

Semi-Lug, Lug and Double Flanged Type



Description Product Group 400 Butterfly Valves

The double eccentric replaceable seat ring butterfly valve is capable of bi-directional flow and bubble tight shut-off at full rated pressure.

AVAILABLE SERIES

Series 420 Double Eccentric Replaceable Seat Ring Semi-Lug Type Butterfly Valve

Series 440 Double Eccentric Replaceable Seat Ring Lug Type Butterfly Valve

Series 450 Double Eccentric Replaceable Seat Ring Double Flanged Type Butterfly Valve

STANDARD COMPLIANCE

Product Group 400 butterfly valves face to face dimensions comply with the following standards; JIS F7480 and KSV 7490 (Others on request).

PRODUCTION RANGE

Size range DN 50 (2") ~ DN 1000 (40")

Working Pressure range 0 barg ~ 25 barg

Working Temperature range -20 to ~ +230 degr. C

APPLICABLE FLANGE

ASME B16.5 Class 150#

EN 1092 / DIN 2501, PN 10, PN 16

BS 4504 PN 10, PN 16

ISO 2084 PN 10, PN 16

KS / JIS, 5K, 10K, 16K, 20K

Semi Lug Type



Series 420

Lug Type



Series 440

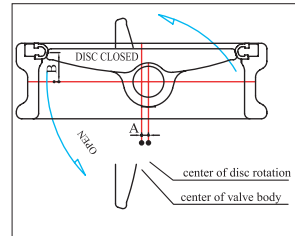
Double Flanged Type



Series 450

The Double Eccentric Design Principle

It effects friction-free contact between body and seat because the rotation axis (stem) of the valve disc has a double offset from the center equal to dimensions of A and B (See sketch). Because of the double offset a cam effect is produced which prevents wear of the seal surface, decreases seating torque and offers longer service life and easy operation.



Main Applications

Cargo oil system in the Tankers
Water ballast system
Tank cleaning system
Cargo tank Venting and Inert gas system
Bilge and Drainage system

Sea water system
Fresh water system
Fuel oil and Diesel oil system
Other piping system where applicable

Classification by Connection

Appearance	Type	General Characteristics
	Series 420 SEMI-LUG Type	<p>General Applications</p> <ul style="list-style-type: none"> - Shipbuilding industry, water works, heating and ventilation, power plants, Chemical industry etc. <p>As wafer type except with a pair of threaded bolt holes at upper and lower side near the stem, for easy maintenance of adjacent pipe. Easy handling and light weight. Less quantity of bolt holes compared to Lug type, easy installation. Keep liquid remained during repairing adjacent pipe.</p>
	Series 440 FULL-LUG Type	<p>General Applications at dead end pipe.</p> <p>Full Lug ring shape bolt holes for bolting with connecting flanges. Keep pressure inside during repair of the adjacent pipeline. Suitable for Dead End Service.</p>
	Series 450 DOUBLE FLANGED Type	<p>General Applications</p> <p>Full flanged at both end. Suitable for shipside valve in the ship. Keep pressure inside during repair of the adjacent pipeline. Suitable for Dead End Service.</p>

Major Properties

This Butterfly Valve Series is designed for heavy loads, high pressure and high-flow rate application.

It is widely adopted for cargo oil valves of tankers, FPSO, terminal and high flow rate piping with a lot of references.

Semi-Lug, Lug and double flange type connections are available.

Operations

In general the following operation possibilities are available valve location and the type of work and service for which the valve is used.

Manual Operation (Handlever, Worm Gear)

Hydraulic Operation (driven by oil cylinder or oil motor)

Pneumatic Operation (driven by air cylinder, air motor)

Electromotor Operation



Series 440
 FULL-LUG Type
 in Alu-Bronze

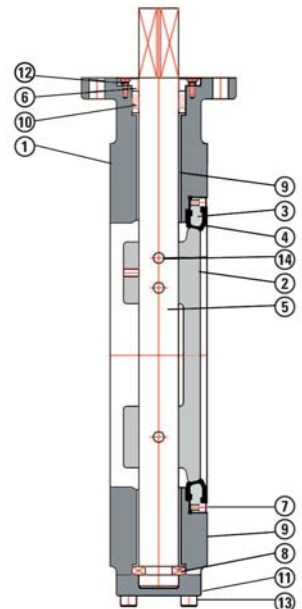
Approvals, Certification

PG 400 butterfly valves have the following approvals, certification.

- CE / PED.
- ABS certificate of design assesment.
- BV, DNV, LRS and KRS type approvals.

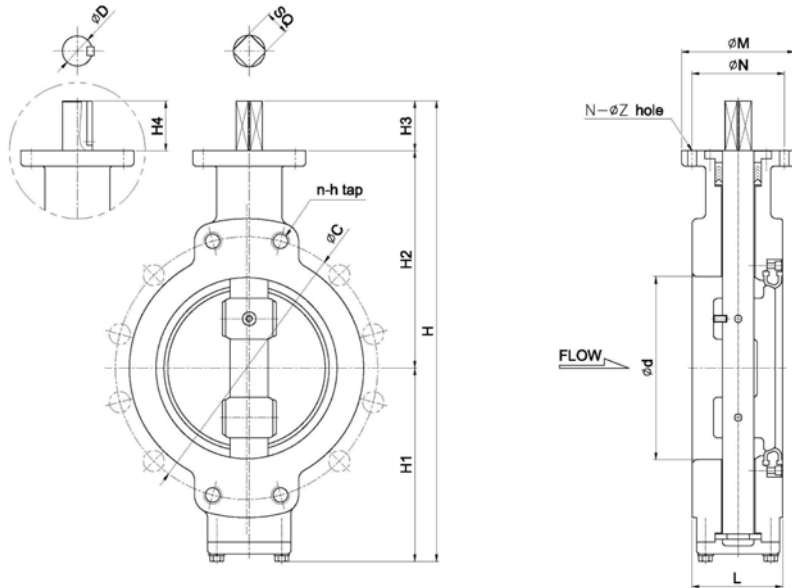


P.NO.	PART NAME	MATERIAL
1	BODY	CAST IRON / DUCTILE IRON STAINLESS STEEL / CARBON STEEL ALUMINUM BRONZE
2	DISC	STAINLESS STEEL / CAST STEEL ALUMINUM BRONZE / ALLOY STEEL
3	RETAINER	CAST IRON / DUCTILE IRON STAINLESS STEEL / CARBON STEEL ALUMINUM BRONZE
4	SEAT	EPDM / NBR / VITON
5	STEM	STAINLESS STEEL(SS304, 316, 410)
6	GLAND BUSH	STANLESS STEEL / BRONZE
7	RETAINER BOLT	STAINLESS STEEL / GALV. STEEL
8	THRUST PLATE	STAINLESS STEEL / BRONZE
9	STEM B/R	STAINLESS STEEL + GP
10	PACKING	NBR / VITON / EPDM
11	BOTTOM COVER	CAST IRON / DUCTILE IRON STAINLESS STEEL / CARBON STEEL ALUMINUM BRONZE
12	GLAND BOLT	STAINLESS STEEL
13	BOTTOM BOLT	STAINLESS STEEL
14	DISC PIN	STAINLESS STEEL



Series 420

(Cargo Semi-Lug) Double Eccentric Butterfly Valve

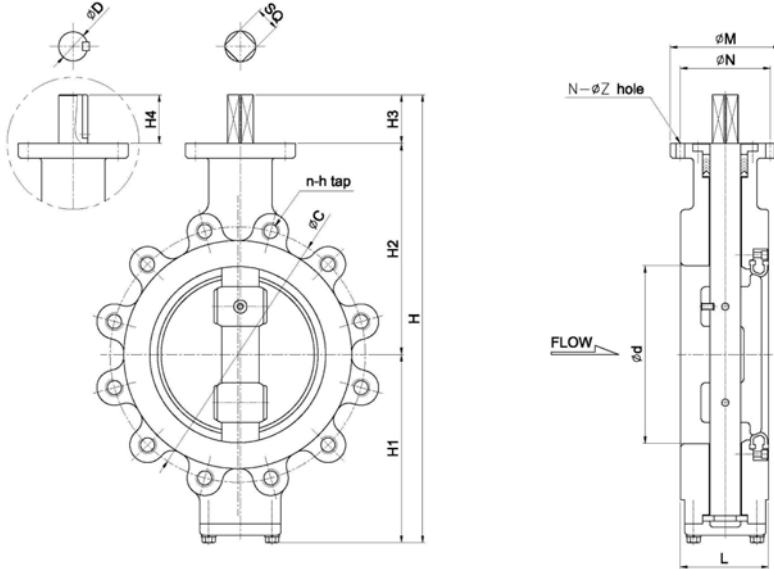


VALVE DIMENSIONS

unit : mm

SIZE		d	L	H	H1	H2	H3	STEM				TOP FLANGE			WEIGHT (APPROX) (kg)	
inch	mm							SQUARE	ROUND			TYPE	N	M		N - Z
									SQ	D	H4					
5	50	62	44	276	113	130	33	12	14	43	5x5	F07	70	90	4-9	5.0
2.5"	65	75	46	286	118	135	33	12	14	43	5x5	F07	70	90	4-9	6.0
3"	80	90	62	298	125	140	33	12	19	43	6x6	F07	70	90	4-9	8.0
4"	100	106	65	339	146	160	33	12	19	43	6x6	F07	70	90	4-9	11.0
5"	125	128	70	406	161	190	55	17	20	43	8x7	F10	102	125	4-12	18.0
6"	150	150	90	459	189	215	55	17	20	43	8x7	F10	102	125	4-12	25.0
8"	200	202	100	508	213	240	55	27	30	65	10x8	F10	102	125	4-12	36.0
10"	250	250	110	605	255	285	65	27	30	65	10x8	F14	140	175	4-18	48.0
12"	300	300	110	654	274	315	65	27	40	85	12x8	F14	140	175	4-18	68.0
14"	350	335	120	748	308	350	90	36	42	85	14x9	F16	165	210	4-22	75.0
16"	400	390	130	819	349	380	90	36	42	85	14x9	F16	165	210	4-22	110.0
18"	450	440	150	888	381	417	90	46	50	85	14x9	F16	165	210	4-22	125.0
20"	500	490	160	953	418	445	90	50	65	100	20x12	F16	165	210	4-22	185.0
22"	550	540	170	1019	452	477	90	50	65	100	20x12	F16	165	210	4-22	265.0
24"	600	600	200	1126	486	520	120	50	65	100	20x12	F25	254	300	8-18	315.0
26"	650	644	210	1176	511	545	120	50	65	100	20x12	F25	254	300	8-18	385.0
28"	700	700	220	1260	550	590	120	50	65	100	20x12	F25	254	300	8-18	480.0
30"	750	750	230	1333	583	620	130	68	85	120	24x16	F30	298	350	8-23	590.0
32"	800	800	240	1470	655	685	130	68	90	120	24x16	F30	298	350	8-23	685.0
34"	850	850	240	1470	655	685	130	75	95	120	25x14	F30	298	350	8-23	797.0
36"	900	900	240	1585	690	735	160	82	100	150	28x16	F35	356	415	8-33	905.0
40"	1000	1000	240	1725	760	805	160	82	110	150	32x18	F35	356	415	8-33	1210.0

Series 440
(Cargo Lug) Double Eccentric Butterfly Valve

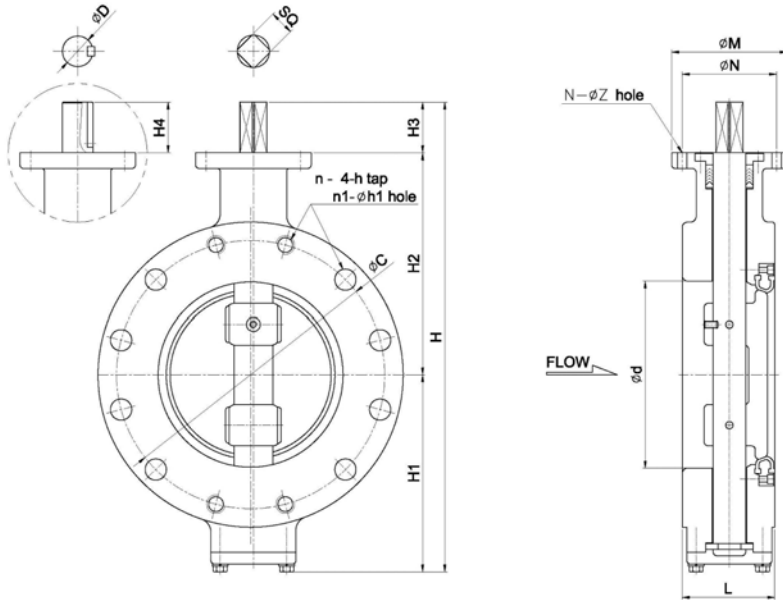


VALVE DIMENSIONS

unit : mm

SIZE		d	L	H	H1	H2	H3	STEM				TOP FLANGE				WEIGHT (APPROX.) (kg)
inch	mm							SQUARE	ROUND			TYPE	N	M	N - Z	
									SQ	D	H4					
5	50	62	44	276	113	130	33	12	14	43	5x5	F07	70	90	4-9	7.5
2.5"	65	75	46	286	118	135	33	12	14	43	5x5	F07	70	90	4-9	9.0
3"	80	90	62	298	125	140	33	12	19	43	6x6	F07	70	90	4-9	11.0
4"	100	106	65	339	146	160	33	12	19	43	6x6	F07	70	90	4-9	15.0
5"	125	128	70	406	161	190	55	17	20	43	8x7	F10	102	125	4-12	20.0
6"	150	150	90	459	189	215	55	17	20	43	8x7	F10	102	125	4-12	29.5
8"	200	202	100	508	213	240	55	27	30	65	10x8	F10	102	125	4-12	42.0
10"	250	250	110	605	255	285	65	27	30	65	10x8	F14	140	175	4-18	60.0
12"	300	300	110	654	274	315	65	27	40	85	12x8	F14	140	175	4-18	75.0
14"	350	335	120	748	308	350	90	36	42	85	14x9	F16	165	210	4-22	87.0
16"	400	390	130	819	349	380	90	36	42	85	14x9	F16	165	210	4-22	125.0
18"	450	440	150	888	381	417	90	46	50	85	14x9	F16	165	210	4-22	159.0
20"	500	490	160	953	418	445	90	50	65	100	20x12	F16	165	210	4-22	200.0
22"	550	540	170	1019	452	477	90	50	65	100	20x12	F16	165	210	4-22	280.0
24"	600	600	200	1126	486	520	120	50	65	100	20x12	F25	254	300	8-18	345.0
26"	650	644	210	1176	511	545	120	50	65	100	20x12	F25	254	300	8-18	410.0
28"	700	700	220	1260	550	590	120	50	65	100	20x12	F25	254	300	8-18	520.0
30"	750	750	230	1333	583	620	130	68	85	120	24x16	F30	298	350	8-23	675.0
32"	800	800	240	1470	655	685	130	68	90	120	24x16	F30	298	350	8-23	795.0
34"	850	850	240	1470	655	685	130	75	95	120	25x14	F30	298	350	8-23	900.0
36"	900	900	240	1585	690	735	160	82	100	150	28x16	F35	356	415	8-33	1100.0
40"	1000	1000	240	1725	760	805	160	82	110	150	32x18	F35	356	415	8-33	1250.0

Series 450
(Cargo Flange) Double Eccentric Butterfly Valve

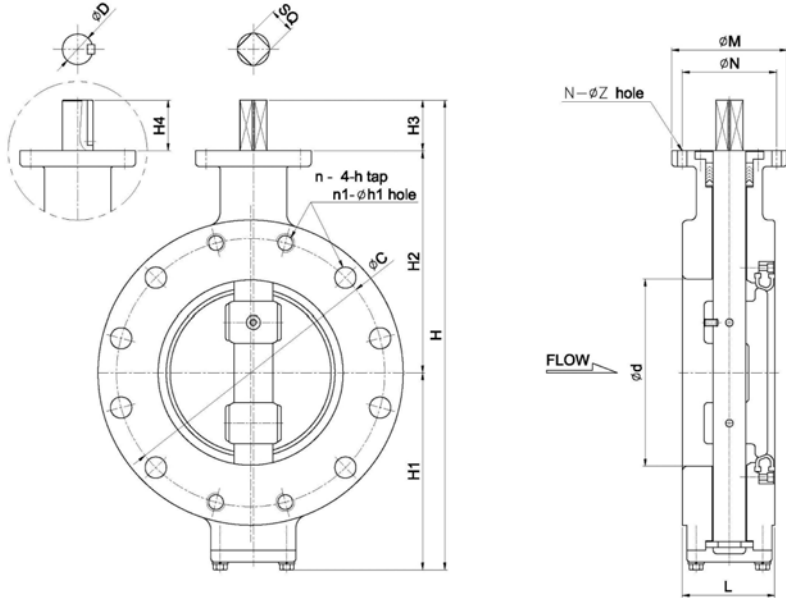


VALVE DIMENSIONS

unit : mm

SIZE		d	L	H	H1	H2	H3	STEM				TOP FLANGE				WEIGHT (APPROX.) (kg)
inch	mm							SQUARE		ROUND		TYPE	N	M	N - Z	
								SQ	D	H4	KEY					
5	50	62	44	276	113	130	33	12	14	43	5x5	F07	70	90	4-9	8.0
2.5"	65	75	46	286	118	135	33	12	14	43	5x5	F07	70	90	4-9	10.0
3"	80	90	62	298	125	140	33	12	19	43	6x6	F07	70	90	4-9	12.0
4"	100	106	65	339	146	160	33	12	19	43	6x6	F07	70	90	4-9	16.0
5"	125	128	70	406	161	190	55	17	20	43	8x7	F10	102	125	4-12	22.0
6"	150	150	90	459	189	215	55	17	20	43	8x7	F10	102	125	4-12	38.0
8"	200	202	100	508	213	240	55	27	30	65	10x8	F10	102	125	4-12	45.0
10"	250	250	110	605	255	285	65	27	30	65	10x8	F14	140	175	4-18	65.0
12"	300	300	110	654	274	315	65	27	40	85	12x8	F14	140	175	4-18	84.0
14"	350	335	120	748	308	350	90	36	42	85	14x9	F16	165	210	4-22	100.0
16"	400	390	130	819	349	380	90	36	42	85	14x9	F16	165	210	4-22	145.0
18"	450	440	150	888	381	417	90	46	50	85	14x9	F16	165	210	4-22	185.0
20"	500	490	160	953	418	445	90	50	65	100	20x12	F16	165	210	4-22	245.0
22"	550	540	170	1019	452	477	90	50	65	100	20x12	F16	165	210	4-22	295.0
24"	600	600	200	1126	486	520	120	50	65	100	20x12	F25	254	300	8-18	370.0
26"	650	644	210	1176	511	545	120	50	65	100	20x12	F25	254	300	8-18	460.0
28"	700	700	220	1260	550	590	120	50	65	100	20x12	F25	254	300	8-18	555.0
30"	750	750	230	1333	583	620	130	68	85	120	24x16	F30	298	350	8-23	705.0
32"	800	800	240	1470	655	685	130	68	90	120	24x16	F30	298	350	8-23	865.0
34"	850	850	240	1470	655	685	130	75	95	120	25x14	F30	298	350	8-23	988.0
36"	900	900	240	1585	690	735	160	82	100	150	28x16	F35	356	415	8-33	1185.0
40"	1000	1000	240	1725	760	805	160	82	110	150	32x18	F35	356	415	8-33	1340.0

Series 450
(Cargo Flange) Double Eccentric Butterfly Valve



FLANGE DIMENSIONS

unit : mm

SIZE		JIS 10K			JIS 16K			JIS 20K			ANSI 150LB			ANSI 300LB			BS 4504 PN10			BS 4504 PN16		
inch	mm	C	n	h	C	n	h	C	n	h	C	n	h	C	n	h	C	n	h	C	n	h
2"	50	120	4	M16	120	8	M16	120	8	M16	120.5	4	5/8	127	8	5/8	125	4	M16	125	4	M16
2.5"	65	140	4	M16	140	8	M16	140	8	M16	139.5	4	5/8	149	8	3/4	145	4	M16	145	4	M16
3"	80	150	8	M16	160	8	M20	160	8	M20	152.5	4	5/8	168	8	3/4	160	8	M16	160	8	M16
4"	100	175	8	M16	185	8	M20	185	8	M20	190.5	8	5/8	200	8	3/4	180	8	M16	180	8	M16
5"	125	210	8	M20	225	8	M22	225	8	M22	216.5	8	3/4	235	8	3/4	210	8	M16	210	8	M16
6"	150	240	8	M20	260	12	M22	260	12	M22	241.5	8	3/4	270	12	3/4	240	8	M20	240	8	M20
8"	200	290	12	M20	305	12	M22	305	12	M22	298.5	8	3/4	300	12	7/8	295	8	M20	295	12	M20
10"	250	355	12	M22	380	12	M24	380	12	M24	362.0	12	7/8	387.5	16	1	350	12	M20	355	12	M24
12"	300	400	16	M22	430	16	M24	430	16	M24	432.0	12	7/8	451	16	1 1/8	400	12	M20	410	12	M24
14"	350	445	16	M22	480	16	M30	480	16	M30	476.0	12	1	514.5	20	1 1/8	460	16	M20	470	16	M24
16"	400	510	16	M24	540	16	M30	540	16	M30	539.5	16	1	571.5	20	1 1/4	515	16	M24	525	16	M27
18"	450	565	20	M24	605	20	M30	605	20	M30	578.0	16	1 1/8	628.5	24	1 1/4	565	20	M24	585	20	M27
20"	500	620	20	M24	660	20	M30	660	20	M30	635.0	20	1 1/8	686	24	1 1/4	620	20	M24	650	20	M30
22"	550	680	20	M30	720	20	M36	720	20	M36	392.2	20	1 1/4	682.15	20	1 1/4	-	-	-	-	-	-
24"	600	730	24	M30	770	24	M36	770	24	M36	749.5	20	1 1/4	813	24	1 1/2	725	20	M27	770	20	M33
26"	650	780	24	M30	820	24	M36	820	24	M36	806.5	24	1 1/4	806.45	24	1 1/2	-	-	-	-	-	-
28"	700	840	24	M30	875	24	M39	875	24	M39	863.5	28	1 1/4	863.6	28	1 1/2	840	24	M27	840	24	M33
30"	750	900	24	M30	935	24	M39	935	24	M39	914.5	28	1 1/4	914.4	28	1 1/2	-	-	-	-	-	-
32"	800	950	28	M30	990	24	M45	990	24	M45	978.0	28	1 1/2	977.9	28	1 1/2	950	24	M30	950	24	M36
34"	850	1000	28	M30	1040	24	M45	1040	24	M45	1029.0	32	1 1/2	1028.7	32	1 1/2	-	-	-	-	-	-
36"	900	1050	28	M30	1090	28	M45	1090	28	M45	1086.0	32	1 1/2	1085.85	32	1 1/2	1050	28	M30	1050	28	M36
40"	1000	1160	28	M36	1210	28	M52	1210	28	M52	1200.0	36	1 1/2	1200.15	36	1 1/2	1160	28	M33	1170	28	M39

Torque figures

Torque figures as mentioned in the torque table below are;

- Initial break away values in Nm (Newton Meters), kg-m (Kilogram Meters) and Ft-Lb (Feet per pound)
- Excluding** any safety factor
- For valves that are operated at least once per month
- Temperature 0 to 50 degr. C

Safety factor (sf)

For sizing and safe operation purposes the specified torque values need to be multiplied with the following minimum safety factors;

- For liquid and lubricant media **sf = 1.20**
- For powdery (non-lubricant) media **sf = 1.55**
- For dry gasses and high viscous media **sf = 1.45**

Service

For assistance in sizing and dimensioning actuator-valve combinations please contact our Engineers. We have wide experience in sizing Pneumatic, Electric and Hydraulic actuators.

TORQUE TABLE

SIZE	WORKING PRESSURE (bar)								
	5bar			10bar			16bar		
	kgf-m	Nm	lbf.ft	kgf-m	Nm	lbf.ft	kgf-m	Nm	lbf.ft
50A	0.95	9.3	6.87	1.10	10.8	7.95	1.71	16.8	12.36
65A	1.40	13.7	10.12	1.80	17.6	13.01	2.20	21.6	15.90
80A	2.05	20.1	14.82	2.72	26.7	19.66	3.84	37.6	27.76
100A	3.70	36.3	26.74	4.64	45.5	33.54	6.08	59.6	43.95
125A	6.50	63.7	46.98	7.00	68.6	50.60	10.00	98.0	72.28
150A	11.00	107.8	79.51	14.80	145.0	106.98	20.00	196.0	144.56
200A	24.50	240.1	177.09	31.25	306.3	225.88	38.45	376.8	277.92
250A	32.00	313.6	231.30	42.40	415.5	306.47	52.00	509.6	375.86
300A	43.50	426.3	314.42	57.60	564.5	416.34	87.20	854.6	630.29
350A	62.00	607.6	448.14	82.40	807.5	595.60	122.40	1199.5	884.72
400A	83.00	813.4	599.93	110.40	1081.9	797.98	164.80	1615.0	1191.19
450A	99.00	970.2	715.58	143.20	1403.4	1035.07	219.20	2148.2	1584.40
500A	129.00	1264.2	932.43	200.00	1960.0	1445.62	285.60	2798.9	2064.35
550A	185.00	1813.0	1337.20	252.00	2469.6	1821.48	380.00	3724.0	2746.68
600A	292.00	2861.6	2110.61	312.80	3065.4	2260.95	472.80	4633.4	3417.45
650A	298.00	2920.4	2153.98	381.60	3739.7	2758.25	578.40	5668.3	4180.74
700A	335.00	3283.0	2421.42	460.80	4515.8	3330.71	698.40	6844.3	5048.11
750A	428.00	4194.4	3093.63	548.00	5370.4	3961.00	783.20	7675.4	5661.05
800A	480.00	4704.0	3469.49	644.80	6319.0	4660.68	981.60	9619.7	7095.11
850A	560.00	5488.0	4047.74	764.80	7495.0	5528.06	1020.20	9998.0	7374.12
900A	750.00	7350.0	5421.08	908.80	8906.2	6568.90	1480.00	14504.0	10697.60
1000A	952.00	9329.6	6881.16	1056.00	10348.8	7632.88	1756.00	17208.8	12692.56

Table of Recommendable Materials

	Fluid	Material	
		Disc	Seat Ring
Water	Clean Water (up to 80 degr. C)	Ductile Cast Iron	NBR
	Clean Water (up to 120 degr. C)	Ductile Cast Iron	EPDM
	Dirty Water	Stainless Steel	NBR
	Brine	Stainless Steel	EPDM
	Sea Water	Stainless Steel	NBR
Oils	Lubricating Oil	Ductile Cast Iron	NBR
	Heavy Oil	Ductile Cast Iron	NBR
	Fuel Oil	Ductile Cast Iron	NBR
	Naphtha	Ductile Cast Iron	NBR
	Crude Oil	Ductile Cast Iron	NBR
	Edible Oils	Stainless Steel	TEFLON
Chemicals	Ammonia Solution	Stainless Steel	EPDM
	Ethyl Alcohol	Stainless Steel	EPDM
	Hydrochloric Acid	TEFLON Lined Steel	TEFLON
	Caustic Soda	Stainless Steel	EPDM
	Dilute Sulfuric Acid(10%)	TEFLON Lined Steel	TEFLON
	Concentrated Sulfuric Acid(98%)	TEFLON Lined Steel	TEFLON
	Acetic Acid	TEFLON Lined Steel	TEFLON
Gases	Air	Ductile Cast Iron	NBR
	Oxygen Gas	Ductile Cast Iron	EPDM
	Ammonia Gas	Stainless Steel	EPDM
	Coke Oven Gas	Ductile Cast Iron	VITON
	Inert Gas	Stainless Steel	NBR
	Hydrogen Gas	Ductile Cast Iron	NBR
	Organic Solvent Gas	TEFLON Lined Steel	TEFLON
	Natural Gas	Ductile Cast Iron	NBR
Powders and Granules	Chlorine Gas	TEFLON Lined Steel	TEFLON
	Cement	Stainless Steel	NBR
	PVC Powder	Stainless Steel	NBR
	Granular Medicine	Stainless Steel	TEFLON
	Grain	Stainless Steel	NBR
	Gypsum Slurry	Stainless Steel	EPDM

*Product Group 100
Bonded Rubber Liner Butterfly Valves*

*Product Group 200
Replaceable Rubber Liner Butterfly Valves*

*Product Group 300
Cassette Type Rubber Liner Butterfly Valves*

*Product Group 400
Double Eccentric Replaceable Seat Ring
Type Butterfly Valves*

*Product Group 500
High Performance Butterfly Valves*

*Product Group 600
Tripple Eccentric Metal Seated Butterfly Valves*

*Product Group 700
Disc Seated Butterfly Valves*

*Product Group 800
Cryogenic Butterfly Valves (LPG, LNG)*

*Product Group 900
Damper Butterfly Valves*



Please contact us for further information