safe certification, API 607 6th Edition
Body Shell Test	API 598
Leakage Tests	API 598, ANSI B16.104(ANSI / FCI 70-2) Class VI
Operators	Manual, Pneumatic, Motorized, Hydraulic
Option	Full Jacket, Semi Jacket, Purge Nozzle, Double Gland Packing with Lantern Ring



Purpose

A globe valve has torque sealing performance for isolation flow in a pipeline. Qublock globe valves are used for applications requiring zero emission and tight shutoff with a metal seat under high pressure and temperature as well as other exotic services. The QG series is especially designed for slurries or fluids containing solids. This design has several strengths, including flexibility of design and application of various hard facing. QG series valves combine various structural benefits such as metal-to-metal, tight shutoff, and corrosion resistance. The QG series can be supplied with a special packing design to provide low emission performance that meets various environmental regulations worldwide.

Double Seal Structure

All parts where emission is possible have a two-stage sealing structure with both soft and metal seals. This design advantage allows intrinsic fire safety performance. In addition, it provides easy control of the torque due to metal-to-metal contact.

Low Emission Packing

The special stem sealing was designed to meet the latest ISO 15848 fugitive emission standard. This packing is made of expanding graphite, which has various advantages such as heat resistance, chemical resistance, less stress relaxation, and low creep. Owing to the special structure, the required tightening pressure is approximately half of that required in the conventional version. In

addition, durability is improved, as compared to that of conventional packing. Thus, this packing provides stabilized seal performance for a valve over the long-term under frequent function and severe service conditions.

Wide Adaption of Design Standard

QG series applies the latest international standards, such as DIN, JIS, BS, ASME, and ISO code, in accordance with customer requirements for many different countries and applications.

Live Loading Design

The live loaded packing systems combine the excellent sealing performance of the graphite packing set with the high performance of the spring pack. The live loaded spring ensures emission prevention. Its fastening studs and nuts provide an effective way to establish and maintain a controlled amount of stress in the packing set.



Packing with Lantern Ring

By applying a lantern ring, an anti-emission mechanism is achieved. Grease is injected through a nipple to maintain packing tension. By injecting a gas into the lantern ring, perfect isolation on the gland packing part and leak check are achieved.

Special Stem Sealing Option - Bellows Seal



Qublock bellows seal bonnets improve sealing capabilities and provide a smooth linear valve movement without gland packing and a long life for applications where emission escaping from a valve stem seal to the atmosphere cannot be tolerated.

Various Flange Types

The QG series provides all flanges such as finish-raised face, plain face, ring joint, weld end, and socket type according to customer requests.

Anti-Galling

Metal friction occurs owing to vertical movement of stem; this phenomenon causes galling. To prevent galling, the QG series can provide aluminum bronze yoke bushing and nitride as options.

High Strength of Packing Retainer

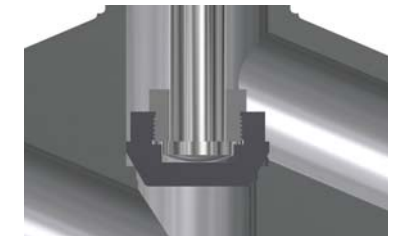
In emergency cases of emission leakage from gland packing, a strong force can be supplied to tighten the bolts for gland packing. A strong packing retainer can transmit the strong force to gland packing and thus limit leakage.

Jacket Type

Valves with a heating/cooling jacket, full jacket, and semi-jacket are available. The Qublock jacket design is provided on the valve body and gland packing position to prevent the fluid status from changing. Jacket design involves fluid fixation.

Self-Alignment Disc

The self-arrangement of the disc structure provides stable seal performance and long operation period. The Qublock standard disc is conical, but the needle type is required for slow opening flow and can be supplied as an option.



Heavy Duty Handle

The QG series is normally used for critical service. Therefore, a heavy-duty type handwheel should be selected as a standard.

Purge Nozzle

The air-purging nozzle can be provided upon customer request. The purge nozzle cleans accumulated particles from the stem or bottom. Anti-emission is achieved by the injection of air or combustion gas.

Anti-Rust Bolts and Nuts

All bolts and nuts used outside the body are made of stainless steel material or better. In chemical plants, corrosion resistance against the external atmosphere is considered to maintain performance over a long period of time and prevent rust.

NACE Application

Qublock is managed according to the international NACE regulations MR0175 and MR0103, which are provided upon request. NACE specification MR-0175/0103 is available for use in applications where the presence of wet H₂S generates the risk of stress corrosion cracking. According to processed data, a proper NACE application is also recommended by Qublock engineers.

Butterfly Valves

Rating	Class 150# to 2500# , JIS 10K to 63K
Size	2" to 60"
Temperature	550°C, 1022°F
Type	Double Offset, Triple Offset
Basic Design Code	API609, ASMEB16.5, ASME B 16.10, ASME B16.34, ISO5752, MSS-SP68
Materials	Titanium, Hastelloy, Inconel, Incolloy, Monel, Zirconium and other exotic materials
Hard Facing	Stellite #6, #12,T-Ni, HCr
Seat leakage	ANSI Class VI, API 598
Flow Direction	Uni-Direction
Fire Safe	Fire safe certification, API 607 6th Edition
Body Shell Test	API 598
Operators	Manual, Pneumatic, Motorized, Hydraulic
Option	Full Jacket, Semi Jacket, Purge Nozzle, Double Gland Packing with Lantern Ring, Extension Bonnet, Long Pattern Dimension



Purpose

Qublock butterfly valves are designed for isolating and regulating fluids in critical applications. The butterfly valve is operated similarly to a ball valve, which allows for quick shutoff and quarter-turn movement. The disc is positioned in the center of the pipe; a rod connected to an actuator on the outside of the valve passes through the disc. The QF series butterfly valves provide great characteristics in terms of not only low emission but also low operation torque and perfect isolation performance. In addition, it has small dimensions as it is small and lightweight.

Extension Bonnet

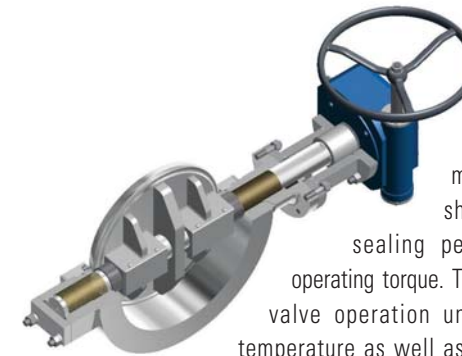
An extension bonnet is recommended when the gland part may be damaged owing to high or low temperatures or when there is a big temperature difference between the pipeline and atmosphere. The Qublock extended bonnet design minimizes damage to the gland packing and valve automation systems. The bonnet height depends on the application temperature and customer requirements.

Low Emission Design (ISO15848 Fugitive Emission)

This structure allows for low friction on the rotary and rising stem valves to provide a stable sealing performance and long cycle life. To tighten against leaks of this part, the structure improves the process quality, process uptime, and working condition. In addition, low emission packing protects the environment by blocking fluid leakage as processes involving refining and chemical production have always insisted on stringent measures to prevent the emission of toxic media into the atmosphere, not only for environmental safety but also for protecting against hazards to human health.

Fire-Safe Design (API 607 6th Edition)

Qublock butterfly valves are designed in accordance with the API 607 6th edition. All parts for fire-safe design are designed with two phases: gasket and metal-to-metal. If the Teflon seat is burned away, the backup metal-seat maintains the seal performance after a fire. Despite metal-to-metal contact for the valve, the QF series prevents leaking under API607 standards and protects against hazards.



Long Bearings

Qublock bearings provide minimum friction during shaft rotation, long-term sealing performance, and stable operating torque. To improve the reliability of valve operation under high pressure and temperature as well as other exotic conditions, RPTFE, carbon, or metal long bearings can be applied as options depending on the fluid conditions. Qublock provides metal-with-Teflon bearings; its unique design offers a wide choice of bearings and is appropriate for high pressure. The QF series bearings need low operating torques and maximum stiffness even after many load cycles and relief of the sealing ring in the open position. This long bearing is also designed for the "no lubrication" condition.

Centering Guide

The QF series centering guide ensures that the disc position is firmly maintained at the center to prevent unbalanced loads to the seat when fully closed. This seal supports long-term and reliable performance at the wetted parts. Not only does it maintain the disc position, but this collar also gives lower torque, lower friction, and long life service by holding the trim part well. In other words, this part prevents damage to the disc and seat by dispersing power.



Thermiculite Packing

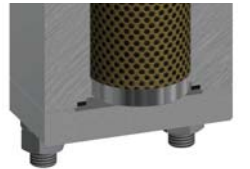
Thermiculite packing is the optimum option for high-temperature such as those involving oxidizing conditions. The more commonly used graphite packing has good heat resistance; however, at over 450°C it can be damaged, which can affect the fluids. Thermiculite packing gives long-life performance to endure against high temperature while maintaining a pure fluid. This packing is used instead of graphite for gland packing because of the low operating temperature of graphite.

Metal U-ring and Karlez O-ring

For oxidation applications requiring a high temperature and for ensuring that pure fluids do not mix, the metal U-ring or Karlez O-ring are options to minimize leaking through the valve bottom side. Other advantages of these special sealing materials include the accommodation of wide tolerances, good sealing performance with minimum friction, and small installation space.

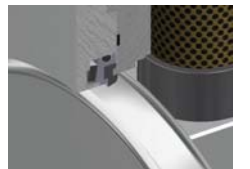
Double Seal Structure

All parts where emission is possible have a two-stage sealing structure with both soft and metal seals. The metal seal supports the soft seal by minimizing the emission. This design provides an intrinsic fire safety performance. In addition, it is easy to control the valve torques in contact with metal. Usually, some torque is needed to fasten the bolts for best performance. However, our double seal structure does not need to control the torque for maintenance.



Unique Seal Design

The QF series is developed for minimizing leakage; it also has low friction. By reducing the leakage and friction, the seal should achieve a long life and great performance. The QF series seal mechanism gives flexibility to the seat and distributes power to the disc equally. In addition, the seat retainer is fixed with independent bolts; our sealing design provides low-operation torque and has great seal performance.



Various Special Materials

A wide range of special materials can be selected in accordance with the fluid and pipeline conditions: titanium, Hastelloy, Inconel, Incolloy, Duplex, Monel, zirconium, and other exotic materials.

Flow Indication Stem

The accuracy of the valve position is examined through a flow indication stem during valve operation. This characteristic helps the valve position to be easily checked when a manual-type lever is installed and prevents damage to the trim part from excessive sealing force.



ISO5211 Top Flange

The QF series top flange was designed according to the ISO 5211 standard for easy mounting on valves and actuators. This also allows the change from manual to automatic operation and vice versa to be simple and not need special tools.

Custom Face-to-Face Dimensions

The QF series can be applied for face-to-face dimensions as required by a customer. The custom dimensions allow present piping dimensions to be maintained when replacing a valve without additional adaption or flanges. Both long and short pattern dimensions are available.

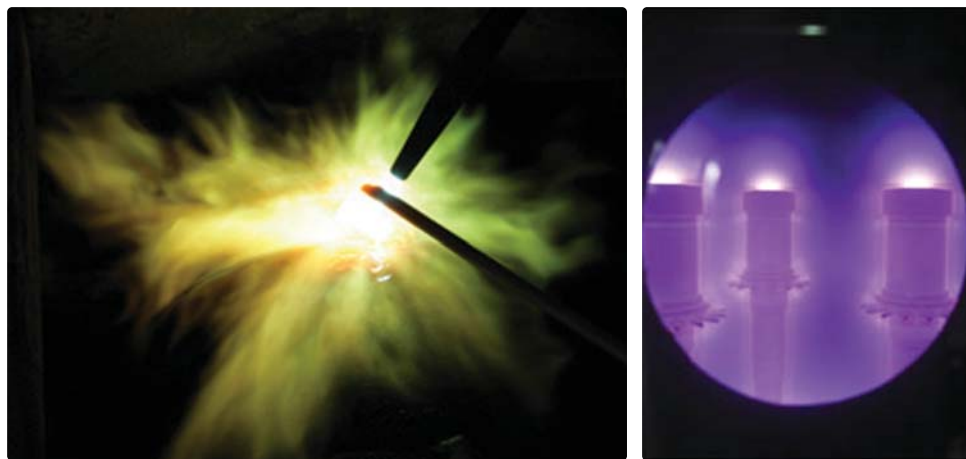
Hard-Facing

In recent years, most valve designers have been considering the protection or removal of the seats and seating members from direct impingement by particles in the flow stream. The downside of metal-seated valves is the inability to provide a repeatable leak rate acceptable for a specific application or the inability to provide seats resistant to abrasive wear and impingement by particulates, fines, and other solids entrained in the process stream. Technical advancements have occurred in hard-facing and coatings.

From the perspective of the selection of the protection method, an appropriate combination of the ball and the seat is the most critical part; thus, we at Qublock provide solutions on the basis of past experience, operation cycle, compatibility with the base material, and fluid conditions. Various Qublock hard-facing solutions can be used to provide high resistance to severe impacts in critical applications such as PTA, polysilicon, coal gasification, and urea processes. Qublock enhances the wear/corrosion resistance of the ball and the

seat materials by weld overlays, electroless nickel coating, plasma coating, detonations, powder flame splaying, and other special treatments depending upon the process conditions and customized specifications.

The choice of which hard-facing to use is determined by the propensity for damage by direct impingement, potential for abrasive wear due to fines, hardness requirement, corrosion and thermal cyclic considerations, bearing properties, and substrate material and geometry.



Type of Hard Facing

	1	2	3		4	5	6	7	8	9	10	11	12
Type of Surface Hardening	Hard Chrome Plating	Electro-less Nickel Plating	Cobalt Chrome Tungsten Alloy		Nickel Alloy Overlay	Tungsten Carbide	Titanium Oxide	Chromium Oxide	Zirconium Oxide	Titanium Welding Nitride	Titanium Gas Nitride	Alumina Oxide	Carbonized Silicon
	HCr	ENP	Stellite #6	Stellite #12	SF Ni 4 (Meteco16C)	WC	TiO ₂	Cr ₂ O ₃	ZrO ₂ -BY ₂ O ₃	Ti-N	Ti-N (Gas)	Al ₂ O ₃	SiC
Process Method	Electric Plating	Chemical Plating	Shielded Metal Arc Welding		Powder Flame Thermal Spraying	Spraying / Detonation	Plasma Thermal Spraying	Plasma Thermal Spraying	Plasma Thermal Spraying	Nitride TIG Welding Overlay	Nitride Gas Overlay	Plasma Thermal Spraying	Spraying / Detonation
Hardness (HRC or HV)	HV 850-1000	HV 800-1000	HRC 37-43	HRC 43-47	HRC 50-60	HRC 60-65	HRC 55-64	HRC 71-75	HRC 61-67	HRC 35-40	HV 800-1000	HRC 67-70	HRC 71
Adhesive Strength (Mpa)	345-482	345-482	920	970	75.3	20	2.5-3.5	2.0-4.0	1.5-2.5	920-970	2-4	2.0-4.0	3.5 and over
Film Thickness (mm or μm)	5μm ~30μm	5μm ~30μm	1mm-5mm		Max. 1mm	Max. 0.3mm	Max. 0.3mm	Max. 0.3mm	Max. 0.3mm	Max. 5mm	Max. 0.3mm	Max. 0.3mm	Max. 0.3mm
Max Allowable Temperature	Max. 350°C	Max. 400°C	Max.800°C		Max. 550°C	Max. 500°C	Max. 400°C	Max. 700°C	Max. 700°C	Max. 400°C	Max. 400°C	Max. 400°C	Max. 700°C

Other types of hard facing are available. For further information, please contact to the sales division at sales@qublock.com.

Material Information

NO.	Description	ASTM		UNS	JIS		Chemical Composition
		Forging / Bar	Casting	Forging / Bar	Casting	Forging / Bar	
1	Titanium Unalloyed Grade 2	B381 F2	B367 C2	UNS R50400	TB340H	-	99Ti-0.2Fe
2	Titanium Unalloyed Grade 3	B381 F3	B367 C3	UNS R50550	TB480H	-	99Ti-0.25Fe
3	Titanium alloy Grade 5	B381 F5	B367 C5	UNS R56400	TAB6400H	-	90Ti-6Al-4V
4	Titanium Low alloyed Grade 7	B381 F7	B367 C7	UNS R52400	TB340PdH	-	99Ti-0.15Pa
5	Titanium alloy Grade 12	B381 F12	-	UNS R53400	-	-	98Ti-0.3Mo-0.8Ni
6	Inconel 625 (Bar)	B446 N06625	A494 CW6MC	UNS N06625	NCF625	-	65Ni-22Cr-9Mo-3.5Nb
7	Hastelloy C276 (Bar)	B574 N10276	A494 CW12MW	UNS N10276	NMCrC	NMCrC	58Ni-16Cr-16Mo-6Fe-4W
8	Hastelloy C22 (Bar)	B574 N06022	A494 CX2MW	UNS N06022	-	-	58Ni-21Cr-14Mo-4Fe-3W
9	Hastelloy B (Bar)	B335 N10001	A494 N-12MV	UNS N10001	NM1B	NMC	67Ni-28Mo-5Fe
10	Hastelloy B2 (Bar)	B335 N10665	A494 N-7M	UNS N10665	NM2B	-	68Ni-31Mo-1Fe
11	Incolloy 800HT (Bar)	B408 N08811	A351 CT15C	UNS N08811	NCF800	-	33Ni-20Cr-45Fe-Nb
12	Incolloy 825 (Bar)	B425 N08825	A494 CU5MCuC	UNS N08825	NCF825	-	43Ni-22Cr-3Mo-30Fe-Nb
13	Monel K-500 (Bar)	FED QQ-N-286(A)	-	UNS N05500	H4551, 4553-4	-	67Ni-30Cu-2.5Al-0.5Ti
14	Monel 400 (Bar)	B164 N04400	A494 M-35-1	UNS N04400	H4551	-	67Ni-30Cr
15	Carpenter 20 Cb3	A182 F20 / B473 N08020	A351 CN7M	UNS N08020	-	SCS23	20Cr-29Ni-2.5Mo-3.5Cu
16	Zirconium	B493 R60702	B752 702C	UNS R60702	-	-	95Zr-4.5Cu
17	Austenitic Cr-Ni Stainless Steel	A182 F304L	A351 CF3	UNS S30403	SUS304L	SCS19A	18Cr-8Ni-LowC
18	Austenitic Cr-Ni Stainless Steel	A182 F316L	A351 CF3M	UNS S31603	SUS316L	SCS16A	18Cr-12Ni-2.5Mo-0.06C
19	Austenitic Cr-Ni Stainless Steel	A182 F347	A351 CF8C	UNS S34700	SUS347	SCS21	18Cr-10Ni-Nb
20	Austenitic Cr-Ni Stainless Steel	A182 F317	A351 CG8M	UNS S31700	SUS317	-	18Cr-12Ni-3.5Mo
21	Austenitic Cr-Ni Stainless Steel	A182 F317L	A351 CG3M	UNS S31703	SUS317L	-	18Cr-12Ni-3.5Mo-LowC
22	Austenitic Cr-Ni Stainless Steel	A182 F310S	A351 CK20	UNS S31008	SUS 310S	SCS18	25Cr-20Ni-0.2C
23	Austenitic Ni-Cr-Mo-N Stainless Steel	A182 F62	A351 CN3MN	UNS N08367	SUS836L	-	21Cr-24Ni-6.5Mo-N
24	Duplex Cr-Ni-N Stainless Steel	A182 F51	A995Gr.1B CD4MCuN	UNS S31803	SUS329 J3L	-	22Cr-5Ni-3Mo-N
25	Duplex Cr-Ni-Mo-W Stainless Steel	A182 F53	A890 Gr.5A CD3MWCuN	UNS S32750	SUS329 J4L	-	25Cr-7Ni-3Mo-Cu-N-W

