有氟密陶瓷阀

Ceramic Valve

Energy saving, environmental protection, innovation, service

CE API 6D DNV OHSAS 18000 ISO 14000 ISO9000 TS TS2710872:2010 TS2710876:2010

Ceramic Performance Specification

Item	Unit	Alumina (AL_2O_3)			Zirconia(ZrO_2)	
		AL_2O_3≥95%	AL_2O_3≥99%	AL_2O_3≥99.5%	3Y-TZP	Ce-TZP
Density	g/cm³	3.7	3.9~3.95	3.95	6.0~6.05	6.0
Hardness	HRA≥	86	88	88	87	87
Flexural Strength	MPa≥	300	350	400	1300	800
Max. temperature	℃	1200	1200	1200	900	1100
Liner Expansion Coeficient	10^{-6}/℃	7.5	8.2	8.2	9.8	9.6
Permittivity	∈r20℃,1MHz	9.0	9.2	9.2	9.3	9.3
Dielectric Loss	tan δ × 10^{4},1MHz	3	2	2	2	2
Volume Resistivities	Ω.cm20℃	10^{13}	10^{14}	10^{14}	10^{16}	10^{16}
Puncture Stength	KV/mm,DC≥	20	20	20	20	20
Compressive Strength	MPa≥	2500	2500	2500	4500	4500
Rupture Strength	MPa≤	200	350	350	1000	1000
Elastic Modulus	Gpa	300	350	350	----	----
Poisson Ratio	----	0.20	0.22	0.22	----	----
Thermal Conductivity	W/m•K(20℃)	20	25	25	----	----

Note: If thermal shock needed, please specify.

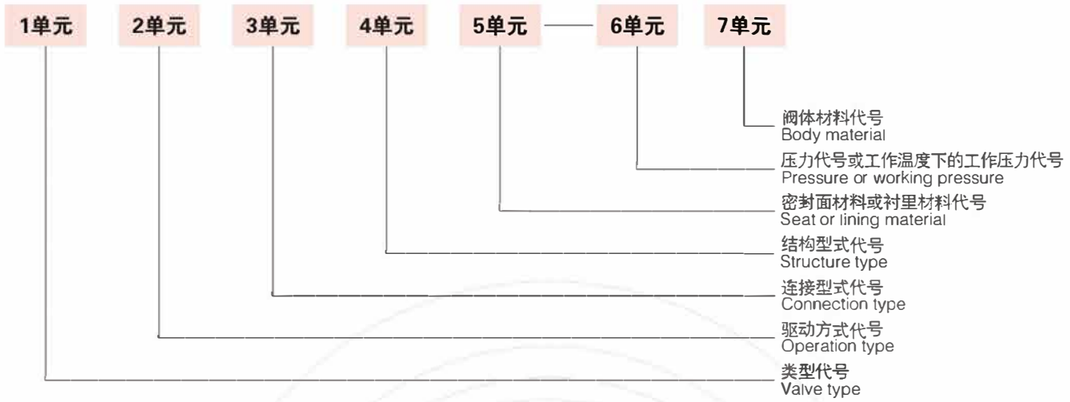
Corrosion Resistance Reference Table

Medium	HCL		H_2SO_4		H_3PO_4	
Mass Fraction	20%	20%	90%	90%	60%	60%
Temperature	60℃	95℃	60℃	95℃	60℃	95℃
99.0%AL_2O_3	a	a	a	a	a	a
99.5%AL_2O_3	a	a	a	a	a	a
ZrO_2	a	a	a	a	a	a
SS304	c	x	c	c	c	c
SS316	c	x	c	c	c	c

Medium	HF		HNO_3		NaOH	
Mass Fraction	10%	46%	60%	60%	30%	30%
Temperature	60℃	95℃	60℃	95℃	60℃	95℃
99.0%AL_2O_3	b	c	a	b	b	b
99.5%AL_2O_3	b	c	a	a	a	a
ZrO_2	a	c	a	a	a	b
SS304	c	x	a	b	a	a
SS316	c	x	a	a	a	b

a. Recommend to use because of no corrosion or corrosion can be ignored
b. Suitable to use because of light or less corrosion
c. Not recommend to use because of medium or high corrosion
x. forbid to use because of serious corrosion

Numbering System



一单元：阀门类型代号 (1. Valve type)

类型 Type	蝶阀 Butterfly Valve	隔膜阀 Diaphragm vaive	止回阀 Check valve	截止阀 Globe valve	节流阀 Throttle valve	排污阀 Discharge valve	球阀 Ball Valve	旋塞阀 Plug Valve	闸阀 Gate valve
代号 Code	D	G	H	J	L	P	Q	X	Z

当阀门还具有其他功能作用或带有其他特殊结构时，在阀门类型代号前再加注一个汉语拼音字母，按下表的规定。
When the valve also has other functions or with other special structure, in the valve type before charging a Chinese phonetic alphabet, by the following table.

第二功能作用名称 Function	保温型 Jacket type	防火型 Fire safe type	视镜球型 Sight glass ball type	排渣型 Discharge type	V型球阀 V-port ball valve	（阀杆密封）波纹管型 (Stem sealing)Bellow type
代号 Code	B	F	S	P	V	W

二单元：传动方式 (2. Operation type)

传动方式 Operation type	蜗轮 Worm gear	正齿轮 Spur gear	伞齿轮 Bevel gear	气动 Pneumatic	电动 Electric	手柄手轮 Handwheel
代号 Code	3	4	5	6	9	无代号 N/M

对于气动机构操作的阀门：常开式用6K、7K表示；常闭式用6B、7B表示　For pneumatic:6k,7k stand for normally open, 6B,7B stand for normally close.

三单元：连接型式 (3. Connection type)

连接方式 Connection type	内螺纹 FNPT	外螺纹 MNPT	法兰 Flange	焊接 Welding	对夹 Wafer
代号 Code	1	2	4	6	7

五单元：衬里材料 (5. Lining material)

材料 Materia	氟塑料Fluorine	陶瓷 Ceramic	硬质合金 Alloy Steel	阀体直接加工 None
代号 Code	F(注)	TC	Y	W

注：氟塑料为FEP、PTFE、PO、PFA时，代号分别为F46、F4、PO、PFA；半衬时，需加上阀瓣的材料。 Note: FEP ,PTFE,PO, PFA code is F46,F4,PO,PFA

六单元：公称压力 (6. Nominal pressure)

公称压力数值用阿拉伯数字直接表示，它是MPa的10倍 It marked with arabic number, which is 10 times of MPa.

七单元：阀体材料 (7. Body material)

阀体材料 Material	碳钢 Carbon steel	Cr13系不锈钢 Cr13 Stainless stee	铬钼钢 Cr-Mo steel	18-8系不锈钢 18-8 Stainless steel	球墨铸铁 Ductile Iron	Mo2Ti系不锈钢 Mo2Ti Stainless steel	塑料 Plastic
代号 Code	C	H	I	P	Q	R	S

TC 有氟密陶瓷阀

Numbering System

(4. Structure types)

Valve structure code refer to the following table.

IGate Valve Structure Type

结构形式Structure type				代号Code
Rising stem	Wedge type	Flexible disc		0
		Solid wedge	Single disc	1
			Double disc	2
	Parallel type		Single disc	3
			Double disc	4
Non-rising stem wedge	Wedge type		Single disc	5
			Double disc	6
	Parallel type		Single disc	7
			Double disc	8

隔膜阀结构形式代号 Diaphragm Valve Structure Type

结构形式 Structure type	代号 Code	结构形式 Structure type	代号 Code
屋脊流道 Weir type	1	直通流道Straight type	6
直流流道 Through type	5	Y形角式流道 Y type	8

蝶阀结构形式代号 Butterfly Valve Structure Type

结构形式 Structure Type		代号 Code
密封型 Seat	单偏心 Single Eccentric	0
	中心垂直板 Vertical disc	1
	双偏心 Double Eccentric	2
	三偏心 Tri-Eccentric	3
	连杆机构 One piece stem	4

截止阀、节流阀和柱塞阀结构形式代号 Globe Valve, Throttle Valve, Plunger Valve Structure Type

结构形式 Structure Type		代号 Code
阀瓣非平衡式 Non-balance disc	直通流道 Straight way	1
	Z形流道 Z way	2
	三通流道 Three way	3
	角式流道 Angle way	4
	直流流道 Through way	5

Check Valve Structure Type

结构形式 Structure type		代号Code
球型止回阀 Ball check valve		0
升降式阀瓣 Lift disc	卧式直通Horizontal through way	1
	立式直通 Lift through way	2
	角式流道 Y through way	3
旋启式阀瓣 Swing disc	单瓣结构 Single disc	4
	多瓣结构Multi-disc	5
	双瓣结构 Double disc	6
蝶形止回式 Wafer Check Valve		7

排污阀结构形式代号 Drain Valve Structure Type

结构形式Structure type		代号Code
液面连接排放 Liquid level connection discharge	截止型直通式 Throttle through way	1
	截止型角式 Throttle angle way	2
液底间断排放 The bottom of the liquid connection discharge	截止型直流式 Throttle through way	5
	截止型直通式 Throttle straight way	6
	截止型角式 Throttle angle type	7
	浮动闸板型直通式 Floating gate through way	8

球阀结构形式代号 Ball Valve Structure Type

结构形式 Structure Type		代号 Code
浮动球 Floating ball	直通流道 Straight way	1
	Y形三通流道Y three-way	2
	L形三通流道L three-way	4
	T形三通流道T three-way	5

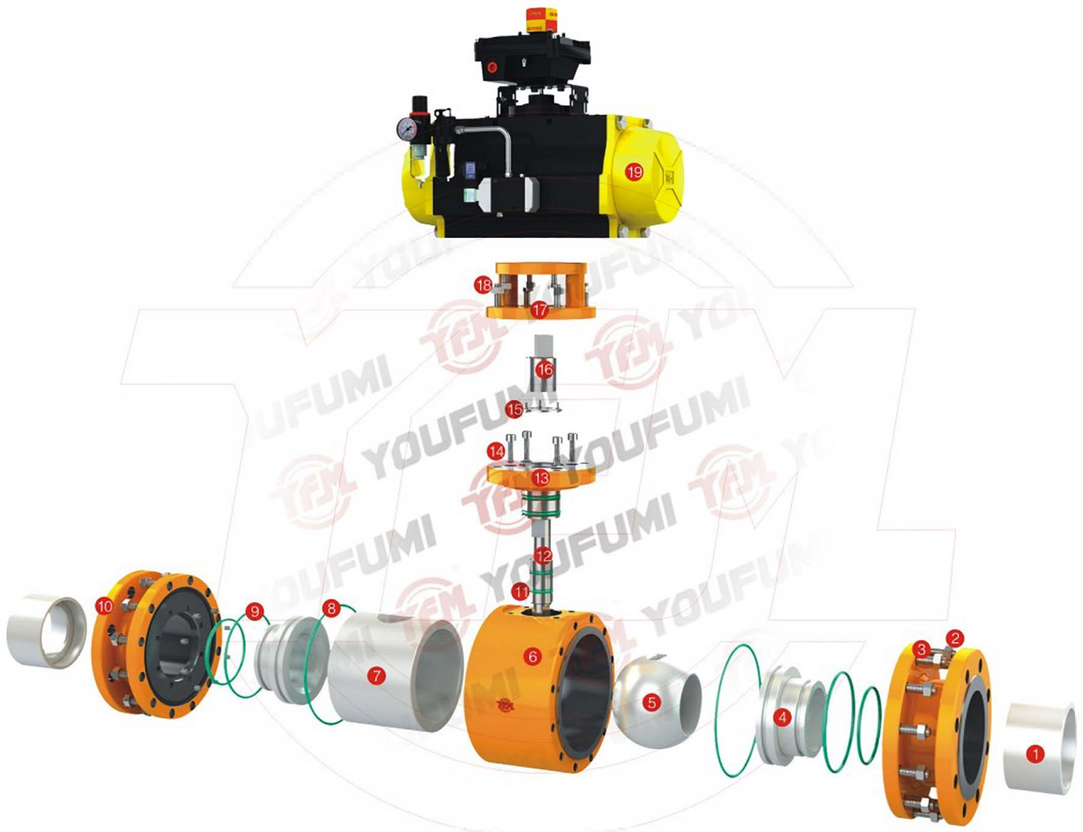
旋塞阀结构形式代号 Plug Valve Structure Type

结构形式 Structure Type		代号 Code
填料密封 Packing	直通流道 Straight way	1
	L形三通流道L three-way	4
	T形三通流道T three-way	5

举例：

1. **Q41TC-16P 表示为：**
   手动法兰式陶瓷球阀，公称压力1.6MPa，阀体材料为不锈钢，衬里材料为结构陶瓷；
   Q41TC-16P stands for manual flange type ceramic ball valve with 1.6 MPa nominal pressure, stainless steel body material and ceramic lining.
2. **Z73TC-16C 表示为：**
   手动对夹式陶瓷刀型闸阀，公称压力1.6MPa，阀体材料为碳钢，衬里材料为结构陶瓷；
   Z73TC-16C stands for manual wafer type ceramic knife gate valve with 1.6 MPa nominal pressure, carbon steel body material and ceramic lining.
3. **PZ644TC-16C 表示为：**
   气动法兰式陶瓷排渣闸阀，公称压力1.6MPa，阀体材料为碳钢，衬里材料为结构陶瓷；
   PZ644TC-16C stands for pneumatic flanged ceramic slug gate valve with 1.6 MPa nominal pressure, carbon steel body material and ceramic lining material.

※分解图(Cutway view)



※扭矩表 Torque Table

规格 Size	DN	DN15	DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150
	NPS	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"	4"	5"	6"
扭矩 Torche (N.M)	气压 0.6MPa	15	20	20	30	40	50	70	110	140	240	350
	水压 1.6MPa	19	30	30	50	70	90	110	200	240	360	450

以上数据是在实验条件下测得，可能与阀门实际使用工况有所不同，仅供参考，建议与我司联系以选用正确的执行机构。
The data shown above was acquied under test conditions that may be some the actual site conditions. This is only for reference, and please contact us for more information.

※各部件材质表 Material Specification

序号 No.	名称 Name	材质 Material	序号 No.	名称 Name	材质 Material	序号 No.	名称 Name	材质 Material
01	接管 Tube	结构陶瓷 Structural ceramics	08	O型圈 O-ring	氟橡胶 Viton	15	防飞垫 Control pad	2Cr13/SS304
02	螺柱 Bolt	A193-B7/B8	09	O型圈 O-ring	氟橡胶 Viton	16	连接轴 Coupling shaft	2Cr13/SS304
03	螺母 Nut	A194-2H/B8	10	阀盖 Bonnet	A105/ SS304	17	支架 Bracket	WCB/CF8
04	阀座 Seat	结构陶瓷 Structural ceramics	11	O型圈 O-ring	氟橡胶 Viton	18	支架螺栓 Bracket bolt	A193-B7/B8
05	球体 Ball	结构陶瓷 Structural ceramics	12	阀杆 Stem	2Cr13	19	气动执行机构 Pneumatic actuator	组件 Assembly
06	中阀体 Middle body	A105/ SS304	13	填料函 Stuffing box	SS316			
07	中体 Middle body	结构陶瓷 Structural ceramics	14	压盖螺钉 Gland bolt	A193-B7/B8			

※ The Advantages of Ceramic Valve

The metal valves are widely used in industrial applications. However there are many restrictions of the metal material under the harsh condition of high abbrasion and corrosion, which will cause serious leakage, shorten life time and affect the stability of the plant operation. Here are the advantages of ceramic valve that can make up for metal valve:

1. The sealing parts and the wearing parts are made by new high-tech structural ceramic material, which improve the performance of abrasive resistance and corrosive protection, prolonging the service life of the valve.
2. It can greatly reduce the replacement, repair cost if the ceramic valve applied, which can further improve the stability of equipment operation, and save labor cost.
3. It can improve the sealing performance of the industrial piping system. At the same time, using ceramic valve has the positive affect on environment protection. Moreover, the raw material of ceramic valve is low cost, can save a lot of metal and rare mineral resources.

陶瓷球阀
Ceramic Ball Valve

TC 有氟密陶瓷阀

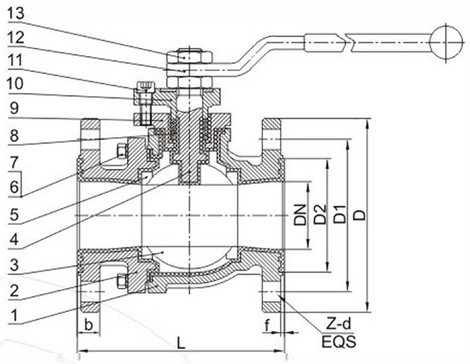
Q941TC电动陶瓷球阀
Q941TC Electric Ceramic Ball Valve

Q41TC手动（手柄）陶瓷球阀
Q41TC Manual (lever) Ceramic Ball Valve

Q641TC气动陶瓷球阀
Q641TC Penumatic Ceramic Ball Valve

※Product Description

- Trim components of ceramic ball valve adopt Alumina or zirconia ceramic with high chemical stability and hardness (HRC88),only inferior to diamond. The ceramic lined valve has very good performance on abrasion erosion, and corrosion resistance, and excellent heat-shielding, electric insulation. Mainly used in electric power, petroleum, chemical, metallurgy, mining, sewage treatment and other industrials where the metal valve cannot be applicable.
- The ball is made by advanced grinding equipment and advanced process technology that can ensure high precision ball roundness, good surface. The self-lubricating capability of ceramic ensures the good sealing after polishing, which radically changed the defects that metal hard sealing valve has such as big torque, non-corrosion-resistant sealing surface.
- Ceramic valve adopts new high-tech type structural ceramic material as sealing and wearing parts,which can improve abrasion and corrosion resistance, and sealing performance, prolonging lifespan, 2-4 times of lifespan than Titanium Alloy and Monel valve. Using ceramic valve can reduce repair or replacement costs and improve safety, stability of operating system.
- This valve fit in granule medium of high hardness, or medium with erosion soft granule. Nominal pressure PN10-PN40, applicable temperature ≤200℃ . Manufacture and design accordance to GB,JIS, API standards.



序号 No.	名称Name	材料Material
1	阀体body	WCB/CF8+PFA
2	阀盖bonnet	WCB/CF8+PFA
3	球体ball	高强度结构陶瓷 High strength structural ceramic
4	阀杆Stem	2Cr13/SS304
5	阀座Seat	高强度结构陶瓷 High strength structural ceramic
6	螺柱Bolt	A193-B7/B8
7	螺母Nut	A194-2H/B8
8	组合填料环 Parking ring	PTFE
9	填料函 Stuffing box	WCB/CF8
10	填料压盖 Gland	WCB/CF8
11	内六角螺栓 Body bolt	A193-B7/B8
12	手柄 Lever	WCB
13	锁紧螺母 Nut	A194-2H/B8

※Product Description

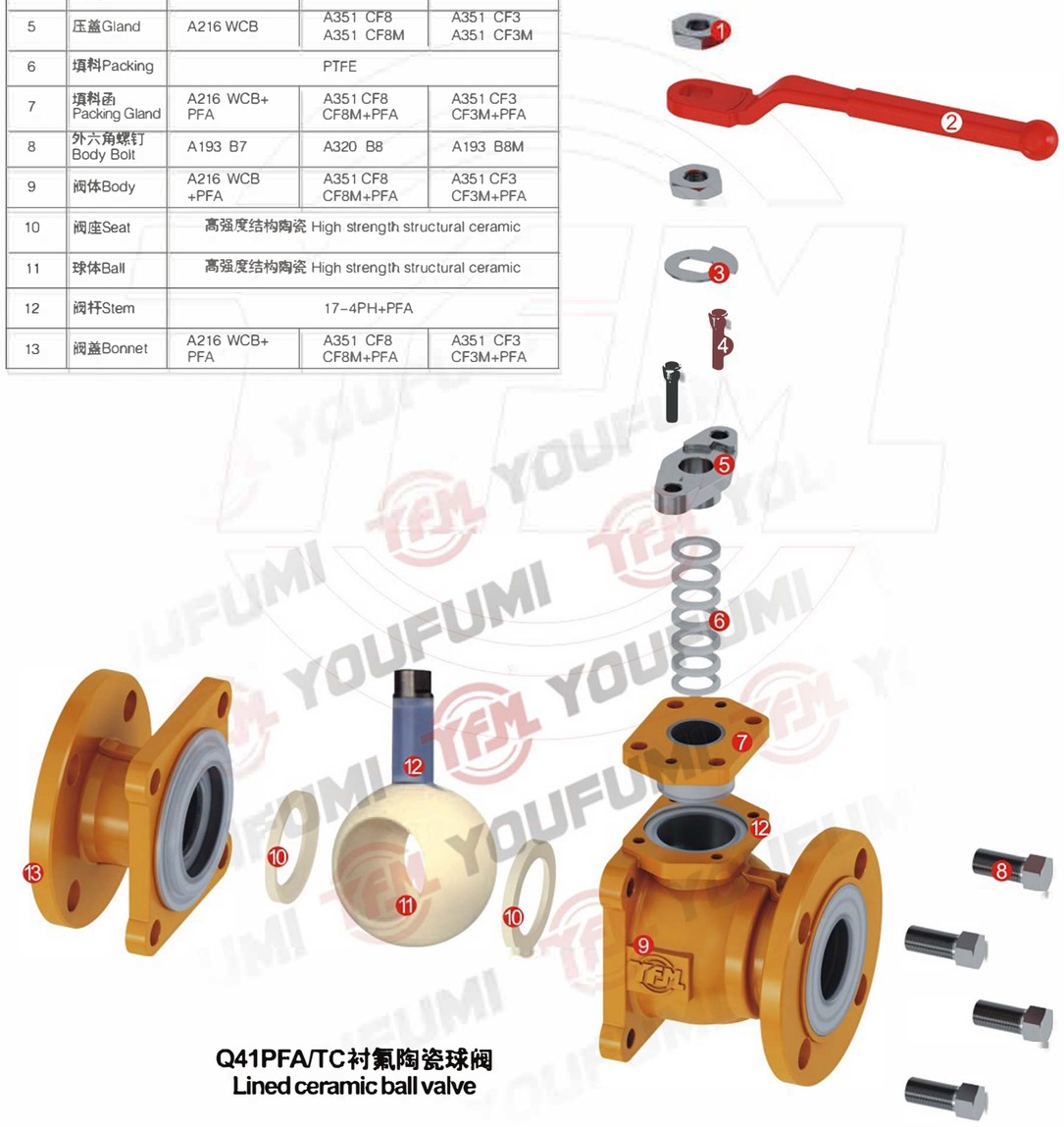
- This type of ceramic ball valve is YFM's first developed high-tech product, featurers PFA lined body. It is compact and good surface and widely used in soft particals with corrosion medium, especially for high wear, strong corrosion and other harsh conditions. Current ceramice valve widely used in petrochemical, medicine and water treatment industries.
- The ball and seat adopts alumina or zirconia ceramic with high chemical stability and hardness (HRC88). The ceramic lined valve has a very high abrasion resistance, corrosion resistance, erosion resistance, good insulation. The wetted body is fully lined with PFA that also has good performance on corrosion resistant. Comparing to the fully lined ceramic valve, PFA lined one lower the whole weight and also more economic.
- Diameter size: DN15-DN300. Nominal pressure: PN10-PN25. Applicalbe temperature:≤200℃. Operation methods can be manual, pneumatic, electric. Manufacture and design as per GB, API, JIS standard.

※技术规范 Technical Specification

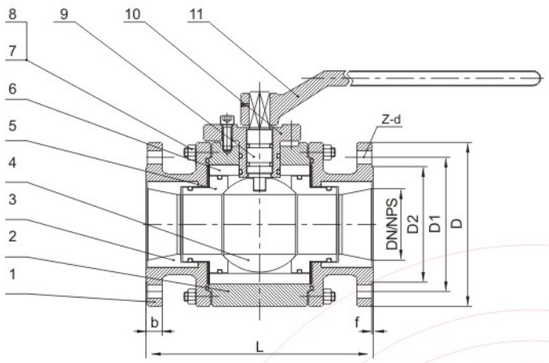
设计与制造 Design & Manufacture		API 6D / GB/T12237
连接端尺寸 Connection Size	结构长度 Face-to-face	ASME B16.10 / GB/T12221
	法兰尺寸 Flange	ASME B16.5 / GB/T9113
检验与试验 Inspection & Test		API598 / GB/T13927
材料 Material	碳钢 Carbon steel	GB/T12229
	不锈钢 Stainless steel	GB/T12230
标志 Mark		GB/T12220
供货 Delivery		GB/T12252
口径 Size		DN15-350
压力 Pressure		1.0MPa 1.6MPa 150LB

※材料明细表 Material Specification

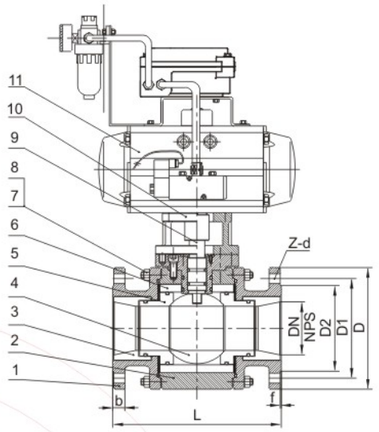
序号No.	名称 Name	材料明细 Material details		
1	螺母Nut	A194 2H	A194 8	A194 8M
2	手柄Wrench	A216 WCB	A351 CF8 A351 CF8M	A351 CF3 A351 CF3M
3	定位片 Locating piece	25# SS304		
4	内六角螺钉 Body bolt	A193 B7	A320 B8	A193 B8M
5	压盖Gland	A216 WCB	A351 CF8 A351 CF8M	A351 CF3 A351 CF3M
6	填料Packing	PTFE		
7	填料函 Packing Gland	A216 WCB+PFA	A351 CF8 CF8M+PFA	A351 CF3 CF3M+PFA
8	外六角螺钉 Body Bolt	A193 B7	A320 B8	A193 B8M
9	阀体Body	A216 WCB +PFA	A351 CF8 CF8M+PFA	A351 CF3 CF3M+PFA
10	阀座Seat	高强度结构陶瓷 High strength structural ceramic		
11	球体Ball	高强度结构陶瓷 High strength structural ceramic		
12	阀杆Stem	17-4PH+PFA		
13	阀盖Bonnet	A216 WCB+PFA	A351 CF8 CF8M+PFA	A351 CF3 CF3M+PFA



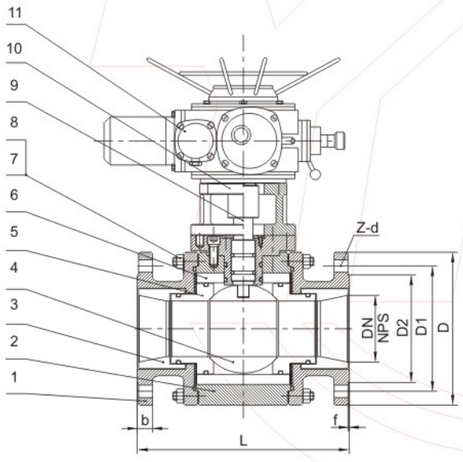
Q41PFA/TC衬氟陶瓷球阀
Lined ceramic ball valve



Q41TC手动（手柄）陶瓷球阀
Q41TC Manual (lever) Ceramic Ball Valve



Q641TC气动陶瓷球阀
Q641TC Penumatic Ceramic Ball Valve



Q941TC电动陶瓷球阀
Q941TC Electric Ceramic Ball Valve

※技术规范 Technical Specification

设计与制造 Design and Manufacture		API 6D / GB/T12237
连接端尺寸 Connection End	结构长度 Face-to-face Dimension	ASME B16.10 / GB/T12221
	法兰尺寸 Flange End	ASME B16.5 / GB/T9113
检验与试验 Inspeection & Test		API598 / GB/T13927
材料 Material	碳钢 Carbon steel	GB/T12229
	不锈钢 Stainless steel	GB/T12230
标志Mark		GB/T12220
供货Delivery		GB/T12252

※主要部件材料 Material Specification

序号No.	名称Name	材料Material	序号No.	名称Name	材料Material
1	阀盖Bonnet	A105/SS304	7	螺柱Stud	A193-B7/B8
2	中阀体Middle body	A105/SS304	8	螺母Nut	A194-2H/B8
3	接管Coupling	高强度结构陶瓷 High strength structural ceramic	9	阀杆Stem	SS316/SS316L
4	球体Ball	高强度结构陶瓷 High strength structural ceramic	10	支架(电、气动) Yoke	Q235/SS304
5	阀座Seat	高强度结构陶瓷 High strength structural ceramic		填料函(手动) Packing Gland	Q235/SS304
6	中体Middle sleeve	高强度结构陶瓷 High strength structural ceramic	11	驱动装置 Driving actuator	组件 Components

※主要外形和连接尺寸 Main Dimension (GB/T 9113)

DN	L	PN10(1.0MPa)						PN16(1.6MPa)					
		D	D1	D2	b	f	Z-d	D	D1	D2	b	f	Z-d
15	130	95	65	45	16	2	4-Φ14	95	65	45	16	2	4-Φ14
20	130	105	75	58	18	2	4-Φ14	105	75	58	18	2	4-Φ14
25	140	115	85	68	18	2	4-Φ14	115	85	68	18	2	4-Φ14
32	165	140	100	78	18	2	4-Φ18	140	100	78	18	2	4-Φ18
40	165	150	110	88	18	3	4-Φ18	150	110	88	18	3	4-Φ18
50	203	165	125	102	18	3	4-Φ18	165	125	102	18	3	4-Φ18
65	220	185	145	122	18	3	4-Φ18	185	145	122	18	3	4-Φ18
80	241	200	160	138	20	3	8-Φ18	200	160	138	20	3	8-Φ18
100	305	220	180	158	20	3	8-Φ18	220	180	158	20	3	8-Φ18
125	356	250	210	188	22	3	8-Φ18	250	210	188	22	3	8-Φ18
150	394	285	240	212	22	3	8-Φ22	285	240	212	22	3	8-Φ22
200	457	340	295	268	24	3	8-Φ22	340	295	268	24	4	12-Φ22
250	533	395	350	320	26	3	12-Φ22	405	355	320	26	4	12-Φ26
300	610	445	400	375	26	4	12-Φ22	460	410	375	28	4	12-Φ26

※ASME B16.5

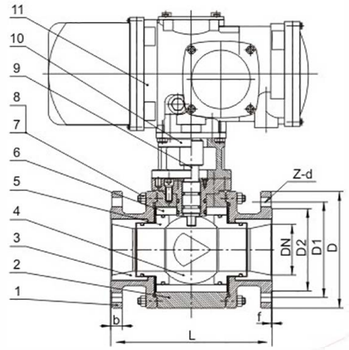
NPS	L	Class150					
		D	D1	D2	b	f	Z-d
1/2	110	89	60.5	35	2	12	4-16
3/4	117	98	70.0	43	2	12	4-16
1	127	108	79.5	51	2	12	4-16
1¼	140	117	89.0	64	2	13	4-16
1½	165	127	98.5	73	2	15	4-16
2	178	152	120.5	92	2	16	4-19
2½	190	178	139.5	105	2	18	4-19
3	203	190	152.5	127	2	19	4-19
4	229	229	190.5	157	2	24	8-19
5	254	254	216.0	186	3	24	8-22
6	267	279	241.5	216	3	26	8-22
8	292	343	298.5	270	3	29	8-22
10	330	406	362.0	324	4	31	12-25

注：更多尺寸，请联系我们工程师。 Note: more size, please contact our engineer

※Product Description

- Electric V-port ceramic control ball valve has equal percentage character which can adjust the flow. It can satisfy small flow control and work stabile, more accurate and flexible besides more wide adjustable range, speed regulation, easy maintenance and cost-saving. In the process of opening and closing, the sphere of the v-shaped channel and the seat with shearing action between medium can be chopped fiber, solid particles, to prevent ball stuck. Especially suitable for freezing pipeline site and control pulp, sewage with fiber and solid particles and powder medium.
- The wetted part adopts ceramic material (HRC88), which only inferior to diamond. The ceramic lined valve has a very high abrasion resistance, corrosion resistance, erosion resistance, good insulation and small thermal expansion, and mainly applied in electric power, petroleum, chemical, metallurgy, mining, sewage treatment and other harsh conditions.
- This valve fit in granule medium of high hardness, or medium with erosion soft granule. Nominal pressure PN10-PN40. Applicable temperature ≤200℃. Manufacture and design as per GB, JIS, API standards.

VQ941TC V型电动陶瓷调节球阀
Electric V-port ceramic control ball valve



VQ941TC V型电动陶瓷调节球阀
Electric V-port ceramic control ball valve

※技术规范 Technical Specification

设计与制造 Design and Manufacture		API 6D / GB/T12237
连接端尺寸 Connection End	结构长度 Face-to-face Dimension	ASME B16.10 / GB/T12221
	法兰尺寸 Flange End	ASME B16.5 / GB/T9113
检验与试验 Inspeection & Test		API598 / GB/T13927
材料 Material	碳钢 Carbon steel	GB/T12229
	不锈钢 Stainless steel	GB/T12230
标志Mark		GB/T12220
供货Delivery		GB/T12252

Material Specification

序号No.	名称Name	材料Material	序号No.	名称Name	材料Material
1	阀盖Bonnet	A105/SS304	7	螺柱Stud	A193-B7/B8
2	中阀体 Middle body	A105/SS304	8	螺母Nut	A194-2H/B8
3	接管Coupling	高强度结构陶瓷 High strength structural ceramic	9	阀杆Stem	SS316/SS316L
4	球体Ball	高强度结构陶瓷 High strength structural ceramic	10	支架Yoke	Q235/SS304
5	阀座Seat	高强度结构陶瓷 High strength structural ceramic	11	电动装置 Electric actuator	组件 Components
6	中体 Middle sleeve	高强度结构陶瓷 High strength structural ceramic			

Main Dimension(GB/T 9113)

DN	L	PN10(1.0MPa)						PN16(1.6MPa)					
		D	D1	D2	b	f	Z-d	D	D1	D2	b	f	Z-d
15	130	95	65	45	16	2	4-Φ14	95	65	45	16	2	4-Φ14
20	130	105	75	58	18	2	4-Φ14	105	75	58	18	2	4-Φ14
25	140	115	85	68	18	2	4-Φ14	115	85	68	18	2	4-Φ14
32	165	140	100	78	18	2	4-Φ18	140	100	78	18	2	4-Φ18
40	165	150	110	88	18	3	4-Φ18	150	110	88	18	3	4-Φ18
50	203	165	125	102	18	3	4-Φ18	165	125	102	18	3	4-Φ18
65	220	185	145	122	18	3	4-Φ18	185	145	122	18	3	4-Φ18
80	241	200	160	138	20	3	8-Φ18	200	160	138	20	3	8-Φ18
100	305	220	180	158	20	3	8-Φ18	220	180	158	20	3	8-Φ18
125	356	250	210	188	22	3	8-Φ18	250	210	188	22	3	8-Φ18
150	394	285	240	212	22	3	8-Φ22	285	240	212	22	3	8-Φ22
200	457	340	295	268	24	3	8-Φ22	340	295	268	24	4	12-Φ22
250	533	395	350	320	26	3	12-Φ22	405	355	320	26	4	12-Φ26
300	610	445	400	375	26	4	12-Φ22	460	410	375	28	4	12-Φ26

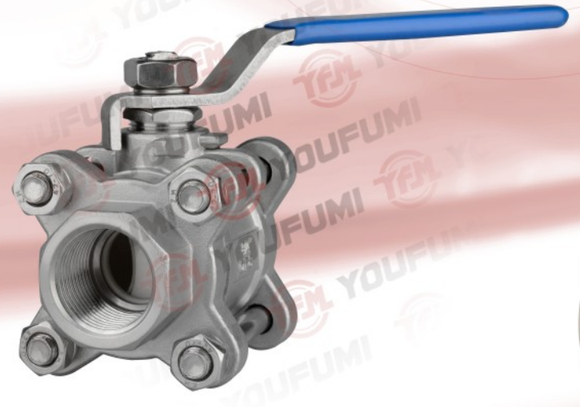
注：更多尺寸，请联系我们工程师。 Note: more size, please contact our engineer

※应用规范

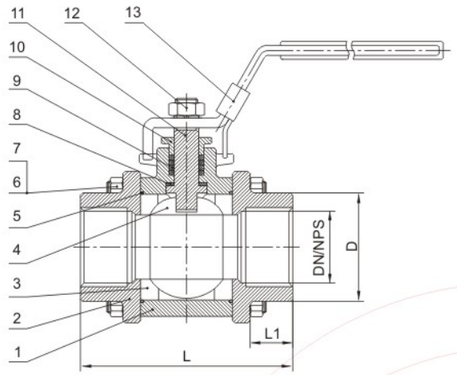
- 三片式陶瓷球阀和旋塞阀是同属一个类型的阀门，只有它的关闭件是个陶瓷球体，陶瓷球体绕阀体中心线作水平旋转来达到开启、关闭的一种阀门。在管路中主要用来做快速切断、分配和改变介质的流动方向。
- 三片式球阀只需要阀杆旋转90度的操作和很小的转动力矩就能关闭严密。全通径的阀体内腔为介质提供了阻力小、直通的流道。主要特点是本身结构紧凑，易于操作和维修，适用于给水处理、煤气管道、锅炉蒸汽、石灰浆液、纺织、含颗粒海水等介质，已广泛应用于矿山、石油、化工、发电、造纸等环境条件恶劣的工况。
- 常用通径为DN15~100，公称压力PN10~PN25，适用温度 -20~280℃，也可根据用户特殊要求定制。

※Product Description

- Pneumatic three-pieces ceramic ball valve is a valve that the ball rotates around the body center line to control on-off, and only trim part adpots ceramic material. It mainly used for quickly cut, distribute and change the deriction of the flow medium in pipeline.
- Pneumatic three pieces ceramic ball valve can close tightly only need rotate 90 degree with small torque by air supply. The equal body cavity provided little resistance with straight flow channel. It suitable for water treatment, gas pipeline, steam boiler, lime slurry, textile, particles seawater medium etc. with characters like compact structure, easy operation and maintenance free. It had been widely used in mining, petroleum, chemical, electricity generation, papermaking and other harsh conditions.
- Nomnal diameter: DN15-100.
  Nominal pressure: PN10-PN25.
  Applicable temperature:-20~280℃.
  It also can be designed according to customer's requirement.



三片式陶瓷球阀
3-PC Ceramic Ball Valve



三片式陶瓷球阀
3-PC Ceramic Ball Valve

※技术规范 Technical Specification

设计与制造 Design and Manufacture		API 6D / GB/T12237
连接端尺寸 Connection End	结构长度 Face-to-face Dimension	ASME B16.10 / GB/T12221
	法兰尺寸 Flange End	ASME B16.5 / GB/T9113
检验与试验 Inspeection & Test		API598 / GB/T13927
材料 Material	碳钢 Carbon steel	GB/T12229
	不锈钢 Stainless steel	GB/T12230
标志Mark		GB/T12220
供货Delivery		GB/T12252

※主要部件材料 Material Specification

序号No.	名称Name	材料Material	序号No.	名称Name	材料Material
1	中阀体 Middle body	WCB/CF8	8	垫圈Washer	柔性石墨 Flexible graphite
2	左右阀体Body	WCB/CF8	9	填料 Parking	PTFE
3	阀座 Seat	高强度结构陶瓷 High strength structural ceramic	10	填料压盖 Gland	WCB/CF8
4	球体 Ball	高强度结构陶瓷 High strength structural ceramic	11	阀杆Stem	SS316/SS316L
5	O型圈 O-ring	氟橡胶Viton	12	锁紧螺母 Nut	A194-2H/B8
6	双头螺柱 Stud	A193-B7/B8	13	手柄 Lever	SS316/SS316L
7	螺母 Nut	A194-2H/B8			

※主要外形和连接尺寸 Main Dimension (GB/T 9113 ASME B16.5)

DN	NPS	L	L1	D
15	1/2"	72	10	22
20	3/4"	85	13	28
25	1"	90	13	35
32	11/4"	112	16	43
40	11/2"	120	16	49
50	2"	145	18	62
65	21/2"	185	18	77
80	3"	215	20	90
100	4"	270	20	115

注：更多尺寸，请联系我们工程师。 Note: more size, please contact our engineer

应用介绍 Applications and Mediums

乙酸 Acetic Acid	绿液 Green Liquor	砂浆 Sand/Tailings Slurry	氧化铝土 Alumina Hydrate	石膏浆液 Gypsum Slurry	苯酸钠 Sodium Benzoate	氧化铝粉 Aluimina Poeder	盐酸 Hydrochloric Acid
碳酸钠 Sodium Carbonate	氯化铝 Alumina Chloride	回收纸 Recycled Paper	氯酸钠 Sodium Chlorate	氨水 Ammonia	过氧化氢 Hydrogen Peroxide	氯化钠 Sodium Chloride	碳酸铵 Ammonium Carbonate
高岭土 Kaolin Slurry	氰化钠 Sodium Cyanide	氧化胺 Ammonium Chloride	煤油 Kerisene	氟化钠 Sodium Fluoride	氟化铵 Ammonium Fluoride	石灰/ 石灰石浆液 Lime/Limestone Slurry	氢氧化钠 Sodium Hydroxide
硅酸按 Ammonium Silicate	氢氧化镁 Magnesium Hydroxide	次氯酸钠 Sodium Hypochlorite	锐钛浆 Anatase Slurry	氧化镁浆液 Magnesium Oxide Slurry	硝酸钠 Sodium Nitrate	苯胺 Aniline	硫酸镁 Magnesium Sulfate
硫酸钠 Sodium Sulfate	灰浆 Ash Slurry	镁粉 Mandesium Slurry/Ore	煤灰浆 Soot Slurry	铝土浆 Bauxite Slurry	氯化汞 Mercuric Chloride	蒸汽 Steam	氯苯 Benzyl Chloride
甲醇 Methanol	二氧化硫 Sulfur Dioxide	黑液 Black Liquor	甲基丙酮 Methyl Acetone	硫酸 Sulfuric Acid	硼酸 Boric Acid	氯甲烷 Methyl Chloride	滑石水 Talcum Water
卤水 Brine	丁酮 Methyl Ethyl Krtone	钛酸 Tarnic Acid	碳酸钙 Calcium Carbonate	二氯甲烷 Methylene Chloride	二氧化钛 Tianium Dioxide	氯酸钙 Calcium Chlorate	石灰乳 Milk of Lime
四氯化钛 Tianium Tetrachloride	氯化钙 Calcium Chloride	母液 Mother Liquor	甲苯 Toluene	次氯酸钙 Calcium Hypochlorite	奈 Napthalene	三氯乙烷 Trichloroethane	碳酸钙 Calcium Sulfate
天然气 Natural Gas	松节油 Turpentine	碳粉 Carbon Slurry	硝酸 Nitric Acid	废酸 Waste Acids	湿氯气 Chlorine(Wet)	发烟硫酸 Oleum	毛屑 Wool Fines
氯硅烷蒸汽 Chlorosilane Vapor	纸浆 Papered Slurry	二甲苯 Xylene	铬酸 Chromic Acid	原油 Petroleum	硫酸锌 Zinc Sulfate	柠檬酸 Citric Acid	苯酚 Phenol
三氯氢硅 Trichlorosilane	粘土浆液 Clay Slurry	磷酸 phosphoric Acid	四氯化硅 Silicon Tetrachloride	氯化铜 Copper Chloride	溴酸钾 Potassium Bromate	氰化铜 Copper Cyanide	碳酸钾 Potassium Carbonate
硫酸铜 Copper Sulfate	氯酸钾 Potassium Chlorate	氯化亚铜 Cuprous Chloride	氯化钾 Potassium Chloride	乙醇 Ethanol	铬酸钾 Potassium Dichromate	乙胺 Ethyl Amine	高氯酸钾 potassium Perchlorate
乙醚 Ehtyl Ether	高锰酸钾 Potassium Permanganate	氯化铁 Ferric Chloride	硫酸钾 Potassium Sulfate	硫酸亚铁 Ferrous Sulfate	沉淀碳酸钙 Precipitated Calcium	烟气 Flue Gas	碳酸盐 Carbonate(PCC)
粉炭灰（干湿） Fiyash(Wet and Dry)	泥浆 Radioactive Slurry	蚁酸 Formic Acid	硅粉 Silica Fume	单晶硅 Monocrystalline Silicon	多晶硅 Polycrystalline Silicon	海水 Sea Water	盐矿 Salt Mine
矿浆 pulp	氧化镁 Oxidation Of Beauty	煤灰 Coal Ash	焦粉 Coke Powder	喷煤 PCI	干灰 Dry Ash	氯硅烷 Chlorosilane	浆渣 Chlorsilane

有氟密陶瓷阀在大部分苛刻工况中都有十分出色的表现，上图列出有氟密陶瓷阀门适用的行业和工况介质，以供参考。
YFM ceramic valves are superior in most severe applications. Here we list some typical industries and applications above for your reference, in which YFM ceramic valves have proven superior performances and long serving time.

1、制浆和造纸行业的应用

纸浆 准备：
纸浆 + 硫酸H_2SO_4 或者和亚硫酸钠(Na_2S)+ 石灰

造纸机器:
生产优质纸产品: 填充及吸收材料, 即. 高岭土, 二氧化镁, 含氢煤
纸张定型/增光剂: 二氧化钛, 硅, 滑石…

控制高密度流体意味着 = 腐蚀 & 侵蚀

2、化肥应用

磷酸 (43% H_3PO_4) 混有磷酸钙固体,
80℃, 3–6 帕, 密度达到1.500 公斤/立方米。

硝酸铵 (NH_4NO_3), + 泥浆, 140℃,
固体硝酸铵 4–8帕, 密度为 1.300公斤/立方米

含白云石的泥浆 ($CaCO_3$ 来源于矿物石)，60℃，5 帕，密度大於1.300 公斤/立方米

取代现有的更换频繁的金属或衬氟衬胶阀门需克服磨损和侵蚀!

经济可行性（一年收回成本）：
（现有阀门的价格*每年更换次数）+更换期间的生产损失+更换的人工成本≥陶瓷阀门的价格

3、电厂应用

煤电厂

废气脱硫FGD:
石灰 浆 备料 (研磨).
对石灰浆到达清洗器和吸收器前的控制
脱硫后硫酸钙加入再循环.
加工水再循环(其中只有少量固体).

飞灰:
在经过电子静力过滤后用气体力学传送灰和剩余未燃烧固体 Dry & bulk. 开关式

4、炼钢炼铁厂应用

PCI, 煤粉末注入熔铁炉.
干散气动喷射和控制.

EAF, 电弧炉 (煤磨粒喷射)
气动喷射控制 (O_2 or N_2 – carbon)

原铁脱硫 (熔化)加入添加材料改变钢的质量: CaC_2, MgO_2, SiO_2.
气动喷射控制, 直接减少矿砂铁矿石在700℃高温下被“减少”

5.废物焚烧炉应用

城市垃圾焚烧炉=硫到大气中
炉气净化在某些国家是严格要求的

6.二氧化钛TiO_2应用

脱硫& 漂白
硫酸二氧化钛提取液 如：
30%TiO_2浆料砂–20%固体硫酸

氯二氧化钛和流体反应过程 如：
TiCl4泥浆，焦炭颗粒，在悬浮液中的金属颗粒

再生：
硫酸精制：从稀释的20%H_2SO_4回到98%H_2SO_4

1. Pulp and Paper Application

Pulp preparation
Pulp+sulphuric acid H_2SO_4 or sodium sulfite(Na_2s)+lime

Paper making:
Offer the high–quality product: Fill and absord material, i.e kaoline, magnesium peroxide , orthohydrous coal
Paper hold / brighteners: titanium dioxide, silicon, talc etc.

High density of flow control=corrosion resistance & erosion resistance

2. Fertilizer Application

Phosphoric acid(43% H_3PO_4) mix with solid calcium phosphate 80℃, 3–6Pa, Density achieved at 1.500 kg/m^3

Ammonium Carbonate(NH4NO3)+slurry, 140℃ ,with solid ammonium carbonate 4–8Pa, Density achieved at 1.300kg/m^3

Slurry with dolomite ($CaCO_3$ origin mineral), 60℃, 5Pa, Density bigger than 1.300kg/m^3

To replace metal and teflon/rubber lined valve which exchange frequently for prevent abrasion and erosion.

Economic feasibility
(Regular valve price*exchange time each year)+Production loss during exchange period +labor cost of exchange≥Ceramic valve cost

3. Power Plant Application

Coal factory

Desulphurization of exhaust gas FGD
Lime slurry and preparation (grind)
To control the lime before reach the cleaner and absorber
Recycle the sulphuric acid after desulfuration
Recycle the processed water(only little solid include)

Ash
Transfer ash and not burn by gas Dynamics after filter from electric–static force

4. Ironmaking And Steelmaking Plant Application

PCI,
Dry bulk pneumatic injection & control

EAF, electric arc furnace (coal powder injection)
Pneumatic injection and control (O_2 or N_2 – carbon)

The original iron desulfurization (injection into): material added to change the steel qualityCaC_2, MgO_2, SiO_2. Pneumatic injection & control
DRI, iron ore is “reduced” at high temp. 700℃

5. Waste Incinerator Application

MSW incinerator= Disperse sulphur into air
Flue gas cleaning is strictly required in some countries.

6. Titanium Dioxide TiO_2 Application

Desulfidation & bleach
Sulfuric TiO_2 extraction process fluids such as:
TiO_2 slurry 30% sand – solids with 20% H2SO4 app. 50℃, 3–5 bar, low pH, control valves.
Chlorine TiO_2 reaction process with fluids such as:
$TiCl_4$ slurry, coke particles (pneumatic injection), $FeCl_3$ (metal particles in suspension). in the $TiCl_4$ case, temp. can be up to 500℃ !!!
Bi–process:
sulfuric acid treatment. from diluted 20% H_2SO_4 back to 98% H_2SO_4

节能 / 环保 / 创新 / 服务

Energy saving,
environmental protection,
innovation,
service