

WEIDOU LI



## **SPECIAL ALLOY CONTROL VALVES**

---

Titanium, Zirconium, Nickel, Tantalum, Hastelloy, Monel  
Inconel, Duplex, Ni Al Br, Alloy 20, 904L



### **WEIDOU LI VALVES CO., LTD.**

Add: No.20, Xingyu Road, Airport Industrial Zone,  
Wenzhou City, 325024, P. R. China

Tel: 86-577-86921659 86-577-86936558

Fax: 86-577-86926789

Web: [www.wsv-valve.com](http://www.wsv-valve.com)

E-mail: [sale@weidouli.com](mailto:sale@weidouli.com)



No.W SV2019-01

**WEIDOU LI VALVES CO.,LTD.**



# CONTENTS

- P01/ Brief Introduction
- P02/ Qualification Certificates
- P03/ Application
- P05/ Quality Control
- P07/ Linear Motion Control Valve
- P11/ Slurry Let Down And Vent Angle Valve
- P12/ Segment Control Valve
- P13/ Control Ball Valve
- P14/ Control Plug Valve
- P15/ Control Discharge Valve
- P16/ Control Butterfly Valve
- P17/ Titanium & Titanium Alloy Characteristics
- P18/ Nickel & Nickel Alloy Characteristics
- P19/ Zirconium & Zirconium Alloy Characteristics
- P20/ Special Alloy Material Series
- P21/ Performance And Gallery

**Weidouli** company committed to the manufacturing of exotic material valves since 1989, with long term history and abundant experience on severe service valves for critical applications.

Valves can be designed, manufactured, assembled and tested in accordance with ANSI/API/ASME norms, DIN/ ISO/BS specifications, NORSOK requirements, JIS standards and tailor-made.

Weidouli factory area 43500m<sup>2</sup>, with modern technology and the new facilities including CNC machine shop, fabrication and inspection and test facilities.

Weidouli advanced manufacturing processes enable to produce a wide range of valves from bars and forgings, castings. Moreover, sizeable stock allows Weidouli to offer a broad selection of exotic materials whilst keeping production time to a minimum.

**Weidouli** have ISO 9001/API 6D/ISO 14001 OHSAS 18001/API 607/API 6FA/CE/EAC/ATEX/ISO 15848/ TS etc. qualifications to guarantee the realizable quality.

Weidouli system includes the selection of raw material from approved vendors, and rigorous oversight of our manufacturing process that is vital to quality control.

Our extensive quality control system carefully monitors our manufacturing processes to assure a product that performs to the highest industry standards. Quality assurance procedures include 100% hydrostatic and pneumatic testing of all valves in full conformance to applicable API standards and industry codes.



API 6D

API 607/6FA

ISO 9001

CE 1155

ATEX



SIL

ISO 14001

OHSAS 18001

EAC

TS

ISO 15848-1

## Cooperate Sincerely Create Win-win

The history of Weidouli dates back to 1989, the initial company named Lixin established in that year with prospective view to begin with exotic material valves manufacturing. With an increase of its production capacity and satisfaction of domestic and oversea clients' requirements, Weidouli furnish with a new modern factory filled with advance and large CNC machine facilities.

Weidouli has worked diligently in past decades to secure our advantageous industry position and become a highly respected and valuable enterprise to the area of anti-corrosive valves application and come to being an culture: Cooperate Sincerely, Create Win-win.

Weidouli will continue to play a good role and make its unceasing efforts in the valve markets with our goals in mind : Global Quality, Total Reliability.

CEO, Chengrui Xia



## Solution for Anti-corrosive Valve

Weidouli is the professional manufacturer of anti-corrosive control valves, famous for its exquisite product design and excellent service .

Valves are delivered worldwide to the Chemical, Aviation military weapons, Petro-chemical, Ocean development, Paper making, Refinery, Power station etc. application area of high acid, high alkali, salty.

## Ongoing developing

Ongoing investment in advanced CNC machine facilities, computerized systems and the latest material research and development technology always enables Weidouli to anticipate and meet the needs of it served industries.

Weidouli valves will provide first class valve solutions to meet customers' requirement and create a mirade in the valve area of the corrosion resistant control valve.

All the Weidouli valves are insured by CPIC.  
The policy no.:  
AWEZ55007118Q000012H



### Petro-Chemical

Fine Chemical  
Alkali Process  
PTA process  
Acetic acid/anhydride process



### Offshore Oil&Gas

Seawater inlet valve  
Seawater Injection  
Oil/Water Separation  
Fire Fighting  
Cooling System  
Ballast System



### Pulp&Paper Industries

Chlorine Dioxide Bleaching System  
Displacement cooking process  
Black Liquor Evaporation Device  
Waste water/acid recovery device



### Mining

Hydrometallurgy  
Hydrometallurgy  
Flash Section  
Oxygen pressure leaching system



### Power Generation

Cooling system  
Desalination  
Desulfurization  
Utilities



### Naval Marine

HVAC  
Ballast System  
Chilled Water  
Grey Water  
Black Water  
Fuel System



↓ Contract evaluation



↓ Design evaluation



↓ Product design



↓ Vacuum foundry



↓ Incoming inspection



Wall thickness test



↑ Metallographic analysis



↑ Vacuum heat treatment



↑ Direct-reading spectrometer



↑ Mechanical test



↑ Chemical analysis



Spectral test



↓ Hardness test



↓ Liquid permeate test



↓ Ultrasonic non-destructive inspection



↓ Coordinate measuring machine



↓ Supersonic spray



QC inspection



↑ Vacuum welding



↑ CNC grinding ball



↑ Driller



↑ CNC machining



↑ Machining center



Horizontal machining lathe



↓ Vacuum hardness treatment



↓ Oil test by Ultraviolet Rays



↓ Cleaning room



↓ Assembly



↓ Pressure test



Dechlorination equipment



↑ After sale service



↑ Packing & shipment



↑ Finished products warehouse



↑ QC inspection



↑ Iron pollution test



Ultrasonic cleaning

Http : //www.wsv-valve.com

Weidouli valves functional quality management system complies with ISO9001 and API6D requirements to ensure production process maintain international safety and quality standard.

Weidouli valves complete production process from start to finish: design, manufacture, test and sale, products are tested rigorously and certified for quality assurance, is carried out with safe highest quality and to be one of global best corrosion resistant valve manufacturer in mind.



WSV CRM&MES System



## Linear Motion Control Valve

LN Series linear motion control valve is combined characteristics of each famous foreign brand with our own advantages. Widely adopt new technology, new process, new material to invent control valve independently.



### 1. Body:

S-shaped valve cavity is closer to streamline than traditional spherical valve cavity. It has advantage of small resistance coefficient and bigger capacity. This structure effectively eliminates rotating vortices and improves the flow capacity and stability.

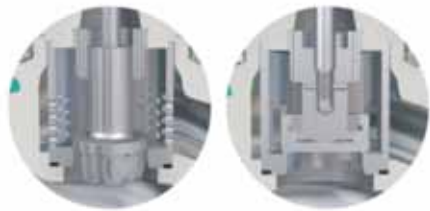
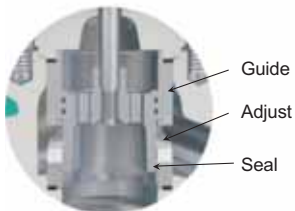


### 2. Trim:

Valve comply with requirement of IEC. The structure one design is according to different requirement, Selecting the best material and processing technology, to improve service life, convenient maintenance. The structure two design: guarantee strictly seal without precision grinding.

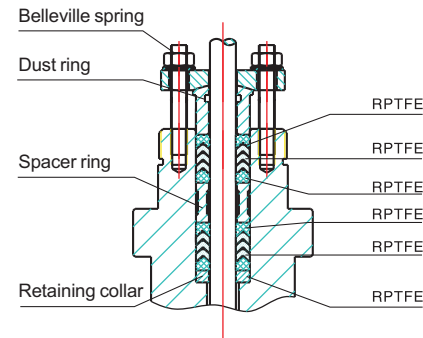
A. Structure One

B. Structure Two

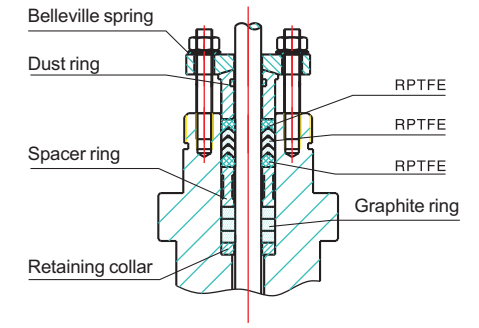


### 3. Combined packing seal:

Combination of the advantage of each structure and material, through the reasonable design, to achieve the best sealing performance.



Packing structure system 1



Packing structure system 2

### 4. Actuator:


AM Pneumatic diaphragm actuator adopt innovative high strength rolling diaphragm design. Air supply can up to 0.6MPa and greater output power than traditional actuator. Moreover, have the characteristics of constant effective area of diaphragm, high accuracy spring and greatly improve the precision of actuator.



Innovative design



Routine design

Product			
Name	Low-flow single-seated control valve	Top-guided single-seated control valve	Noise-reduction single-seated control valve
Model	LN1210	LN2210	LN2410
DN	15/20/25	32/40/50/65/80/100/125/150/200	32/40/50/65/80/100/125/150/200
PN	PN16、PN25、PN40、PN63 ; ANSI 150(PN20), ANSI 300(PN50), ANSI 600(PN110)	PN16、PN25、PN40、PN63 ; ANSI 150(PN20), ANSI 300(PN50), ANSI 600(PN110)	PN16、PN25、PN40、PN63 ; ANSI 150(PN20), ANSI 300(PN50), ANSI 600(PN110)
Rated Cv	0.01~14	10~700	10~700
End connection	RF、RJ、M、FM	RF、RJ、M、FM	RF、RJ、M、FM
Flow character	equal percentage, linear	equal percentage, linear	equal percentage, linear
Adjustable range	50:1	50:1	50:1
Actuator	AM2/AE	AM/AE/AH	AM/AE/AH
Operational temperature	-196~816 °C	-196~816 °C	-196~816 °C
Leakage rate	Comply with GB/T17213.4-2005/ IEC60534-4:1999 Class IV, Class V	Comply with GB/T17213.4-2005/ IEC60534-4:1999 Class IV, Class V	Comply with GB/T17213.4-2005/ IEC60534-4:1999 Class IV, Class V

Product			
Name	Cage guided single-seated control valve	Cage guided single-seated noise-reduction control valve	Cage guided single-seated low noise control valve(with silencer)
Model	LN3220	LN3410	LN3610
DN	40/50/65/80/100/125/150/200/250/300/350/400	40/50/65/80/100/125/150/200/250/300/350/400	40/50/65/80/100/125/150/200
PN	PN16、PN25、PN40、PN63 ; ANSI 150(PN20), ANSI 300(PN50), ANSI 600(PN110)	PN16、PN25、PN40、PN63 ; ANSI 150(PN20), ANSI 300(PN50), ANSI 600(PN110)	PN16、PN25、PN40、PN63 ; ANSI 150(PN20), ANSI 300(PN50), ANSI 600(PN110)
Rated Cv	11~2000	11~1800	11~580
End connection	RF、RJ、M、FM	RF、RJ、M、FM	RF、RJ、M、FM
Flow character	linear	equal percentage, linear	linear
Adjustable range	50:1	50:1	50:1
Actuator	AM/AE/AH	AM/AE/AH	AM/AE/AH
Operational temperature	-50~200 °C	-5~593 °C	-5~593 °C
Leakage rate	Comply with GB/T17213.4-2005/ IEC60534-4:1999 Class IV, Class V	Comply with GB/T17213.4-2005/ IEC60534-4:1999 Class IV, Class V	Comply with GB/T17213.4-2005/ IEC60534-4:1999 Class IV, Class V

## Slurry Let Down And Vent Angle Valve

Weidouli Valves company researched "Slurry let down and vent angle valve" which has strong anti-erosion performance. It can be long-term safe and stable operation under the scour of big pressure differential medium. It has greatly increased the production efficiency and safety, effectively save the production cost.

Slurry let down and vent angle valve is the most best choice for mining, smelting, chemical industry equipment in pipeline. It makes up for the scour resistance valve technology of deficiency in domestic, solves all kinds of problem for weak erosion resistance of control valve, improves the reliability in the process of control valve in chemical refining pipelines.

### Relevant patent of valve:

ZL201220223527.7 Slurry let down and vent angle valve

#### 1. The buffer structure design of valve's cavity.

Reducing pressure is useful for buffering before medium through the disc. The valve body instantly reduces the pressure of medium, the slurry can not lead to the body in excessive erosion and wear.

#### 2. The parabola without dead end design for valve's cavity.

The design can make the fluid to flow through smoothly, it can not have a positive erosion with inner parts because of a sharp turn for the shell wall.

#### 3. Guide the medium flow direction.

The medium will generate to cavitation after high speed flow, the cavitation will focus on the disc and seat. So the disc and seat need use select material which is in high hardness and wear-resistant.

#### 4. Guide sleeve design.

The guide sleeve design is isolating medium and protect the valve stem core, the disc will not be vibrated and it has multiple spacer rings.

#### 5. Renewable disc and Renewable seat design.

If the disc and seat are damaged and worn out in special condition, it is unnecessary to replace the valve, only need replace the disc and seat is fine. It is save the repair time and cut down the repair cost charge.

#### 6. Lengthened seat for flash drum control valve.

The lengthened seat is mainly protect the flashing tank, let the medium straight flow one direction to center position of reaction tank, and do not allow the medium to scour the wall of tank.



## Segment Control Ball Valve

A special V-shaped cut is designed on the valve core (hemisphere) to provide it with best disconnection and control ability in ball valves. Segment ball has shearing action with metal seat. Segment ball valve is applicable in some fluids such as Fibers, micro granules and slurry etc. Sealing face is self-clearance. When the ball rotates away the seat, the fluid in pipe will averagely flow through the ball sealing face in 360 degree. This design can avoid the scouring on seat and wash away the accumulation, namely the self-clearance.

### Relevant patent of valve:

ZL200620141832.6 Titanium steam jacket ball valve

ZL200820171392.8 Trunnion type titanium, zirconium ball valve

ZL201120141048.6 Scouring resistance ball valve

ZL201420327887.0 Half spherical ball valve in full bore

ZL201420327876.2 High temperature and resistant scour intelligent reversing valve

### Features:

1. Hardness treatment will be performed on stem and ball to achieve a protective film on surface that can strengthen the anti-corrosion and HB. Thus will be more flexible to open switch and avoid from the scratch.
2. Spring load design on the seat enhances the pressure and sealing performance.
3. Single seat design will eliminate the medium accumulation in body vent.
4. V-notch on the ball let the flowing characteristic approximate equal percentage
5. Three-seal protecting for packing's part: back seal, O ring seal, packing seal.
6. The valve can reach the maximum flow capacity and low pressure loss when fully opened.
7. Packing seal material is PTFE from Japan DAKIN Company or flexible graphite.
8. V type gland flange design
9. Replaceable seat and ball
10. ISO 5211 mounting pad



## Control Ball Valve

Ball valve is evolved from plug valve, the opening and closing parts is a ball, using the ball goes around the axis of the stem 90 degree to achieve the aim of opening and closing. In pipeline, ball valve is mainly used for cutting rolling, the distribution and change the flow direction of medium.

### Relevant patent of valve:

ZL200620141832.6 Titanium steam jacket ball valve  
 ZL200820171392.8 Trunnion type titanium, zirconium ball valve  
 ZL201120141048.6 Scouring resistance ball valve  
 ZL201420327887.0 Half spherical ball valve in full bore  
 ZL201420327876.2 High temperature and resistant scour intelligent reversing valve

### Features:

1. For special alloy control ball valve: hardness treatment will be performed on stem to achieve a protective film on surface that can strengthen the anti-corrosion and HB. Thus will be more flexible to open switch and avoid from the scratch.
2. Three-seal protecting for packing's part: back seal, O ring seal, packing seal.
3. Packing and stuffing box in Low leakage prevention design.
4. Packing seal material is PTFE from Japan DAKIN Company or flexible graphite.
5. Fire protection and anti-static structure design.
6. Blow-out proof stem
7. V type gland flange design
8. Floating type or trunnion type
9. ISO 5211 mounting pad



## Control Plug Valve

The plug valve can rotate 90° to connect or cut the medium. Body cavity with grooves and convex edges structure design can fix sleeve effectively, which can meet special application need. And the design can protect valves avoid from sleeve and plug rotation at the same time which may cause valve broken when close.

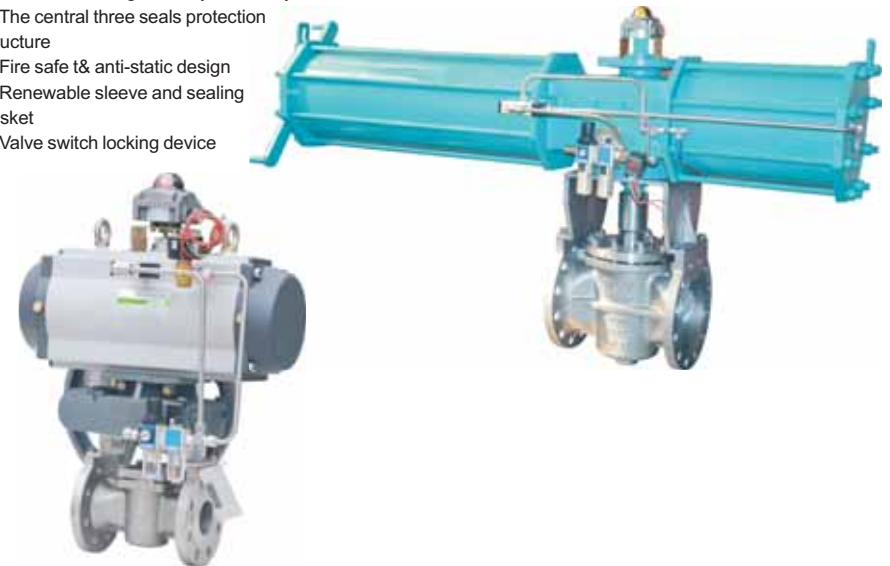
Sleeve material use Dupont PTFE, it has good strength, small friction factor, small torque, reliable seals, long service life etc. advantage.

### Relevant patent of valve:

ZL200920201533.0 Trunnion plug valve for severe application  
 ZL200920190134.9 Special alloy plug valve for severe application  
 ZL200920190135.3 Adjusting special alloy plug valve  
 ZL200920190136.8 Fire safe special alloy plug valve  
 ZL200620141806.3 Hastelloy double-groove soft seals Plug valve  
 ZL200720108251.0 Environmental full closed sampling valve  
 ZL200720108254.0 Environmental protection fully enclosed sampling valve

### Features:

1. The plug valve is regular port design, prevent medium deposit.
2. Seal sleeve closed the body prevent sleeve cold flow and deformation
3. Hardness treatment is performed on plug to achieve a protective film on stem's surface that can strengthen the anti-corrosion and hardness, so can be switching flexibility, not easily scratched.
4. The central three seals protection structure
5. Fire safe t& anti-static design
6. Renewable sleeve and sealing gasket
7. Valve switch locking device



## Control Discharge Valve

Discharge valve mainly used in reactor, tanks and other bottom containers. According to the actual requirement, the bottom reaction kettle designed to flat and body for Y type, taper disc can adjust flow control. When open the valve, the seat protect body from the medium erosion, corrosion, and do the hard face for disc&stem. Used line sealing, ensure the reliability of the seal and prevent scarring.

### Relevant patent of valve:

ZL200820171393.2 Titanium&Zirconium anti crystallization discharge valve.

### Features:

1. Discharge valve used Y type structure, the cavity smooth and small flow resistance coefficient. Medium through the valve pressure loss is small, and not easy to crystallization structure.
2. Replace disc and seat, sealing surface maintenance convenience.
3. Splintage stem, prevent disc rotating wearing off seal surface.
4. Packing gland bolts of double disc spring design, protect packing seal.
5. V type packing plate, prevent packing seal leakage
6. According to the reactor structure limits, discharge valve can be designed upward structure and downward structure.



## Control Butterfly Valve

Butterfly valve is a valve which can be used for isolating or regulating flow. It is called quarter-turn valve too. In operation, the valve is fully open or closed when the disc is rotated a quarter turn. The "butterfly" is a metal disc mounted on a rod. The closing mechanism takes the form of a disk. Operation is similar to that of a ball valve, which allows for quick shut off. The disc is positioned in the center of the pipe, passing through the disc is a rod connected to an actuator on the outside of the valve. Rotating the actuator turns the disc either parallel or perpendicular to the flow. Butterfly valves are generally favored because they are lower in cost to other valve designs as well as being lighter in weight.

### Relevant patent of valve:

ZL200510060404.0 Titanium butterfly valve with powerful oxidation corrosion resistance

ZL200620141833.0 Hastelloy butterfly valve

ZL201420327875.8 Bidirectional seals Butterfly valve

### Features:

1. Stem surface hard face, generating a protective film, improve anti-corrosive&surface hardness, switching flexibility, not easily scratched
2. V-wedge packing, good packing seal performance
3. Anti-low leak design packing&stuffing box
4. Packing&sealing material choose import PTFE
5. Fire resistant&anti-static structure
6. Blow-out proof stem
7. V-packing plate design
8. Sealing principle choose double eccentric or three eccentric
9. ISO5211 manual connecting



## Titanium And Titanium Alloy Characteristics

### 1. Outlet

"Strong, light, and rustproof" and what makes titanium so important. Titanium is an exceptional metal, highly reactive and uniquely corrosion-resistant.

Titanium is a remarkable, very light metal with a silvery colour that resists corrosion, that's because it reacts readily with oxygen and forms a protective layer of titanium oxide that keeps out air and water, also resists attack by strong acids and alkalis. Titanium was first used in chemical plant in the mid-1960's. Its outstanding resistance to corrosion in oxidising chloride environments, sea water and other aggressive media were rapidly established. In several processes titanium is the first and only choice for effective plant performance and acceptable levels of life cycle cost. Today titanium is more widely used.

### 2. Titanium valves Corrosion resistance characteristics

WSV titanium valves normally use titanium Grade 2, Gr.3, Gr.5, Gr.7, Gr.12

The general properties of titanium valves can be summarised as follows:

- High corrosion resistance • Good erosion resistance
- Favourable strength • Pleasing appearance • Hard smooth oxide skin
- Titanium valves in the atmosphere, fresh water, sea water, high temperature steam, almost no corrosion;
- Titanium valves in alkaline media is very anti-corrosion;
- Titanium valves in the resistance to chloride ion (Cl) capability is very strong, has good resistance
- Titanium valves in aqua regia, sodium hypochlorite. Chlorine water, wet chlorine gas and other media have a good corrosion resistance;
- Titanium in organic acids in acid corrosion resistance as the reduction or oxidation of the size of;
- Titanium valves in reducing acid corrosion resistance, as the media is a corrosion inhibitor be;
- Titanium valves, light weight, high mechanical strength, widely used in aviation and military fields

Such as low density, good mechanical characteristics and corrosion resistance are important factors that will quickly justify the use of titanium valves. Up to now it has turned out that applying titanium valves guarantees an effective solution to corrosion problems in certain environments Titanium should in principle always be considered, Nitric acid industry, Onshore and offshore sea water environments, Chlor-alkali industry, Soda industry, Fine chemical industry and so on, Well-known applications also include pulp & paper industry.

### 3. Titanium Valve Selection Considerations

- Should not be used for concentration of > 98% or with > 6% free NO<sub>2</sub> of red fuming nitric acid;
- Should not be used in water content less than 1.5% of the dry chlorine gas in pure oxygen (PO<sub>2</sub> > 35%) occur naturally in the explosion;
- Titanium valve corrosion medium containing hydrogen, in addition to considering corrosion, the hydrogen should pay full attention to the danger of hydrogen embrittlement of titanium valves;
- Titanium valves need pay attention on the points in the corrosive medium and stress corrosion crack orientation;
- Titanium valve temperature should not exceed 330°C.

Titanium valve material selection, we must fully consider the corrosive condition of the working temperature, medium composition, the concentration of each component, the water content, with special consideration of titanium valves appear in the condition medium point crevice and stress corrosion tendency, natural explosions, attention for various reasons to produce hydrogen embrittlement of titanium and other catastrophic damage factors.

## Nickel And Nickel Alloy Characteristics

### 1. Outlet

Nickel and nickel alloy materials to ensure that pipeline valves long-term safe, reliable, stable operation even in the extreme harsh corrosive medium. Widely applies in chemical, petrochemical, metallurgy, atomic energy, ocean development, desulfurization plant and so on pipeline industries. Nickel and nickel alloys valves such as pure nickel valves, nickel-chromium alloy valves, nickel-copper alloys, Ni-Mo alloy valves, Ni-Cr-Mo alloy valves.

### 2. Anti-corrosion characteristic and application:

**Pure nickel valves corrosion resistance feature:** It is extreme anti-corrosion under any densities and high temperature caustic alkaline solution, and the anti-alkali crack performance is outstanding. Mainly applies in high temperature thick alkali corrosive medium condition.

**Monel valves corrosion resistance feature:** It has an excellent anti-corrosion performance in the reducing acid medium, and resistant to any density of hydrofluoric acid solution corrosion. Mainly applies in high-temperature hydrogen fluoride gas and hydrofluoric acid solution condition.

**Inconel/Incoloy valves corrosion resistance feature:** It has very well bears the stress corrosion performance in the high thick chloride solution. Widely applies in high-temperature water, high-temperature alkaline solution corrosive medium.

**Hastelloy C series valves corrosion resistance feature:** Hastelloy C series are many advantages of corrosion resistant alloys. Have good resistance for corrosion and oxidation medium reducing media, excellent resistance to stress corrosion cracking and resistance to localized corrosion. Hastelloy C series in the chemical and petrochemical industry has been widely used, such as the application of the contact elements and catalytic systems in chloride-containing organic compounds. Particularly suitable for use at high temperatures, contaminated magazine inorganic acids (phosphoric acid) and organic acids (such as acetic acid, formic acid, acetic acid), sea water corrosion and other conditions.

**Hastelloy B series valves corrosion resistance feature:** Have high corrosion resistance for all concentrations hydrochloric acid below boiling temperature; have corrosion resistance for below 60% concentration sulfuric acid, phosphoric acid, secondary copper chloride etc. reducing salt medium.

**Hastelloy G series valves corrosion resistance feature:** Phosphate and many highly oxidizing acid medium of mixed acids such as nitric acid / hydrochloric acid, nitric acid / hydrofluoric acid and sulfuric acid medium, Hastelloy G series material relative to the other alloys have a more effective anti-corrosion.



## Zirconium And Zirconium Alloy Characteristics

### 1. Outline:

Zirconium is a precious metal and the price is relatively expensive. But as a result of its unique physics and chemistry corrosion resistance performance, so that it cannot be substituted in domain applications and so on the nuclear industry, aviation, civil aviation and chemical industrial. Widely used in pipeline safety technology to ensure long-term, stable and reliable operation.

Zirconium materials in civilian industry, because it has the outstanding corrosion resistance characteristic in the oxidative medium and the reducible medium corrode condition, in particular in temperature above 100°C reducible hydrochloric acid and the sulfuric acid, the phosphoric acid, the acetic acid. Has the excellent corrosion resistance which other material like titanium and the titanium alloy, the nickel and the nickel alloy etc. materials are unable to compare. Zirconium corrosion resistance compared to the nickel alloy is high to several levels, and widely used in harsh corrosion conditions.

### 2. Anti-corrosion characteristic and application:

Have excellent corrosion resistance for any density and high temperature even boiling hydrochloric acid, it is not easy to have the slit corrosion, point corrosion and stress corrosion.

Available in the sulfuric acid medium which the density below 70% and temperature is boiling point or higher than the boiling point.

Available in any density acetic acid medium below 250°C, and does not corrode nearly.

It is a unique anticorrosion material that applicable for any density alkaline solution and the fusing alkali medium.

It has the extremely good corrosion resistance in the organic acid.

### 3. Attention:

Forbid strictly applying in the hydrofluoric acid, the aqua regia, the hydrofluosilicic acid and the sulfuric acid, in the nitric acid nitration mixture medium.

Forbid strictly using in the dry chlorine and the fuming nitric acid medium.

Must fully consider the corrosive medium temperature, medium ingredient, various ingredients density, water content etc. upon select the zirconium valves.

## SPECIAL ALLOY MATERIAL SERIES

Material Group	Forgings	Castings	Bars	
	Spec.No.Grade	Spec.No.Grade	Spec.No.Grade	
Titanium alloy	Titanium			
	Titanium Gr. 2	B381 Gr. F-2	B367 Gr. C-2	B348 Gr. 2
	Titanium Gr. 3	B381 Gr. F-3	B367 Gr. C-3	B348 Gr. 3
	Titanium alloy			
	Titanium Gr. 5	B381 Gr. F-5	B367 Gr. C-5	B348 Gr. 5
	Titanium Gr. 6	B381 Gr. F-6	B367 Gr. C-6	B348 Gr. 6
	Titanium Gr. 12	B381 Gr. F-12	B367 Gr. C-12	B348 Gr. 12
Titanium Gr. 7	B381 Gr. F-7	B367 Pd7B	B348 Gr. 7	
Nickel base alloy	Ni			
	Nickel200	B564 N02200	A494 C2100	B160 N02200
	Nickel201	B160 N02201		B160 N02201
	Ni-alloy			
	Monel 400	B564 N04400	A494 M35-1/M35-C	B164 N04400
	Monel K500	B865 N05500		B865 N05500
	Inconel 600	B564 N06600	A494 CY40	B166 N06600
	Inconel 625	B564 N06625	A494 CW6MC	B446 N06625
	Incoloy 800	B564 N08800	A351 CT15C	B408 N08800
	Incoloy 800H	B564 N08810		B408 N08810
	Incoloy 825	B564 N08825	A494 CU5MCuC	B425 N08825
	Hastelloy B	B335 N10001	A494 N12MV	B335 N10001
	Hastelloy B-2	B462 N10665	A494 N7M	B335 N10665
	Hastelloy C276	B564 N10276	A494 CW12MW / CW6M	B574 N10276
Hastelloy C-22	B564 N06022	A494 CX2MW	B574 N06022	
Hastelloy C-4	B574 N06455	A494 CW2M	B574 N06455	
Hastelloy G	B462 N06007		B581 N06007	
Hastelloy G30	B462 N06030		B581 N06030	
Zirconium	Zirconium702	B493 R60702	B752 702C	B550 R60702
Zirconium	Zirconium705	B493 R60705	B752 705C	B550 R60705
Iron base alloy	Duplex stainless steel			
	Duplex S31803	A182 F51(2205)	A890/A995 4A(CD3MN)	A276 S31803
	Super-Duplex S32750	A182 F53(2507)	A890/A995 5A(CE3MN)	A276 S32750
	Super-Duplex S32760	A182 F55	A890/A995 6A(CD3MWCuN)	A276 S32760
	Super austenitic stainless steel			
	904L	A182 F904L		B649 N08904
	254SMO	A182 F44	A351 CK3MCuN	A276 S31254
	AL-6XN	B462 N08367	A351 CN3MN	B688 N08367
	Alloy 20	A182 F20/B462 N08020	A351 CN7M	B473 N08020
	austenitic stainless steel			
	304	A182 F304	A351 CF8	A276 304
	304L	A182 F304L	A351 CF3	A276 304L
	316	A182 F316	A351 CF8M	A276 316
	316L	A182 F316L	A351 CF3M	A276 316L
	316Ti	A182 F316Ti		A276 316Ti
	317	A182 F317	A351 CG8M	A276 317
	317L	A182 F317L	A351 CG3M	A276 317L
	347	A182 F347	A351 CF8C	A276 347
	310	A182 F310	A351 CK20	A276 310
	310S	A182 F310S	A351 CK20	A276 310S
Copper	Copper alloy			
	Ni-Al-Br		B148 C95800/C95500	

The above materials are applicable to valve shell. Contact WSV for the valve component materials. Trademarks appeared on the book: SandvikAB for SAF2205/ SAF2507 SPECIALS METALS for Inconel, Monel, Incoloy, Haynes for Hastelloy Allegheny Ludlum for AL-6XN Avesta for 254SMO, SUMITOMO for DP3W/NAR.

