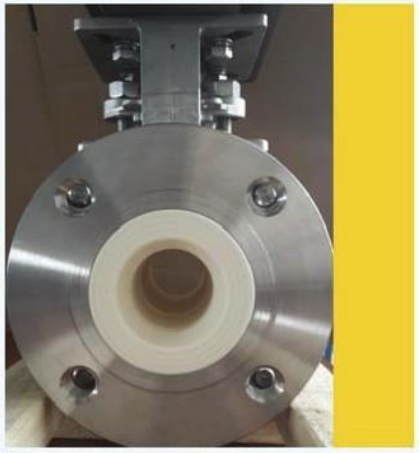

ABIS SEALS
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Ceramic Ball Valves

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Full Lined Ceramic Ball Valve

Due to the significant corrosion and abrasion resistant. ABIS series fully lined ceramic ball valves have the best performances kinds of excessively corrosive and abrasive applications as an on/off or a **control valve.**

A standard fully lined ceramic ball valve is designed with a flanged 3-pieces body for PN16-63(ASME Class 150-600), and in sizes DN15-DN300(1/2"-12j, while DN15-DN100(1/2"-4") has a floating ball and DN125-DN300(5"-12") has a trunnion ball. The **valves made of special materials are available on customers' request.**

Features

Construction

The three pieces design of the valves allows direct connection to the existing pipelines without pipe reducers in front and behind the valve. We can fulfill all your special requirements of Face-to-Face and flange type.

All the ceramic components are assembled within the forged metal body which absorbs the physical load and vibr ation f rom the piping **lines.**

Actuator is connected by yoke interface that meets ISO 5211. Most pneumatic and electric actuators of ball valves are 1/4 turn actuators. The yoke interface is removable and able to be easily modified to accommodate speclal applicatlons. Manual hand levers and gear **boxes are also available.**

Corrosion Resistant

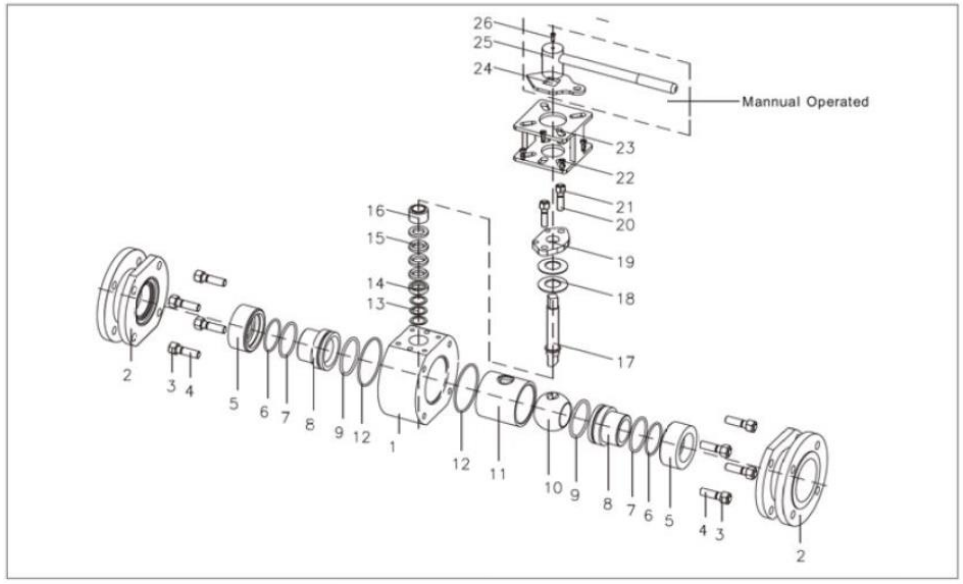
Cold Isostatic Pressing (CIP} and high-temperature sintering nanometer high-purity 99.5%alumina and zirconia ceramics will not interact with almost all organic and inorganic chemicals, nor contaminate the process media. Their physically and chemically stability against most acids and alk alis will last for many years with **little or no corrosive degradation.**

Abrasion Resistant

The hardness of99.5% allumina ceramics is about HRA88 or above, harder than zirconia (about HRA85), about 8 times harder than stainless Steel. As valve core**.ceramic components make thevalve** done well in the most severe abrasive conditions, such as pneumatic conveying to transport silicon powder.

Ceramic Ball Valves

Exploded View

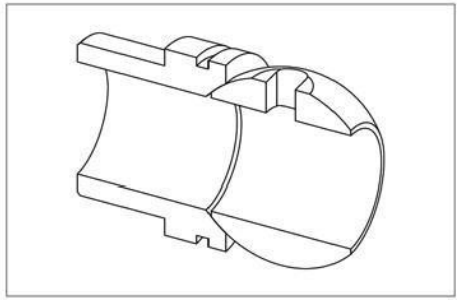


Parts List

Item	Part Name	Material
1	Body	A105N/SS304/SS316 SS304L/SS316L
2	End Range	A 105N/ SS304/SS316 SS304L/SS316L
3	Nuts	A194-2HA/8
4	Studs	At93-B7/B8
5	Clamp Ring	Ceramics
6	0-Ring	*Viton*
7	0-Ring	*Viton*
8	Seat	Ceramics
9	0-Ring	Viton
10	Ball	Ceramics
11	Housing	Ceramics
12	0-Ring	*Viton*
13	Washer	PTFE

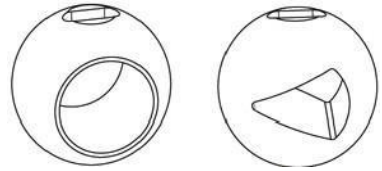
Item	Part Name	Material
14	Sleeve	SS304/SS316L/Hastelloy C 276
15	Packing	Graphite/ PTFE
16	Gland	SS304
17	Stem	17-4PH/ SS316/ Hastelloy C276
18	Disc Spring	SS304
19	Gland Flange	A351 CF8
20	Studs	ASTM A193-B7/B8
21	Nuts	ASTM A194-2H/8
22	Bolts	SS304
23	Yoke	A351CF8
24	Stopper	SS304
25	Handle Lever	SS304
26	Bolt	Stainless Steel

Ceramic Ball Valves



Ceramic-to-Ceramic Spherical Seal

The perfect spherical seal between the ceramic ball and seat ensureaClass VIshutoff. There is no clearance between the balland seat, which prevent the deep sealing surface being marred andscratched by particles. andthe ceramic ballwill not be stuckanyway



Round and V-port balls

ABIS offers each linesize two different balls: Round-port and V-Port. In general, the round-port ceramic ball valve is often used as a on-off valve. If precise and stable control **performance are highly required inanyapplication. the equal percentV-port ceramic ball valve isthe best choice.**

Technical Specifications

Size Range

DN15.20.25.32.40.50.65.80.100.125.150.200.250.300
NPS 1/2',3/4,1',11/4',11/2',2",21/2',3'.4'.5',6' .8", 10",12'

Size Range

PN16,25.40,63
ANSI Class 150.300.600

Face-to-Face Dimensions

According to ASME B16.10 or on customers'request

Temperature Range

-30°C-- 230°C (Standard Valves)
Max.600°C (High-temperature design)

Valve lightness

ANSI 816.104 Class VI(Zero leakage)

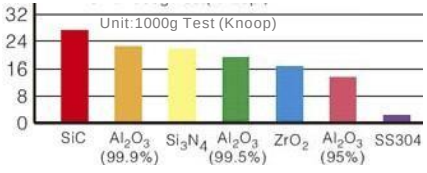
Materials

Body--A105N, SS304, SS316, SS304L, SS316L
Trim-High pure ceramics (99. 5% AI203. ZrC2)
Stem-17-4PH, SS316, SS316L, Hastelloy C276
Packing-Graphite. PTFE

Cv Values

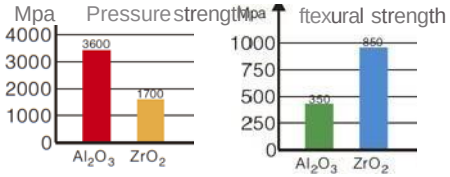
Size	Cv max 0-Port	Cv max V-Port
1/2"	15	8
3/4"	34	18
1"	45	18
11/4'	63	35
11/2'	114	87
2"	227	122
2112'	316	175
3"	482	240
4"	810	406
5"	1140	485
6"	1900	610
6"	2350	
10'	3870	
12'	5200	

Hardness Chart



Ceramics Performance

Items \ Materials	Unit	99,5 % Al_2O_3	Y-ZrO_2	Ce-ZrO_2
Bulk Density	g/cm³	3.9	6.0	5.5
Flexural Strength	Mpa	400	950	800
Elastic Modulus	Gpa	300	200	250
Hardness	HRA	88	85	86
Max.Temperature	℃	1500	500	500
Linear Expansion Coefficient	10^{-6}/°C	7.5	9.6	9.6



Corrosion Resistance

Compared to most materials, ceramics used in our valves **have more universal and much higher corrosion resistance, including in majority high-temperature acids and alkalis. But please be well noted that ceramics is sensitive in some certain media with different mixtures, state, pressure and temperature. Experienced application engineers from our** company is willing to supply professional technical support for you.

Corrosio n Resistance Chart

Media	Temp.	Al_2O_3 99,5%	ZrO_2	SS316	HC276
20%HCL	60 °C	A	A	C	B
20%HCL	90°C	A	A	X	C
60%H_2SO_4	60°C	A	A	C	B
60%H_2SO_4	90°C	A	A	C	C
10%HF	60°C	B	C	C	B
50%HF	90°C	C	X	X	C
60%HNO_3	60°C	A	A	A	C
60%HNO_3	90°C	B	A	B	C
30%NaOH	60°C	A	A	A	A
30%NaOH	90°C	B	B	B	A

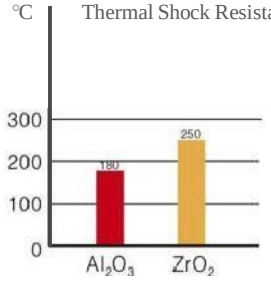
A-Negligible or no corrosion, recommended for valve use.
B-Little or slight corrosion, fitness for valve use.
C-Significantcorrosion, not recommended for valve use.
X-Violent corrosion, not allowed for valve use.

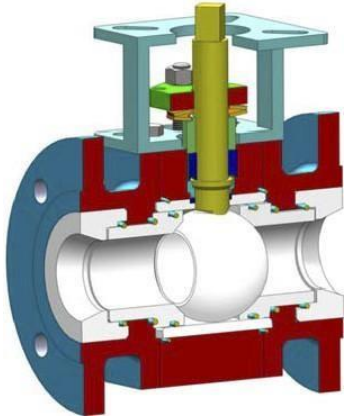
Mechanical properties

The mechanical properties of ceramics are very different from **metals. The pressure resistance of all ceramics is many times higher** than metals, but the tensile and the flexural strength is lower. Due to the high torque load, ceramic valve balls require materials with high flexural strength, in most applications, zirconia ceramics is used for valve balls.

High-Temp.&Thermal Shock Resistance

High pure alumina and stabilized, zirconia components could maintain their shape, structure, mechanical strength as well as other physical and(or) chemical characteristics up to high temperature that more than 1OOO°C. In addition to the material dependency, the thermal shock resistance is also highly different dependenting on the shape. In general, some simple shapes such as pipes and tablets have better thermal shock **resistance than components that havecomplex construction. therefore, all related conditions must be closely conserved.**





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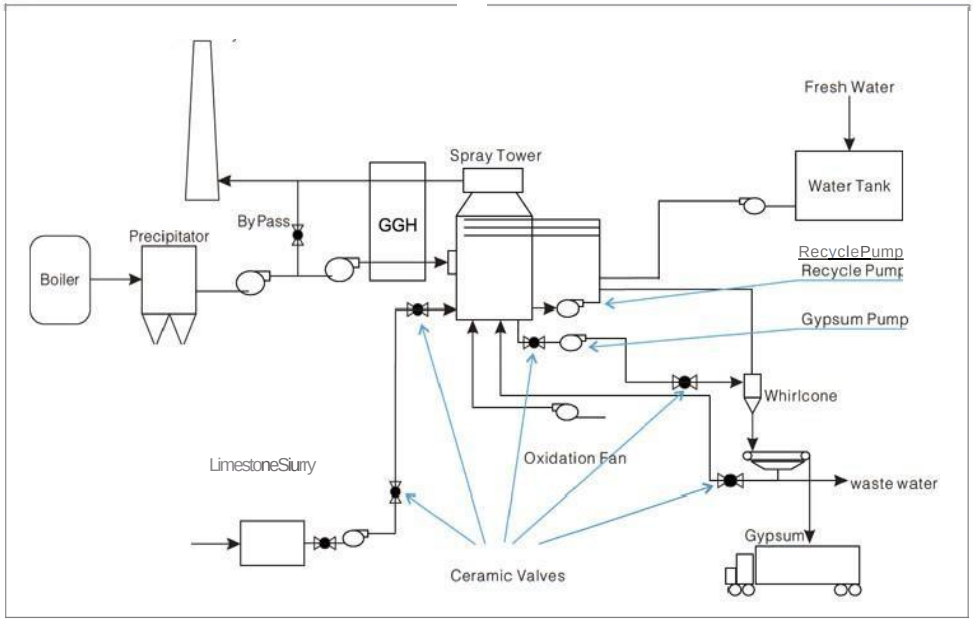
Ceramic Ball Valves

Typical Applications for Ceramics Ball Valves

Flue Gas Desulfurization,FGD

FGD is a process of treating flu gases with limestone slurry to remove SOx, NOx and other pollutants and produce gypsum slurry as a by-product. One of the technological challenges in FGD system is the highly corrosion and abrasion of the **slurry to the pipe lines and valves. Severe corrosion and** abrasion can result i n unacceptably high costs for replacement and maintenance. Therefore, by choosing the **best corrosion and abrasion resistant ceramic ball valves** and pipes will ensure that FGD can be cost-effectlve and stabilized.

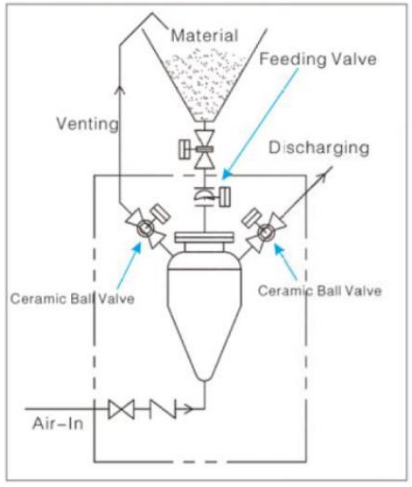


Ceramic Ball Valves

Powder Pneumatic Conveying

As the most popular transportation method for powder **materials all over the world. Pneumatic conveying** is **more** efficient, but the wear and abrasion problems normally occur in the pipe bends and valves, where the conveyed **material is subject to a high degree of turbulence, and the system's efficient will be reduced.**

When alumina and zirconia ceramics are used in pipes, bends and valves, things get better. Our ceramic ball valves have a unique structure with ceramics lines the flow path, which ensure wear and abrasion are avoided significantly. Generally, the service life of our fully lined **ceramic ball valve used in powder pneumatic conveying is about 3times longerthanothervalves.**



Notes:
(1) This is a typicalsystem, and others arealsoapplicable.
(2) Ceramic double-discvalve will be a good choice **asafeeding valve.**

Our **fully**lined ceramicball valvesarewidely used in all kinds of **powder andsolid materials including:**

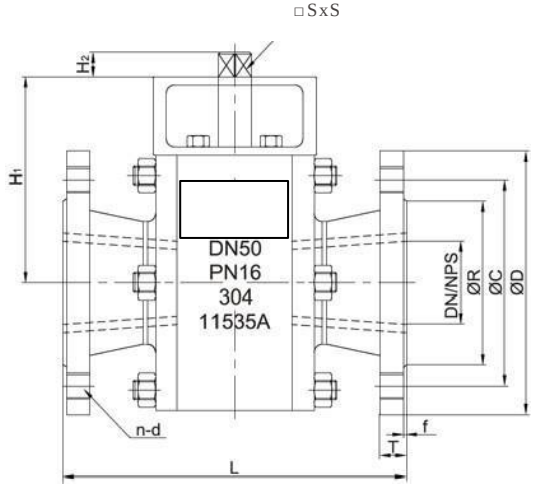
Powder
Resins
Pellets
Flakes
Fiber

Main Industries served:

Silicon powder
Alumina powder
Dry coal powder
Limestone powder
Cement
Coalpowder injection
Magnesium powder
Quarz sand
Metallurgical dust
Petroleum solid catalyst
Kaolin

Ceramic Ball Valves

Installation Dimensions



Size		(GB/T 9113.1 PN16.RF) Installation Dim.							(ASME B1.5 Class 150.RF) Installation Dim.						
DN	NPS	L	D	C	n-d	R	T	f	L	D	C	n-d	R	T	f
DN15	1/2"	108	95	65	4-M12	46	14	2	108	90	60.3	4-M12	34.9	11.6	2
DN20	3/4"	117	105	75	4-M12	56	16	2	117	100	69.9	4-M12	42.9	13.2	2
DN25	1'	127	115	85	4-M12	65	16	2	127	110	79.4	4-M12	50.8	14.7	2
DN32	1 1/4'	140	140	100	4-M16	76	18	2	140	115	88.9	4-M12	63.5	16.3	2
DN40	11/2'	165	150	110	4-M16	84	18	2	165	125	98.4	4-M12	73.0	17.9	2
DN50	2'	178	165	125	4-M16	99	20	2	178	150	120.7	4-M16	92.1	19.5	2
DN65	21/2'	190	185	145	4-M16	118	20	2	190	180	139.7	4-M16	104.8	22.7	2
DN80	3'	203	200	160	8-M16	132	20	2	203	190	152.4	4-M16	127.0	24.3	2
DN100	4'	229	220	180	8-M16	156	22	2	229	230	190.5	8-M16	157.2	24.3	2
DN125	5'	356	250	210	8-M16	184	22	2	356	255	215.9	8-M20	185.7	24.3	2
DN150	6'	394	285	240	8-M20	211	24	2	394	280	241.3	8-M20	215.9	25.9	2
DN200	8'	457	340	295	12-M20	266	24	2	457	345	298.5	8-M20	269.9	29.0	2
DN250	10"	533	405	355	12-M24	319	26	2	533	405	362.0	12-M24	323.8	30.6	2
DN300	12"	610	460	410	12-M24	370	28	2	610	485	431.8	12-M24	381.0	32.2	2

Note: The dataabove isstandarddimension. valves with other special dimension are available on request.

Actuation Installation Dimensions

Size	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	Dn125	Dn150	Dn200	Dn250	Dn300
1505211F-xx(1)	F-05	F-05	F-05	F-05	F-05	F-07	F-07	F-07	F-10	F-10	F-10	F-12	F-14	F-14
H1		94	94	102.5	108	135	146	160	196	213	235	270	330	350
H2	12	12	12	14	15	15	18	20	27	27	27	40	40	50
□SxS (2)	9x9	9x9	9x9	11x11	11x11	14x14	19x19	19x19	22x22	27x27	27x27	36x36	36x36	46x46
Torque	t9	25	25	30	40	50	90	130	220	260	350	550	1800	1800

Note:(1) Actuator connectionisdone byayoke interface that meets the dimensional standards of 1505211.
(2) Recommended torque of the actuators inN·M. Safely factor isnot included.

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