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FVFT BRAND, RELIABLE QUALITY FOR YOU CE&ISO 9001:2015 CERTIFIED ACQUIRED 15 YEARS FLUID SOLUTION EXPERIENCES EXPORTING TO OVER 40 COUNTRIES EXCELLENT VALUE-ADDED SERVICE.

## **Lined Valve Expert**

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We focus on Details We Make Different FVFT Brand, that can be trust.

FVFT Technology Founded in year 2010, we specialize in Manufacturing Various Lined Valves&Fittings, Including PTFE/PFA/FEP Lined Valve and Ceramic Lined Valve, as well as standard and customized fittings. The products are widely used in modern anti-corrosion engineering fields such as Lithium Battery, petroleum, chemical industry, pharmacy, printing and dyeing, electrical engineering, ship building, metallurgy, military industry, semiconductor chemistry, electronic phosphoric acid, Etc.

Our Principle: Pragmatic, Creative and Excellent.

FVFT Brand that you can trust.

#### FVFT Product Line:

Lined Valves (Lined Butterfly Valve, Lined Ball Valve, Lined Diaphragm Valve Etc.)

Lined Pipe&Fittings (Y-Type Strainer, Sight Glass, Elbow, Tee, Reducer, Expansion Joint, Pipe Etc.)

Ceramic Lined Valve (Ceramic Lined Butterfly Valve, Ceramic Lined Ball Valve, Ceramic Lined Diaphragm Valve Etc.)

Ceramic Lined Fitting (Y-Type Strainer, Sight Glass, Elbow, Tee, Reducer, Expansion Joint, Pipe Etc.)

Plastic Valve&Fitting (Plastic Globe Valve, Plastic Check Valve, Plastic Y-Type Strainer Etc.)



## Contents





**FVFT Lined Valve** 

2

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## Processing



# Stockage





# Inspection







## **Lined Diaphragm Valve**



### **Diaphragm Valve Series**

Diaphragm valve is a special type of valve with cut-off function. Its opening and closing parts are composed of steel valve disc and diaphragm which is made of soft materials (rubber and fluoroplastic composite). And the inner cavity of the body and the inner cavity of the bonnet are separate. When the hand wheel is operated clockwise, the valve stem will move down, and the valve disc will drive the diaphragm down to cut off the passage. Otherwise, the valve will open.

FVFT lined diaphragm valve series 1. The composite diaphragm separates the inner cavity of the valve body from the innercavity of the bonnet, and forms a direct channel. So that the inner parts such as the stem and the disc which locate above the diaphragm are completely isolated from the medium. The structure of the packing and sealing is no need. So that the internal and external leakage of the medium can be avoided at the same time.



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2. The diaphragm valve can be used for various highly corrosive media except "molten and elemental fluorine", with diaphragm made of PTFE (Teflon) fuoroplastic and synthetic rubber and the valve body lined with fluorine material.

3. The diaphragm as an actuator is prone to fatigue fracture due to frequent opening and closing. It should be replaced regularly according to the working condition, medium and its characteristics.

4. See "fluorine plastic performance table" for the anticorrosion performance and recommended operating temperature .

28



#### **Lining Material Test**

All lined valves must undergo individual tests for the integrity Lined Rubber, Butyl Rubber, Spark test: 14kV AC/DC Lined Rubber, HRL, Spark test: 17kV AC/DC Lined Plastic, Spark test: 20kV AC/DC

	Body Material				
Cast Iron BS EN 1561	Flange Connection	DN15-DN350			
Ductile Iron* BS EN 1563 BS EN 1563	Thread Connection Flange Connection	DN15-DN50 DN15-DN150			
Cast Steel	Flange Connection	DN15-DN300			
Bronze# BS EN 1982 BS EN 1982	Thread Connection Flange Connection	DN15-DN50 DN15-DN100			
Stainless Steel BS 3100 BS 3100	Thread Connection Flange Connection	DN15-DN50 DN15-DN150			

Note: Materials marked with\*are commonly used, while materials marked with# are non-standard and require customization.

#### Specincations for rubber-lined valve

Size Range: DN20-DN350 Soft Rubber Lining: EPDM Hardness: 60-66° IRHD (International Rubber Hardness Degrees) Hard Rubber Lining (HRL) Hardness: 75-85° Shore D Lining Thickness Range: 2-4.5 mm

#### **Body Material and Lining Material**





Lined Valve Weir Plan View

#### Cross-Sectional Diagram of a Lined Valve Body

#### **Plastic-lined valve body characteristics**

Ductile Iron Valve Body - High mechanical strength

Ductile Iron Valve Body - Provides mechanical support for plastic lining

Lining prevents ultraviolet rays from entering valves Smooth valve weir, conducive to diaphragm sealing and achieving zero leakage

Lining thickness range: 3-4 millimeters (DN20-DN150)

#### **Protective Layer and Lining Material**

External Protective Coating: For corrosion resistance, all valve bodies are coated with epoxy resin paint. Acutators and handwheels can be coated with electrostatic [powder spraying for special operating conditions, covering the entire surface. These valves are suitable for extremely corrosive process environments Existing Specifications:

-Valves lined with FEP, DN20-DN150 -Valves lined with PFA, DN20-DN150

#### Lining Material

#### Hard Rubber [NR/HRL]

Used for:Salt-containing water, Dilute mineral acids. Chlorinated wate Deionized water, Electroplating (stripping) solution, Drinking water

#### EPDM [Ethylene Propylene Diene Monomer]

Suitable for corrosive and abrasive slurries, mineral acids, and acidic slurries

#### ETFE [Ethylene Tetrafluoroethylene]

Suitable for strong acids operating at high temperatures and solvents operating at moderate temperatures in salt-containing water

#### PFA [Perfluoroalkoxy]

Best suited for concentrated mineral acids, aromatic hydrocarbons, aliphatic hydrocarbons, and chloride solvents operating at high temperatures

#### Natural Rubber [AA/SRL]

Offers excellent abrasion resistance, suitable for powders, abrasive slurries, clay, coal dust, dry fertilizers, and gypsum





#### **Diaphragm Structure and Materials**

As the core component of the diaphragm valve, the diaphragm directly affects the service life of the valve

For years, we have been dedicated to improving and investing in diaphragm technology, providing our customers with a range of safe and reliable diaphragms.

#### **Key Factors:**

- 1.Flexibility Performance
- 2.Compression Performance
- 3.Corrosion Resistance
- 4.Wear Resistance
- 5. Aging Resistance:

#### **Rubber Diaphragm**

Our independently designed rubber diaphragms are precisely matched with the valve body height to ensure maximum strength and durability of the diaphragm.

#### **Our PTFE diaphragms**

Our PTFE diaphrams feature a dual-layer structure consisting of a PTFE face membrane and a rubber backing, enhancing pressure resistance and extending the diaphragm's lifespan. The viscosity of PTFE particles is stronger and more suitable for diaphragm materials, significantly enhancing the diaphragm's fatigue resistance. Compared to ordinary diaphragms, PTFE diaphragms excel in temperature resistance, chemical resistance, and overall lifespan. The diaphragm is composed of multiple layers of rubber and reinforcement mesh. The fastening head bolts are mechanically and adhesively fixed to the diaphragm. The raised ribs on the sealing surface ensure a tight seal and reduce closing torque.

The diaphragm perfectly matches the valve body and pressure support arc, extending the diaphragm's lifespan.

30

## **Pneumatic Actuators**

Our company has independently developed aluminum and plastic pneumatic actuators, which are compact and highly corrosionresistant. These actuators are an integral part of the control system, enabling remote control.All actuators have three operating modes-

- Spring-close (air-open)
   Spring-open (air-close)
- 3. Double-acting (air-open and air-close)

Among these, the air-open mode is the most common. In the air-open mode: - All actuators with rubber diaphragms are

- designed for a 5bar air supply.
- All actuators with PTFE diaphragms are
- designed for a 6bar air supply.
- If a specific air supply is required, please specify

#### Plastic pneumatic actuators DN15-DN50

The plastic pneumatic actuators are injection molded from PES (Polyethersulfone) material, making them highly suitable for highcorrosion environments. These actuators are compact in size, making them ideal for installation in tight spaces



#### Aluminum Alloy Pneumatic Actuators DN15-DN125

The aluminum alloy pneumatic actuators are cast from highpressure aluminum, ensuring high strength and resistance to deformation. They are coated with corrosion-resistant and salt sprayresistant paint.

These actuators are suitable for various diameters and come with different size platforms, making them suitable for low air supply environments.













# SIZE L D1 f n-Φd ΦD H2 H1

#### Large diameter actuators DN150-DN200

The large diameter actuators use aluminum alloy material with a surface powder coating for corrosion resistance. Despite of their large size, they feature a compact design, with a maximum outer diameter not exceeding 500mm



#### **DIMENSIONS PN16**

DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN125	DN150	DN200
127	146	159	190	216	254	305	356	406	521
79.5	89	98.5	120.5	139.5	152.5	190.5	216	241.5	298.5
3	3	3	3	3	3	3	3	3	3
4-15	4-15	4-15	4-19	4/19	4-19	8-19	8-23	8-23	8-23
117	140	150	165	185	200	229	250	280	343
112	144	156	177	213	273	320	386	453	626
100	127	136	151	183	198	266	319	380	506

#### **DIMENSIONS 150LB**

DN20	DN25	DN32	DN40	DN50	DN65	DN80	DN100	DN150
117	127	146	159	190	216	254	305	406
70	79.5	89	98.5	120.5	139.5	152.5	190.5	241.5
3	3	3	3	3	3	3	3	3
4-15	4-15	4-15	4-15	4-19	4-19	4-19	8-19	8-23
100	110	120	130	150	180	190	229	279
110	112	144	156	177	213	273	320	580
98	100	127	136	151	183	198	266	510

32

#### **Fluorine Plastic Performance**

Perfor		Name	PTFE	PCTFE	PVDF	RE.	PFA	GXPO	PE	PP
mance	Code Item Unit		F4	F3	F2	F46	PFA	GXPO	PE	PP
	Specifc Gravity	g/cm³	2.1~2.2	2.1~2.2	1.76	2.1~2.2	2.1~2.2	0.92	0.92	0.92
	Water absorpion	%	0.001~0.005	≤ 0.005	0.04	≤ 0.01	≤ 0.01	0.005	0.005	0.005
Physical Performance	Shrinkage rate of finished product	%	1~5	1-2.5	2.0	2~5	1~5	1~2	1~2	1~2
	Embrittlement coefficient	10 <sup>-₅</sup> /K	10-12	4.5-7.0	8.5-15.3	8.3~10.5	8.3-12	2	-	-
	Embrittlemen temperature T1	ç	-180~-195	-180~-195	-62	-260	-180~-195	-40	-40	-20
	Hot resistance T2	°C	260	120-190	150	204	260	100	100	100
	Recommend working temperature T3	°C	≤ 180	≤ 120	≤ 100	≤ 150	≤ 200	≤ 85	≤ 85	≤ 85

						/				
Mechanical Performance	Hardness	SOSIXO	D50-65	D74-78	D80	(R45)	D50-65	D40	D40	D40
	Friction coefficient f	-	0.06	0.3~0.4	0.14~0.17	0.06~0.01	0.06~0.01	-	-	-
	Tensile strength σb	Мра	13.7-24.5	31.3-39.2	45~48.3	20.0~24.5	14~28	≥ 10	6.9~14	7.5~14
	Bending strength ơw	Мра	10.7-137	53.9-68.6	-	-	15~28	-	-	-
	Compression strength σy	Мра	111	80.3-50.9	68.6	-	111	-	-	-
	Impact strength σk	KJ/M²	16	12.7~16. 6	19.7	No breakage	1+	-55	45	50
	Ultimate elongation Δλ	%	250~350	30~190	30~300	250~270	300~500	480	300~600	600~700
	Breakdown voltage v	KV/mm	25~40	19.7	10.2	40	24~40	-	-	-

Proc	compression molding	Good	
essing F	Injection molding	-	Good
Performance	Lamination	Good	
	Layer	Good	

#### **Fluorine Plastic Performance**

	Medium	Concentration (%)	Temperature ° C	PTFE	PCTFE	PVDF	FEP	PFA	GXPO	PE	PP
	Sulfuric acid	10~98	Normal temperature ~100	A	A~B	A~B	А	A	Concentration ≤ 50%	Concentration ≤ 60%	A
	Ntric acid	5~98	Normal temperature ~100	А	A	A	А	А	Concentration ≤ 30%	Concentration ≤ 60%	А
	Hydrochloric acid	10~38	Normal temperature ~100	А	A	A	A	А	Concentration ≤ 38%	Concentration ≤ 60%	A~B
	Acetic acid	10~100	Normal temperature ~100	А	A~B	A~B	А	А	Concentration ≤ 10%	Concentration ≤ 60%	А
	Chromic acid	50~100	Normal temperature ~70	А	A~B	A~B	А	A	Concentration ≤ 30%	Concentration ≤ 20%	А
	phosphoric acic	50~85	Normal temperature ~100	A~B	D	D	A~B	А~В	Concentration ≤ 85%	Concentration ≤ 80%	А
	Trichloromethan	100	Normal temperature	с	В	В	с	с	х	х	х
	Coppersulfate	15	Normal temperature	А	с	c	А	А	Concentration ≤ 90%	Concentration ≤ 80%	А
	Diethy ether	100	Normal temperature	В	с	с	В	В	x	х	х
	Ethyl acetate	100	Normal temperature	В	А	A	В	В	x	х	х
orforms	Petrol	100	Normal temperature	А	A~B	A~B	A	A	x	х	х
	Hydrogen peroxide	3~30	Normal temperature	А	A	A	А	A	Concentration ≤ 30%	Concentration ≤ 60%	А
	Nitrobenzene	100	Normal temperature	A	A~B	A~B	A	A	x	х	х
oforon	Superalkali	10~50	Normal temperature ~100	А	А	A	А	А	Concentration ≤ 80%	Concentration ≤ 60%	А
	Sodium Hypochlorite	_	70	A	В	В	A	A	Concentration ≤ 80%	Concentration ≤ 60%	A~B
	Hydroxyl acid	40~99	-10~30	A~B	В	В	A~B	A~B	Concentration ≤ 80%	Concentration ≤ 60%	A~B
	Oleum	20	Normal temperature	A	В	В	А	А	x	х	х
	Acrylonitrile	-	Normal temperature	В	с	С	В	В	-	-	-
	Aniline	100	Normal temperature	В	В	В	В	В	Concentration ≤ 60%	Concentration ≤ 20%	В
	Benzene	100	Normal temperature	В	С	с	В	В	x	х	х
	Butyl acetate	100	Normal temperature	В	с	с	В	В	Concentration ≤ 60%	Concentration ≤ 20%	В
	Tetrachloromethane	Reagent grade	Normal temperature	В	С	С	В	В	х	х	х