Slab Gate Valve

GT00,000 Series

The flat gate valve is a sliding valve with a parallel gate as the closure member. The closure member can be a single gate or a double gate with a split mechanism between them. The design shall be of a new floating seating construction. The pressure on the gate-to-valve seat is controlled by the media pressure acting on the floating gate or floating seat.

The construction of this product shall be novel in design, with appropriate material selection, strict testing, and easy operation. Because of its strong corrosion, wear, and erosion resistance, this valve is an ideal new type of equipment for the petroleum industry.

SNY parallel double disc gate valves are position-sealed valves that provide initial sealing force to the gate and valve seat under low pressure through preload. The higher the media pressure, the more reliable the sealing performance is. Therefore, parallel double disc gate valves are widely used in high-temperature and high-pressure pipelines.

Size
2" to 60 " [50 to 1500 mm]

Pressure Classes
ASME 150 to 1500
DIN PN10 to 250
ISO PN 20 to 250

End Connection
Double Flanged RF/RTJ, Butt-welding

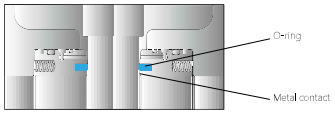
Temperature Range
-45 to +1500°F [-50 to +815°C]

Body Material
WCB, LCB;
WC6, WC9, C5, C12;
CF8, CF8M,CF3, CF3M, CF8C;
Duplex, Superduplex;
Inconel®, Alloy 20, Monel®, Incoloy®, Hastelloy®, Titanium.

Industry Applications
Natural gas, petroleum, chemical industry
Urban pipeline, gas pipeline
Venting system, storage facilities, etc.

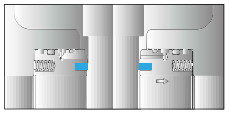
Design Features:

- Optional split-type gate design.
- Optional design without deflector hole.
- Optional design with parallel double disc gate.
- Optional hard seat design.
- ISO5210 standard upper flange.
- Valve stem with anti blow-out design.

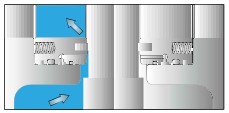


- SNY is designed with a soft seat and a metal double seat valve seat. In the event of damage to the soft seat valve seat, the metal seat valve seat will act as a secondary seal.
- The reliable design of the valve, with spring preload and double O-rings, ensures that the valves can be effectively sealed under both low and high pressures.

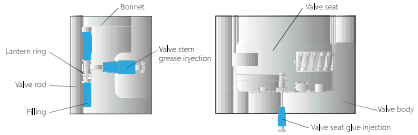
- The double block design of the valve ensures that it will block the pressure of the upstream and downstream pipelines when it is closed, regardless of whether there is pressure or not. This is because the spring seats on both sides of the valve will be in a state of balanced pressure when the valve is closed.



- When pipeline pressure is applied, the flat gate is forced to move towards the downstream valve seat under the media pressure to form a seal. Meanwhile, the upstream pipeline pressure guarantees the sealing of the upstream.



- When the valve is closed, the cavity pressure of the double block and bleed (DBB) construction may abnormally increase. If the cavity pressure exceeds the pipeline pressure, the valve seat will be forced away from the valve body and the excessive cavity pressure will be released into the pipeline.



- Both the valve stem and seat have a secondary sealant injection sealing system. In the event of damage to the sealing ring, an emergency sealant injection can be made to prevent leakage from the valve stem and seat.

Bellow Valve

GB/GLB00,000 Series

Bellow valves are primarily used in highly toxic and dangerous environments to prevent major accidents or significant impacts on personnel and environmental safety caused by media leakage.

The upper port of the SNY bellow valve is attached to the valve cover, and the lower port is attached to the valve stem. The upward and downward movement of the valve stem causes the bellows to retract, eliminating potential leakage caused by the sliding seal of the valve stem.

The valve is composed of the valve body, cover, drive part, sealing part, guide plate, and indicator. The product has the advantages of long service life, small operating torque, and good sealing.

This series of products is designed and inspected in accordance with API 623, ASME B16.34, API 602, API 600, API 598, ISO 15848, etc..

Size
1/2" to 16" [15 to 400 mm]

Pressure Classes
ASME 150 to 1500
DIN PN10 to 250
ISO PN 20 to 250

End Connection
Double Flanged RF/RTJ, Butt-welding

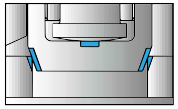
Temperature Range
-45 to +1500°F [-50 to +815°C]

Body Material
WCB/A105, LCB/LF2; WC6/F11, WC9/F22, C5/F5, C12/F9;
CF8/F304, CF8M/F316,CF3/F304L, CF3M/F316L;
Duplex, Superduplex;
Inconel®, Alloy 20, Monel®, Incoloy®, Hastelloy®, Titanium.

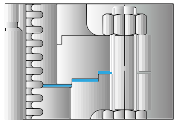
Industry Applications
Petrochemical, chemical fiber and textile,
plastic, paper making, printing and rubber,
power, steel, natural gas,
chlorine, liquid chlorine
Various highly dangerous media

Design Features:

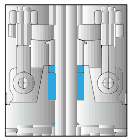
- Long service life, suitable for high-frequency service conditions.
- Double sealing achieved with bellows and packing.
- The sealing surfaces of the seat rings are faced with cobalt-based material.
- The anti-blowout stem design enables the replacement of packing while the valve is fully open.
- Hinged bolts that can be rotated laterally are better for packing maintenance because they allow for easier access to the packing.
- Impact handwheels and gearboxes can be equipped in accordance with SNY standards and customer requirements.



- The unique conical flat sealing design of the globe valve effectively guarantees the sealing effect and low operating torque.
  Special blade design can be used for cut off impurities, e.g., chlorine scale, etc..
  The valve disc is faced with STL cobalt-based alloy, and hardening treatment is applied.
  Integrally pressed PTFE is used for the valve seat to improve the sealing performance.



- A tongue-and-groove sealing construction is used to ensure that the flanges are fully mated, which prevents leakage at the body-cover joint.



- Valve stem and packing design:
  The design of valve stem shall be of a back seal.
  The valve stem axis is guided throughout its full stroke.
  Double sealing guarantee for bellows and stuffing boxes.
  The packing seal thickness should be at least twice the travel of the valve stem.
- Valve stem sealing design with fugitive emission:
  API622 stem packing with fugitive emission.
  The valve stem is guided and positioned throughout its full travel to prevent packing leakage caused by side-to-side movement.
  Surface roughness control of the valve stem and packing box assembly is important to prevent leakage.
  Optional pressing plate for dynamic load.
  The fugitive emissions comply with ISO 15848, API 641 and TA-Luft.

- The service life of the bellows shall be 10000 cycles and above.
  Two to six layers of overlap are used for the bellows to prevent single layer damage that could cause the valve to leak and extend the valve's service life.

Pressure Self-sealing Valve

GP/GLP/CP00,000 Series

This series of products, one of SNY's main products, is supplied to our national and international customers in large quantities every year. SNY can provide a full range of sizes, pressures, and material options.

All products in this series meet the requirements of API 591 and have passed the pressure tests conducted in accordance with API 598. This series of valves has been certified in accordance with ISO 15848-1 and API 624 for fugitive emissions.

SNY maintains a large inventory of parts for this series of products to meet the on-site urgent needs of users.

Size
2" to 60" [50 to 1,500 mm]

Pressure Classes
ASME 600 to 2500
DIN PN100 to 420
ISO PN100 to 420

End Connection
Double Flanged RF/RTJ, Butt-welding

Temperature Range
-425 to +1500°F [-254 to +815°C]

Body Material
WCB, LCB;
WC6, WC9, C5, C12;
CF8, CF8M,CF3, CF3M,CF8C;
Duplex, Superduplex;
Inconel®, Alloy 20, Monel®, Incoloy®, Hastelloy®, Titanium.

Operating Means
- Handwheel/gear
- Electric actuator
- Pneumatic actuator
- Pneumatic-hydraulic actuator
- Electric-hydraulic actuator

Industry Applications
Petrochemical industry,
long-distance oil and gas transportation pipelines.

Pressure Self-sealing Gate Valve GP00,000

Size:
2" to 60" (DN 50 to DN 1500)
Pressure Classes:
Class 600 lb to 2500 lb (PN 100 to PN 420)
Body Material:
Carbon steel, stainless steel, alloy steel, duplex steel
End Connection:
Flanged RF/RTJ, Butt-welding
Operating Means:
Handwheel, gear, electric actuator, pneumatic actuator

Design Features:
- The four split rings absorb the outward thrust caused by the internal pressure on the valve stem.
- The sealing ring provides a pressure-bearing surface for the gaskets and prevents them from deforming.
- The flexible-wedge gate compensates for the surface distortion of the seat ring and the deformation of the valve body due to the pipeline stress.
- The seat rings' sealing surface, faced with No. 6 cobalt-based material, are installed using sealing welding.
- Stainless steel cladding ensures the effectiveness and corrosion resistance of the critical sealing area of carbon and alloy steel valve bodies.
- Anti-blowout stem design ensures that the conical back seat contacts with the back seat of the bonnet when the valve is in the fully open position.
- Mild steel gaskets that have large sealing surfaces provide excellent sealing performance.

Pressure Self-sealing Globe Valve GLP00,000

Size:
2" to 24" (DN 50 to DN 600)
Pressure Classes:
Class 600 lb to 2500 lb (PN 100 to PN 420)
Body Material:
Carbon steel, stainless steel, alloy steel, duplex steel
End Connection:
Flanged RF/RTJ, Butt-welding
Operating Means:
Handwheel, gear, electric actuator, pneumatic actuator

Design Features:
- The four split rings absorb the outward thrust caused by the internal pressure on the valve stem.
- Stainless steel cladding ensures the effectiveness and corrosion resistance of the critical sealing area of carbon and alloy steel valve bodies.
- The sealing ring provides a pressure-bearing surface for the gaskets and prevents them from deforming.
- The seat rings' sealing surface, faced with No. 6 cobalt-based material, are installed using sealing welding.
- Mild steel gaskets that have large sealing surfaces provide excellent sealing performance.

Pressure Self-sealing Check Valve CP00,000

Size:
2" to 60" (DN 50 to DN 1500)
Pressure Classes:
Class 600 lb to 2500 lb (PN 100 to PN 420)
Body Material:
Carbon steel, stainless steel, alloy steel, duplex steel
End Connection:
Flanged RF/RTJ, Butt-welding

Design Features:
- The four split rings absorb the outward thrust caused by the internal pressure on the valve stem.
- The sealing ring provides a pressure-bearing surface for the gaskets and prevents them from deforming.
- Mild steel gaskets that have large sealing surfaces provide excellent sealing performance.
- Stainless steel cladding ensures the effectiveness and corrosion resistance of the critical sealing area of carbon and alloy steel valve bodies.
- Hinge pin without external leakages.
- Standard swing-type discs are suitable for horizontal or vertical lines with the flow in an upward direction.
- The hinge and pin that are installed inside the valve body allow the disc to move fully.

Automated Trunnion Ball Valve Seriesv

The SNY trunnion ball valves are classified into side entry, top entry soft seated, side entry hard seated, and fully-welded trunnion ball valves. The soft seated valves have been fire-tested in accordance with API 607 and API 6FA, and certified in accordance with the requirements of TUV and Det Norske Veritas (DNV).

The side entry type soft seated trunnion ball valves adopt a two-piece or three-piece split side entry design that complies with API 6D. They are particularly suitable for fluid control in large-diameter and high-pressure pipelines, and this series of valves can achieve double block and bleed.

Top entry type trunnion ball valves comply with API 6D. They are particularly suitable for fluid control in large-diameter and high-pressure pipelines, and this series of valves can achieve double block and bleed. The top entry construction allows for online replacement, making maintenance convenient.

Fully-welded trunnion ball valves comply with API 6D. Sleeves, lifting eyes, and other customer-required accessories can be provided. They are particularly suitable for fluid control in large-diameter and high-pressure pipelines, and this series of valves can achieve double block and bleed. The fully-welded construction minimizes external leakage and ensures reliable sealing.

Side entry type hard seated trunnion ball valves shall be split construction. The valve seat shall be metal hard seated, which is characterized by high temperature and wear resistance after hardening treatment. They are suitable for service conditions with high temperature, corrosive media, or particle-containing media.

Industry Applications

Oil,Natural gas,Chemical industry,
coal chemical industry

Scope of Product

Size:
2" to 60"
Pressure Classes:
150 lb to 2500 lb
Body Materials:
Carbon steel, stainless steel, alloy steel, and duplex steel
Trims:
A105N+ENP, 3Cr, F304, F316, F51, F55
Sealing Form:
Soft seated or hard seated
Temperature Range:
-50 to 500℃

Operating Means

Pneumatic actuator
Electric actuator
Pneumatic-hydraulic actuator
Electric-hydraulic actuator

Design Features

Designed with full or reduced bores.
Multi-piece or fully welded design.
Fire certification (API 607 & API 6FA).
Anti-static, anti blow-out stem.
Double block and bleed.
Sealant injection system provided on the valve stem/seat ring.
Optional fugitive emission design, additional sleeves, buried service application.
Top flanges provided according to ISO 5211.
Optional sealing design with dual pistons.

Optional Automation Solutions

Remote Operated Valve
Emergency Shut Down Valve
Motor Operated Valve
Electric-hydraulic Valve
Pneumatic-hydraulic Valve

Automated Floating Ball Valve

SNY automated floating ball valves are classified into two categories: soft seated, and metal hard seated. This series of soft seated valves shall be fire-safe, fire-tested to API 607 and API 6FA, and certified to TUV and Det Norske Veritas (DNV).

The SNY side entry type soft seated floating ball valves adopt either an one-piece integral body or a two-piece split design, both of which comply with ISO17292.

SNY forged steel soft seated floating ball valves adopt a two-piece or three-piece split design that complies with ISO17292.

SNY metal hard seated floating ball valves shall be metal hard seated, which is characterized by high temperature and wear resistance after hardening treatment. They are suitable for service conditions with high temperature or particle-containing media.

Industry Applications

- Liquefied Natural Gas
- Production of industrial gas
- Gas storage
- Oil, gas, chemical, petrochemical production
- Shut-off media
- Not applicable for throttling control
- Media such as water, oil, and gas
- Not applicable for environment containing dry powders

Scope of Product

Size:
1/2" to 10" (DN 15 to DN 250)

Pressure Classes:
150 lb to 2500 lb

Body Materials:
Carbon steel, stainless steel, alloy steel, and duplex steel

Trims:
A105N+ENP, 3Cr, F304, F316, F51, F55

Sealing Form:
Soft seated or hard seated

Temperature Range:
-50 to 500℃

Operating Means

- Handwheel, gearbox
- Pneumatic actuator
- Electric actuator
- Pneumatic-hydraulic actuator
- Electric-hydraulic actuator

Design Features

- Designed with full or reduced bores.
- One-piece/two-piece/three-piece or fully welded design.
- Fire certification (API 607 & API 6FA).
- Anti-static, anti blow-out stem.
- Double block and bleed.
- Sealant injection system provided on the valve stem/seat ring.
- Optional fugitive emission design.
- Top flanges provided according to ISO 5211.
- Optional sealing design with dual pistons.

Optional Automation Solutions

- Remote Operated Valve
- Emergency Shut Down Valve
- Motor Operated Valve
- Pneumatic Valve

Automated Gate Valve

The SNY automated gate valves comply with API 600 and ASME B16.34, and a wider range of products is available for selection, such as pressure seal design, outside yoke and screw, resilient seat design, and bellow construction.

Gate valves are commonly used on-off valves that are widely used in situations where bidirectional flow is required. They can be used as either normally open or normally closed valves.

Gate valves are not suitable for partial opening or throttling.

Gate valves are widely used in conjunction with automation solutions to control the flow of various fluids in pipelines.

Industry Applications

- Petrochemical and refineries
- Liquefied Natural Gas
- Ship, paper mill and mineral processing industry
- Power plant
- Ultra-low temperature or high temperature process transformation
- Chemical industry

Scope of Product

Size:
2" to 66" (DN 50 to DN 1650)

Pressure Classes:
150 lb to 2500 lb

Body Materials:
Carbon steel, stainless steel, alloy steel, duplex steel

End Connection:
Flanged RF / RTJ, Butt-welding

Temperature Range:
-196 to 650℃

Operating Means

- Handwheel, gearbox
- Pneumatic actuator
- Electric actuator
- Hydraulic actuator
- Pneumatic-hydraulic actuator
- Electric-hydraulic actuator

Design Features

- Designed in accordance with API 600 & ASME B16.34
- Bolted bonnet construction
- Optional pressure seal design
- Open pole bracket OS58Y
- Top flanges provided according to ISO 5211
- Resilient valve seat
- Optional bellow construction
- Certified in accordance with API 591
- Certified by fugitive emission tests.

Optional Automation Solutions

- Remote Operated Valve
- Motor Operated Valve
- Electric-hydraulic Valve
- Pneumatic-hydraulic Valve

Automated Globe Valve

Globe valves are forced sealed valves that are typically used as media isolation valves. They are characterized by small valve openings, short travel distances, and short opening and closing times.

SNY can provide two types of valve stems: rising stem and rotating rising stem. The design requirements include optional bellows, fugitive emission, and pressure sealing. A full series of products is available for selection, including T-pattern, Y-pattern, and angle pattern.

In conjunction with automation solutions, globe valves are widely used to block and regulate the flow of various fluids in pipelines.

Industry Applications

- Petrochemical, oil refining, power plants
- Liquefied Natural Gas
- Marine, paper making and mineral processing
- Cryogenic or high temperature process improvements
- Chemical industry

Scope of Product

Size:
2" to 24" (DN 50 to DN 600)

Pressure Classes:
150 lb to 2500 lb

Body Materials:
Carbon steel, stainless steel, alloy steel, duplex steel, cryogenic steel, nickel- based alloy, titanium alloy, etc.

End Connection:
Flanged RF / RTJ, Butt-welding

Temperature Range:
-196 to 500°C

Operating Means

- Handwheel, gearbox
- Pneumatic actuator
- Electric actuator
- Hydraulic actuator
- Pneumatic-hydraulic actuator
- Electric-hydraulic actuator

Design Features

- Design standards: BS 1873 & API 623 & ASME B16.34
- Designed with bolted bonnet
- Low leakage design
- Optional pressure seal design.
- Top flanges provided according to ISO 5211.
- The disc can be designed as optional needle type.
- Optional bellow construction.

Optional Automation Solutions

- Remote Operated Valve
- Motor Operated Valve
- Electric-hydraulic Valve
- Pneumatic-hydraulic Valve

Automated Double Offset Butterfly Valve

SNY double offset-type butterfly valves shall be designed to be offset-type and compliant with API 609. The valve stem shall be designed to be anti-blowout to prevent the stem from ejection and causing operator injury due to misoperation.

SNY double offset-type butterfly valves shall be constructed with resilient pressure self-sealing seats. These seats are characterized by bidirectional zero leakage and lower torque requirements, which can help to reduce the procurement cost of the driving device.

The cam-effect sealing construction separates the valve seat from the disc after the valve is opened at a certain angle, reducing friction and significantly improving the valve's service life. In conjunction with several automation solutions, they are widely used to block and regulate the flow of various fluids in pipelines.

Industry Applications

- Drinking water, industrial wastewater, power plants
- Shipbuilding, paper making, and general industry
- Flow regulation
- Water/oil/gas

Scope of Product

Size:
3" to 120" (DN 80 to DN 3000)

Pressure Classes:
150 lb to 600 lb (PN 16 to PN 100)

Body Materials:
Carbon steel, stainless steel, alloy steel, duplex steel, etc.

Sealing Materials:
EPDM, NBR, PTFE, VITON

End Connection:
Wafer/ lug/ double flange

Temperature Range:
-40 to 120°C

Operating Means

- Handwheel, gearbox
- Pneumatic actuator
- Electric actuator
- Hydraulic actuator
- Pneumatic-hydraulic actuator
- Electric-hydraulic actuator

Design Features

- Design standards: API 609
- Offset-type disc
- Zero leakage
- Soft seals, low torque
- Anti blow-out stem design
- Top flanges provided according to ISO 5211

Optional Automation Solutions

- Remote Operated Valve
- Emergency Shut Down Valve
- Motor Operated Valve
- Electric-hydraulic Valve
- Pneumatic-hydraulic Valve

Automated Triple Offset Butterfly Valve

SNY triple offset-type butterfly valves shall be designed to be offset-type and compliant with API 609. The valve stem shall be designed to be anti-blowout to prevent the stem from ejection and causing operator injury due to misoperation.

SNY triple offset-type butterfly valves are characterized by bidirectional sealing, zero leakage, and low torque. The metal sealing seat design makes the valve suitable for severe service conditions. The offset-type design allows the disc to detach from the valve seat immediately when the valve is opened, reducing friction between the seat and disc and significantly improving the valve's service life. The valve also has inherent fire resistance.

The exquisite construction design and interchangeable sealing pairs reduce maintenance costs.

In conjunction with several automation solutions, they are widely used to control, block, and regulate various fluids in pipelines.

Industry Applications

- Petrochemical and oil refining
- Marine, paper making and mineral processing
- Liquefied Natural Gas
- Flow regulation
- Water/oil/gas
- Cryogenic or high temperature process improvements

Scope of Product

Size:
3" to 80" (DN 80 to DN 2000)
Pressure Classes:
150 lb to 2500 lb (PN 16 to PN 420)
Body Materials:
Carbon steel, stainless steel, alloy steel, duplex steel, etc.
Sealing Materials:
Pure metal seals , or multiple seals
End Connection:
Wafer/lug/double flanged/butt-welding
Temperature Range:
-196 to 650°C

Operating Means

- Handwheel, gearbox
- Pneumatic actuator
- Electric actuator
- Hydraulic actuator
- Pneumatic-hydraulic actuator
- Electric-hydraulic actuator

Design Features

- Design standards: API 609
- Offset-type disc
- Forward and reverse seals with zero leakage
- Sealing pairs are interchangeable, and the maintenance costs are reduced
- Opening and closing with low friction
- Anti blow-out stem design
- Top flanges provided according to ISO 5211

Optional Automation Solutions

- Remote Operated Valve
- Emergency Shut Down Valve
- Motor Operated Valve
- Electric-hydraulic Valve
- Pneumatic-hydraulic Valve

Cryogenic Gate, Globe, Check, Ball and Gate Valves

C00,000 Series

The SNY cryogenic valves include cryogenic ball valves, gate valves, globe valves, check valves, and butterfly valves.

The SNY cryogenic valves are suitable for cryogenic service below -254 ° C. They are designed with advanced concepts, high-precision machining, rigorous process management, and strict production controls. This results in outstanding advantages, such as reliable sealing, low operating torque, high cryogenic stability, and long service life. The SNY cryogenic valves are widely used in liquefied natural gas, liquefied petroleum gas, air separation, and other cryogenic applications.

Scope of Product

Size:
1/2 " to 160" (DN 50 to DN 4000)
Pressure Classes:
150 lb to 2500 lb (PN 16 to PN 420)
Body Materials:
Carbon steel, stainless steel, cryogenic steel
End Connection:
Flanged, welding, threaded, socket welding
Temperature Range:
-254 to 150°C
Operating Means:
Handwheel, gearbox, electric actuator, pneumatic actuator
Industry Applications:
Liquefied natural gas, liquefied petroleum gas, liquefied ethylene gas, air separation, etc..

Cryogenic Gate Valve

Size:
2 " to 56" (DN 50 to DN 1400)
Pressure Classes:
150 lb to 2500 lb (PN 16 to PN 420)
Body Materials:
Stainless steel, cryogenic steel
End Connection:
Flanged, butt-welding, socket welding
Operating Means:
Manual, electric actuator, pneumatic actuator

Design Features

- Designed with extended bonnet
- Packing with fugitive emission
- The sealing surfaces are faced with cobalt-based materials on both sides
- Discharge holes are drilled and back seats are lifted upstream to prevent abnormal pressure rise in the cavity and bonnet extension
- The valve stems are designed to be stable

Cryogenic Globe Valve

Size:
1/2 " to 24" (DN 15 to DN 600)
Pressure Classes:
150 lb to 2500 lb (PN 16 to PN 420)
Body Materials:
Stainless steel, cryogenic steel
End Connection:
Flanged, butt-welding, socket welding
Operating Means:
Manual, electric actuator, pneumatic actuator

Design Features

- Designed with extended bonnet
- Packing with fugitive emission
- The sealing surfaces are faced with cobalt-based materials on both sides
- The valve stems are designed against instability
- Optional soft seals, with PTFE/PCTFE used for the sealing surface of the valve disc or seat

Cryogenic Gate, Globe, Check, Ball and Gate Valves

C00,000 Series

Cryogenic Check Valve

Size:
1/2" to 42" (DN 15to DN 1050)
Pressure Classes:
150 lb to 2500 lb (PN 16 to PN 420)
Body Materials:
Stainless steel, cryogenic steel
End Connection:
Flanged, butt-welding, RTJ

Design Features

- Integral valve body, with no external leakage design.
- Harden treated sealing surfaces.
- The disc is designed to prevent rotating (optional).
- Soft sealed valve seat PTFE or PCTFE is applied(optional).
- Swing type or rising type is available.
- The swing-type check valve has a ball-shaped disc head that automatically centers itself to ensure contact with the axial flow. It has a no-impact design.
- The ports are calculated using CFD software to guarantee flow capacity and reduce flow resistance.
- For dual-plate wafer check valves and axial flow check valves with springs, the spring preload must be applied to ensure that a certain seal differential pressure acts on the sealing surface when closed. This will guarantee the sealing.
- The internal design of the axial flow type check valve body shall be a Venturi design.

Cryogenic Ball Valve

Size:
1" to 24" (DN 25 to DN 600)
Pressure Classes:
150 lb to 1500 lb (PN 16 to PN 250)
Body Materials:
Stainless steel, cryogenic steel
End Connection:
Flanged, butt-welding, RTJ
Construction Style:
Top entry or side entry
Operating Means:
Manual, electric actuator, pneumatic actuator, hydraulic actuator

Design Features

- The stuffing box shall be lifted.
- Packing with fugitive emission.
- Sealing rings designed with LIP SEAL.
- Cavity overpressure protection.
- Stable cryogenic performance imported valve seat materials are used.
- The seat sealing is designed with patented construction.
- The valve seat and pressure relief constructions are designed to meet the different requirements of the services.
- The top entry design can achieve online maintenance.
- Guided bearings.

Cryogenic Triple Offset Butterfly Valve

Size:
3" to 120" (DN 80 to DN 3000)
Pressure Classes:
150 lb to 900 lb (PN 16 to PN 150)
Body Materials:
Stainless steel, cryogenic steel
End Connection:
Wafer, lug, double flanged, butt-welding
Operating Means:
Handwheel, gear, electric actuator, pneumatic actuator

Design Features

- Designed with extended bonnet.
- Designed with fugitive emission.
- Resilient hard seals.
- Tripe offset-type design.
- Torque forced seals.
- Replaceable valve seat and sealing.
- The top entry design can achieve online maintenance.
- Intrinsic fire-safe design.
- Drip plate with standard construction to prevent condensation water from entering the insulation.

Valves for Oxygen Services

Valves for oxygen services are specially designed for oxygen pipelines. Oxygen is a combustion aid, so serious accidents, such as valve fires or pipeline explosions, can occur if an ignition source is present. Therefore, valves for oxygen services must have a high level of safety.

In addition to the functions of conventional valves, valves for oxygen services have their own unique characteristics. For oxygen services, there are special requirements for the design, material selection, and cleanliness of the valves. Stringent oil-free measures must be taken during manufacturing, and all parts must be degreased prior to installation.

SNY designs and manufactures valves for oxygen services that meet the requirements of different service conditions and parameters.

Industry Application

Coal chemical plant:

Coal gasification unit/black water and ash water treatment/conversion unit/low-temperature methanol washing/PSA hydrogen recovery.

Air separation unit:

Oxygen purification system/oxygen separation system/oxygen secovery system.

Scope of Product

Type of Valves for Oxygen Services:
Gate valve,globe valve,check valve,ball valve,butterfly valve
Size:
1/2" to 24" , 1/2" to 16" , 1/2" to 12 "
Pressure Classes:
150 LB to 600 LB, 900 LB, 1500 LB
End Connection:
RF, RTJ, BW
Operating Means:
Manual, gearbox, pneumatic actuator

Design Features(Globe Valve for Oxygen Services)

- Anti-static design.
- The cavity is designed with no sharp corners or edges.
- Rounded flow passage with smooth transition.
- The parabola type disc is selected for globe valves.
- The valve seat and back seats shall be integral or fully welded.
- The disc is designed to prevent rotating.
- The design of valve stem shall be rising type.
- Avoid small parts and welded construction where possible.
- The dimension of the welds shall be at least 6 mm.
- Non-metallic materials with BAM certification are used.
- Controlled with low torque.
- Fugitive emission design.

Design Features(Ball Valves for Oxygen Services)

- Anti-static design.
- The cavity is designed with no sharp corners or edges.
- Rounded flow passage with smooth transition.
- The construction used to cancel the sealant injection shall be provided on the seat/stem of the ball valve.
- Avoid small parts and welded construction where possible.
- The dimension of the welds shall be at least 6 mm.
- Non-metallic materials with BAM/WHA certification are used.
- Controlled with low torque.
- Fugitive emission design.
- The gear/turbine/electric actuators shall use lubricating grease suitable for oxygen.

Plug Valve

SNY plug valves are widely used in various industrial fields, such as petroleum, chemical, power, pharmaceuticals, and metallurgy. They can be used to control the flow rate, pressure, and temperature of fluids, and to shut off fluids for servicing and maintenance.

Size
2" to 24"(DN 50 to DN 600)

Pressure Classes
CLASS 150 to 600 (PN 16 to 100)

Temperature Range
-46℃ to 250℃

Body Materials
Carbon steel/stainless steel/ low-temperature alloy steel, etc.

End Connection
Flanged/Welding

Design Features
- Low operating force
- Lubricated hard seals
- Fire-safe design
- Anti-static design
- Adjustable sealing positions
- Long service life
- Standard inner diameter with low flow resistance
- Finite element analysis is applicable

Industry Application
Petrochemical industry

Jacketed Valve

SNY jacketed ball valves are used in the chemical industry for fluids with high viscosity and a tendency to solidify. The valves are designed as a one-piece, fully jacketed unit with insulation media inside the jacket to prevent the solidification of the internal media in the valve, thus ensuring unobstructed flow.

Size
2" to 24"(DN 50 to DN 600)

Pressure Classes
CLASS 150 (PN16)

Temperature Range
-46℃ to 570℃

Body Materials
Carbon steel, stainless steel, etc.

End Connection
Flanged

Design Features
- Fire-safe design
- One-piece, fully jacketed construction
- Packing with fugitive emission
- Anti blow-out stem
- Anti-static design

Industry Application
Chemical industry, and fluids with high viscosity and a tendency to solidify.

Marine Valve

SNY marine valves are designed to be lightweight and compact, which reduces installation costs and saves ship space. SNY marine valves are widely used in many ships.

Size
1/2" to 12 "(DN 15 to DN 300)

Pressure Classes
CLASS 150 to 300 (PN 16 to PN 40)

Temperature Range
-46℃ to 425℃

Body Materials
Carbon steel, bronze, stainless steel, castiron, DSS, super DSS.

End Connection
Flanged/Welding

Design Features
- Non-rising stem gate valve
- Bronze trims
- Angle pattern globe valve
- Stop-check type disc
- Manual or pneumatic quick closing valve
- ABS certification.

Industry Application
Marine

PRODUCT QUALITY COMMITMENT

Our company promises to repair, replace, or refund the purchase price of any defective product if the buyer can confirm that the product has been correctly installed and used in accordance with our company's recommended methods. The defects must be verifiable, and the complaint must be submitted in writing within 18 months of the product's purchase or 12 months of its installation, whichever comes first. Our company will not be responsible for labor costs incurred in the repair or replacement of the defective product, materials, equipment, engineering, or other related costs. This quality warranty supersedes all other expressed or implied warranties, and is the buyer's sole remedy.

Scope of Product

Valve Type		Design Standards	Size					ASME Pressure Classes							
			1/2 to 2"	2 to 4"	6 to 12"	12 to 24"	≥ 26"	150	300	600	800	900	1500	2500	4500
Gate Valve	Conventional gate valve	API 600		◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆
	Stainless steel gate valve	API 603	◆	◆	◆	◆		◆	◆	◆					
	Forged steel gate valve	API 602	◆					◆	◆	◆	◆	◆	◆	◆	◆
	Non-rising stem gate valve	ASME B16.34	◆	◆	◆	◆		◆	◆						
	Pressure self-sealing gate valve	ASME B16.34		◆	◆	◆	◆			◆		◆	◆	◆	
	Full-bore gate valve	API 6D	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆		
Globe Valve	Conventional globe valve	BS 1873		◆	◆	◆		◆	◆	◆		◆	◆	◆	◆
	Globe valve	API 623		◆	◆	◆		◆	◆	◆		◆	◆	◆	◆
	Stainless steel globe valve	ASME B16.34	◆	◆	◆	◆		◆	◆	◆					
	Forged steel globe valve	API 602	◆					◆	◆	◆	◆	◆	◆	◆	◆
	Pressure self-sealing globe valve	ASME B16.34		◆	◆	◆				◆		◆	◆	◆	
	Bidirectional three-way globe valve	ASME B16.34		◆	◆			◆	◆	◆					
	T-pattern globe valve	BS 1873/API 623	◆	◆	◆			◆	◆	◆					
	Quick closing globe valve	ASME B16.34	◆	◆	◆			◆	◆						
	Angle pattern globe valve	BS 1873/API 623	◆	◆	◆			◆	◆	◆	◆				
Check Valve	Conventional check valve	BS 1868		◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆
	Stainless steel check valve	ASME B16.34	◆	◆	◆	◆		◆	◆	◆					
	Forged steel rising-type check valve	API 602	◆					◆	◆	◆	◆	◆	◆	◆	
	Forged steel swing-type check valve	API 602	◆					◆	◆	◆	◆	◆	◆	◆	
	Pressure self-sealing check valve	ASME B16.34		◆	◆	◆				◆		◆	◆	◆	
	Full opening check valve	API 6D		◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	
	Axial flow type check valve	API 6D	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	
	Butterfly type check valve	API 594		◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	
	Stop-check valve	BS 1873/API 623	◆	◆	◆			◆	◆	◆					
	Tilting disc check valve	ASME B16.34		◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	
Ball Valve	One-piece floating ball valve	ISO 17292 API 608/API 6D	◆	◆	◆			◆	◆						
	Two-piece floating ball valve	ISO 17292 API 608/API 6D	◆	◆	◆			◆	◆	◆	◆	◆	◆	◆	
	Three-piece floating ball valve	ISO 17292 API 608/API 6D	◆					◆	◆	◆	◆	◆	◆	◆	
	Top entry type floating ball valve	ISO 17292 API 608/API 6D	◆	◆				◆	◆	◆	◆	◆	◆		
	Metal seated floating ball valve	ISO 17292 API 608/API 6D	◆	◆	◆			◆	◆	◆	◆	◆	◆	◆	
	Two-piece trunnion ball valve	API 6D		◆	◆	◆		◆	◆	◆	◆	◆	◆		
	Three-piece trunnion ball valve	API 6D		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	
	Top entry type trunnion ball valve	API 6D		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
	Metal seated trunnion ball valve	API 6D		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	
	Fully-welded ball valve	API 6D		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆		
	DBB double ball valve	API 6D	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	
Butterfly Valve	Centerline type butterfly valve	API 609		◆	◆	◆	◆	◆							
	Double offset-type butterfly valve	API 609		◆	◆	◆	◆	◆	◆	◆					
	Triple offset-type butterfly valve	API 609		◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	
Special Valve	Jacketed valve	ASME B16.34	◆	◆	◆	◆		◆	◆	◆	◆				
	Forged steel valves for power plants	JB/T 3595	◆	◆						◆	◆	◆	◆	◆	
	Bellow valve	ASME B16.34	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆		
	Three-way ball valve		◆	◆	◆			◆	◆						
	Combined ball valve		◆					◆	◆						
	Special material valve	ASME B16.34	◆	◆	◆			◆	◆						

Valve Type		Temperature					Materials				End Connection						Special Features					Applications							
		-196 to -50°C	-50 to -29°C	-29 to 200°C	200 to 425°C	>425°C	Carbon and Low Alloy Steel	Stainless Steel	Nickel-based Alloy	Titanium and Titanium Alloys	Socket Welding	Threaded End	Flanged	Butt-welding	Wafer-type	Lug-type	High Temperature	Cryogenic	Fugitive Emission	Fire-safe Design	Anti-static Design	Petroleum and Natural Gas	Oil Refining and Petrochemical	Chemical Industry	Power	Shipbuilding and Marine Engineering	Coal Chemical Industry	LNG	Air Separation
Gate Valve	Conventional gate valve	◆	◆	◆	◆	◆	◆	◆	◆				◆	◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Stainless steel gate valve	◆	◆	◆	◆			◆	◆				◆	◆				◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆
	Forged steel gate valve	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Non-rising stem gate valve		◆	◆	◆		◆						◆						◆	◆	◆					◆			
	Pressure self-sealing gate valve		◆	◆	◆	◆	◆	◆					◆	◆			◆		◆	◆	◆	◆	◆	◆	◆	◆	◆		◆
	Full-bore gate valve		◆	◆	◆		◆	◆					◆	◆					◆	◆	◆	◆	◆						
Globe Valve	Conventional globe valve	◆	◆	◆	◆	◆	◆	◆	◆				◆	◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Globe valve	◆	◆	◆	◆	◆	◆	◆	◆				◆	◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Stainless steel globe valve	◆	◆	◆	◆			◆	◆				◆	◆				◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆
	Forged steel globe valve	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Pressure self-sealing globe valve		◆	◆	◆	◆	◆	◆					◆	◆			◆		◆	◆	◆	◆	◆	◆	◆	◆	◆		◆
	Bidirectional three-way globe valve		◆	◆	◆		◆	◆	◆				◆						◆	◆	◆	◆	◆	◆	◆	◆		◆	◆
	T-pattern globe valve		◆	◆	◆	◆	◆	◆	◆				◆	◆					◆	◆	◆	◆	◆	◆		◆	◆		◆
	Quick closing globe valve			◆			◆	◆					◆							◆	◆		◆			◆			
	Angle pattern globe valve		◆	◆	◆		◆	◆	◆		◆	◆	◆	◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Check Valve	Conventional check valve	◆	◆	◆	◆	◆	◆	◆	◆				◆	◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Stainless steel check valve	◆	◆	◆	◆			◆	◆				◆	◆				◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆
	Forged steel rising-type check valve	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Forged steel swing-type check valve	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆			◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Pressure self-sealing check valve		◆	◆	◆	◆	◆	◆					◆	◆			◆		◆	◆	◆	◆	◆	◆	◆	◆	◆		◆
	Full opening check valve		◆	◆	◆		◆						◆	◆					◆	◆	◆	◆	◆						
	Axial flow type check valve	◆	◆	◆	◆	◆	◆	◆	◆				◆	◆			◆	◆	◆	◆	◆	◆	◆	◆				◆	◆
	Butterfly type check valve	◆	◆	◆	◆	◆	◆	◆	◆				◆	◆	◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Stop-check valve		◆	◆	◆	◆	◆	◆	◆				◆	◆			◆		◆	◆	◆	◆	◆	◆		◆	◆		
	Tilting disc check valve		◆	◆	◆	◆	◆	◆					◆	◆			◆		◆	◆	◆	◆	◆	◆	◆	◆	◆		
Ball Valve	One-piece floating ball valve		◆	◆			◆	◆	◆				◆						◆	◆	◆		◆	◆		◆			
	Two-piece floating ball valve	◆	◆	◆			◆	◆	◆		◆	◆	◆	◆				◆	◆	◆	◆	◆	◆	◆		◆		◆	◆
	Three-piece floating ball valve		◆	◆			◆	◆	◆		◆	◆							◆	◆	◆	◆	◆	◆		◆			
	Top entry type floating ball valve	◆	◆	◆			◆	◆	◆		◆	◆	◆	◆				◆	◆	◆	◆	◆	◆	◆		◆		◆	◆
	Metal seated floating ball valve	◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆			◆	◆	◆	◆	◆	◆	◆	◆		◆	◆	◆	◆
	Two-piece trunnion ball valve	◆	◆	◆			◆	◆	◆				◆	◆				◆	◆	◆	◆	◆	◆	◆		◆		◆	◆
	Three-piece trunnion ball valve	◆	◆	◆			◆	◆	◆				◆	◆				◆	◆	◆	◆	◆	◆	◆		◆		◆	◆
	Top entry type trunnion ball valve	◆	◆	◆			◆	◆	◆				◆	◆				◆	◆	◆	◆	◆	◆	◆		◆		◆	◆
	Metal seated trunnion ball valve		◆	◆	◆	◆	◆	◆	◆				◆	◆			◆		◆	◆	◆	◆	◆	◆		◆	◆		
	Fully-welded ball valve		◆	◆			◆	◆	◆				◆	◆					◆	◆	◆	◆							
	DBB double ball valve		◆	◆			◆	◆	◆				◆	◆					◆	◆	◆					◆			
Butterfly Valve	Centerline type butterfly valve			◆			◆	◆					◆		◆	◆						◆	◆	◆	◆	◆	◆		
	Double offset-type butterfly valve	◆	◆	◆			◆	◆	◆				◆		◆	◆		◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
	Triple offset-type butterfly valve	◆	◆	◆	◆	◆	◆	◆	◆				◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Special Valve	Jacketed valve		◆	◆	◆		◆	◆	◆		◆		◆	◆					◆	◆	◆	◆	◆	◆					
	Forged steel valves for power plants				◆	◆	◆	◆	◆		◆		◆				◆		◆	◆	◆				◆				
	Bellow valve		◆	◆	◆		◆	◆	◆		◆	◆	◆	◆					◆	◆	◆	◆	◆	◆		◆			
	Three-way ball valve		◆	◆			◆	◆	◆				◆	◆					◆	◆	◆					◆			
	Combined ball valve		◆	◆			◆	◆	◆				◆	◆					◆	◆	◆					◆			
	Special material valve			◆						◆	◆	◆	◆	◆	◆	◆							◆	◆		◆			

Summary of Valve Material Specification

Body Materials	Trim Materials	Seal Materials	End Connection	Operating Means	Other Requirements
Ductile iron	Cr13	Nitrile rubber	RF	Handwheel/lever	ISO top flanges
WCB/WCC/A105	A105/ENP	EPDM	RTJ	Gear	Position indicator
LCB/LCC/LF2	LF2/ENP	PTEF	BW	Pneumatic	lockable
CF8/F304	304	FKM	SW	Electric	Buried
CF8/F316	304L	Nylon	WAFER	Hydraulic	Extended stem
CF3/F304L	316	Ceramics	LUG	Gas Hydraulic (Gas over oil)	By-pass
CF3M/F316L	316L	Graphite	NPT/FNPT	Electric-Hydraulic	Coating
CF8C/F321	321/347		Clamp	Bare Shaft	
WC6/F11	F51		GROOVE	Solenoid	
WC9/F22	F53				
C5/F5	F55				
C12/F9	HB				
C12A/F91	HC				
4A/F51	ALLOY 20				
5A/F53	INCONEL 600				
6A/F55	INCONEL 625				
CN7M	MONEL 400				
N12MV/H.B	Aluminum bronze				
CW6MC/H.C					
CY40/INCONEL 600					
CW6MC/INCONEL 625					
M-30C/MONEL 400					
Aluminum bronze					

According to standards	GB, GB/T, ISO, DIN, BS, ANSI, ASME, API, MSS, JIS
According to service	Water industry, buildings, HVAC, heating, power, metallurgy, petroleum, petrochemical, pharmaceutical, natural gas, marine, food, chemical, sugar making, shipbuilding, agricultural irrigation, etc..
According to media	Water, gas, oil, liquid, steam, powder, fluidized solids, slurry.
According to temperature	Room temperature: -29°C to 120°C; moderate temperature: 120°C~ to ≤425°C; low temperature:-40°C to -196°C; high temperature: >425°C
According to pressure	PN 16, PN 25, PN 40, Class 125/150/300/600, 125 LB to 2500 LB, 10K, 16K, 20K

Valve Nominal Diameter and Size Comparison Table

inch	1/4"	3/8"	1/2"	1"	1¼"	1½"	2"	2½"	3"	4"	5"	6"	8"	10"	12"	1/4"
DN(mm)	8	10	15	25	32	40	50	65	80	100	125	150	200	250	300	8
inch	14"	16"	18"	24"	26"	28"	30"	32"	36"	48"	60"	72"	80"	88"	96"	14"
DN(mm)	350	400	450	600	650	700	750	800	900	1200	1500	1800	2000	2200	2400	350

Material Comparison Table

TRADE NAME	ASTM PIPE	SPECIFICATION FITTINGS	UNS	WERKST OFF	DIN	BARSTOCK	FORGING	CASTING
FERRALIUM ® 255	A790	A815	S32550					
NICKEL200	B161	B366/WPN	N02200	2.4066		B160	B564 NO2200	
NICKEL201	B161	B366/PNL	N02201	2.4068		B160	B564 N02201	
MONEL ® 400	B165	B366/WPNC	N04400	2.4360		B164 N04400	B564 NO4400	A494 M35-1
MONEL ® K500			N05500	2.4375		B865 N05500		
INCOLOY ® 800	B163	B366-WPNIC	N08800	1.4876	X10NiCrAlTi3320	B408 N08800	B564 N08800	
INCOLOY ® 800H	B407	B366/WPNIC10	N08810	1.4958		B408 N08810	B564 N08810	
INCOLOY ® 800HT		B366-WPNIC11	N08811	1.4959		B408 N08811	B564 N08811	
INCOLOY ® 825	B423	B366/WPNICMC	N08825	2.4858	NiFe30Cr21Mo3	B425 N08825	B564 N08825	
INCONEL ® 600	B167	B366/WPNCI	N06600	2.4816		B166 N06600	B564 N06600	A494 CY40
INCONEL ® 625	B444	B366/PNCMC	N06625	2.4856	NiCr22Mo9Nb	B446 NO6625	B564 N06625	A494 CW 6MC
INCONEL690			N06690			B166 N06690		
INCONEL718			N07718			B637 N07718	B637	
INCONEL ® X750			N07750	2.4669		B637 N07750	B637	
HASTELLOY ® B2	B622	B366/WPHB-2	N10665	2.4617		B335 N10665	B564 N10665	A494 N 12MV
HASTELLOY ® B3			N10675	2.4600		B335 N10675	B564 N10675	
HASTELLOY ® C			N10002					A494 CW6M
HASTELLOY ® C22	B622	B366/WPHC22	N06022	2.4602	NiCr21Mo14W	B574 N06022	B574 N06022	A494 CX2MW
HASTELLOY ® C276	B622	B366/WPHC276	N10276	2.4819		B574 N10276	B564 N10276	
HASTELLOY ® C4	B622	B366/WPHC4	N06455	2.4610		B574 N06455	B574 N06455	
HASTELLOY G		B366-WPHG	N06007			B581 N06007	B564	
HASTELLOY G3		B366-WPHG3	N06985			B581 N06985	B564	
HASTELLOY G30		B366-WPHG30	N06030			B581 N06030	B564	
HASTELLOY X		B366-WPHX	N06002			B572 N06002	B564	
TANTALUM ®			R05200					
TITANIUM GR.1			R50250	3.7025		B348 GR.1	B381 F1	B367 C1
TITANIUM GR.2	B337/B861	B363/WPT-2	R50400	3.7035		B348 GR.2	B381 F2	B367 C2
TITANIUM GR.3			R50400	3.7055		B348 GR.3	B381 F3	B367 C3
TITANIUM GR.5	B377/B861		R50400	3.7165		B348 GR.5	B381 F5	B367 C5
TITANIUM GR.7	B377/B861	B363/WPT-7	R52400	3.7235		B348 GR.7	B381 F7	B367 C7
ZIRCONIUM ® 702		B653-PZ(Gr)	R60702			B550	B493	
ZIRCONIUM ® 705			R60705					
904L	B677	A403/WP904L	N08904	1.4432 1.4539	X1NiCrMoCu25205	B649 N08904	B625 N08904	
ALUSD83	B241	B361/WPSD83	S083	3.3547				
CARPENTER 20	B729	B366/WP20CB	N08020	2.4660		B473	B462	A351 CN7M
DUPLEX 4462	A190	A815	S31803	1.4462	X2CrNiMoN2253	A276 or A479 S31803	A182 F51	A890 Gr 4A
SAF 2507	A790	A815	S32750	1.4469	G-X-25Cr7Ni4MoN	A276/479 S32750	A182 F53	A890 Gr6A A351 Gr CD4Mcu
ZERON 100			S32760	1.4501		A276/479 S32760	A182 F55	A351 Gr CD3MWCrN
CuAl10Ni5Fe4			C63000 C63200	2.0966	QAL10-4-4	B150	B124	
CuAl10Ni			C95800	2.0976		B148		
CuAl11Ni			C95500	2.0981		B148		B271
CuAl10Fe			C61900	2.0936	QAL10-3-1			
CuAl8Fe				2.0930	QAL9-4			
CuAl2Mn			C61000	2.0960	QAL9-2			
Bronze			C83600			B584		B62
Bronze			C92200			B584		B61
Bronze			C84400			B584		
Brass			C36000					B16
CARBON STEEL(C22)			K30504	1.0402	C22	A105	A105	A216 WCB
CARBON STEEL(C22.8)				1.0460		A105N	A105N	
LOW TEMP CARBON STEEL			K03011	1.0508	TT St E 36	A350 LF2	A350 LF2	A352 LCB
HIGH YIELD STEEL			K03014			A694 F60	A694 F60	
3 1/2 NICKEL STEEL			K32025	1.5639		A350 LF3	A350 LF3	A352 LC3
5 CHROME,1/2 MOLY			K41545	1.7362	12CrMo19.5	A182 F5	A182 F5	A217 C5
1/4 CHROME,1/2 MOLY			K11572 K11597	1.7733 1.7335	24CrMoV-55 13 CrMo 44	A739 B11	A182 F11	A217 WC6
2 1/4 CHROME,1/2 MOLY			K21590	1.7380	10CrMo910	A739 B22	A182 F22	A217 WC9
9 CHROME,1 MOLY			K90941	1.7386		A182 F9	A182 F9	A217 CW6
X 12 CHROME,091 MOLY			K91560	1.4903			A182 F91	A217 C12
13 CHROME			S41000			A276 or A479 410	A182 F6A	A351 CA15
17-4PH			S17400	1.4542		A564 630	A564 630	
254 SMo	A312	A403/WPS31254	S31254	1.4547		A.482 F44	A182 F44	A351 CK3MCuN
304	A312	A403/WP304	S30400	1.4301	X5CrNi1810/X5CrNi189	A276 or A479 304	A182 F304	A351 CF8
304H			S30409	1.4948	X6CrNi1811			
304L			S30403	1.4306	X2CrNi1911	A276 or A479 304L	A182 F304L	A351 CF3
309	A312	A403/WP309	S30900	1.4828	X15CrNiSi2012	A276 or A479 309	A182 F309	
310			S31008	1.4845		A479 310		A351 CK20
310S	A312	A403/N/P310S	S31008	1.4845	X12CrNi2521	A276 or A479 310S	A182 F310S	A351 CK20
310/314	A312	A403/WP310	S31000	1.4841	X15CrNiSi2520	A276 or A479 310	A182 F310	
316	A312	A403/WP316	S31600	1.4401 1.4436	X5CrNiMo17122 X5CrNiMo17133 X5 CrNiMo1810	A276 or A479 316	A182 F316	A351 CF8M
316H			S31609	1.4919	X8CrNiMo1712			
316L	A312	A403/WP316L	S31603	1.4404	X2CrNiMo17132	A276 or A479 316L	A182 F316L	A351 CF3M
316Ti	A312	A403/P316Ti	S31635	1.4571	X6CrNiMoTi17122	A276 or A479 316Ti	A182 F316Ti	
317	A312	A403/WP317	S31700	1.4449	X5CrNiMo1713	A276 or A479 317	A182 F317L	
317L	A312	A403/WP317L	S31703	1.4438	X2CrNiMoN18164	A276 or A479 317L	A182 F317L	A351 CG8M
321	A312	A403/WP321	S32100	1.4541	X6CrNiTi1810	A276 or A479 321	A182 F321	A351 CG8M
347	A312	A403/WP347	S34700	1.4550	X6CrNiNb1810	A276 or A479 347	A182 F347	A351 CF8C
WCB	A216							
WCC	A216							
LCC	A352							
WC6	A217							
WC9	A217							
C5	A217							
C12	A217							
C12A	A217							

Comparison Table for Corrosion of Special Materials

Media	Concentration (W/W)	Temperature (°C)	316	F55	Titanium	HASTELLOY® B-3	HASTELLOY®C-276	Alloy 20	F51	Avesta 254 SMO®	INCONEL®625	INCONEL®825	MONEL®400
acetic acid	All	to 60℃	●	●	●	●	●	●	●	●	●	●	●
acetic acid	0-50%	Boiling	▲	●	●	●	●	●	●	●	●	●	▲
acetic acid	50-100%	80℃	●	●	●	●	●	●	●	●	●	●	●
acetic acid vapor	100%	140℃	▲	●	X	●	●	▲	ND	ND	●	●	▲
acetic anhydride	0-100%	to Boiling	●	●	●	▲	●	●	●	●	ND	●	▲
acetylchloride	100%	20℃	▲	●	●	●	●	ND	ND	ND	ND	ND	ND
nitric acid + sulfuric acid	50%+50%	to Boiling	▲	●	X	X	X	●	ND	ND	X	X	X
nitric acid + sulfuric acid	50%+20%	80℃	▲	●	ND	ND	ND	ND	●	●	ND	ND	ND
nitric acid + sulfuric acid	75%+25%	to Boiling	X	▲	X	X	X	ND	ND	ND	X	X	X
nitric acid + phosphoric acid	50%+50%	70-80℃	X	▲	X	X	X	ND	ND	ND	X	X	X
alcohol	100%	to Boiling	▲	●	●	●	●	●	●	●	●	●	▲
ethanol	All	20C-BP	▲	●	●	●	●	●	●	●	●	●	▲
aluminium oxide	All	20℃	X	▲	X	●	●	▲	SC	SC	ND	ND	▲
aluminium oxide	5%	100℃	X	▲	●	ND	ND	ND	●	●	ND	ND	ND
aluminium oxide	25%	60℃	X	▲	●	ND	ND	ND	X	▲	ND	ND	ND
potassium aluminum sulfate	All	20℃	▲	●	●	●	●	●	●	●	●	●	▲
potassium aluminum sulfate	All	Boiling	▲	▲	●	X	●	▲	▲	ND	●	●	▲
ammonium carbamate	40%	to 120℃	▲	●	●	●	▲	ND	▲	ND	●	●	ND
ammonium chloride	All	75℃	X	●	●	●	●	▲	SC	SC	●	●	▲
ammonium chloride	50%	115℃	X	●	●	●	●	ND	▲	●	●	●	ND
ammonium hydroxide	All	0℃-BP	●	●	●	●	●	●	●	●	●	●	X
ammonium nitrate	All	Boiling	▲	●	●	▲	●	●	●	●	●	●	X
ammonium sulfate	All	70℃	X	●	●	X	▲	●	●	●	●	●	▲
ammonium sulfate	All	20℃-BP	X	●	●	X	▲	●	●	●	●	●	▲
benzenamine	0-100%	20℃	●	●	●	●	●	●	●	●	●	●	▲
benzene	100%	100℃	▲	●	●	●	●	●	●	●	●	●	▲
benzene{wet}	Pure	Boiling	X	ND	●	▲	●	X	ND	ND	●	▲	X
tetrafluoromethane{dry}	100%		▲	●	●	▲	●	●	●	●	●	●	▲
citric acid	All	to Boiling	▲	●	●	●	●	●	●	●	●	●	▲
citric acid	0.70%	Boiling	▲	●	●	●	●	●	●	●	●	●	▲
citric acid + 6 % sodium oxide	5%	140℃	▲	●	●	●	●	▲	ND	ND	ND	ND	ND
Chlorine {wet gas}	-	20℃	X	ND	●	X	●	X	X	X	X	X	X
magnesium sulfate+sulfuric acid	10%+10%	to Boiling	▲	●	●	X	X	●	●	●	ND	ND	ND
diethyl ether	100%	20℃	●	●	●	●	●	ND	●	●	●	●	●
diethyl ether	100%	20℃-BP	●	●	●	●	●	ND	●	●	●	●	●

Media	Concentration (W/W)	Temperature (°C)	316	F55	Titanium	HASTELLOY® B-3	HASTELLOY®C-276	Alloy 20	F51	Avesta 254 SMO®	INCONEL®625	INCONEL®825	MONEL®400
ethyl chloride (dry)	100%	to 60℃	●	●	●	●	●	●	●	●	●	●	▲
ethyl chloride (dry)	100%	BP	●	●	●	●	●	●	●	●	●	●	▲
vinyl chloride (dry)	100%	20℃	ND	●	●	●	▲	●	●	●	●	●	ND
vinyl chloride (dry)	100%	20℃-BP	ND	●	●	●	▲	●	●	●	●	●	ND
diethyl ether	100%	20℃	●	●	●	●	▲	●	●	●	●	●	▲
(Fe2(SO4)3)ferric sulfate	0-10%	to Boiling	●	●	●	X	▲	●	ND	ND	●	●	x
(Fe2(SO4)4)ferric sulfate	10%-30%	70℃	▲	●	●	X	●	●	●	●	●	▲	x
fluorine (dry)	100%	20℃	●	●	X	X	●	●	ND	ND	●	ND	ND
fluorine (dry)	100%	100℃	●	●	X	X	●	●	●	●	●	▲	▲
formaldehyde	All	20℃-BP	●	●	●	●	●	●	●	●	ND	ND	▲
formic acid	All	66℃	▲	●	X	●	●	X	▲	●	●	▲	X
formic acid	100%	BP(1000℃)	▲	●	X	●	●	X	SC	SC	●	▲	X
hydrochloric acid	1%	to Boiling	X	●	▲	●	●	X	▲	●	●	▲	▲
hydrochloric acid	1%	80℃	X	●	▲	●	●	X	X	X	●	▲	▲
hydrochloric acid	1%	Boiling	x	●	▲	●	●	X	▲	●	●	▲	▲
hydrochloric acid	1%	20℃	X	●	X	●	●	X	X	●	●	●	●
chlorofluoric acid	10%	20℃	X	▲	X	●	●	X	X	▲	●	●	●
hydrofluoric Acid	0-100%	20℃	X	ND	X	●	●	X	SC	SC	●	●	●
hydrochloric acid	1%	40℃	X	ND	ND	●	●	ND	ND	●	ND	ND	●
chlorofluoric acid	0.5%	50℃	ND	ND	ND	●	●	ND	ND	▲	ND	ND	●
hydrofluoric Acid	0-100%	50℃	X	ND	X	●	●	X	SC	SC	▲	X	●
hydrogen peroxide	50%	20℃	▲	●	●	X	●	▲	●	●	●	●	▲
hydrogen peroxide	50%	40℃	▲	●	●	X	●	ND	●	●	●	●	▲
hydrogen sulfide (dry)	4%	200℃	●	●	●	●	●	●	●	●	●	●	●
hydrogen sulfide (dry)	100%	to 250℃	●	●	●	●	●	●	SC	SC	●	●	▲
hydrogen sulfide (wet)	-	20℃	▲	●	●	●	●	▲	▲	ND	●	●	X
lactic acid	20%	100℃	X	●	●	●	●	▲	SC	SC	●	●	▲
lactic acid	90%	Boiling	X	●	ND	ND	ND	ND	●	●	ND	ND	ND
magnesium chloride	10-30%	20℃	▲	●	●	●	●	●	●	●	●	●	●
magnesium chloride	5%	Boiling	▲	●	●	●	●	●	●	●	●	●	●
nickel sulphate	All	Roiling	▲	●	●	X	▲	▲	●	●	●	●	▲
nitric acid	0-70%	20℃	●	●	●	X	●	●	●	●	●	●	X
nitric acid	100%	20℃	▲	●	●	X	●	●	ND	ND		▲	X

Formula for Temperature Calculation

- $C=\frac{5}{9}(F-32)$, $F=\frac{9}{5}C+32$
- C+273.15 = K Kelvin
- F+459.67 = R Rankine

Bars bar

x 100	=	Kilopascals(kPa)
x 14.504	=	Pounds-force per square inch (psi)
x 33.52	=	Feet of water(ft H_2O)at 68°F
x 29.53	=	Inches of mercury (inHg)at 0°C
x 1.0197	=	Kilograms-force per square centimeter (kg/cm^2)
x 0.98692	=	Atmospheres (atm) sea-level standard
x 1.0443	=	Tons-force per square foot(tonf/ft^2)
x 750.06	=	Torr(torr)(-mmHg at 0°C.)

Kilopascals-kPa

x 10^3	=	Pascals(Pa)or newtons per square meter (N/m^2)
x 0.1450	=	Pounds-force per square inch (psi)
x 0.010197	=	Kilograms-force per square centimeter (kg/cm^2)
x 0.2953	=	Inches of mercury (inHg)at 32°F
x 0.3351	=	Feet of water (ft H_2O) at 68°F
x 4.021	=	Inches of water (in H_2O)at 68°F

Pounds-Force Per Square Inch - psi

x 6.896	=	Kilopascals (kPa)
x 0.06805	=	Standard atmospheres
x 2.311	=	Feet of water (ft H_2O) at 68°F
x 27.73	=	Inches of water (in H_2O)at 68°F
x 2.036	=	Inches of mercury (inHg)at 0°C
x 0.07031	=	Kilograms-force per square centimeter (kg/cm^2)

Temperature Comparison Table

-459.4°to 0°			1°to 60°			61°to 290°			300°to 890°			900°to 3000°		
Cent. C	or Fah.	F	Cent. C	or Fah.	F	Cent. C	or Fah.	F	Cent. C	or Fah.	F	Cent. C	or Fah.	F
-273	-459.4		-17.2	1	33.8	16.1	61	141.8	149	300	572	482	900	1652
-268	-450		-16.7	2	35.6	16.7	62	143.6	154	310	590	488	910	1670
-262	-440		-16.1	3	37.4	17.2	63	145.4	160	320	608	493	920	1688
-257	-430		-15.6	4	39.2	17.8	64	147.2	166	330	626	499	930	1706
-251	-420		-15.0	5	41.0	18.3	65	149.0	171	340	644	504	940	1724
-246	-410		-14.4	6	42.8	18.9	66	150.8	177	350	662	510	950	1742
-240	-400		-13.9	7	44.6	19.4	67	152.6	182	360	680	516	960	1760
-234	-390		-13.3	8	46.4	20.0	68	154.4	188	370	698	521	970	1778
-229	-380		-12.8	9	48.2	20.6	69	156.2	193	380	716	527	980	1796
-223	-370		-12.2	10	50.0	21.1	70	158.0	199	390	734	532	990	1814
-218	-360		-11.7	11	51.8	21.7	71	159.8	204	400	752	538	1000	1832
-212	-350		-11.1	12	53.6	22.2	72	161.6	210	410	770	849	1020	1868
-207	-340		-10.6	13	55.4	22.8	73	163.4	215	420	788	560	1040	1904
-201	-330		-10.0	14	57.2	23.3	74	165.2	221	430	806	571	1060	1940
-196	-320		-9.4	15	59.0	23.9	75	167.0	227	440	824	582	1080	1976
-190	-310		-8.9	16	60.8	24.4	76	168.8	232	450	842	593	1100	2012
-184	-300		-8.3	17	62.6	25.0	77	170.6	238	460	860	604	1120	2048
-179	-290		-7.8	18	64.4	25.6	78	172.4	243	470	878	616	1140	2084
-173	-280		-7.2	19	66.2	26.1	79	174.2	249	480	896	627	1160	2120
-169	-273	-459.4	-6.7	20	68.0	26.7	80	176.0	254	490	914	638	1180	2156
-168	-270	-494	-6.1	21	69.8	27.2	81	177.8	260	500	932	649	1200	2192
-162	-260	-436	-5.6	22	71.6	27.8	82	179.6	266	510	950	660	1220	2228
-157	-250	-418	-5.0	23	73.4	28.3	83	181.4	271	520	968	671	1240	2264
-151	-240	-400	-4.4	24	75.2	28.9	84	183.2	277	530	986	682	1260	2300
-146	-230	-382	-3.9	25	77.0	29.4	85	185.0	282	540	1004	693	1280	2336
-140	-220	-364	-3.3	26	78.8	30.0	86	186.8	288	550	1022	704	1300	2372
-134	-210	-346	-2.8	27	80.6	30.6	87	188.6	293	560	1044	732	1350	2462
-129	-200	-328	-2.2	28	82.4	31.1	88	190.4	299	570	1058	760	1400	2552
-123	-190	-310	-1.7	29	84.2	31.7	89	192.2	304	580	1076	788	1450	2642
-118	-180	-292	-1.1	30	86.0	32.2	90	194.0	310	590	1094	816	1500	2732
-112	-170	-274	-0.6	31	87.8	32.8	91	195.8	316	600	1112	843	1550	2822
-107	-160	-256	0.0	32	89.6	33.3	92	197.6	321	610	1130	871	1600	2912
-101	-150	-238	0.6	33	91.4	33.9	93	199.4	327	620	1148	899	1650	3002
-96	-140	-220	1.1	34	93.2	34.4	94	210.2	332	630	1166	927	1700	3092
-90	-130	-202	1.7	35	95.0	35.0	95	203.0	338	640	1184	954	1750	3182
-84	-120	-184	2.2	36	96.8	35.6	96	204.8	343	650	1202	982	1800	3272
-79	-110	-166	2.8	37	98.6	36.1	97	206.6	349	660	1220	1010	1850	3362
-73	-100	-148	3.3	38	100.4	36.7	98	208.4	354	670	1238	1038	1900	3452
-68	-90	-130	3.9	39	102.2	37.2	99	210.2	360	680	1256	1066	1950	3442
-62	-80	-112	4.4	40	104.0	37.8	100	212.0	366	690	1274	1093	2000	3632
-57	-70	-94	5.0	41	105.8	43	110	230	371	700	1292	1121	2050	3722
-51	-60	-76	5.6	42	107.6	49	120	248	377	710	1310	1149	2100	3812
-46	-50	-58	6.1	43	109.4	54	130	266	382	720	1328	1177	2150	3902
-40	-40	-40	6.7	44	111.2	60	140	284	388	730	1346	1204	2200	3992
-34	-30	-22	7.2	45	113.0	66	150	302	392	740	1364	1232	2250	4082
-29	-20	-4	7.8	46	14.8	71	160	320	399	750	1382	1260	2300	4172
-23	-10	14	8.3	47	116.6	77	170	338	404	760	1400	1288	2350	4262
-17.8	0	32	8.9	48	118.4	82	180	356	410	770	1418	1316	2400	4352
			9.4	49	120.2	88	190	374	416	780	1436	1343	2450	4442
			10.0	50	122.0	93	200	392	421	790	1454	1371	2500	4532
			10.6	51	123.8	99	210	410	427	800	1472	1399	2550	4622
			11.1	52	125.6	100	212	413.6	432	810	1490	1427	2600	4712
			11.7	53	127.4	104	220	428	438	820	1508	1454	2650	4802
			12.2	54	129.2	110	230	446	443	830	1526	1482	2700	4892
			12.8	55	131.0	116	240	464	449	840	1544	1510	2750	4982
			13.3	56	132.8	121	250	482	454	850	1562	1538	2800	8072
			13.9	57	134.6	127	260	500	460	860	1580	1566	2850	5162
			14.4	58	136.4	132	270	518	466	870	1598	1593	2900	5252
			15.0	59	138.2	138	280	536	471	880	1616	1621	2950	5342
			15.6	60	140.0	143	290	554	477	890	1634	1649	3000	5432