

# Sure Seal's LBF Series Lined Butterfly Valve

100% of all valves are seat-tested to 110% of rated working pressure.



Direct Actuator Mounting on 2" - 24" Valves

SURE SEAL INCORPORATED IS PROUD TO BE



**Fully-lined, high-performance butterfly valves specifically engineered for the demanding requirements of the following industries and chemicals:**

### Industries

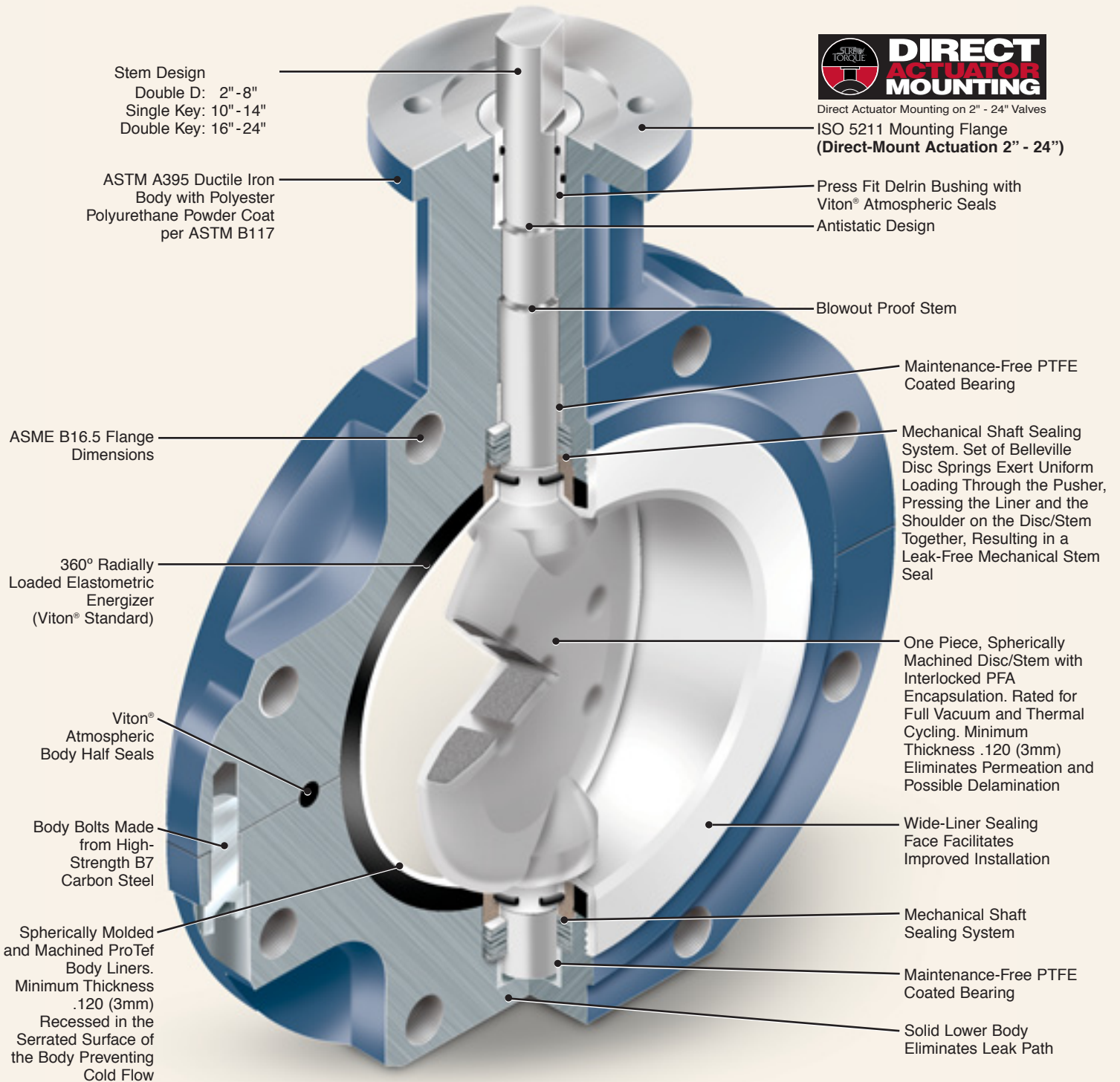
Chlor Alkali	Semiconductor
Petro Chemical	Mining
Textile	Pulp And Paper
Pharmaceutical	Agriculture

### Chemicals

Acetic Acid	Chlorinated Organics	Sodium Hypochlorite
Brine	Chlorinated Solvents	Sodium Chlorate
Bromine	Chlorinated Brine	Sulfuric Acid
Caustic	Hydrochloric Acid	Ultra Pure Water
Chlorine Gas	Hydrofluoric Acid	Vinyl Chloride
Chlorine Condensate	Hydrobromic Acid	White Liquor
Chlorine Dioxide	Nitric Acid	

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A DOVER COMPANY



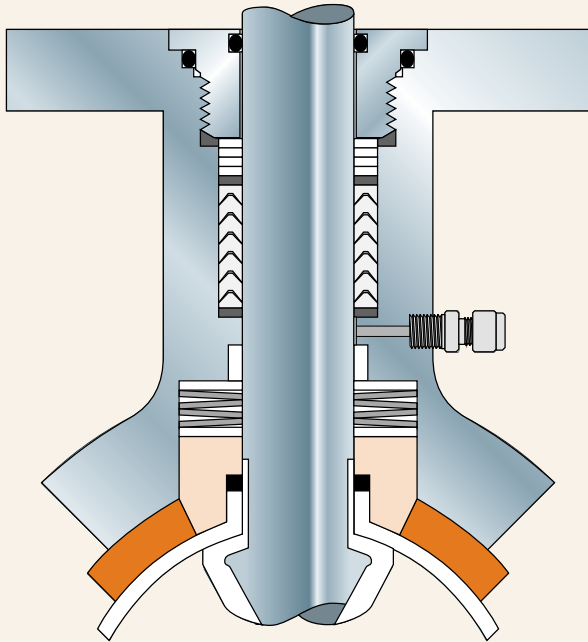
## Materials

The PFA/ProTef disc/liner combination provides the ultimate in corrosion resistance. The ProTef liner is made from molecular enhanced PTFE to ensure the densest seat possible. Then, it is machined to strict tolerances. The one piece disc/stem has a 3 mm thick precision-molded PFA locked-in-liner, encapsulating the wetted surfaces of the 316 stainless steel core. This eliminates the permeation and delamination commonly found in lined butterfly valves. Viton® elastomer backup rings are fitted to give a bubble tight shut-off at minimum operating torque. The stem seal is mechanical with a set of belleville disc springs. This provides a live load to keep the sealing surfaces under a constant controlled pressure. The result is a butterfly valve with a maintenance-free seal and high cycle life.

An UHMWPE (ultra high molecular weight polyethylene) valve in the same basic construction is also available and offers exceptional resistance to abrasion and corrosive slurries.

A fully PFA lined and fully ETFE (Tefzel) lined valve in the same basic construction are also available.

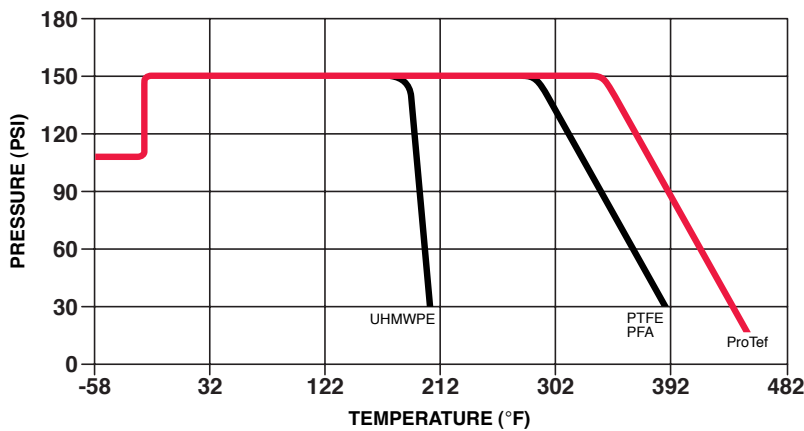
# Sure Seal's Optional SSS System



The optional **Sure Seal SSS System** incorporates an independent sealing system, featuring a belleville spring loaded packing gland, complete with monitoring ports. The SSS design permits the monitoring of the region between the two mechanical seals. Separate systems such as differential pressure switches, inert gas pads and routing to scrubbers can easily be adapted to the monitoring ports.

**Max DP at 100°F 2"-10" 150 PSIG.**  
**Max DP at 100°F 12"-24" 100 PSIG.**

## PRESSURE/TEMPERATURE CURVE OF VALVE LININGS

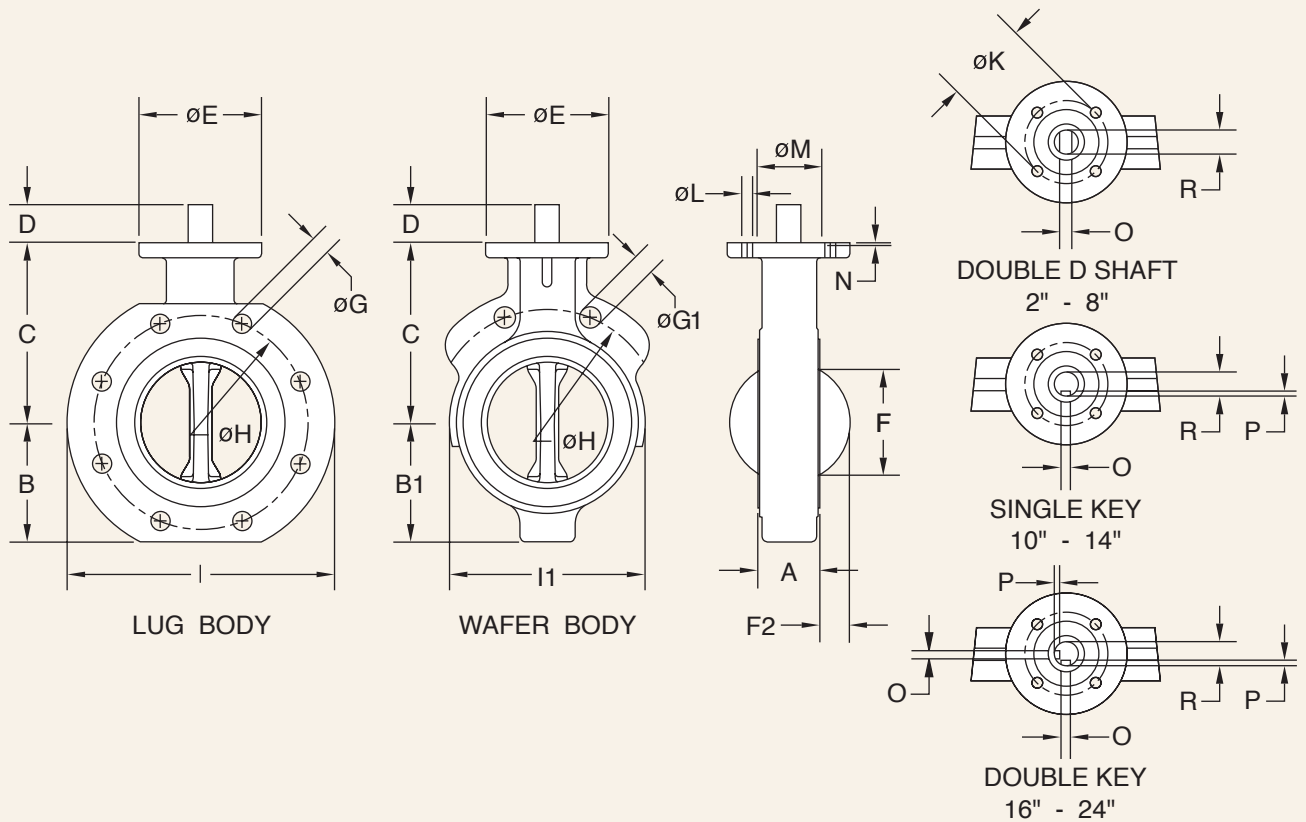


## SURE SEAL LINED BUTTERFLY FLOW RATE VALUES C<sub>v</sub>

### Valve Disc Angle of Degrees Open

Valve Size	20	30	40	50	60	70	80	90
2"	4	10	20	36	59	99	178	198
3"	13	33	66	120	199	332	598	664
4"	25	61	123	221	368	613	1103	1225
6"	46	115	231	415	692	1153	2075	2305
8"	136	339	679	1221	2036	3393	6107	6786
10"	220	550	1100	1981	3301	5502	9903	11003
12"	339	848	1695	3052	5086	8477	15259	16954
14"	457	1144	2287	4117	6862	11436	20585	22872
16"	542	1355	2711	4879	8132	13554	24397	27108
18"	700	1750	3501	6301	10502	17503	31505	35006
20"	961	2403	4805	8649	14416	24026	43247	48052
24"	1328	3321	6642	11956	19927	33212	59781	66423

# LBF Series Lined Butterfly Valve Dimensions



ANSI 150																					
INCH	A	B	B1	C	D	E	F	F2	G	G1	H	I	I1	K	L	M	N	ISO	O	P	R
2	1.69	2.28	2.20	5.12	0.748	4.02	1.22	0.24	4 x 5/8 - 11	2 x 3/4	4.75	6.02	4.09	2.76	0.35	2.205	0.14	F07	0.375	0.500	
3	1.81	3.46	3.31	6.50	0.748	4.02	2.48	0.67	4 x 5/8 - 11	2 x 3/4	6.00	8.27	5.69	2.76	0.35	2.205	0.14	F07	0.437	0.551	
4	2.05	4.02	3.94	7.28	0.984	4.02	3.54	1.06	8 x 5/8 - 11	2 x 3/4	7.50	9.65	6.46	2.76	0.35	2.205	0.14	F07	0.500	0.750	
6	2.19	4.92	4.92	8.54	1.181	4.02	5.31	1.81	8 x 3/4 - 10	2 x 7/8	9.50	11.61	8.66	2.76	0.35	2.205	0.14	F07	0.625	0.875	
8	2.36	6.30	6.22	9.65	1.181	5.98	7.44	2.80	8 x 3/4 - 10	2 x 7/8	11.75	14.44	10.79	4.92	0.51	3.425	0.14	F12	0.625	0.875	
10	2.68	7.64	7.48	10.63	1.181	5.98	9.41	3.62	12 x 7/8 - 9	2 x 1	14.25	16.97	12.99	4.92	0.51	3.425	0.14	F12	0.250	0.125	1.125
12	3.08	9.02	8.86	12.13	1.181	5.98	11.42	4.41	12 x 7/8 - 9	2 x 1	17.00	20.31	14.94	4.92	0.51	3.425	0.14	F12	0.250	0.125	1.125
14	3.62	10.08		12.99	1.457	8.27	12.91	4.92	12 x 1 - 8		18.75	22.82		6.50	0.83	5.197	0.20	F16	0.250	0.125	1.125
16	4.02	11.50		14.37	1.457	8.27	14.84	5.75	16 x 1 - 8		21.25	25.45		6.50	0.83	5.197	0.20	F16	0.394	0.197	1.420
18	4.49	12.28		15.75	1.969	8.27	16.72	6.46	16 x 1 1/8 - 8		22.75	27.04		6.50	0.83	5.197	0.20	F16	0.500	0.216	1.875
20	5.00	13.49		17.13	1.969	8.27	18.78	7.24	20 x 1 1/8 - 8		25.00	29.54		6.50	0.83	5.197	0.20	F16	0.500	0.216	1.875
24	6.06	15.72		20.08	2.460	8.27	22.05	8.46	20 x 1 1/4 - 8		29.50	34.50		6.50	0.83	5.197	0.20	F16	0.500	0.216	1.875

PN 10																					
DN	A	B	B1	C	D	E	F	F2	G	G1	H	I	I1	K	L	M	N	ISO	O	P	R
50	43	58	56	130	19	102	31	6	4 x M16	2 x 18	125	153	104	70	9	56	3.5	F07	9.52		12.7
80	46	88	84	165	19	102	63	17	8 x M16	2 x 18	160	210	144	70	9	56	3.5	F07	11		14
100	52	102	100	185	25	102	90	27	8 x M16	2 x 18	180	245	164	70	9	56	3.5	F07	12.70		19.05
150	56	125	125	217	30	102	135	46	8 x M20	2 x 22	240	295	220	70	9	56	3.5	F07	15.88		22.22
200	60	160	158	245	30	152	189	71	8 x M20	2 x 22	295	367	274	102	11	71	3.5	F10	15.88		22.22
250	68	194	190	270	30	152	239	92	12 x M20	2 x 22	350	431	330	102	11	71	3.5	F10	6.35	3.18	28.58
300	78.2	229	225	308	30	152	290	112	12 x M20	2 x 22	400	516	380	125	13	87	3.5	F12	6.35	3.18	28.58
350	92	256		330	37	210	328	125	16 x M20		460	580		165	21	132	5.1	F16	6.35	3.18	28.58
400	102	292		365	37	210	377	146	16 x M24		515	646		165	21	132	5.1	F16	10	5.00	36.07
450	114	312		400	50	210	425	164	20 x M24		565	687		165	21	132	5.1	F16	12.7	5.50	47.63
500	127	343		435	50	210	477	184	20 x M24		620	750		165	21	132	5.1	F16	12.7	5.50	47.63
600	154	399		510	64	210	560	215	20 x M27		725	876		165	21	132	5.1	F16	12.7	5.50	47.63

NOTE: ALL VALVES ARE DESIGNED IN CONFORMANCE WITH API 609 STANDARDS.  
VALVES GREATER THAN 24" ARE AVAILABLE ON SEPARATE DATA SHEETS.



Sure Seal's LBF Series Lined Butterfly Valves feature "The Most Effective Technology" available for controlling and isolating corrosive, high-purity and abrasive process media. Our valves incorporate the absolute highest standards of quality, performance, safety, and reliability that is required by the most demanding industries.

## Features of Sure Seal's LBF Series Lined Butterfly Valves

**Design Criteria** - All Sure Seal LBF series butterfly valves conform to the following specifications: API 609, MSS SP-67, ISO 5752/20 (5752/25 for 14"), PED 97/23/EC, MSS-SP25, ASME B16.5, and ISO 5211 (Mounting Flanges). Valves are also available in conformance with the PN10 requirements.

**Bubble Tight Shut-Off** - All Sure Seal valves feature a non-wetted, 360 deg. radially loaded, elastometric energizer that is engineered to provide uniform pressure to the outer circumference of the liner and disc. This energizer ensures **absolute bubble tight shut-off**. Each valve is individually tested and certified for 100% bubble tight shut-off per the API 598 criteria.

**Mechanical Shaft Sealing Mechanism** - Sure Seal's state-of-the-art mechanical shaft sealing mechanism features an industry proven, three point, dynamically loaded Belleville spring technology. The primary seal is created by Belleville springs exerting an axial force at the liner/disc hub interface. The secondary seal is created at the PFA encapsulated stem/Teflon® collar interface, and the tertiary seal is created by a radially loaded Viton® o-ring that is strategically placed around the top of the Teflon® extended collar. Sure Seal's unique, spherically shaped disc and liner eliminates the axial cold flow and deformation problems typical of conventional lined butterfly valves, resulting in a reliable, maintenance-free, environmentally safe stem seal.

**Disc Swing Clearance** - The disc swing of all Sure Seal lined high-performance butterfly valves is compatible with ASTM 1545-97 Teflon®-lined piping systems as well as other fiberglass and carbon steel systems. This results in the elimination of spacers during installation.

**Size Range** - Sure Seal's standard size range is 2"-24" and includes wafer and lug bodies. (Valves through size 42" are available upon request and are featured on separate data sheets.)

**Temperature Rating** - Sure Seal's LBF Valves' temperature rating ranges from -40 deg. F to 450 deg. F depending upon liner selection.

**ISO 5211 Mounting Flange** - Sure Seal's ISO 5211 mounting flange allows the direct mounting of actuators; thus, eliminating hysteresis and costly automation hardware.

**Permeation Resistance** - Sure Seal's ProTef proprietary lining and molding technology features a minimum lining thickness of 3mm and was developed to provide long-term resistance to permeation, absorption, and swelling. Our lining technology features a substantially greater crystallinity, density and lower melt viscosity during the sintering process than conventional fluoropolymer lined valves. This results in lower rates of permeation, diffusion and absorption. The industry proven results of our ProTef technology include long-term, maintenance-free operation in harsh environments such as halogens, chlorinated organics and hydrochloric acid applications.

**Reduced Liner Cold Flow** - Sure Seal's mechanically enhanced ProTef liner technology is specifically engineered to reduce the effects of cold flow; thus, facilitating the installation of our valves. The ProTef technology features superior joint, creep and vacuum resistance, especially at elevated temperatures, placing Sure Seal valves in a performance class of its own. The LBF design features spherically molded and machined, wide-liner sealing surfaces that are securely anchored within the faces of the valve body by a series of concentric serrations, resulting in the reduction of radial cold flow.

**Robust Body Construction** - The robust body construction of the Sure Seal LBF valve is designed to be equally as strong as the ANSI 150# counter flanges it will be fastened to when used. Our technically superior design eliminates the deflection problems experienced by conventional lined butterfly valves, resulting in improved flange sealing properties. Valve bodies meet the minimum wall thickness requirement specified in ASME B16.42.

**External Corrosion Protection** - Polyester Polyurethane powder coating. Test conforms to ASTM B117.

**Chlorine Valves** - Sure Seal LBF series lined butterfly valves are ideally suited for chlorine gas service. Valves for these services are thoroughly cleaned, degreased and packaged per our factory certified procedures and conform to the Chlorine Institute, *Pamphlet 6*, requirements. Our dense, superior crystalline structured linings offer industries using these chemicals unparalleled performance and reliability.

ISO 9001: 1994 ABS type certified.

## QUALITY ASSURANCE

Sure Seal's LBF series lined butterfly valves are strictly produced under a company committed, statistical quality assurance process to assure defect-free products that are delivered to our customers on time. All valves are manufactured utilizing the latest computer aided production methods and molding technology, guaranteeing control of the manufacturing process and reduction of rework. Each valve is individually tested in accordance with the API 598 specifications and is spark tested with 30,000 volts to assure lining integrity. Each valve is individually designed and tested using applicable standards as a minimum requirement. A PMI process is performed on all critical components allowing total identification. Valves are also subject to visual and dimensional examinations as well as functional tests. Upon successfully completing all testing, each valve is assigned a stainless steel serial numbered identification plate that quickly identifies the valve and assures complete traceability. Mill Test Certificates are available upon request.

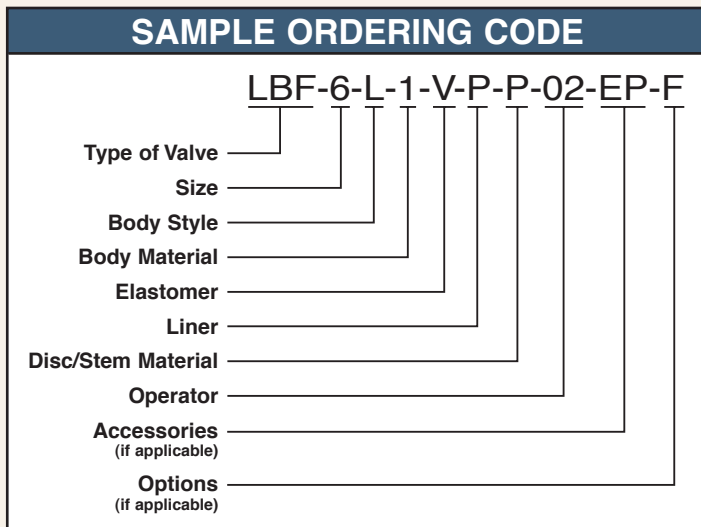
TORQUE VALUES						
	Breakaway Torque*		Body Style			
	ProTef		Wafer		Lug	
Size ANSI	Nm	In Lbs	KG	Lbs	Kg	Lbs
2	30	266	2.6	5.7	4.7	10.4
3	44	399	4.3	9.5	8.9	19.6
4	60	531	6.3	13.9	12.3	27.1
6	114	1009	10.9	24.0	17.7	39.0
8	190	1682	16.2	35.7	28.8	63.5
10	300	2655	24.1	53.1	40.3	88.8
12	400	3540	31.2	68.8	61.4	135.3
14	465	4115			87.8	193.5
16	615	5443			92.4	203.7
18	755	6682			112	246.9
20	920	8142			122.2	269.3
24	1200	10620			183.1	403.6

*\*Actual operating torques will be lower*

*When sizing actuator multiply torque values by 1.25 safety factor.*

## Sure Seal's LBF Series Lined Butterfly Valve Ordering Information

<b>BODY STYLE</b>	<b>BODY MATERIAL</b>	<b>ELASTOMER</b>	<b>LINER</b>	<b>DISC/STEM</b>	<b>OPERATOR</b>
W Wafer	1 A395 Ductile Iron	V Viton®	P ProTef (Molecular Enhanced PTFE)	P PFA Lined 255SS	00 Bare Stem
L Lug	2 316 Stainless Steel	S Silicone	T PTFE	E ETFE Lined 255SS	01 Lever Locking Handle
		H Hypalon	U UHMWPE	A Alloy 20	02 Manual Gear
		E EPDM	E ETFE	B Hastelloy B	03 Double Acting Pneumatic Actuator
			A PFA	I Inconel 600	04 Fail Open Pneumatic Actuator
				S 316L Stainless Steel	05 Fail Closed Pneumatic Actuator
				SP 316L Stainless Steel Polished	06 Electric Actuator
				T Titanium Grade 2	07 Hydraulic Actuator
				H Hastelloy C276	



- ACCESSORIES**
- P Pneumatic Positioner
  - EP Electro Pneumatic Positioner
  - PS Proximity Switch Box
  - LS Micro Limit Switches

- OPTIONS**
- S Solenoid Valve
  - F Filter Regulator W/ Gauge
  - M Manual Override

**For additional options and materials contact your nearest Sure Seal distributor.**

Purchasers are expected to make their own tests to determine the suitability of these products for their particular purposes. The data represented in this brochure are for general information only. Manufacturer is not responsible for acceptability of these products in regard to individual system requirements. For specific performance data and correct materials selection, please contact your Sure Seal Dealer. ©2003 Sure Seal, Incorporated • Printed in the USA

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