



PFA LINED BUTTERFLY VALVE Model 190-150



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Introduction: The ChemValve Model 190-150 is a PFA lined butterfly valve suitable for many applications where flow control of corrosive and aggressive chemical liquids or vapors is required. It is available in sizes from 2" – 24", including models with enhanced seats, seat pads, and encapsulated discs for chlorine and brine service.

GENERAL PRODUCT INFORMATION

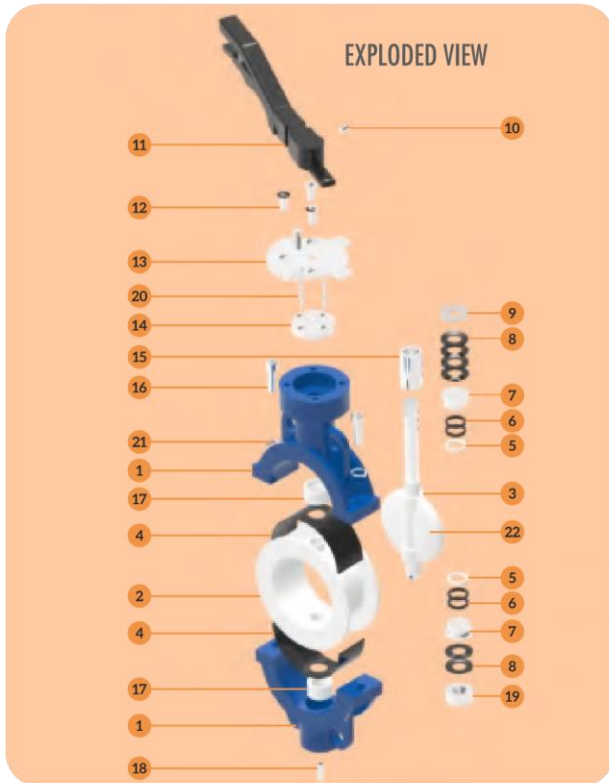
BUTTERFLY VALVES	FEATURE OFFERED	OPTIONS AVAILABLE
APPLICATIONS	MOST CORROSIVE & AGGRESSIVE CHEMICALS & VAPOURS	
STANDARDS FOLLOWED	DESIGN : API 609 WAFER & LUG FACE TO FACE DIMENSIONS : API 609 CATEGORY : A CONNECTION RATING : ANSI B 16.5 TEST : API 598	TEST : ISO 9393-2 OR BS EN 12266-1-2003
BODY	ASTM A 216 GR. WCB	ASTM A 351 GR. CF8 OR 8M
DISC LINING MATERIALS	PFA	FEP/PVDF/ETFE/ECTFE & PPH
SEAT / LINERS	ISOSTATICALLY MOULDED PTFE	ISOSTATICALLY MOULDED TFM / OR MPTEF
VALVE PAINTING	EPOXY 2 PART PAINT	PU PAINT
TEMPERATURE	- 40 DEG.F TO 450 DEG. F (PFA)	LINING IN FEP, ETFE & PVDF IS AVAILABLE WITH DIFF TEMPERATURE RANGE
DISC SEALING	CLASS VI, TIGHT SHUT OFF AS PER API 598	
SHAFT SEALS	LOADED PACKING WITH GLAND COVERS ON TOP & BOTTOM	
MAX. PRESSURE	225 PSI	
FLOW DIRECTION	BI-DIRECTIONAL	
SPARK TEST FOR LINED COMPONENTS	20 KVDC	

ENHANCED FEATURES OF MODELS FOR CHLORINE AND BRINE SERVICE¹

FEATURE	SERVICE PROBLEM	BENEFIT
8mm thick TFM seat (normal seat thickness is 3 – 3.5mm)	Permeation of chlorine or chlorine compounds	Significantly reduced permeation due to increased seat thickness
Seat pad	Need for elastomer backup pad – Viton	Continued shut off for life of valve
PVDF disc encapsulation	Permeation and erosion of PTFE or PFA encapsulation of disc	PVDF is very resistant to permeation and erosion
One-piece disc and stem of Duplex 2205	300 series stainless steel disc and stem can be subject to stress crack corrosion	Longer service life
Sealed bottom hub	Leakage to bottom hub could cause safety issues	Elimination of a safety issue

¹ Available in Lever-Operated 4" or Gear-Operated 6" and 8" Lugged Types. Please refer to *Additional Application Information* at the end of this document.

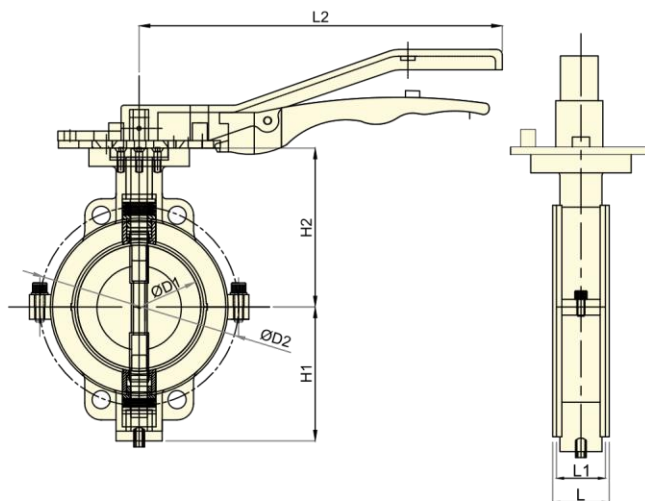
LINED BUTTERFLY VALVE LEVER OPERATED - WAFER



MATERIAL LIST

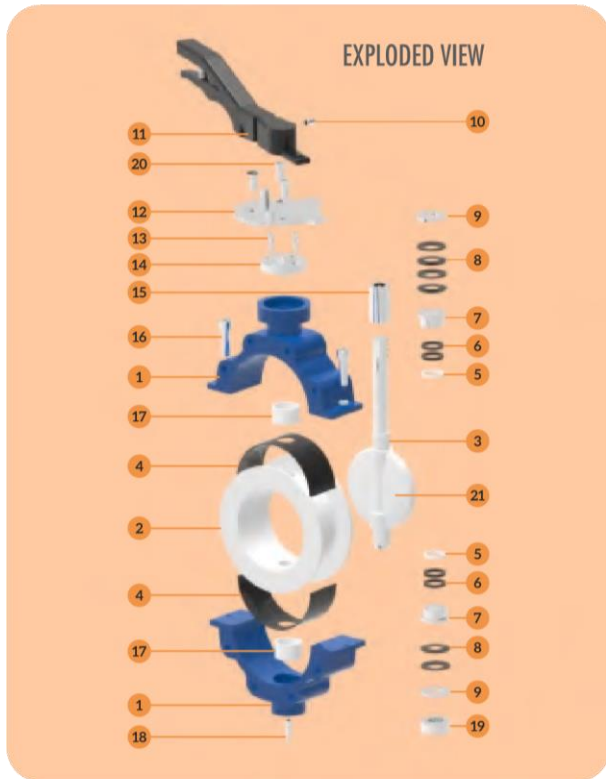
PAR NO.	DESCRIPTION	MATERIAL OF CONSTRUCTION	QTY.
1	Body	ASTM A 216 GR. WCB / SS 304 / SS 316	2
2	Seat	PTFE / MPTEF / TFM	1
3	Disc	ASTM A 890 GR. 4A (CD3MN) + PFA	1
4	Seat Pad	VITON / SILICON	2
5	Washer	PTFE	2
6	Gland Seals	VITON	4
7	T-Bush	SS 304	2
8	Disc Springs	50 Crv 4	6
9	Retainer	SS 304	2
10	Pin For Handler	STEEL	1
11	Handle	WCB	1
12	Allen CSK Bolt for Teeth Plate	HT 12.9	3
13	Teeth Plate	WCB / SS	1
14	Thrust Collar Top	SS 304	1
15	Sleeve	SS 304	1
16	Body Bolts	ASTM A 193 GR. B7	2
17	Bush	PFA	2
18	Grub Screw	STEEL	1
19	Bottom Gland Cover	SS 304	1
20	Allen CSK for Top Thrust Collar	HT 12.9	4
21	Spring Washer	STEEL	2
22	Disc Lining Material	PFA / FEP / PVDF / ETFE / ECTFE / PPH	-

SECTIONAL VIEW



Size	L ± .12		L1 ± .04		ØD1 ± .08		ØD2 ± .08		H1 ± .31		H2 ± .31		L2 ± .31		ØDD		W	
	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM
2"	1.85	47	1.69	43	1.97	60	4.76	121	3.27	83	4.60	117	10.47	266	0.55	14	0.43	11
2.5"	1.97	50	1.81	46	2.55	65	5.51	140	3.54	90	5.39	137	10.47	266	0.55	14	0.43	11
3"	1.97	50	1.81	46	2.95	75	6	152	3.54	90	5.04	128	10.47	266	0.55	14	0.43	11
4"	2.20	56	2.04	52	3.93	100	7.5	191	4.52	115	6.14	156	10.47	266	0.71	18	0.55	14

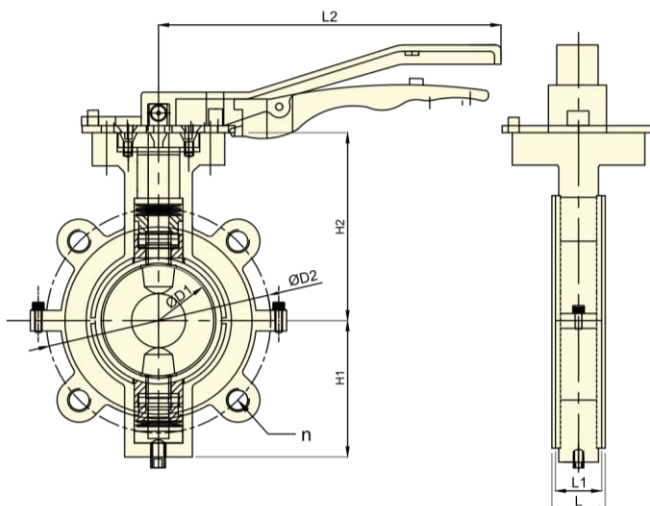
LINED BUTTERFLY VALVE LEVER OPERATED – FULL LUG



MATERIAL LIST

PAR NO.	DESCRIPTION	MATERIAL OF CONSTRUCTION	QTY.
1	Body	ASTM A 216 GR. WCB / SS 304 / SS 316	2
2	Seat	PTFE / MPTEF / TFM	1
3	Disc	ASTM A 890 GR. 4A (CD3MN) + PFA	1
4	Seat Pad	VITON / SILICON	2
5	Washer	PTFE	2
6	Gland Seals	VITON	4
7	T-Bush	SS 304	2
8	Disc Springs	50 Crv 4	6
9	Retainer	SS 304	2
10	Pin For Handler	STEEL	1
11	Handle	WCB	1
12	Teeth Plate	WCB / SS	1
13	Allen CSK Bolt for Thrust Collar	HT 12.9	4
14	Thrust Collar Top	HT 12.9	1
15	Sleeve	SS 304	1
16	Body Bolts	ASTM A 193 GR. B7	2
17	Bush	PFA	2
18	Grub Screw	STEEL	1
19	Bottom Gland Cover	SS 304	1
20	Allen CSK Bolt for Teeth Plate	HT 12.9	3
21	Disc Lining Material	PFA / FEP / PVDF / ETFE / ECTFE / PPH	-

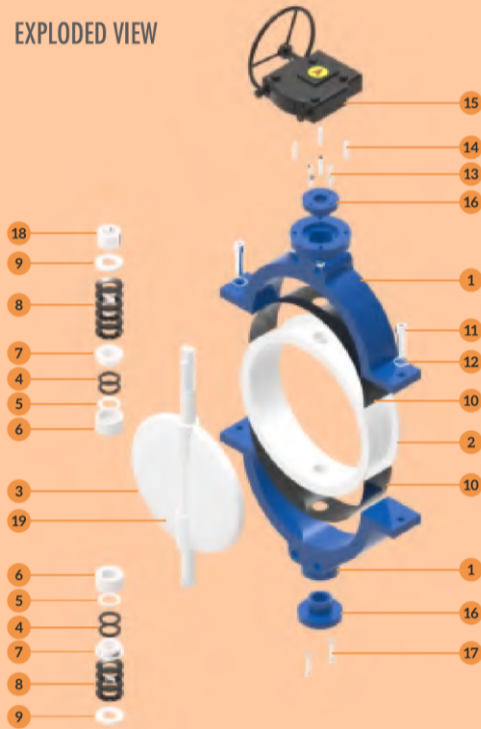
SECTIONAL VIEW



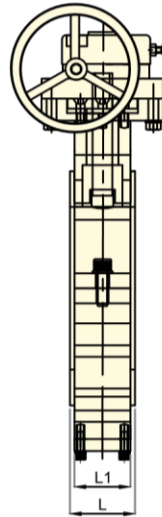
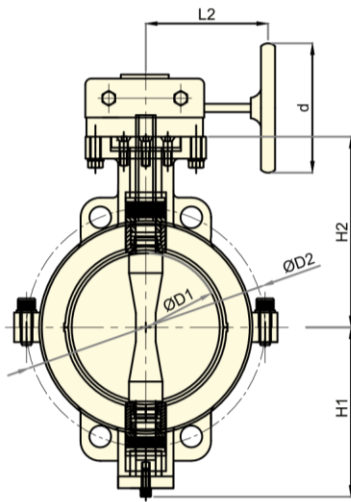
Size	L ± .12		L1 ± .04		ØD1 ± .08		ØD2 ± .08		H1 ± .31		H2 ± .31		L2 ± .31		ØDD		W		n
	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	
2"	1.85	47	1.69	43	1.97	50	4.76	121	3.27	83	4.60	117	10.47	266	0.55	14	0.43	11	04
2.5"	1.97	50	1.81	46	2.55	65	5.51	140	3.54	90	5.39	137	10.47	266	0.55	14	0.43	11	04
3"	1.97	50	1.81	46	2.95	75	6	152	3.62	92	5.03	128	10.47	266	0.55	14	0.43	11	04
4"	2.20	56	2.04	52	3.93	100	7.5	191	4.52	115	6.18	157	10.47	266	0.71	18	0.55	14	08

LINED BUTTERFLY VALVE GEAR OPERATED – WAFER

EXPLODED VIEW



SECTIONAL VIEW



MATERIAL LIST

PAR NO.	DESCRIPTION	MATERIAL OF CONSTRUCTION	QTY.
1	Body	ASTM A 216 GR. WCB / SS 304 / SS 316	2
2	Seat	PTFE / MPTEF / TFM	1
3	Disc	ASTM A 890 GR. 4A (CD3MN) + PFA	1
4	Gland Seals	VITON	4
5	Washer	PTFE	2
6	Bush	PFA	2
7	T-Bush	SS 304	2
8	Disc Spring	50 Crv 4	10
9	Retainer	SS 304	2
10	Seat Pads	VITON / SILICON	2
11	Body Bolts	ASTM A 193 GR. B7	2
12	Spring Washer	STEEL	2
13	Gland Bolts	HT 12.9	2
14	Gear Box Mounting Studs	SS 304	4
15	Gear Box	Cast Iron Epoxy Painted	1
16	Thrust Collar	SS 304	2
17	Bottom Cover Bolts	HT 12.9	2
18	Sleeve	SS 304	1
19	Disc Lining Material	PFA / FEP / PVDF / ETFE / ECTFE / PPH	-

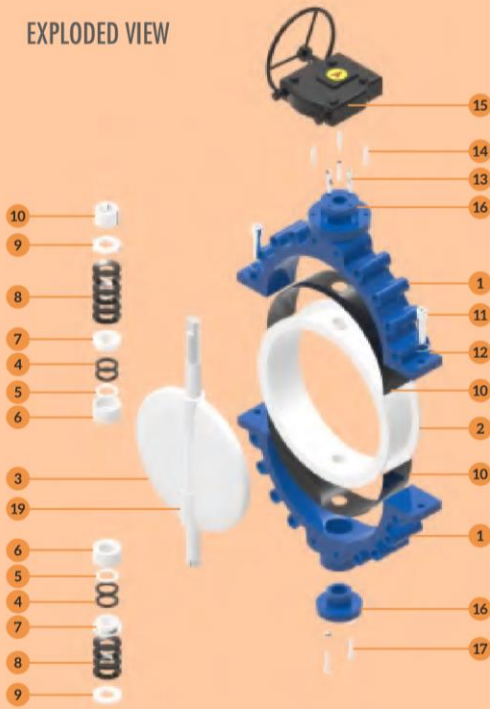
Size	L ± .12		L1 ± .04		ØD1 ± .08		ØD2 ± .08		H1 ± .31		H2 ± .31		L2 ± .31		d		ØDD		W	
	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM
5"	2.36	60	2.20	56	4.92	125	8.50	216	5.90	150	6.45	164	7.68	195	9.84	250	0.79	20	0.55	14
6"	2.36	60	2.20	56	5.90	150	9.49	241	6.37	162	7.63	194	7.68	195	9.84	250	0.79	20	0.55	14
8"	2.52	64	2.36	60	7.87	200	11.75	298	7.20	183	9.25	235	7.68	195	9.84	250	0.98	25	0.74	19
10"	2.83	72	2.68	68	9.84	250	14.25	362	9.21	234	9.88	251	8.89	226	13.78	350	1.10	28	0.86	22
12"	3.30	84	3.07	78	11.81	300	17	432	10.66	271	11.57	294	8.89	226	13.78	350	1.10	28	0.86	22
14"	3.30	84	3.07	78	13.78	350	18.70	476	12.20	310	12.79	325	8.89	226	13.78	350	1.10	28	0.86	22
16"	4.25	108	4.01	102	15.74	400	21.25	540	13.18	335	13.58	345	9.84	250	19.68	500	1.41	36	1.1	28
18"	4.72	120	4.49	114	17.71	450	22.75	578	15.55	395	14.76	375	9.84	250	19.68	500	1.41	36	1.1	28
20"	5.23	133	5	127	19.44	494	25	635	16.73	425	16.33	415	11.10	282	23.62	600	1.79	45.5	1.41	36
24"	6.29	160	6.06	154	23.54	600	29.52	749	18.70	475	19.48	495	11.10	282	23.62	600	2	51	1.45	37

LINED BUTTERFLY VALVE GEAR OPERATED – FULL LUG

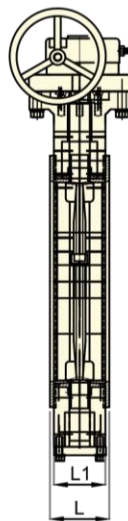
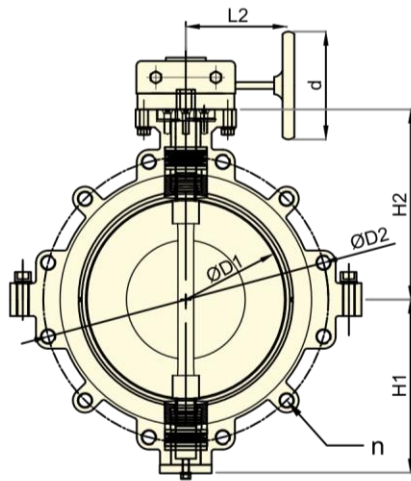
MATERIAL LIST

PAR NO.	DESCRIPTION	MATERIAL OF CONSTRUCTION	QTY.
1	Body	ASTM A 216 GR. WCB / SS 304 / SS 316	2
2	Seat	PTFE / MPTE / TFM	1
3	Disc	ASTM A 890 GR. 4A (CD3MN) + PFA	1
4	Gland Seals	VITON	4
5	Washer	PTFE	2
6	Bush	PFA	2
7	T-Bush	SS 304	2
8	Disc Spring	50 Crv 4	10
9	Retainer	SS 304	2
10	Seat Pads	VITON / SILICON	2
11	Body Bolts	ASTM A 193 GR. B7	2
12	Spring Washer	STEEL	2
13	Gland Bolts	HT 12.9	2
14	Gear Box Mounting Studs	SS 304	4
15	Gear Box	Cast Iron Epoxy Painted	1
16	Thrust Collar	SS 304	2
17	Bottom Cover Bolts	HT 12.9	2
18	Sleeve	SS 304	1
19	Disc Lining Material	PFA / FEP / PVDF / ETFE / ECTFE / PPH	-

EXPLODED VIEW

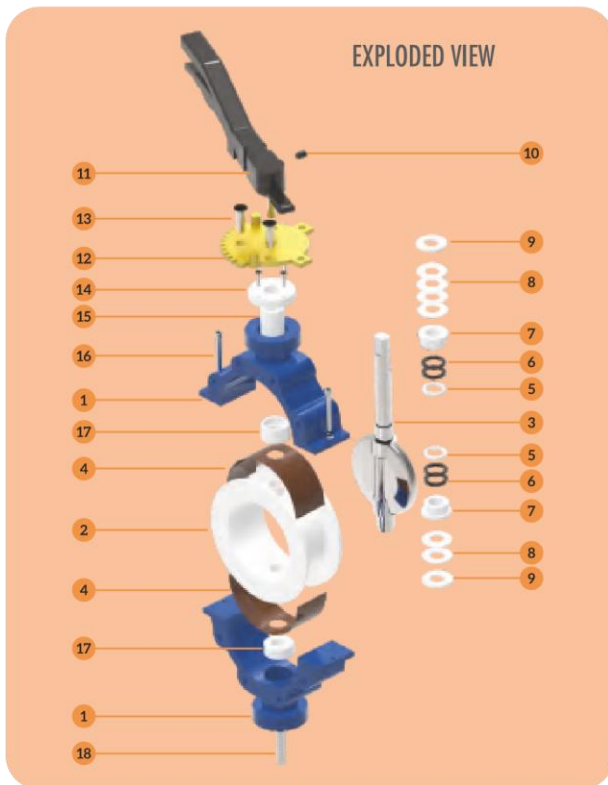


SECTIONAL VIEW



Size	L ± .12		L1 ± .04		ØD1 ± .08		ØD2 ± .08		H1 ± .31		H2 ± .31		L2 ± .31		d		ØDD		W		n
	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	INCH	MM	
6"	2.36	60	2.20	56	5.90	150	9.49	241	6.41	163	7.48	190	7.68	195	9.84	250	0.79	20	0.55	14	08
8"	2.52	64	2.36	60	7.87	200	11.75	298	7.79	198	9.13	232	7.68	195	9.84	250	0.98	25	0.74	19	08
10"	2.83	72	2.68	68	9.84	250	14.25	362	8.58	218	9.84	250	8.89	226	13.78	350	1.10	28	0.86	22	12
12"	3.30	84	3.07	78	11.81	300	17	432	10.43	265	11.33	288	8.89	226	13.78	350	1.10	28	0.86	22	12
14"	3.30	84	3.07	78	13.78	350	18.70	476	12.55	319	12.44	316	8.89	226	13.78	350	1.10	28	0.86	22	12
16"	4.25	108	4.01	102	15.74	400	21.25	540	13.19	335	13.58	345	9.84	250	19.68	500	1.41	36	1.10	28	16
18"	4.72	120	4.49	114	17.71	450	22.75	578	15.74	400	14.72	374	9.84	250	19.68	500	1.41	36	1.10	28	16
20"	5.23	133	5	127	19.44	494	25	635	16.73	425	16.33	415	11.10	282	23.62	600	1.79	45.5	1.41	36	20
24"	6.29	160	6.06	154	23.54	600	29.52	749	19.37	492	19.88	505	11.10	282	23.62	600	2	51	1.45	37	20

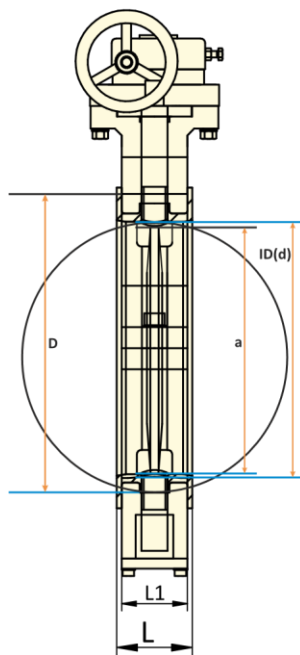
METAL DISC BUTTERFLY VALVE LEVER & GEAR OPERATED – FULL LUG & WAFER



MATERIAL LIST

PAR NO.	DESCRIPTION	MATERIAL OF CONSTRUCTION	QTY.
1	Body	ASTM A 216 GR. WCB	2
2	Seat	PTFE / MPTEF / TFM	1
3	Disc	Duplex / Super / Duplex / AL. Bronze / Cf8 / CF8M	1
4	Seat Pad	VITON / SILICON	2
5	Washer	PTFE	2
6	Gland Seals	VITON	4
7	T-Bush	SS 304	2
8	Disc Springs	50 Crv 4	6
9	Retainer	SS 304	2
10	Pin For Handle	STEEL	1
11	Handle	WCB	1
12	Teeth Plate	WCB / SS	1
13	Allen CSK Bolts	HT 12.9	3
14	Thrust Collar Top	SS 304	1
15	Sleeve	SS 304	1
16	Body Bolts	ASTM 193 GR. B7	2
17	Bush	PFA	2
18	Grub Screw	STEEL	1

INSTALLATION DETAILS OF LINED BUTTERFLY VALVE WAFER & LUGGED CONSTRUCTION



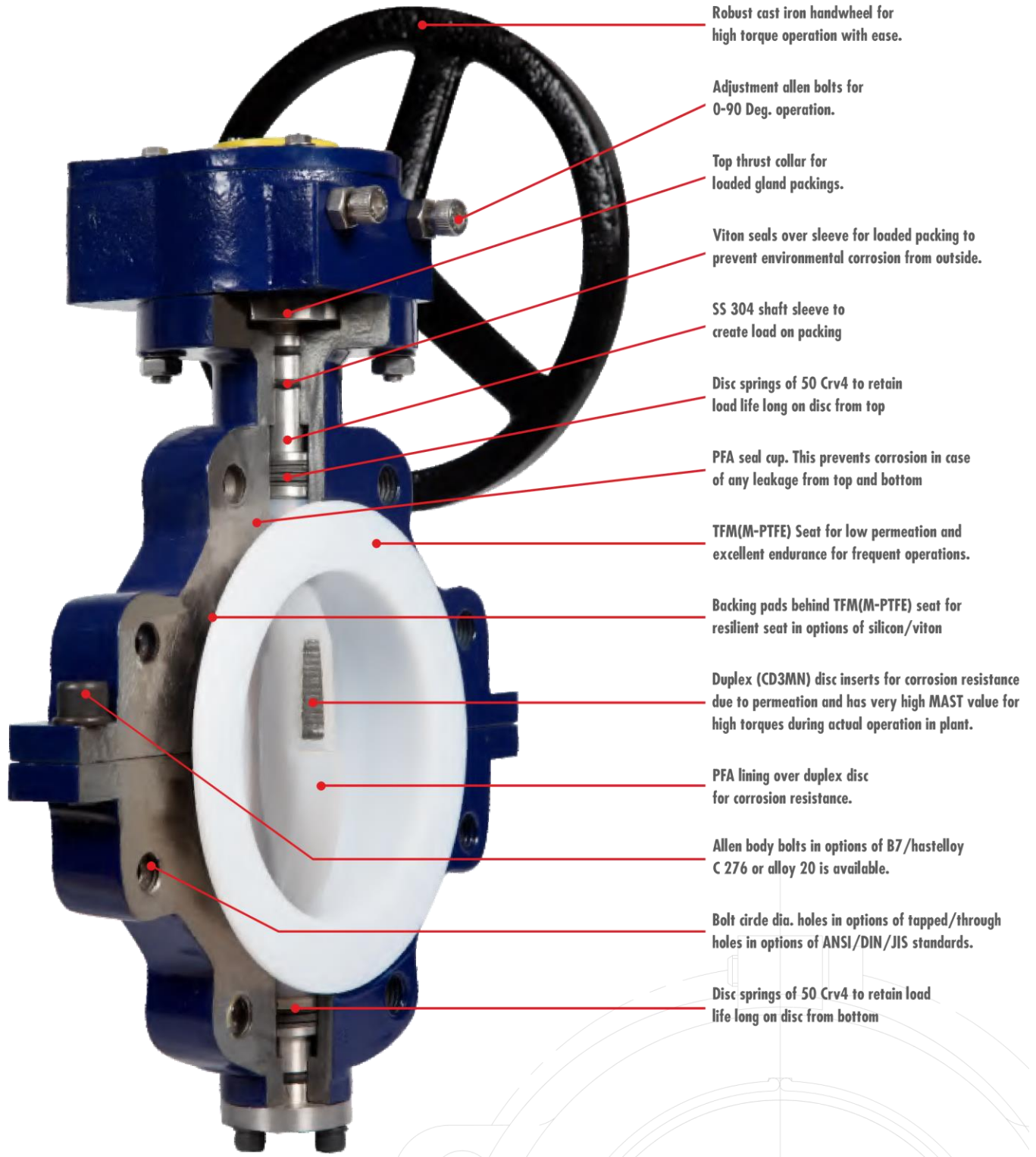
MINIMUM PIPE ID REQUIRED FOR FULL DISC OPENING

Size (MM)	F / F		D		a		Pipe I.D Req.(d)	
	INCH	MM	INCH	MM	INCH	MM	INCH	MM
600	6.29	160	27.6	700	22.6	575	23.0	585
500	5.23	133	23.0	584	18.7	477	19.3	490
450	4.72	120	21.0	534	16.9	430	17.3	440
400	4.25	108	18.5	470	15.1	384	15.4	390
350	3.3	84	16.2	412	13.3	338	13.5	344
300	3.3	84	15.0	380	11.3	286	11.5	292
250	2.83	72	12.7	323	9.3	236	9.5	242
200	2.52	64	10.6	270	7.4	187	7.6	193
150	2.36	60	8.5	216	5.4	136	5.5	140
125	2.36	60	7.3	185	4.2	107	4.4	110
100	2.2	56	6.2	157	3.2	80	3.3	83
80	1.97	50	5.0	127	2.1	52	2.2	55
65	1.97	50	4.1	105	1.42	36	1.54	39
50	1.85	47	3.6	92	VALVE DISC OPEN INSIDE "L"			

L = Face to face dimension of Butterfly Valve
a = Chord of disc in open position

ID (d) = Minimum Pipe ID Required
50mm to 100mm size Lever Type, Above 100mm size Gear Type

VALVE FEATURES



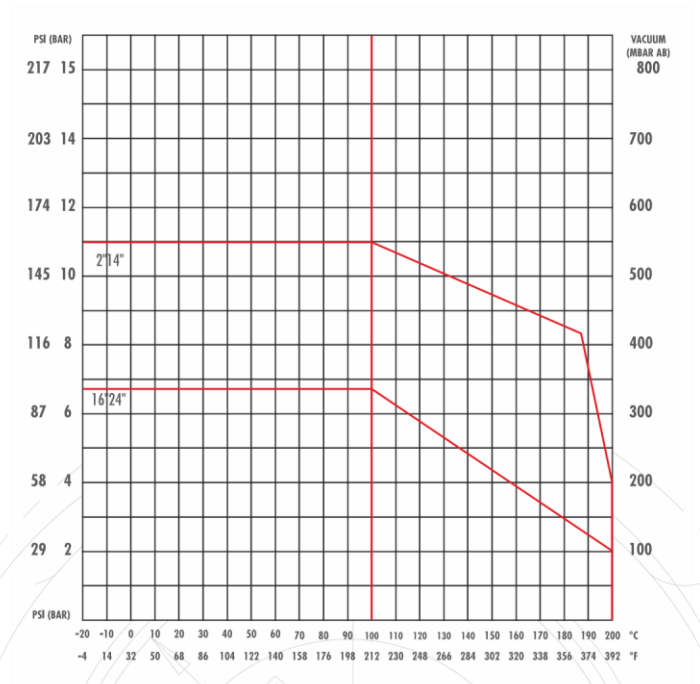
Cv VALUES FOR BUTTERFLY VALVE AT DIFFERENT POSITIONS

SIZE	20°	30°	40°	50°	60°	70°	80°	90°
2"	5.8	13	28	49	74	107	137	155
2.5"	9.3	22	47	81	125	180	232	263
3"	17	38	83	145	220	313	388	455
4"	23	56	110	188	296	447	563	678
5"	44	95	191	296	528	748	945	1177
6"	70	151	273	458	748	1108	1415	1734
8"	110	267	539	922	1369	2105	2796	3538
10"	203	406	824	1346	1867	2807	4234	5232
12"	307	605	1154	1995	3091	4599	6914	8363
14"	406	765	1369	2088	3341	5278	8329	10161
16"	591	1142	1717	2842	4907	7598	10730	13166
18"	771	1456	2587	4466	7250	10672	14210	17284
20"	1032	1879	3456	6206	9454	13688	18050	20880
24"	1125	2494	4849	8607	13166	19082	24592	28420

BREAK TORQUE VALUES FOR BUTTERFLY VALVES

SIZE	TORQUE IN Nm	TORQUE IN LB INCH
2"	30	265
2.5"	30	265
3"	30	265
4"	60	530
5"	110	972
6"	125	1105
8"	180	1591
10"	360	3183
12"	480	4243
14"	800	7072
16"	1200	10608
18"	2018	17840
20"	2460	21746
24"	3075	27183

PRESSURE - TEMPERATURE GRAPH FOR WCB+ PFA / PTFE LINED BUTTERFLY VALVES





WEIGHT / VALVE

SIZE	KGS.		LBS.	
INCHES	WAFER	FULLLUG	WAFER	FULLLUG
2"	5.00	6.50	11	14.30
2.5"	6.00	7.50	13	16.50
3"	7.00	8.60	15	19.00
4"	9.00	13.40	20	16.08
5"	20.00	23.00	44	50.60
6"	23.00	25.50	51	56.10
8"	26.00	30.50	57	67.10
10"	45.00	51.00	112	112.20
12"	62.00	75.00	136	165.00
14"	66.00	80.00	145	176.00
16"	112.00	135.00	246	297.00
18"	157.00	189.00	346	415.80
20"	288.00	346.00	634	761.20
24"	420.00	504.00	924	1109.00

Additional Application Information

The general temperature limit for PVDF is 275F. However, in the case of chlorine, chlorine gas, brine, and hydrochloric acid the specific concentrations and operating conditions will limit the maximum operating temperatures and pressures. Therefore, please contact ChemValve with the specific service conditions to determine the maximum temperature and pressure recommendations.

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