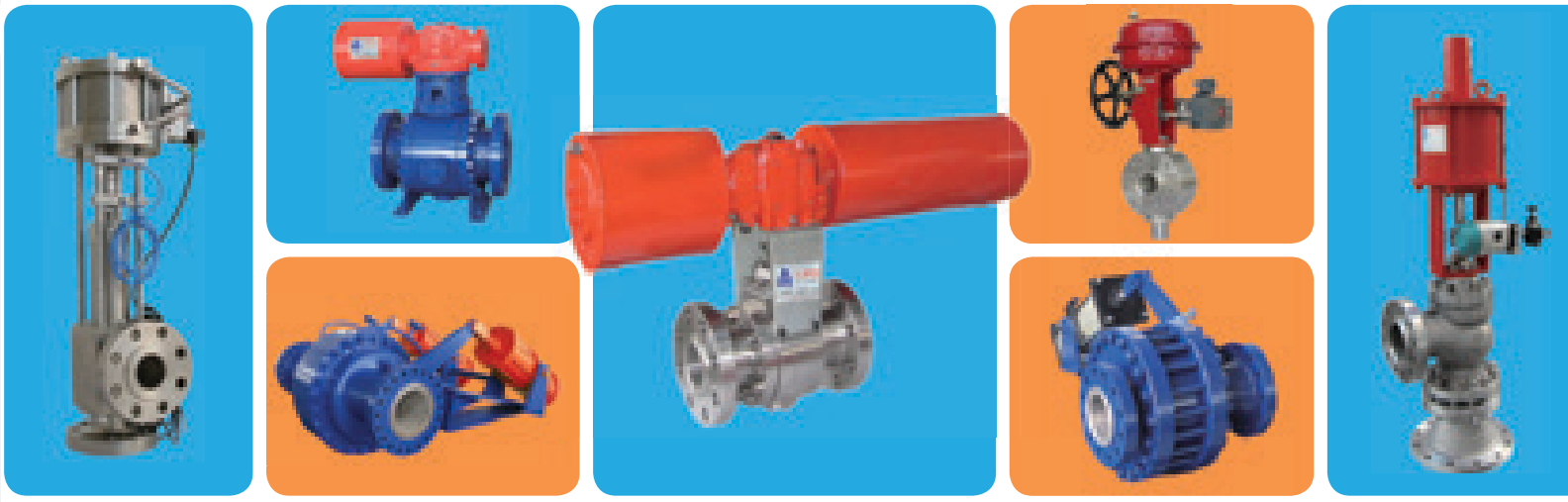
Oxygen Service Ball Valve



Suzhou Antiwear Valves Co., Ltd.

Leading Manufacturer and Designer of Full Ranges of Industrial Valves

Antiwear Group, as a leader in designing and manufacturing of full ranges of industrial valves, from general use applications to harsh conditions, supplies ball valve, butterfly valve, plug value, gate valve, globe valve, check valve, piston valve, regulating valve, rotating disc valve and labyrinth control valve, which are widely applied in refinery, oil&gas, power generation, water treatment, petrochemical, urban construction, paper&pulp, pipeline transferring and other industries. The performance of above valves supplied by Antiwear is appreciated by more and more users worldwide.

Antiwear firmly believes that honesty is not just a virtue, but a work attitude and way of life. In the high-speed development of Antiwear, the company has gradually formed "It's reliable" culture, which means reliable products, reliable people and reliable service. Antiwear Group has completed the quality assurance system certification and passed a series of certificates, including ISO9001, ISO14000, ISO18000, TS, API6D, API607, ISO5848, PED, API6A and so on.

Antiwear Group boasts manufacturing workshops in Suzhou, Wenzhou, and Shanghai, China and will establish localized warehouses, sales and distributors around the world. Through the Internet + production and APP system applications, it can quickly respond to customer needs. Antiwear's ultimate goal is to "help customers enjoy a better life"

Best Solution

In the spirit of excellence, continuous improvement, Antiwear keeps on improving the quality of the valve. Besides general use application, Antiwear has done lots of research on critical service including high temperature, high pressure, corrosion, crystallization, high frequently operating and other severe conditions in silicon chemical industry, coal gasification, petrochemical, hydrometallurgical and other areas and summed up the excellent solution in a large number of practices.

- High temperature and high pressure pure oxygen and hydrogen conditions ---- oxygen and hydrogen ball valve, globe valve, check valve
- Solid abrasive material ----- metal sealed ball valve, rotating disc valve, twin-disc valve
- High temperature exceeding 450℃ conditions ------ high temperature ball valve, high temperature rotating disc valve, high temperature gate valve

•PP/PE system annual operating cycles reaching 1.6 million ----- PDS high-frequently operating metal and soft sealed ball valve
•Solid abrasive particles at high pressure differential venting----- sliding plate valve
•Corrosive conditions ------ plug valve, ball valve
•Fiber and pulp working conditions ----eccentric semi-ball valve
•High temperature solid particles bi-directional sealed ball valve- S-ZORB ball valve
•Flushing, flashing, cavitation conditions ---- angle slurry control valve
•Zero-leakage request with gas medium at large size pipe ---- triple-eccentric butterfly valve
•Slurry conditions ---- Y-type globe valve
•Crystallization or slurry conditions ----- plug valve, eccentric semi-ball valve
•Precipitation conditions ---- piston valve
•Multi-level buck and flash conditions ---- Labyrinth control valve

Five strengths of Antiwear

Overall solution
•Full range of valves
•All industry applications
•Application of all conditions
•Customize for customers
•Excellent performance under harsh conditions
•Extensive R&D and experience

Best quality
•100% parts inspection
•100% finished product inspection
•100% supplier certification
•100% process tracking
•Advanced processing and testing equipment
•Complete quality control system and certification

Quick response
•24 hours fast response
•Global warehousing
•Global sales and distributors
•Quick inquiry / quote software
•Order information bar code query system
•Abnormal order information active push

Internet + production model
•Online sales and service
•Personalized customization
•Specialized small intelligent factory
•Online development, design, procurement, production

Reliable culture
•Reliable product
•Trustworthy person
•Timely service
•Wish you enjoy better life

ANTIWEAR VALVES

Product Display under Harsh Working Conditions

Metal Seated Ball Valve
Features: Quantitative compression, Double bearings, Belleville spring compensation, many hard alloy coatings meet different medium requests
Serve area: abrasive resistant, high temperature
Size Range: DN15 ~ DN600, 1 / 2 "~ 24"
Temperature range: -196 ° C to 850 ° C
Pressure Rating: PN10 ~ PN670,
CLASS150 ~ CLASS4000

Oxygen Service Metal-Seated Ball Valve
Features: No sticking while operating after fully degreased, fire-proof and anti-static, smoothly operating without any "jam", leakage rate meet ASME B16.104 VI within a long time running
Size Range: DN15 ~ DN600, 1 / 2 "~ 24"
Temperature range: -196 ℃ ~ 420 ℃
Pressure Rating: PN10 ~ PN420,
CLASS150 ~ CLASS2500

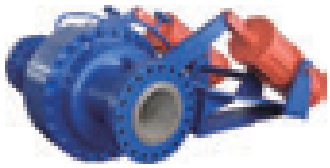
Triple Eccentric Butterfly Valves
Features: No sealing surface friction during operating, meet "Zero" leakage at uni-directional & bi-directional conditions.
Size Range: DN50 ~ DN4000, 2 "~ 160"
Temperature range: -196 ° C to 600 ° C
Pressure Rating: PN10 ~ PN420,
CLASS150 ~ CLASS2500

High Pressure Differential Control Angle Valve with Solid-liquid Fluid
Features: High pressure differential resistant, corrosive resistant, erosive resistant, pressure or flow regulating
Size Range: DN50 ~ DN300, 2 "~ 12"
Temperature range: ≤300 ° C
Pressure Rating: PN10 ~ PN260,
CLASS150 ~ CLASS1500

Rotating Disc Valve
Feature: abrasive resistant, much longer service life.
Serve area: coal gasification, polysilicon industry
Size Range: DN25 ~ DN1200, 1 "~ 48"
Temperature range: -196 ℃ ~ 850 ℃
Pressure Rating: PN10 ~ PN260,
CLASS150 ~ CLASS1500

Double Eccentric Butterfly Valve
Features: Small sealing surface friction during operating, very low leakage rate
Size Range: DN50 ~ DN4000, 2 "~ 160"
Temperature range: -46 ° C to 300 ° C
Pressure Rating: PN10 ~ PN50,
CLASS150 ~ CLASS300

High Frequently Operating Ball Valve
Features: quick opening/closing, high frequently operating, metal or soft seated
Serve area: PDS unit in polypropylene and polyethylene system, PSA unit
Size Range: DN15 ~ DN600, 1 / 2 "~ 24"
Temperature range: -46 ° C to 450 ° C
Pressure Rating: PN10 ~ PN260,
CLASS150 ~ CLASS1500

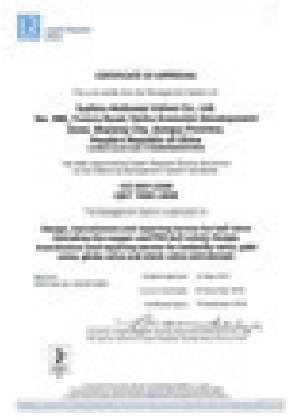


Rotating Twin-disc Valve
Features: Self-rotating & self-milling disc, pressure self-relieving design, frequently operating, abrasive resistant and longer service life
Serve area: lock hopper unit to feed coal powder, slurry, fly ash, silicon powder and other fluid
Size Range: DN80 ~ DN1200, 3 "~ 48"
Temperature range: -196 ° C to 850 ° C
Pressure Rating: PN10 ～ PN260,
CLASS150 ～ CLASS1500

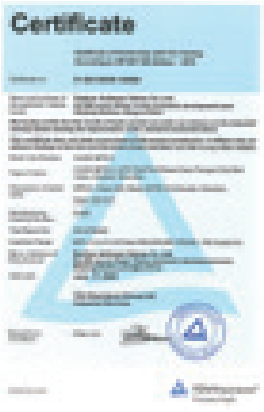
Labyrinth Control Valve
Features: flashing vaporization and cavitation resistant, low noisy, up to 24 multi-stages pressure decreasing design
Serve area: steam treatment, high pressure diffential
Size Range: DN25 ~ DN600, 1 "~ 24"
Temperature range: ≤ 700 ° C
Pressure Rating: PN10 ~ PN760,
CLASS150 ~ CLASS 4500

Patents

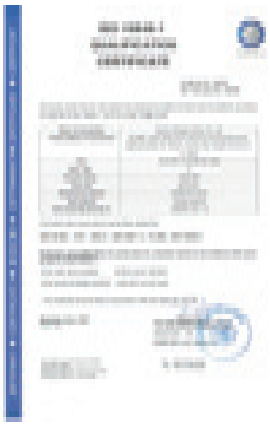
Certificates



ISO9001



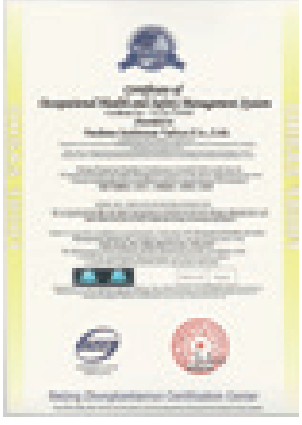
API607



ISO15848

PED

ISO14001



OHSAS18001

API6D

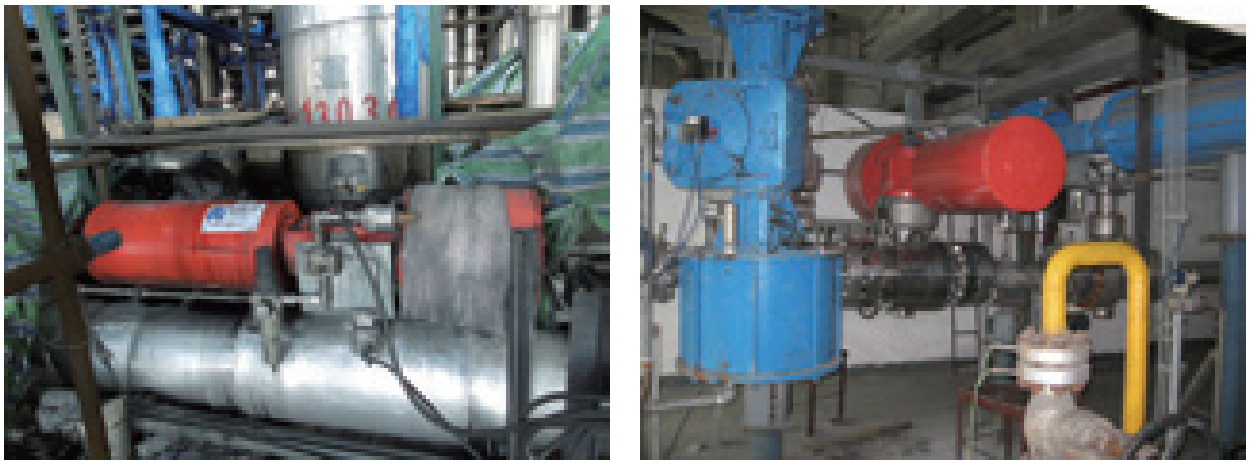
ANTIWEAR VALVES

Content

Brief Introduction

Product Introduction and Application

Oxygen valve has is widely used in coal chemical industry and air separation system of Texaco and Shell. Because of the oxygen is a strong oxidizing property media, once the heat accumulation, static shootout or leak is happened to the valve, it is easy to trigger the flaming or even explosion. So there is a very strict requirement for the valve which including the internal and external leakage, switching time, material selection, and useful life.



Oxygen Valve field application

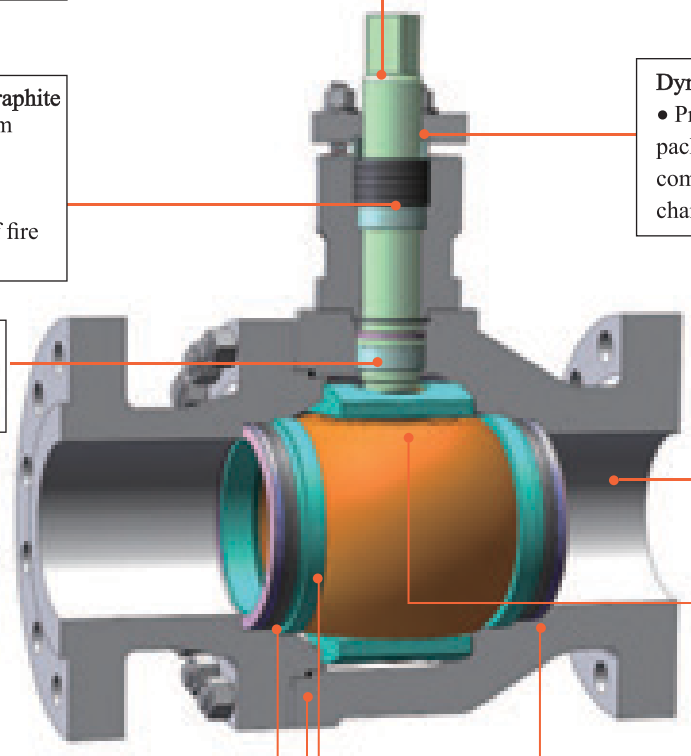
Antiwear special oxygen hard seal ball valve adopts Germany advanced technology, and has the following features:

- Special hard alloy coating completely solve the problems of hard alloy bond and heataccumulation under the condition of high pressure, high temperature, and pure gas. Under normal operating conditions, we can guarantee scatheless hard alloy coating for 30 years.
- Structure design of quantitative compression, double bearing, and butterfly spring compensation can ensure the torque's stability and switch position under high temperature, room temperature and low temperature conditions.
- Double slider bearing all the stem radial force, so that the valve stem do not have to bear the force. At the same time, the dynamic spring bearing packing design can ensure the external leakage to meet EPA and TA-LUFT standard.
- All the medium contact with sealing parts are oil-free and anti stripping graphite, not using an Oring, which can prevent the external and internal leakage because of the aged O ring.
- Fireproof and antistatic.
- Quality Guarantee period: 5 years.

Brief Introduction

Design Features

Antiwear special oxygen hard seal ball valve is using the advanced design concepts, and has the advantage of small torque, reliable sealing, good resistance, strong pertinence and long service life compare with similar products, Especially the Antiwear's hard sealing system is built on a large number of experimental and research basis, with strong abrasion and oxidation corrosion resistance.



The reliable design of valve stem
- Preventing Design
- Special anti-erosion design
- 1/4 fast switch

Actuator
- Manual, pneumatic and electric

Oil-free and anti stripping graphite
- Ensure the long life of stem sealing
- Leakage meets EPA and TA-LUFT standard
- Meet the API6FA needs of fire control

Dynamic pressure-bearing plate
- Provide pretightening force for packing which can effectively compensate temperature, pressure changing and abrasion damage

Unique two-bearing design
- Significantly reduce the friction torque

Smoothing design of channel
- Fillet of channel arris
- Weak stream channel, no impulse

Pressure- bearing slide
- Valve stem against radial force
- The protection design of valve stem, more reliable switch
- Reducing valve switching torque
- Reducing the Leakage

- Special sealing material
- Double wedge type self sealing packing structure ensures zero leakage between the valve seat and the valve body
- No O-ring, which can avoid catching fire, assemblage damage , cleaning damage and aging

Median flange quantitative pressure
- Reliable seal; stable switching torque
- Leakage meets EPA and TA-LUFT standard
- No O-ring, which can avoid catching fire, assemblage damage, cleaning damage and aging

Reliable sealing
- Meet the requirements of upper API 598/ ASME B16.104 VI
- Reliable bi-direction sealing

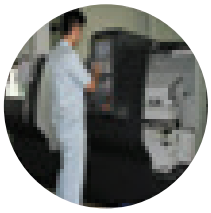
Optimal design of disc spring
- Ensure the excellent sealing feature in the low temperature differential
- Excellent high temperature features
- Compensate sealing abrasion

Cleaning and Assemblage

Assemble

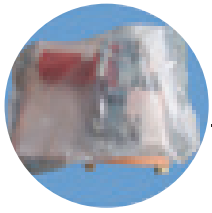
We assembled and packed the valves in the cleanroom which meets the GB50073-2001《Cleanroom Design Specification》.

According to the actual needs of components and raw material we had tests of RT, UT, MT, PT, and required 100% material composition test and mechanical properties test.



Antiwear has horizontal machining center, vertical machining center, horizontal digital readout boring head, spherical grinding digital display boring machine, vertical lathe, CNC lathe, surface grinder, grinding machine, various types of spherical lathe and device for heat treatment and other advanced processing equipment, which effectively ensure the processing precision and efficiency.

Reliable packaging: First cover the valve,second put it into the oil-free bag, third sealing after filling protection nitrogen and precluding pollution



Antiwear trained the relevant stuffs to ensure they know the design requirements and working specification of oxygen valve.

Professionally test the degreasing part, and clean the unclean parts

Antiwear degreases the parts under the requirements of European 4WPI-SW70003《oxygen cleaning and inspection and acceptance requirements》

Hard Sealing System

Oxygen valve's hard sealing system is mainly composed of a valve ball and a valve seat. Compared to ordinary metal hard seal ball valve, oxygen valve " dry friction is more serious, because the ordinary valve friction medium, such as coal, silica fume, water and so on, have a certain lubrication features. While the oxygen valve's medium is oxygen. And at the same time, after degreasing the valve sealing surface has no impurities, which is the true meaning of "friction", and this is a great challenge for the sealing surface of the wear resistance of the material. While through a large number of tests, dozens of sealing material proportioning test, Antiwear seek out the oxygen valve materials with super conditions pertinence, wear resistance and the reliability.

Damage Mechanism

The main damage mechanism of hard sealing system：

Adhesion	Micro welding between the valve ball and valve seat.
Friction Oxidation	Valve ball or valve seat produces reaction when the ball or seat activated after friction.
Abrasion	Micro-cutting between valve ball and valve seat, or between the valve plug and flow media.
Erosion	Valve plug micro-cutting because of flow media.
Corrosion	Uniform corrosion, pitting, contact corrosion, intercrystalline corrosion and stress corrosion.
Surface Damage	The fatigue of sealing material because of the thermal stress and mechanical stress change.

All of the above mechanism may become a lethal “killer” to hard sealing system; they may appear in the same time and interact. And in the oxygen medium, the abrasion has the biggest influence.

Damage coursed by Metal agglutination

Valve Seat Material

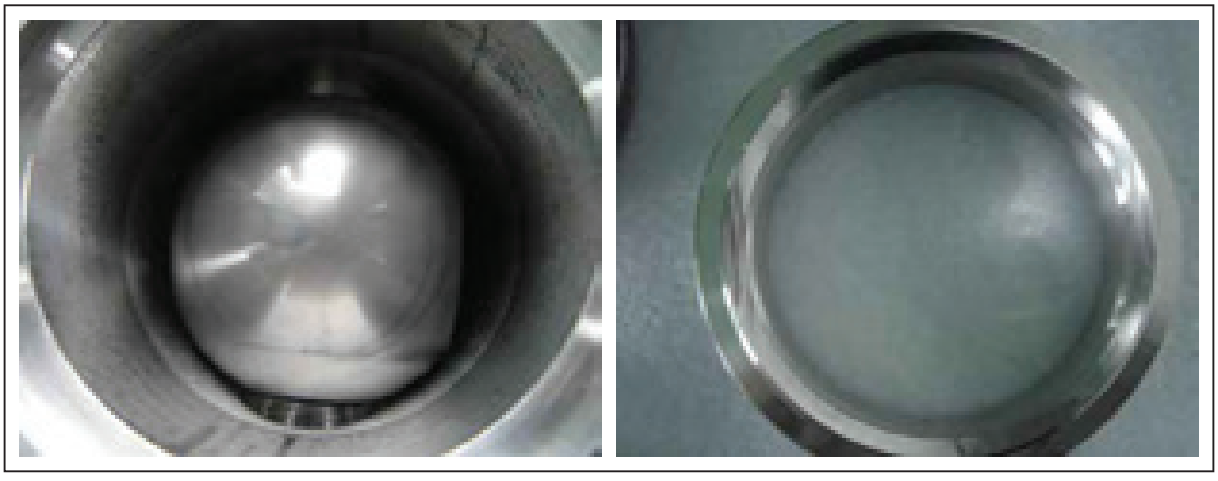
According to the different application conditions, the hard alloys of the valve seat and disc materials are available in the following types:

Hard alloy reference	Service Temp. (℃)	Hardness	Basic Elements	CoatingThickness (um)	Treatment Mode	Basic Materials
FSLLOY8	<550	55~59(HRC)	W-Cr-Si-Ni	400~600	High-temp. surfacing(c)	SS，Inconel
FSLLOY20	<300	82.5~85.5(HRA)	Al-O-Zr	----	Integral sintering	SS，Inconel
FSLLOY22	<650	68~74(HRC)	W-Cr-Si-Ni-C	120~220	Supersonic spraying	SS，Inconel
FSLLOY24	<650	68~74(HRC)	W-C-Co	120~220	Supersonic spraying	SS，Inconel
FSLLOY26	<850	This material is for Oxygen Valve			Supersonic spraying	SS，Monel，Inconel

a. Integral sintering means that the whole work piece is made from hard alloy by die-casting, molding, mechanical processing and high-temperature sintering. It has porosity of <1% with best strength and hardness as well as longer service life.

b. Supersonic spraying coating process is using supersonic flame air flow (the highest temperature is 3000 ℃ and speed is range from 1400 to 1700m/s) due to high temperature and high pressure generated in the combustion chamber by the fuel gas (e.g. propane) to spray the hard alloy powder on the surface of the components with high speed. The coating generated has such advantages as low porosity (Type A porosity <1%), high-bond strength (>70MPa, up to 83MPa), low residual stress and smooth surface, etc.

c. c.Spray-welding at high-temperature is another method for forming molten layer hard alloy surface by hot spraying onto preheated basic material and then integral heating for the coating to be re-melted on the surface of the basic material. The coating formed is a welded layer of a metal and the basic material rather than a pure cover coating. So it has the advantages of high-bond strength (up to 400MPa), low residual stress, and good resistance to corrosion, thermal impact and mechanical impact. The coating is very hard to fall off the basic material.



FSLLOY26 carbide and degreasing the valve ball and valve seat after switching 10000 times

Oxygen valve special hard alloy FSLLOY26 switched 10000 times in 9MPA high pressure, high temperature of 300 degrees celsius and degreasing condition, the switch still has no metal bonded jam phenomenon, and the sealing still meets ASME B16.104 VI level requirements!

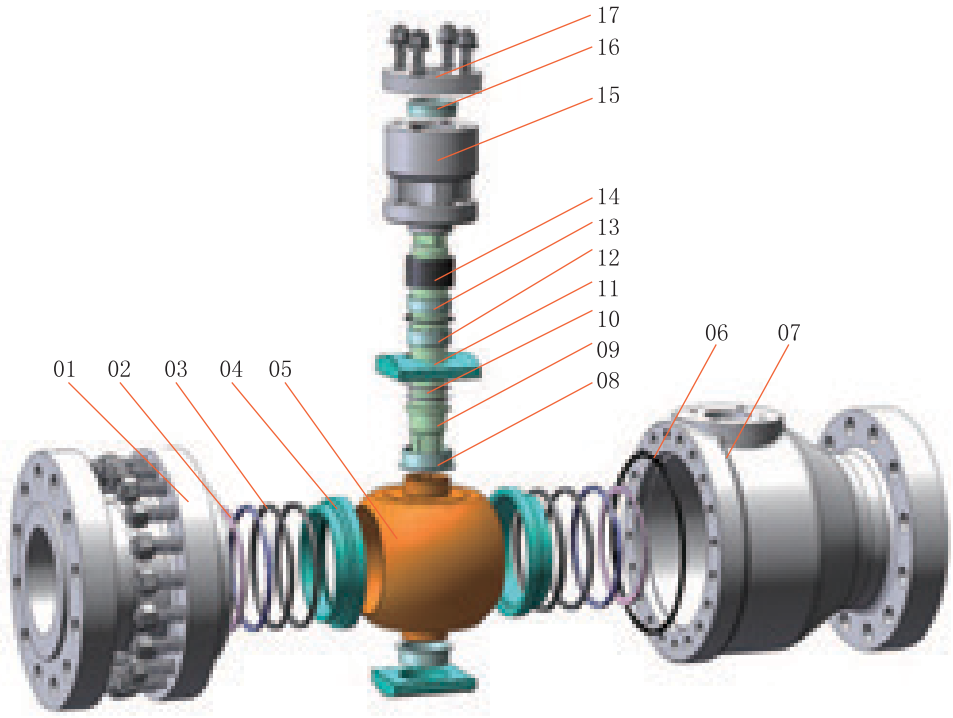
Structure

Technical specification

Standards	API 6D/ASME B16.34
Dimensions	ASME B16.10
Flange size	ASME B16.5
Test	API 598/ASME B16.104

Performance：

Size	1/2″ ~ 12″
Pressure Class	CLASS150 ~ CLASS4000
Temperature	-196℃ ~ 500℃



No.	Name	Material	No.	Name	Material
1	Body	F304/F316/CF8M/Monel/Inconel/Incolloy	11	Slide	F304/F316/Monel/Inconel/Incolloy
2	Disc Spring	Inconel	12	Bearing	F304/F316/Monel/Inconel/Incolloy+Fslloy
3	Sealing Ring	Oil-free Graphite	13	Sleeve2	F304/F316/Monel/Inconel/Incolloy+Fslloy
4	Seat	F304/F316/Monel/Inconel/Incolloy+Fslloy	14	Sealing Ring	Oil-free Graphite
5	Ball	F304/F316/Monel/Inconel/Incolloy+Fslloy	15	Sleeve3	F316/Monel/Inconel/Incolloy+Fslloy
6	Graphite Ring	Oil-free Graphite	16	Packing	Oil-free Graphite
7	Press Ring	F316/Monel/Inconel/Incolloy	17	Packing Box	SS
8	Cap	F316/CF8M/Monel/Inconel/Incolloy	18	Packing Bushing	SS
9	Sleeve 1	F304/F316/Monel/Inconel/Incolloy+Fslloy	19	Packing PressurePlate	SS
10	Stem	F304/F316/Monel/Inconel			

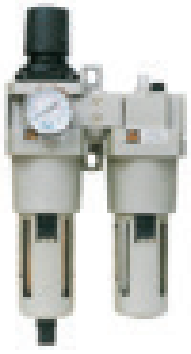
Note：For the other materials .

Actuator and Fittings

Our company can offer such services: providing actuator, Solenoid valve, positional valve and supplementary services of these fittings.

Pneumatic Actuator

Pipeline Accessories



Typically, for safety reasons, oxygen piping requirements quickly open fast-shut off, therefore, selection requirements is high for the actuators and accessories. Antiwear combines site gas usage, improves the design, and chooses high quality accessories and parts to ensure the stability and reliability in gas passage in use.

Ordering Instrucation

Model Schedule illustration

1	2	3	4	5	6	7	8	9	10	
AB	— 2	— T22	— 600	— RF	— 02	— A	— 02	— P	— O	

1、Product code name

AB——Ball Valve

2、Nominal diamete

NPS	1/2	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8	10	12
DN	15	20	25	40	50	65	80	100	125	150	200	250	300

3、Series

F21: Floating2-part cast ball valve
F22: Floating 2-part forged ball valve
F31: Floating 3-part cast ball valve
F32: Floating 3-part forged ball valve

T21: Trunnion 2-part cast ball valve
T22: Trunnion 2-part forged ball valve
T31: Trunnion 3-part cast ball valve
T32: Trunnion 3-part forged ball valve

4、Pressure Class

150	300	600	900	1500	2500	4000
CLASS 150	CLASS 300	CLASS 600	CLASS 900	CLASS 1500	CLASS 2500	CLASS 4000

010	016	025	040	063	100	160	260	420	670
PN10	PN16	PN25	PN40	PN63	PN100	PN160	PN260	PN420	PN670

5、Connection Mode

Raisedfaceflange	Ring join	Flat flange	Male& female	Tongue& groove	Threaded
RF	RJ	FF	FM/M	TG	TH

6、Body Material

03	F316/CF8M
09	Monel/ Inconel/Incolloy
10	F304L/CF3
11	F316L /CF3M
00	Other

7、Ball Material

C	E	F	G	H	X
316	Inconel 625	Monel	304L	316L	Other

8、Sealing Surface Material

26	FSLLOY26

9、Actuator

Handle	Worm gear	Pneumatic actuator	Electric actuator
L	W	P	E

Data Sheet

Suchou Antiwear Valves Co., Ltd.			INSTRUMENT DATA SHEET BALL VALVE Client Name				Rev.			
							Page			
1		Valve Model				Delivery Date				
2		Valve Name								
3		Tag No.				Actuator	Brand/Model			
4		Quantity					Quantity			
5		PID No.					Oper. Mode	Choose		
6		LINE NO.					Action Mode	Choose		
7		Pipe Size /Material					Gas Fail Position	Choose		
8							Elec. Fail Position	Choose		
9	Operation Condition	Process Fluid					Open/Close Time s			
10		Fluid State	Choose				Air Pressure Mpa			
11		Medium component	volume fraction				Pneumatic Connection	Choose		
12			mass fraction			Limit Switch	Brand/Model			
13			Min.	Nor.	Max.		Quantity			
14		Flux unit					Switching Type	Choose		
15		Flow Gas					Position	Choose		
16		Flow Liquid					Action Mode	Choose		
17		Density kg/m³					Contact Capacity	Choose		
18		Switching frequency Times/Day					Contact State	Choose		
19		Oper./Design Temp. ℃					Protection	Choose		
20		Oper./Design Press. Mpa					Elec Cert	Choose		
21		Inlet Pressure Mpa					Case Material	Choose		
22		Outlet Pressure Mpa					Elec Connection	Choose		
23		Diff. Press Mpa					Junction Box	Choose		
24		Opening △P MPa					Field Indicator	Choose		
25	Body	Body Structure				Solenoid Valve	Brand/Model			
26		Trim Type	Choose				Quantity			
27		NPS.	Choose				Body Structure	Choose		
28		Class rating	Choose				Action Mode	Choose		
29		Flange Connection Type	Choose				Operation State	Choose		
30		Leakage Class	Choose				Body Material	Choose		
31		Flange STD.		Choose			Coils	Choose		
32		Sealing	Choose				Energize Time	Choose		
33		Material Valve Body					Energize Power	Choose		
34		Material Valve Ball					Power Consumption	Choose		
35		Material Valve Seat					Protection	Choose		
36		Material Valve Steam					Elec Cert	Choose		
37		Material Valve Packing	Choose				Elec Connection	Choose		
38	Valve Service						Pneumatic Connection	Choose		
39							Junction Box	Choose		
40	Remarks:						Manual Device	Choose		
41	1.The default service temperature of pneumatic parts: -10℃~60℃;					Accessories	Back-pressure Valve	Choose		
42							Filter regulators	Choose		
43	2.The default assemble direction: vertical(except cutting valve);						Gas Tank Assembly	Choose		
45							Filter regulators	Choose		
47							Companion Flange	Choose		

Rev.	Description	Prepared	Checked	Approved	Date

Open Reliable Enterprising Innovative

FLOWTEX
It's reliable

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