Fujikin®

For Abrasive, Corrosive and Erosive Applications

Fine Ceramic Valves

COSMIX™

Made in Japan

About Fujikin®

Founded in 1930, Fujikin is now recognized as one of the world's leading manufacturers of specialty valves.

Since we received our first patent for a needle valve in 1953, we have been a manufacturer of valves and fittings, as well as ultra-precision flow control systems.

Today, Fujikin' s state-of-the-art products are used throughout the semiconductor, aerospace, chemical, pharmaceutical, power generation, and other industries.

As a global business, Fujikin operates four plants and one R & D center in Japan, as well as plants in Vietnam, Ireland, and the United States. In addition, there are service centers in China, Korea and Taiwan.

In 1975, Fujikin developed the first fine ceramic valve in response to customer concerns about conventional metal valves.

Featuring fine ceramic materials with significant abrasion and corrosion resistance, Cosmix Fine Ceramic Valves have been sold around the world over the last 30 years.

Globalization and Localization

COSMIX™ Fine Ceramic Ball Valves

Ceramic materials offer greater hardness and excellent abrasion and corrosion resistance.
Cosmix Ball Valves feature fine ceramics in all wetted parts.

Features

- Excellent durability due to ceramic materials.
- Excellent flow control performance.
- Floating ball structure, especially useful in slurry applications.
- Simple construction, lightweight and compact.
- Easy maintenance.

Performance

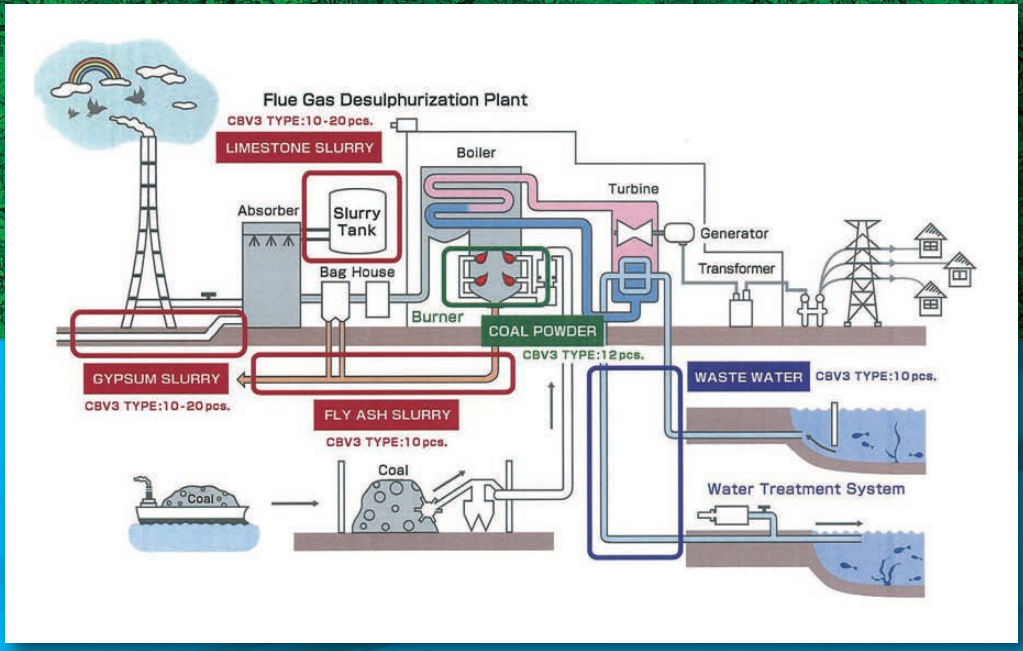
Item	Performance
Maximum Operating Pressure	0.98 MPa
Maximum Operating Differential Pressure	0.98～0.49 MPa(Depend on valve sizes)
Maximum Operating Temperature	200 °C
Seat Leakage	1/10000 of Maximum Cv Value [ANSI FCI 70-2 CLASS IV (ANSI B 16.104)]
Valve Size	1/2"～6"
Rangeability	15:1
Flange Connection	DIN PN 10, ANSI 150, JIS 10K

Applications

For flow control and on-off service of abrasive and corrosive fluids

Coal-Fired Thermal Power Plants
Flue Gas Desulphurization Plants

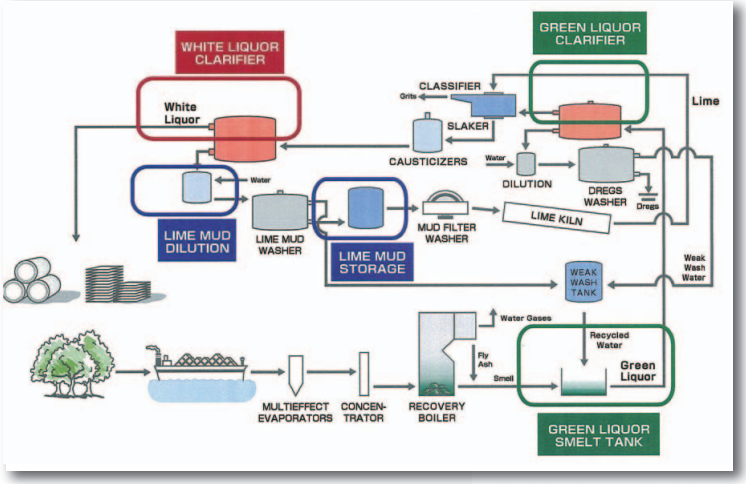
Limestone slurry
Gypsum slurry
Fly ash slurry
Waste water
Coal powder



Fujikin is committed to protecting the environment

Pulp & Paper Mills

Green liquor
White liquor
Black liquor
Lime mud
Talc
Clay

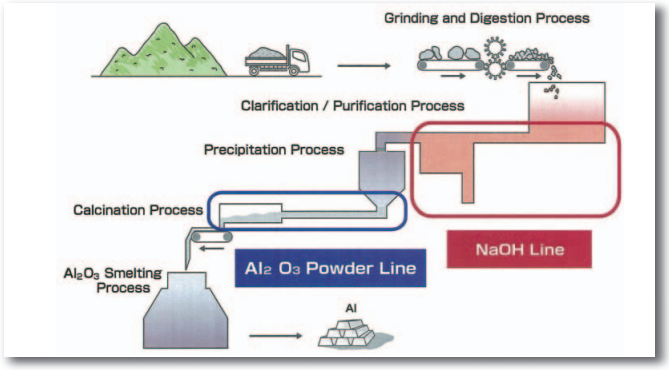


Chemical Plants

Hydrogen fluoride
Phosphoric acid
Caustic soda

Alumina Refining

Caustic soda
Alumina powder



Steel Plants

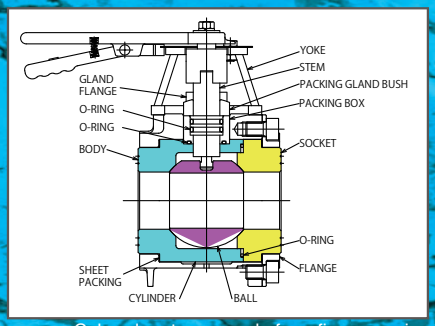
Dry dust remover
Coal powder

Oil Sands

COSMIX
Fine Ceramic Ball Valves

For Flow Control & On-Off Service of Abrasive and Corrosive Fluids

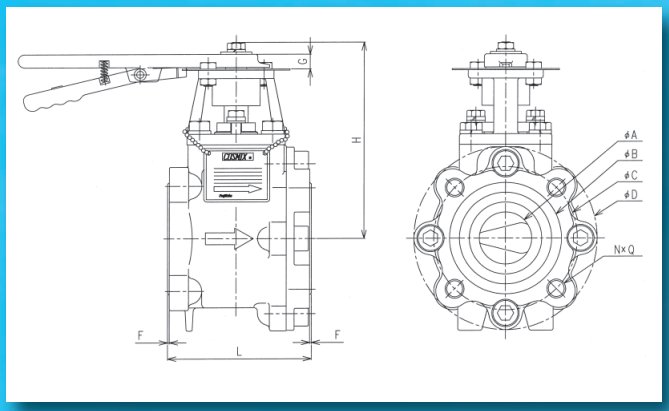
Structure



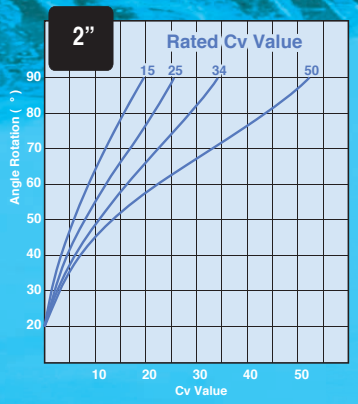
Colored parts are made from fine ceramics

Features

1. Excellent durability for abrasive and corrosive fluids. Wetted parts are made from solid fine ceramics.
2. Excellent flow controllability:
   Each valve size offers 3-4 equal percentage (EQ%) triangular ports for precise flow control and a round hole ball for on-off service.
3. Floating ball structure.
4. Low seat leakage.
5. Small number of parts.
6. Simple structure, lightweight and compact.
7. Good maintainability.



Cv Value Curves



Cv Value Table

Sizes	Cv Value				
	ROUND PORT	TRIANGULAR PORT			
1/2"	8	4	2.5	1.5	
3/4"	14	9	5	2.5	
1"	24	17	11	7	3
1 1/2"	55	35	25	15	10
2"	90	50	34	25	15
2 1/2"	130	80	54	35	25
3"	195	120	80	58	40
4"	340	200	130	85	57
6"	750	500	350	250	

Manual Operated Type Dimension Table

Sizes	A	B	C	D	F	G	H	L	N	Q
1/2"	12	40	60.5	95	1	7	106	71	UNC 1/2	4
3/4"	17	48	69.9	100	1	7	109	79.5	UNC 1/2	4
1"	23	56	79.3	125	1.5	7	143	85	UNC 1/2	4
1 1/2"	36	76	98.6	140	1.5	9	158	111	UNC 1/2	4
2"	44	94	120.7	155	1.5	9	164	120	UNC 5/8	4
2 1/2"	56	104	140.0	175	1.5	9	172	140	UNC 5/8	4
3"	72	124	152.4	199	1.5	9	179	164.5	UNC 5/8	4
4"	89	148	190.5	229	1.5	Please consult with Fujikin for assistance with specifications.		193.5	UNC 5/8	8
6"	134	212	241.3	310	2.5			250	UNC 3/4	8

(unit: mm)

Accessories

Actuator

Pneumatic Actuator

Standard:
EL-O-MATIC

Electric Actuator

AUMA

ROTORK

Positioner

EP

PP

Standard: SSS

Regulator

Standard: SSS

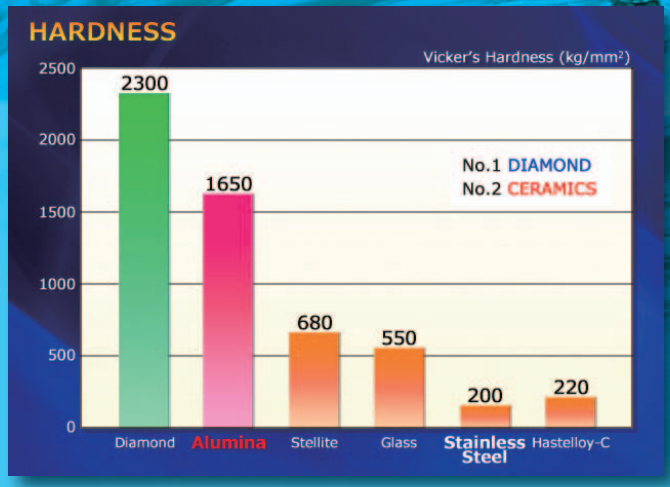
Characteristics of Fine Ceramic Materials

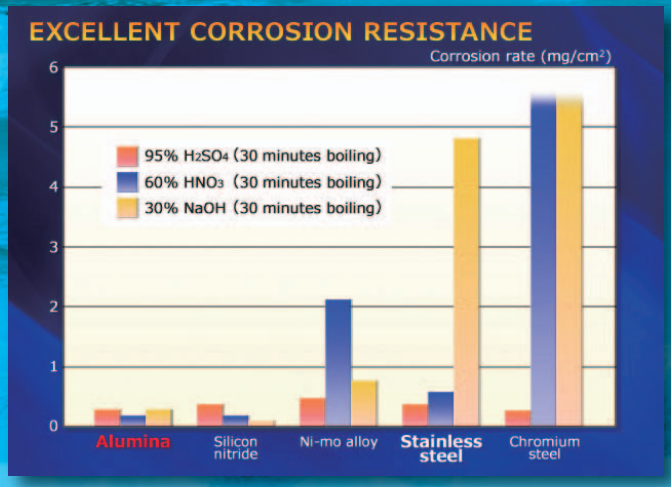
Characteristic		Material (Kyocera No.)						
		99.5% Alumina Al_2O_3 (A-479M)	99.5% Alumina Al_2O_3 (A-479SS)	99.9% Alumina Al_2O_3 (A-601D)	Y Zirconia ZrO_2 (Z-201N)	Mg Zirconia ZrO_2 (Z-220)	Sillicon Carbide SiC (SC-221)	Sillicon Nitride Si_3N_4 (SN-220)
Color		White	White	Ivory	Ivory	Yellow	Black	Black
Bulk Density		3.8	3.8	3.9	6.0	5.7	3.0	3.2
Water Absorbency (%)		0	0	0	0	0	0	0.1
Vickers Hardness, 500g Test	kg · m/mm²	1650	1700	1750	1250	1100	2400	1450
	GPa	16.2	16.7	17.2	12.8	10.8	23.5	14.2
Flexural Strength (Bending Strength)	kg · m/mm²	31	33	50	100	70	50	60
	MPa	304	323	490	980	686	490	588
	Knsi	44	47	71	143	100	71	86
Compressive Strength	kg · m/mm²	220	240	-	580	-	500	390
	MPa	2157	2353	-	5686	-	4902	3824
	Knsi	314	343	-	829	-	714	557
Thermal Conductivity at 20°C (cal·cm/cm²·sec °C)		0.06	0.06	0.08	0.009	0.008	0.17	0.04
Fracture Toughness (MN/m$^{3/2}$)		3.4	3.4	3.4	6.0	11.5	3.1	3.9
Maximum Use Temperature (°C)		1600	1600	1750	200	800	1400	1200
Thermal Shock Resistance	°C	200	250	250	300	450	350	550
	°F	392	482	482	572	842	662	1022
Cost Comparison (%)		100	150	200	700	350-400	600-700	600-700

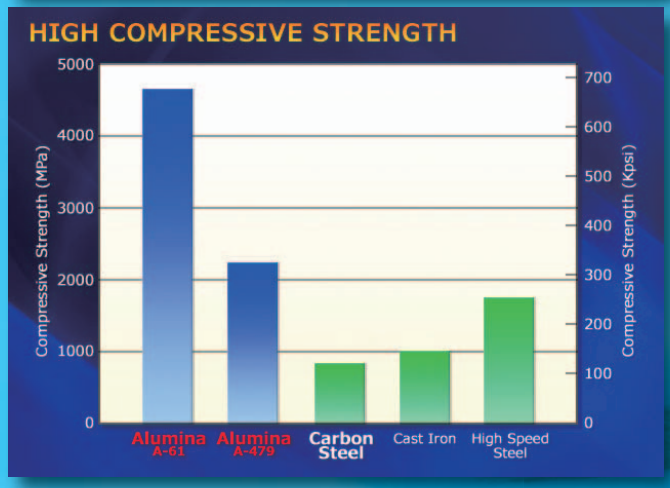
Key Features

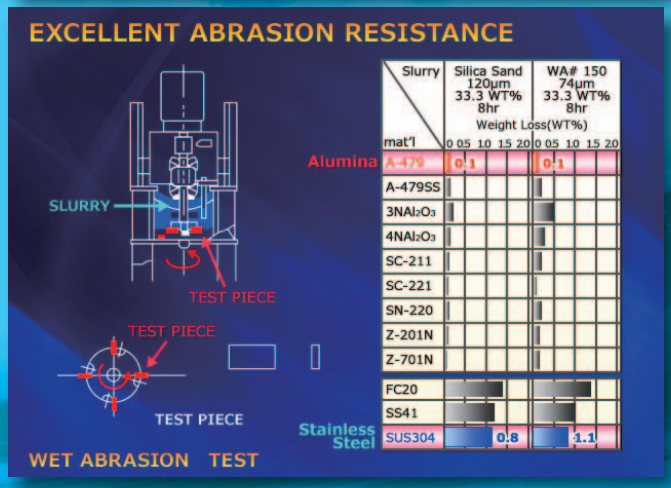
1. Greater hardness
2. Greater compressive strength
3. Stronger chemical resistance
4. Higher maximum temperature
5. Smaller bulk density

Standard material: 99.5% alumina (Kyocera A-479M)



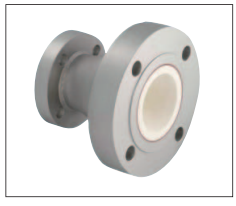


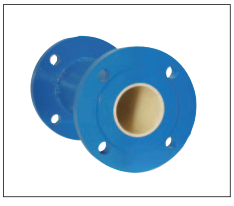


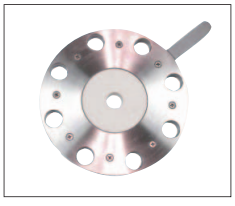


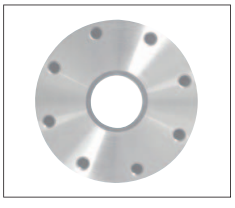
Fine Ceramic Reducers, Pipes and Orifices

Reducer | **Straight Pipe Spool** | **Restriction Orifice Plate** | **Flange Adapter**





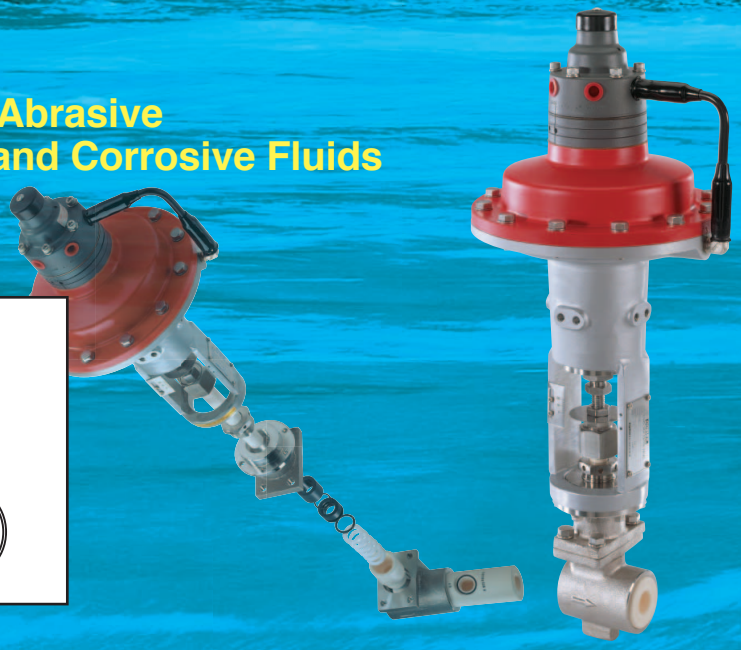




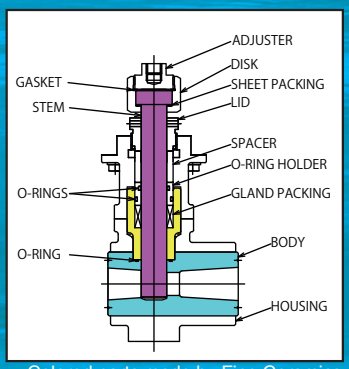
Ceresist

COSMIX
Fine Ceramic Plug Valves

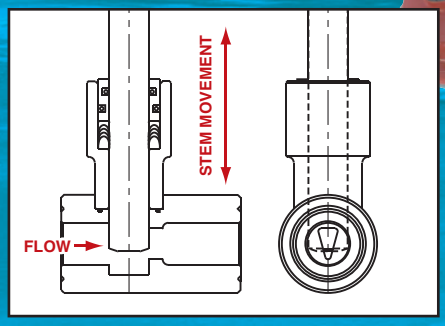
For Precise, Small-Cv Flow Control of Abrasive and Corrosive Fluids



Structure



Colored parts made by Fine Ceramics



Performance

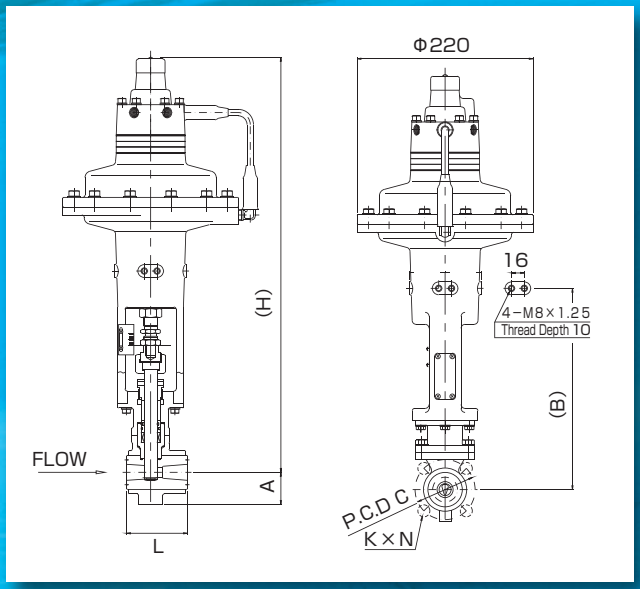
Item	Performance
Maximum Operating Pressure	1.96 MPa
Maximum Operating Differential Pressure	1.47 MPa
Maximum Operating Temperature	200 °C
Seat Leakage	1/1000 of Maximum Cv Value [ANSI FCI 70-2 CLASS III (ANSI B 16.104)]
Valve Size	1/2"～1 1/2"
Rangeability	15:1
Flange Connection	DIN PN 10, 16, ANSI 150, 300, JIS10K, 20K

Accessories

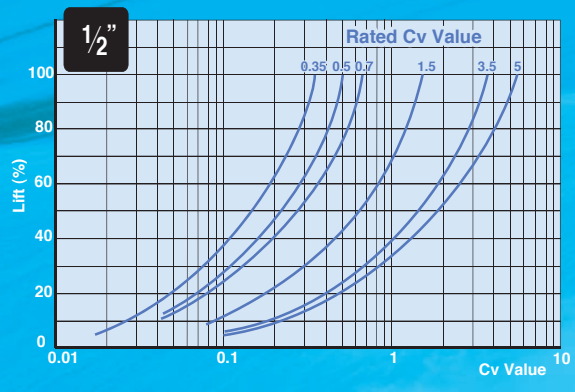
- Positioner (EP/PP)
- Regulator

Features

1. Excellent durability for abrasive and corrosive fluids.
   Wetted parts are made from solid fine ceramics.
2. Excellent flow controllability:
   Each valve size offers 3-6 equal percentage (EQ%) triangular ports for precise flow control.
3. Low seat leakage.



Cv Value Curves



Cv Value Table

Sizes	Rated Cv Value					
1/2"	5	3.5	1.5	0.7	0.5	0.35
3/4"	7	5	3.5	1.5	0.7	0.35
1"	17	7	3	–	–	–
1 1/2"	35	25	15	–	–	–

Dimensions

Sizes	L	A	H	ANSI 150			ANSI 300			DIN PN10, 16			Item No.
				C	K	N	C	K	N	C	K	N	
1/2"	64	35	507	60.5	UNC 1/2	4	66.6	UNC 1/2	4	65	M12	4	CP-D
3/4"	76	40	516	69.9	UNC 1/2	4	82.6	UNC 5/8	4	75	M12	4	CP-E
1"	102	45	530	79.3	UNC 1/2	4	88.9	UNC 5/8	4	85	M12	4	CP-F
1 1/2"	114	55	727	98.6	UNC 1/2	4	114.3	UNC 3/4	4	110	M16	4	CP-H

(unit: mm)

Fujikin's Osaka Plant is ISO 9001 certified.

JAB
QMS Accreditation
R007

KHK
ISO 9000

Quality Management System Certificate

FUJIKIN INCORPORATED
OSAKA PLANT
3-9-21 Nagata, Higashi-Osaka, Japan

This is to certify that the quality management system of the above organization has been assessed by the ISO Registration Center of KHK and found to be in accordance with the standard as below within the scope of product/service on the appendix 98QR-132R3-01EA :

Standard : ISO 9001:2000 / JIS Q 9001:2000
Registration No. : 98QR-132

Registration Date : October 1, 1998 Issue Number : 132R3-01E
Issue Date : September 20, 2007 Valid Through : September 30, 2010

THE HIGH PRESSURE GAS SAFETY INSTITUTE OF JAPAN (KHK)

Eiji Sakuta
President

Takayuki Matsuo
Managing Director / Senior Executive
ISO Registration Center

AWARDS

Vaaler Award
-Chemical Processing, U.S.A.

24th 10 Best New Products Award
-The Business & Technology Daily News, JAPAN

9th Researcher Achievement Award
-Ministry of Science and Technology, JAPAN

Invention Grand Prize
-Japan Institute of Invention and Innovation
-The Business & Technology Daily News, JAPAN

Best Products Award
-Society of Chemical Engineers
-Japan Management Association, JAPAN

CE Marking

Fujikin's compliance with the PED 97/23/EC

Fujikin's **Cosmix** fine ceramic ball valve's main application is flue gas desulphurization. For this application, or any other application for which the working fluid is a liquid from Fluid Group 2 (i.e., a non-hazardous liquid), **COSMIX** falls within the range of Table 9 on the category graphs of the PED. Taking the maximum operating pressure and nominal size of the valve into account and referring to Table 9, **COSMIX** comes under the scope of Article 3, Paragraph 3 (referred to as Sound Engineering Practices) of the PED.

Article 3 of the PED states that "pressure equipment covered in this category must be designed using The SEP, must be accompanied by adequate instructions for safe use and must bear a mark which allows identification of the manufacturer."
Pressure equipment covered under Article 3, Paragraph 3 of the PED does not carry the CE mark, and therefore **Cosmix** valves do not bear the CE mark.

Fujikin Carp Group

URL http://www.fujikin.co.jp/ E-mail info@fujikin.co.jp

The Year 2013 Prime Minister's Prize
The 5th Monodzukuri Nippon Grand Award
Overseas Operation "Excellence Prize"

CAT: No.133-01E-F