

API

Технические характеристики

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API Butterfly Valve

TEK VALVE

Our butterfly valves are structured to centered seal, single eccentric seal, double eccentric seal, triple eccentric seal and variable eccentric seal. The sealing principles of these structures are stated as following.

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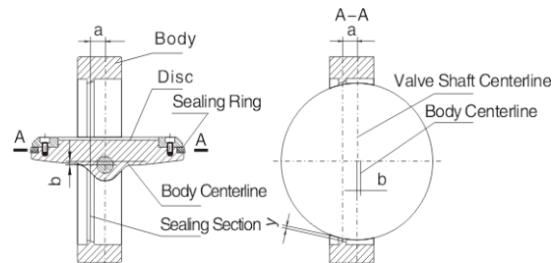
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Sealing Principle of Double Eccentric Seal Butterfly Valve

The rotation center of disc (namely the center of valve shaft) and the centerline of body form up a 'b' eccentric on the base of single eccentric butterfly valve. Making the sealing face of disc disengaged from seat sealing face more quickly than single eccentric seal butterfly valves during the process of open and close. Once disc turns to $8^{\circ} \sim 12^{\circ}$, the disc sealing face will be completely disengaged from the seat sealing face. Once fully opened, a gap 'Y' will be formed up between the two sealing faces. This type of butterfly valves are designed to have greatly lowered the mechanical wear and extrusion deformation between the two sealing faces, making the sealing performance of butterfly valve much better.

The characteristic of this structure is to make stem axis not only deviated from the center of disc, but also the center of the body. The effect of double eccentric is that, when valve has been opened, disc can be quickly disengaged from seat, thus to greatly eliminate the unnecessary excessive extrusion and scratch between the disc and seat, reduce opening resistance, lower the abrasion and improve the service life of seat. As scratch has been greatly lowered, metal seat can be used for double eccentric butterfly valve, so that butterfly valves are able to be used in high temperature fields. However, as its seal is positioned sealing construction, i.e. the sealing faces disc and seat is lineal contact, disc extruding seat to produce elastic deformation, thus to effect the sealing performance has high requirement on close position, especially for those with metal seat and is given poor pressure endurance. This is why butterfly valves are conventional IV, not resistant to high temperature and leakage.



Sealing Structure of Double Eccentric Seal Butterfly Valve

Sealing Principle of Triple Eccentric Seal Butterfly Valve

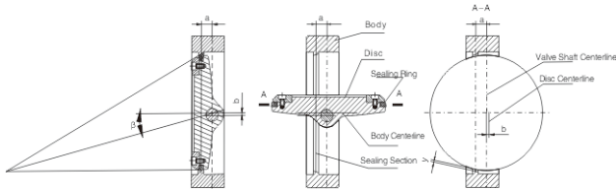
A B eccentric is formed up between the centerline of seat and the centerline of body on the base of double eccentric butterfly valve, making disc sealing face immediately disengaged from seat sealing face upon the opening of butterfly valve, and in close contact with the seat sealing face upon closing. When fully opened, a gap 'Y', which is the same as that in double eccentric seal butterfly valve, is formed up between the two sealing faces. The design of this type of valves has thoroughly eliminated the mechanical wear and scratch between the two sealing faces, making the sealing performance and service life of butterfly valves greatly improved. When valve is closed, with sealing ring under the extrusion of body sealing face and disc, two upward elastic deformations are produced. the sealing face is fallen under outward tension at long shaft and

API Butterfly Valve

TEK VALVE

inward compressive stress at short shaft The long and short shafts produce elastic deformation of different directions, thus to maximizing the sealing force between the sealing faces of valve.

This distinctive eccentric combination not only uses cam effect, but also eliminates friction completely, thus to ensure no friction between seat and sealing ring on disc during the 90 ° stroke of valve, a perfect solution to clear away the possibilities of abrasion and leakage.



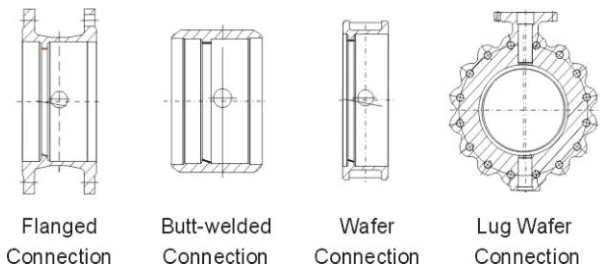
Close State Diagram of Triple Eccentric Seal Butterfly Valve

Open State Diagram of Triple Eccentric Seal Butterfly Valve

Sealing Principle of Triple Eccentric Seal Butterfly Valve

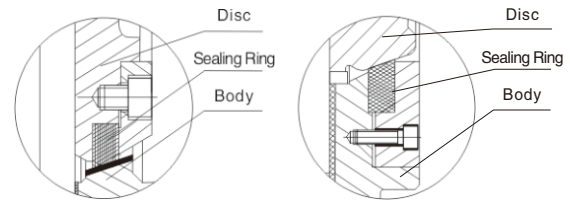
Butterfly valves are used to open and close(seal type)or adjust the medium flow in pipes in the fields of foodstuff, drinks, chemical, industrial water treatment, high-rise constructions, water supply and drainage etc. They are mainly structured as following:

1、 Simple structure, small sizes, light weight and low installation dimensions. According to the types of body connection, they are basically classified to wafer type(including lug wafer type), flanged and welded.



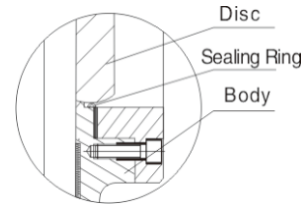
1. Multilayer Hard Seal Structure(See fig. right)

Multilayer hard seal structure is applicable. double and triple eccentric butterfly valves, pressure rating \leq CLASS 600. And triple eccentric butterfly valve can maintain two-way leak-tightness. Multilayer sealing ring is composite of stainless steel and nonmetal material. The nonmetal material can be flexible graphite, PTFE or non asbestos material etc. according to the actual working conditions.



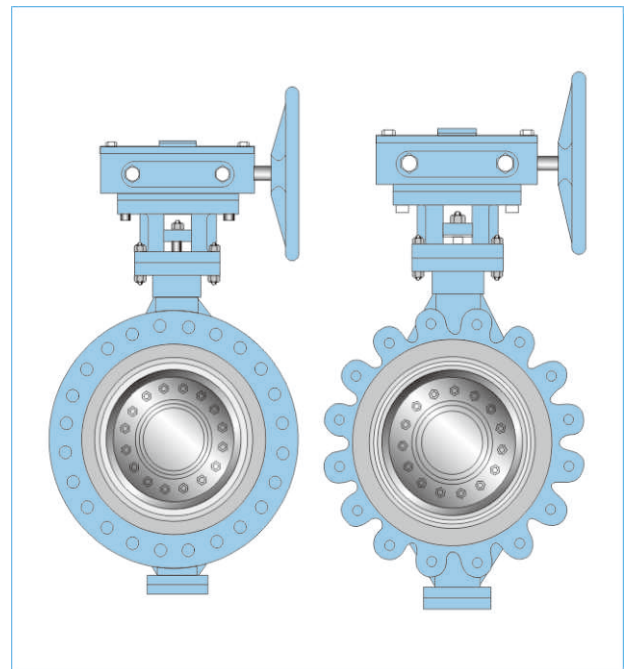
Multilayer Hard Seal Structure

2. Elastic ring hard seal structure(see fig right)is of the structure of J-type metal sealing ring. It is applicable and double eccentric butterfly valves. pressure rating \leq CLASS 300. Provided with fireproof structure to adapt to conditions with great temperature changes, it is featured by outstanding seal, long service life and easy workmanship.



Elastic Ring Hard Seal Structure

- When butterfly valve is fully opened, flow resistance is low. When partially opened, it may carry out sensitive flow control.
- Low driving moment, easy and quick operation.



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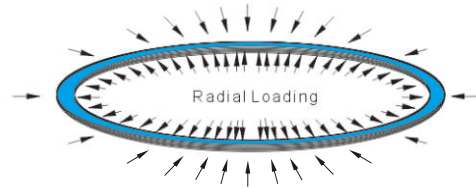
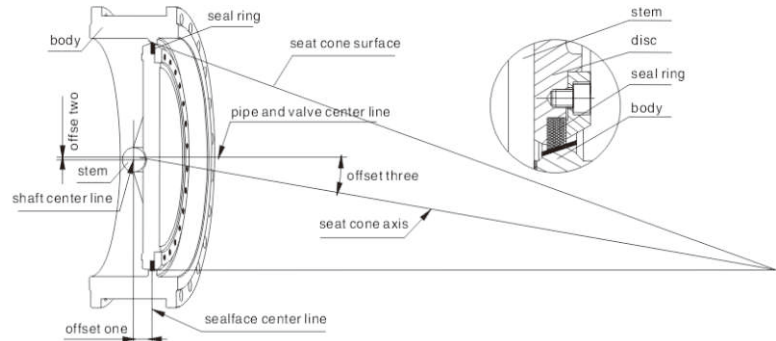
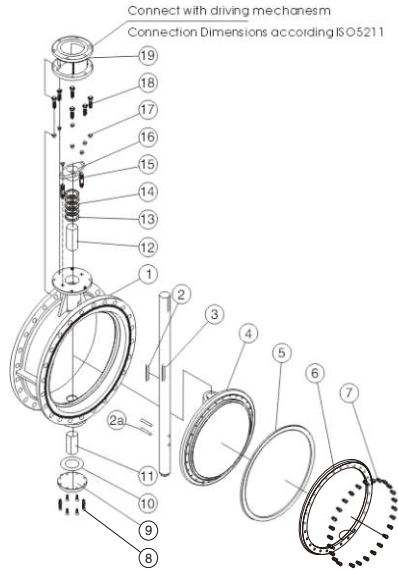
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API Butterfly Valve

TEK VALVE

The Triple Offset Geometry



ASTM Materials List of Butterfly Valve

No.	Part Name	Carbon Steel to ASTM	Stainless Steel to ASTM	
1	Body	A216 WCB	A351 CF8	A351 CF8M
2	Key	A182 F6a	SS304	SS316
2a	Pin		SS304	SS316
3	Stem		A182 F304	A182F316
4	Disc	A216 WCB	A351 CF8	A351 CF8M
5	Seal Ring	Graphite+304		
6	Retainer Flange	A216 WCB		
7	Bolt	A193 B7		
8	Bolt			
9	Cover			
10	Gasket			
11	Bushing	PTFE+Bronze		
12	Bushing	PTFE+Bronze		
13	Packing Seat	SS		
14	Packing	Graphite		
15	Bolt	-		
16	Packing Bushing	SS		
17	Nut	-		
18	Bolt	-		
19	Yoke	Carbon Steel		

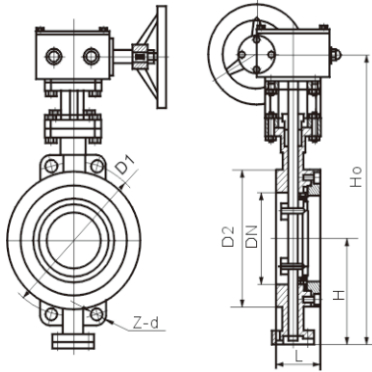
API SERIES

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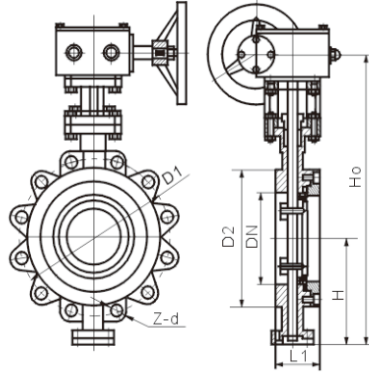
JIS SERIES

API Triple Offset Butterfly Valve

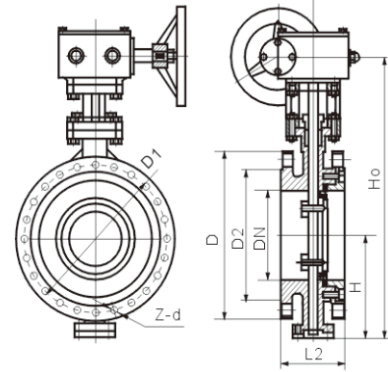
TEK VALVE



Wafer Butterfly



LUG Butterfly



Flange Butterfly

API 150LB Wafer , LUG, Flange Butterfly

Nominal Diameter		Structure Length						External Dimension				Connection Dimension						Weight kg			
		Wafer L		LUG L1		Flange L2		H		H0		D		D1		D2				Z-d	
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm		Wafer
2"	50	1.69	43	1.69	43	4.25	108	4.33	110	13.58	345	6	150	4.75	120.5	3.625	92	4-19	9	20	
3"	80	1.88	48	1.88	48	4.50	114	4.92	125	14.96	380	7	190	6	152.5	5.000	127	4-19	11	29	
4"	100	2.12	54	2.12	54	5.00	127	5.70	145	16.34	415	7.50	230	7.5	190.5	6.19	157	8-19	13	33	
5"	125	2.19	56	2.19	56	5.50	140	6.50	165	17.91	455	9	255	8.5	216	7.31	186	8-22	16	38	
6"	150	2.25	57	2.25	57	5.50	140	6.89	175	21.45	545	10	280	9.5	241.5	8.5	216	8-22	26	74	
8"	200	2.50	64	2.50	64	6.00	152	8.26	210	24.21	615	11	345	11.75	298.5	10.625	270	8-22	34	86	
10"	250	2.81	71	2.81	71	6.50	165	9.84	250	27.36	695	13.50	405	14.25	362	12.75	324	12-25	51	142	
12"	300	3.19	81	3.19	81	7.00	178	11.24	285	32.78	830	19	485	17	432	15	381	12-25	72	167	
14"	350	3.62	92	3.62	92	7.50	190	12.60	320	35.43	900	21	535	18.75	476	16.25	413	12-29	106	218	
16"	400	4.00	102	4.00	102	8.50	216	13.98	355	38.58	980	23.5	600	21.25	540	18.5	470	16-29	133	275	
18"	450	4.50	114	4.50	114	8.75	222	14.96	380	40.55	1030	25	635	22.25	578	21	533	16-32	176	315	
20"	500	5.00	127	5.00	127	9.00	229	16.34	415	43.70	1110	27.5	700	25.00	635	23	584	20-32	190	395	
24"	600	6.06	154	6.06	154	10.50	267	18.70	475	51.37	1305	32	815	29.5	749.5	27.25	692	20-35	394	580	
26"	650	6.50	165	6.50	165	11.50	292	20.85	530	54.72	1390	34.25	870	31.75	806.5	29.25	749	24-35	415	620	
28"	700	6.50	165	6.50	165	11.50	292	22.04	560	58.07	1475	36.5	927	34.00	863.6	31.5	800	28-35	435	650	
30"	750	6.50	165	6.50	165	12.52	318	22.38	580	60.03	1525	38.75	984	36.00	914.4	33.75	857	28-35	476	717	
32"	800	7.50	190	7.50	190	12.50	318	24.80	630	62.40	1585	41.75	1060	38.5	978	36.00	914	28-41	618	880	
34"	850	7.88	200	7.88	200	13.00	330	25.60	650	63.00	1600	43.75	1111	40.5	1029	38.00	965	32-41	670	980	
36"	900	7.88	200	7.88	200	13.00	330	26.77	680	69.48	1765	46.00	1168	42.75	1086	40.25	1022	32-41	762	1042	
38"	950	7.88	200	7.88	200	16.14	410	27.95	710	72.84	1850	48.75	1238	45.25	1149	42.25	1073	32-41	960	1250	
40"	1000	8.50	216	8.50	216	16.14	410	29.53	750	76.00	1930	50.75	1289	47.25	1200.2	44.25	1124	36-41	1050	1500	

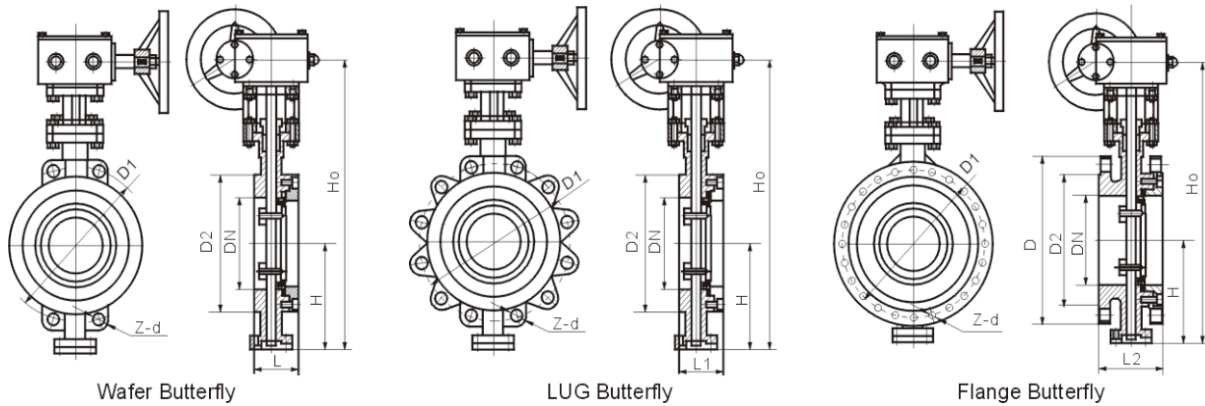
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JIS SERIES

API Triple Offset Butterfly Valve

TEK VALVE



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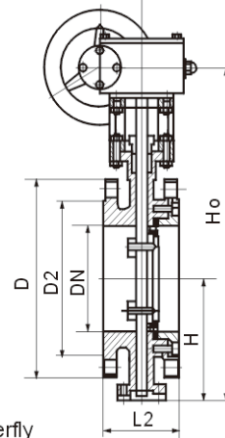
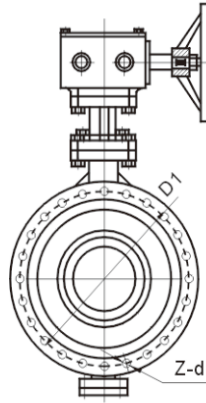
JIS SERIES

API 300LB Wafer , LUG, Flange Butterfly

Nominal Diameter		Structure Length								External Dimension				Connection Dimension						Weight Jkg/J			
		Wafer L		LUG L1		Flange (Short) L2		Flange (Long) L2		H		H0		D		D1		D2				Z-d	
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm		Wafer
2"	50	1.69	43	1.69	43	4.25	108	-	-	4.33	110	13.58	345	6.5	165	5.0	127	3.62	92	8-19	9	20	
3"	80	1.88	48	1.88	48	4.50	114	7.09	180	4.92	125	14.96	380	8.25	210	6.62	168.5	5.0	127	8-22	12	29	
4"	100	2.12	54	2.12	54	5.00	127	7.48	190	5.70	145	16.34	415	10	25	7.88	200	6.19	157	8-22	13	35	
5"	125	2.19	56	2.19	56	5.50	140	-	-	6.50	165	17.91	455	11	280	9.25	235	7.31	186	8-22	18	40	
6"	150	2.31	59	2.31	59	5.50	140	8.27	210	6.89	175	21.45	545	12.5	320	10.62	270	8.5	216	12-22	28	81	
8"	200	2.88	73	2.88	73	6.00	152	9.06	230	8.26	210	24.21	645	15	380	13.0	330	10.62	270	12-26	37	94	
10"	250	3.25	83	3.25	83	6.50	165	9.84	250	9.84	250	27.36	695	17.5	445	15.25	387.5	12.75	324	16-29	56	158	
12"	300	3.62	92	3.62	92	7.00	178	10.63	270	11.24	285	32.78	830	20.5	520	17.75	451	15.0	381	16-32	79	183	
14"	350	4.62	117	4.62	117	7.50	190	11.42	290	12.60	320	35.43	900	23.0	585	20.25	514.5	16.25	413	20-32	116	239	
16"	400	5.25	133	5.25	133	8.50	216	12.20	310	13.98	355	38.58	980	25.5	650	22.5	571.5	18.5	470	20-35	146	302	
18"	450	5.88	149	5.88	149	8.74	222	12.99	330	14.96	380	40.55	1030	28.0	710	24.75	628.5	21.0	533	24-35	193	346	
20"	500	6.25	159	6.25	159	9.00	229	13.78	350	16.34	415	43.70	1110	30.5	775	27.0	686	23.0	584	24-35	209	434	
24"	600	7.12	181	7.12	181	10.50	267	15.35	390	18.70	475	51.37	1305	36.0	915	32.0	813	27.25	692	24-41	433	638	
26"	650	8.25	210	8.25	210	11.50	292	16.14	410	20.00	510	54.0	1370	38.25	972	34.5	876.3	29.5	749	28-45	450	650	
28"	700	9.01	229	9.01	229	11.50	292	16.93	430	22.04	560	58.07	1475	40.75	1035	37.0	934	31.5	800	28-45	498	698	
30"	750	9.01	229	9.01	229	12.52	318	17.72	450	22.38	580	60.03	1525	43.0	1092	39.25	997	33.75	857	28-48	523	788	
32"	800	9.48	241	9.48	241	12.52	318	18.50	470	25.59	650	64.37	1635	45.25	1149	41.5	1054.1	36.0	914	28-51	588	988	
34"	850	9.50	241	9.50	241	13.00	330	20.80	510	26.00	660	66.0	1675	47.5	1207	43.5	1105	38.0	965	32-51	750	1050	
36"	900	9.48	241	9.48	241	13.00	330	20.80	510	26.77	680	69.48	1765	50.0	1270	46.0	1168.4	40.25	1022	32-54	838	1146	
38"	950	11.80	300	11.80	300	16.15	410	20.87	530	28.5	725	72.0	1830	46.0	1168	43.0	1092.2	40.5	1029	32-41	1200	1450	
40"	1000	11.80	300	11.80	300	16.15	410	21.65	550	31.0	785	78.0	1980	48.75	1238	45.5	1156	42.75	1086	32-45	1600	2000	

API Triple Offset Butterfly Valve

TEK VALVE



Flange Butterfly

API 600LB Flange Butterfly

Nominal Diameter		Face-to-face (Standard)		External Dimension				Connection Dimension						Reference Weight JkgJ	
		L		H		H0		D		D1		D2			Z-d
inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm		
2	50	5.90	150	4.5	115	15.0	380	6.5	165	5.0	127	3.62	92	8-19	20
3	80	7.10	180	6.1	155	17.5	445	8.25	210	6.62	168.3	5.0	127	8-22	35
4	100	7.48	190	7.8	195	20.8	530	10.72	275	8.5	215.9	6.19	157	8-26	60
5	125	7.88	200	8.8	225	23.2	590	13.0	330	10.5	266.7	7.31	186	8-29	90
6	150	8.25	210	9.4	240	24.5	620	14.0	355	11.5	292.1	8.5	216	12-29	120
8	200	9.05	230	11.0	280	29.0	735	16.5	420	13.75	349.2	1.62	270	12-32	170
10	250	9.85	250	12.4	315	32.0	810	20.0	510	17.0	431.8	12.75	324	16-35	250
12	300	10.62	270	13.5	345	34.5	875	22.0	560	19.25	489	15.0	381	20-35	340
14	350	11.42	290	14.5	370	37.8	960	23.75	605	20.75	527	16.25	413	20-39	450
16	400	12.20	310	16.5	420	41.7	1060	27.0	685	23.75	603.2	18.5	470	20-42	570
18	450	13.00	330	17.5	445	43.7	1110	29.25	745	25.75	654	21.0	533	20-45	700
20	500	13.78	350	19.0	485	50.0	1270	32.0	815	28.5	723.9	23.0	584	24-45	900
24	600	15.36	390	22.5	570	56.7	1440	37.0	940	33.0	838.2	27.25	692	24-51	1300
26	650	16.15	410	23.0	585	60.0	1525	40.0	1016	36.0	914.4	29.56	749	28-51	1600
28	700	16.93	430	24.5	620	62.6	1590	42.25	1073	38.0	965.2	31.5	800	28-55	1800
30	750	17.72	450	25.5	650	65.0	1650	44.5	1130	40.25	1022.4	33.75	857	28-55	2000
32	800	18.50	470	27.0	685	68.9	1750	47.0	1194	42.5	1079.5	36.0	914	28-60	2300
34	850	19.30	490	28.0	710	71.0	1800	49.0	1245	44.5	1130.3	38.0	965	28-60	2500
36	900	20.08	510	30.5	775	76.0	1930	51.75	1314	47.0	1194	40.25	1022	28-67	2800
38	950	20.86	530	29.8	755	75.2	1910	50.0	1270	45.75	1162	41.5	1054	28-60	2700
40	1000	21.65	550	31.5	800	78.7	2000	52.0	1321	47.75	1213	43.75	1111	32-60	3000

API SERIES

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High Performance Butterfly Valve

TEK VALVE

No-leaking for 500000 times circle test

High Performance Butterfly Valve

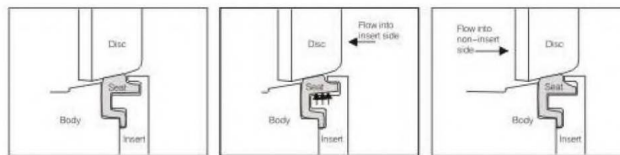
TEK VALVE



Seat Designs

When the valve is shut, the disc slightly deflects the seat. This slight deflection "energizes" the seat. While energized, the sealing surface of the seat is constantly pushing against the edge of the disc. When pressure is on the insert side, pressure is applied under the seat lip. This further amplifies the sealing force between the disc and the seat.

When pressure is on the non-insert side, the disc moves into the seat. Due to the spherical profile of the disc, the more the disc moves into the seat, the tighter the shut-off. Excessive movement of the seat is limited by the flexible lip which contacts the bottom of the groove in the insert ring.



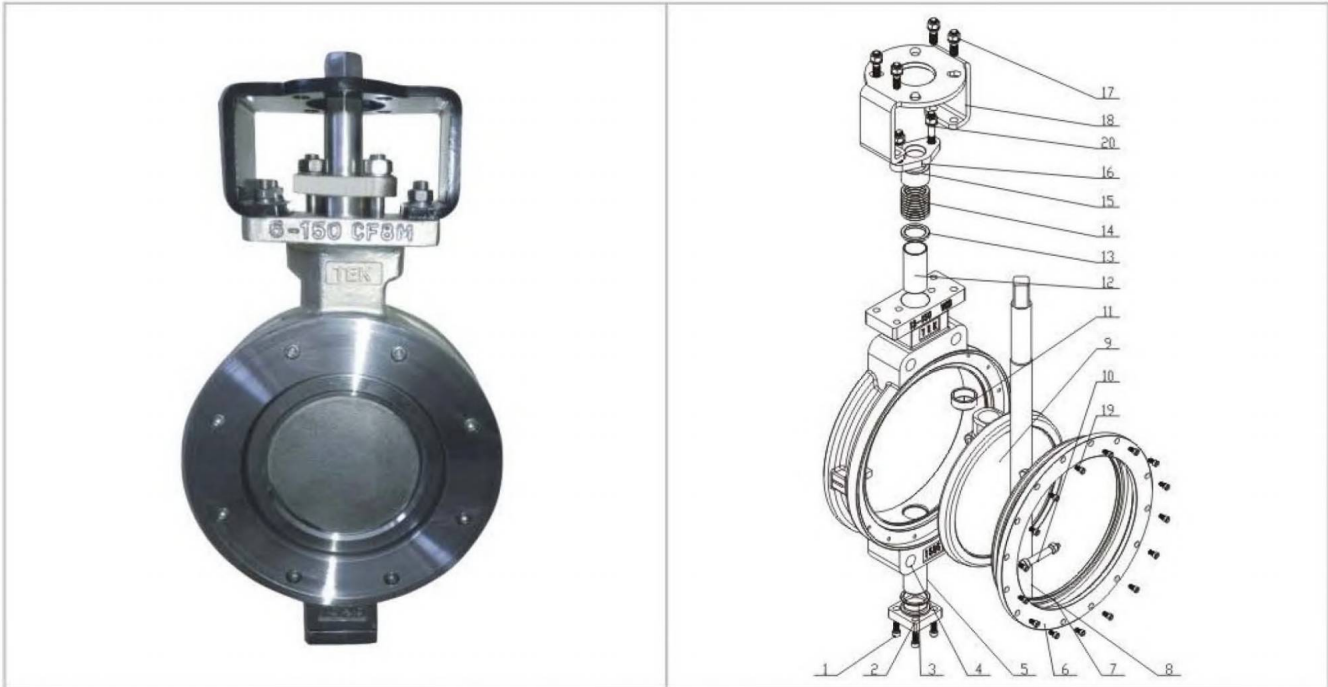
Valve Torque Data

VALVE SIZE		VALVE TORQUE DATA-150LB					
Inches	ON	100psi FT.LBS	6.9bar N.m	200psi FT.LBS	13.8bar N.m	28Spsi FT.LBS	19.7bar N.m
2-1/2	65	21	29	23	31	24	33
3	80	25	34	27	37	29	39
4	100	35	47	39	53	43	58
5	125	48	65	56	76	63	86
6	150	72	97	83	113	93	126
8	200	121	164	142	193	160	217
10	250	163	222	202	274	234	318
12	300	214	290	287	390	350	475
14	350	362	491	505	684	626	849
16	400	463	628	646	876	802	1087
18	450	602	816	844	1144	1050	1423
20	500	810	1098	1140	1546	1421	1926
24	600	1234	1673	1758	2384	2200	2983
30	750	2170	2942	2940	3986	3595	4873
36	900	3530	4786	6589	6589	5990	8121

VALVE SIZE		VALVE TORQUE DATA-150LB					
Inches	ON	300psi FT.LBS	400psi FT.LBS	500psi FT.LBS	600psi FT.LBS	700psi FT.LBS	740psi FT.LBS
2-1/2	65	25	27	30	33	35	36
3	80	31	34	38	41	44	45
4	100	52	58	65	72	78	81
5	125	85	98	112	125	138	143
6	150	119	138	158	178	197	205
8	200	231	271	312	352	392	408
10	250	354	422	490	557	625	652
12	300	492	582	673	764	854	890
14	350	824	1012	1200	1388	1576	1651
16	400	989	1212	1435	1658	1881	1970
18	450	1279	1562	1845	2128	2411	2524
20	500	1707	2096	2485	2874	3263	3419
24	600	2309	2832	3355	3878	4401	4610
30	750	4210	5080	5950	6820	7690	8038
36	900	7220	8760	10300	11840	13380	13996

High Performance Butterfly Valve

TEK VALVE

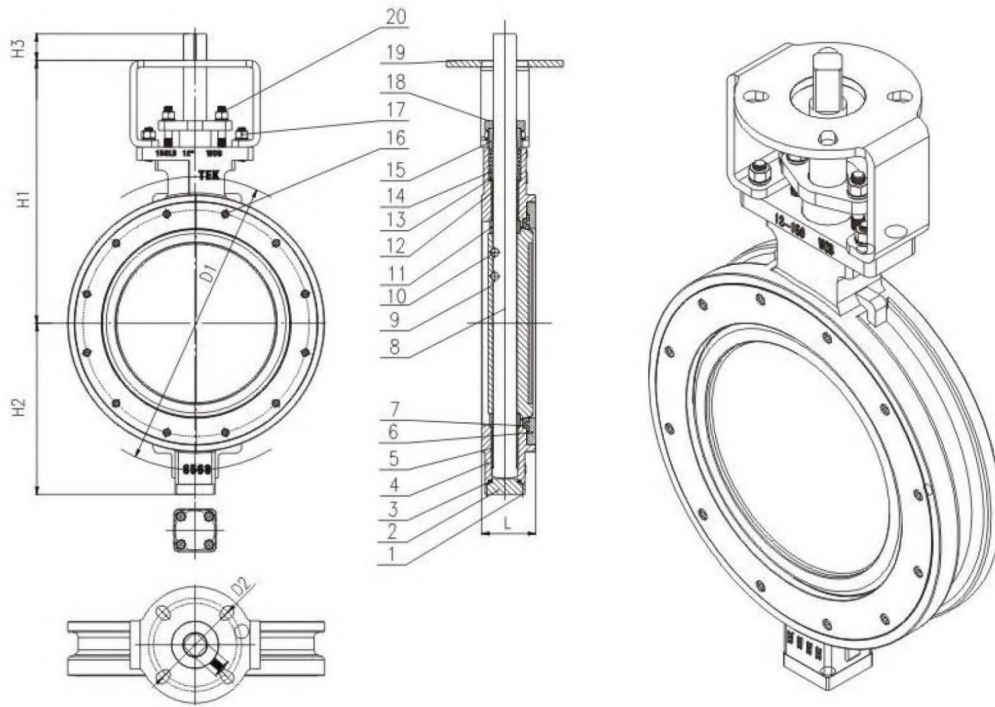


ASTM Material list of High Performance valve

No	Part Name	Carbon Steel to ASTM		Stainless Steel to ASTM			
1	Screw	A193B8	A193B8	A193B8	A193B8	A193B8	A193B8
2	End Housing	ASTMA105	A352LF2	A182F304	A182F304L	A182F316	A182F316L
3	Gasket	SS304+Graphite	SS304+Graphite	SS304+Graphite	SS316+Graphite	SS316+Graphite	SS316+Graphite
4	Body	A216WCB	A352LCB	A351CF8	A351CF3	A351 CF8M	A351 CF3M
5	Bushing	SS316+PTFE					
6	Retainer Flange	Carbon Steel	SS304	SS304	SS304L	SS316	SS316L
7	Seat	RPTFE					
8	Stem	17-4PH					
9	Disc	A351 CF8	A351 CF8	A351CF8	A351 CF3	A351 CF8M	A351CF3
10	Pin	SS316					
11	Positioning adjustment set	SS316					
12	Bushing	SS316+PTFE					
13	Packing Gasket	SS316					
14	Packing	PTFE					
15	Packing Gland	SS316					
16	Gland Flange	A351 CF8					
17	Bolt	A193B8					
18	York	Carbon Steel					
19	Disc Bolt	A193 B8M					
20	Bolt	A193 B8					

High Performance Wafer Butterfly Valve

TEK VALVE

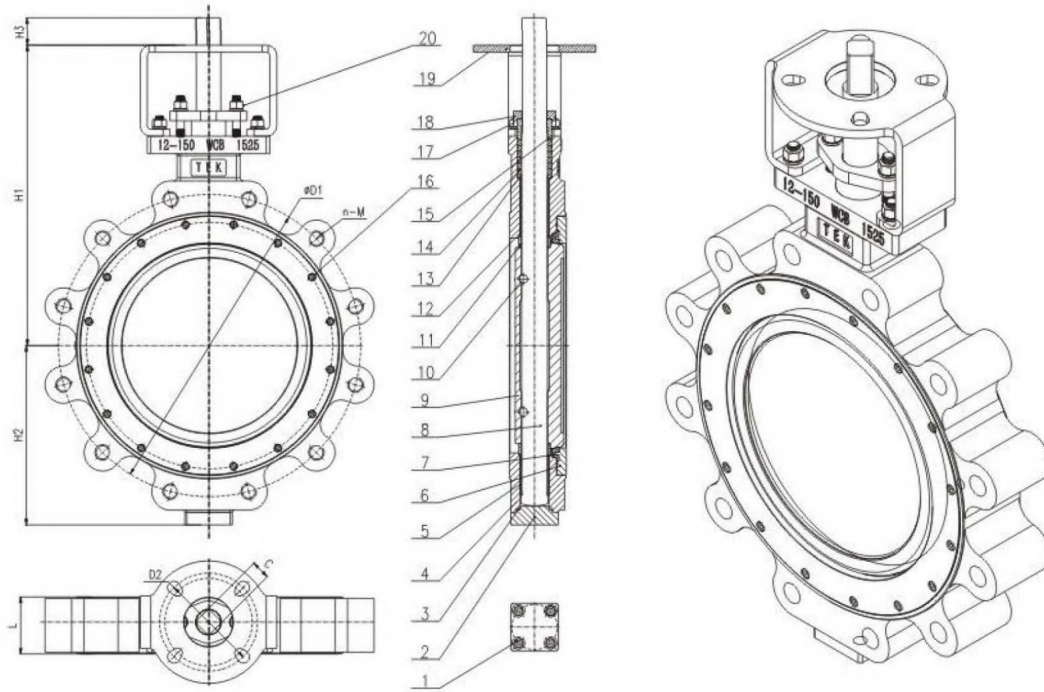


Main size of outside & Torque

Class	Size		Dimensions (mm)								TOP FLANGE ISO5211	TORQUE N.m
	NPS	DN	L	DI	D2	C*C	H1	H2	H3	n-d		
Class 150	2 1/2	65	43	121	70	11*11	180	75	20	4-19	ISO5211 F07	26N.m
	3	80	48	152.4	70	11*11	225	85	20	4-19	ISO5211 F07	39N.m
	4	100	54	190	70	14*14	235	105	25	8-19	ISO5211 F07	58N.m
	6	150	57	241	70	17*17	270	152	25	8-22	ISO5211 F07	126N.m
	8	200	64	298.4	102	19*19	300	188	32	8-22	ISO5211 F10	217N.m
	10	250	71	361.9	125	22*22	386	219	35	12-25	ISO5211 F12	318N.m
	12	300	81	431.8	140	27*27	429	256	40	12-25	ISO5211 F14	475N.m
	14	350	92	476.2	165	27*27	472	282	40	12-29	ISO5211 F16	849N.m
	16	400	102	539.8	165	36*36	509	322	55	16-29	ISO5211 F16	1087N.m
	18	450	114	577.9	165	36*36	545	347	55	16-32	ISO5211 F16	1423N.m
	20	500	127	635	165	40*40	570	372	60	20-32	ISO5211 F16	1926N.m
24	600	154	749.3	254	46*46	658	432	70	20-35	ISO5211 F25	2983N.m	

High Performance LUG Butterfly Valve

TEK VALVE



Main size of outside & Torque

Class	Size		Dimensions (mm)								TOP FLANGE ISO5211	TORQUE N.m
	NPS	DN	L	DI	D2	C*C	H1	H2	H3	n-d		
Class 150	2 1/2	65	43	121	70	11*11	180	75	20	4-5/8"	ISO5211 F07	26N.m
	3	80	48	152.4	70	11*11	225	85	20	4-5/8"	ISO5211 F07	39N.m
	4	100	54	190	70	14*14	235	105	25	8-5/8"	ISO5211 F07	58N.m
	6	150	57	241	70	17*17	270	152	25	8-3/4"	ISO5211 F07	126N.m
	8	200	64	298.4	102	19*19	300	188	32	8-3/4"	ISO5211 F10	217N.m
	10	250	71	361.9	125	22*22	386	219	35	12-7/8"	ISO5211 F12	318N.m
	12	300	81	431.8	140	27*27	429	256	40	12-7/8"	ISO5211 F14	475N.m
	14	350	92	476.2	165	27*27	472	282	40	12-1"	ISO5211 F16	849N.m
	16	400	102	539.8	165	36*36	509	322	55	16-1"	ISO5211 F16	1087N.m
	18	450	114	577.9	165	36*36	545	347	55	16-1-1/8'	ISO5211 F16	1423N.m
	20	500	127	635	165	40*40	570	372	60	20-1-1/8'	ISO5211 F16	1926N.m
	24	600	154	749.3	254	46*46	658	432	70	20-1-1/4'	ISO5211 F25	2983N.m

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