



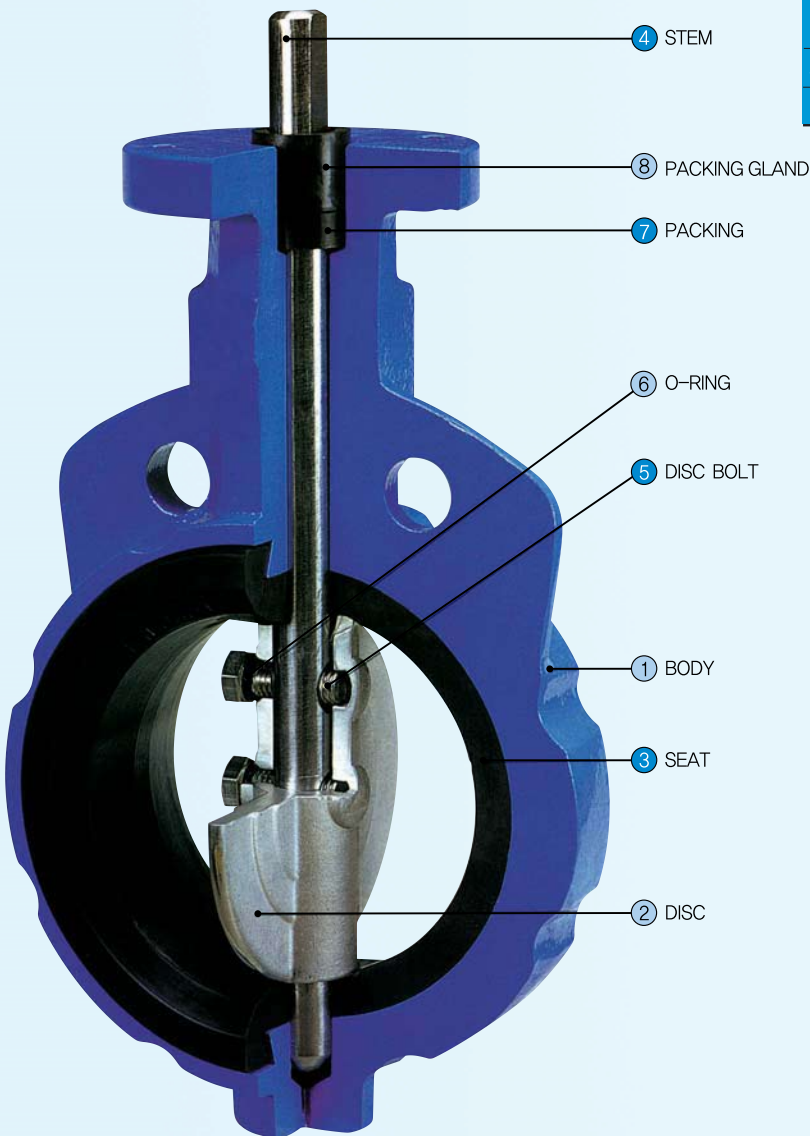
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BUTTERFLY VALVE HS-Series



Butterfly Valve HS-Se

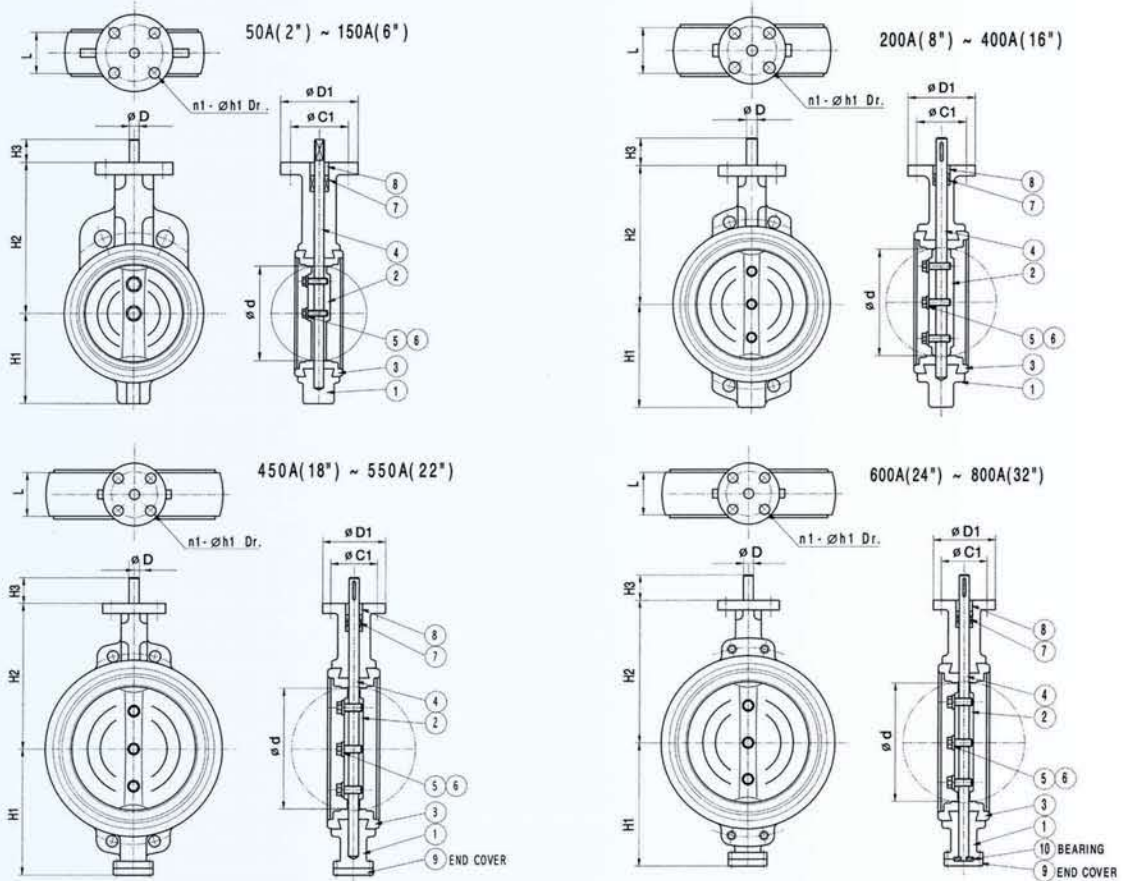
☐ BUTTERFLY VALVE CONSTITUTION TABLE



Standard	API 609, MSS SP 67, BS EN 593
Product Range	50mm up to 1,000mm (2" ~ 40")
Pressure Range	Max. 16 bar
Face to Face	API 609, MSS SP 67, ISO 5752, BS EN 593
Flange	JIS B 2210 10K, 16K / ASME B 16.5 Class 150
	BS 4504 PN10, PN16
Seat and Shell Test	API 598, ASME B 16.34, ANSI B16.104
Top Flange	ISO 5211

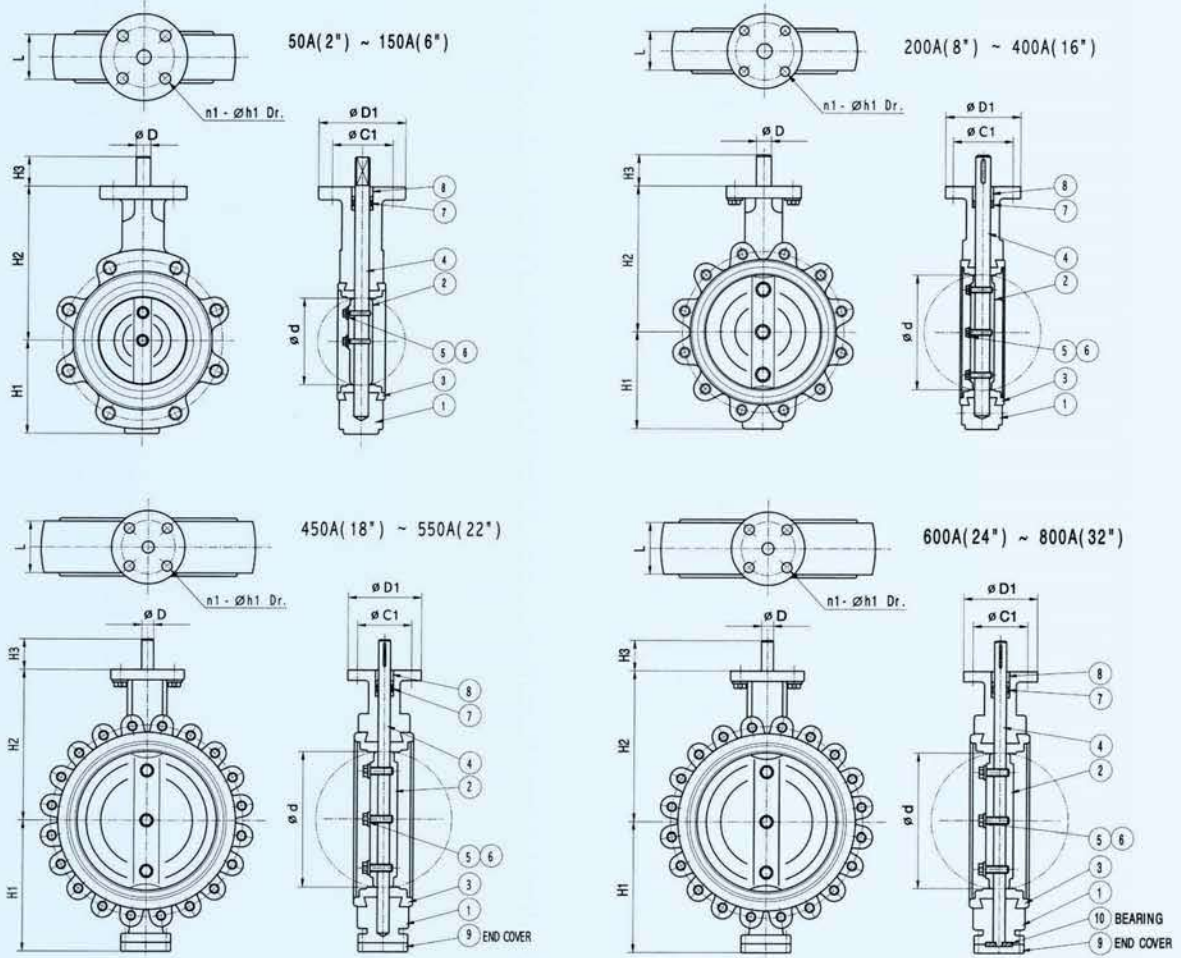
NO.	Name of part	Materials		Standard Materials
		JIS	ASTM	
1	BODY	FC	A126	FC200
		FCD	A536	FCD450
		SC	A216	SC480
		SCS	A351	SCS13
		BC	B584	BC6
		AIBC	B148	AIBC3
		AC	B108	AC2A
2	DISC	SCS	A351	SCS13
		BC	B584	
		AIBC	B148	
3	SEAT	NBR		NBR
		EPDM		EPDM
		BUNA-N		
		VITON		
		PTFE		
4	STEM	SUS	A276	SUS410
		MONEL	A564	SUS630
5	DISC BOLT	SUS	A276	SUS410
		MONEL	A564	SUS630
6	O-RING	NBR		NBR
		EPDM		& EPDM
		BUNA-N		
		VITON		
		PTFE		
7	PACKING	NBR		NBR
		EPDM		& EPDM
		BUNA-N		
		VITON		
		PTFE		
8	PACKING GLAND			ACETAL

☐ WAFER TYPE BUTTERFLY VALVES (HS-Series)




Size		d	L	D	C1	D1	n1	h1	H1	H2	H3	Weight (Kg)
mm	inch											
40	1 1/2	40	40	14	70	90	4	9	54	122	35	3.1
50	2	52	43	14	70	90	4	9	57	129	35	3.7
65	2 1/2	65	46	14	70	90	4	9	67	139	35	4
80	3	80	46	14	70	90	4	9	78	156	35	4.4
100	4	100	52	16	70	90	4	9	100	164	35	5.9
125	5	125	56	19	70	90	4	9	107	187	35	8.9
150	6	150	56	19	70	90	4	9	122	200	35	9
200	8	198	60	22	70	90	4	9	160	238	35	11
250	10	248	68	22	102	125	4	12	215	283	45	20
300	12	298	78	28	102	125	4	12	245	316	45	31.5
350	14	327	78	32	102	125	4	12	285	341	45	43
400	16	387	102	38	140	175	4	18	304	382	70	63.5
450	18	438	114	38	140	175	4	18	330	403	70	99
500	20	477	127	45	165	230	4	22	370	442	70	114.5
550	22	518	140	50	165	230	4	22	410	475	70	149.5
600	24	560	154	55	165	230	4	22	420	510	70	214.5
650	26	585	165	55	165	230	4	22	455	530	70	260
700	28	690	165	65	165	230	4	22	480	580	70	377
750	30	729	180	65	250	300	4	22	535	585	70	460
800	32	785	180	70	250	300	6	22	570	630	70	542
850	34	820	200	80	250	300	6	22	590	660	70	542
900	36	870	203	80	250	300	6	22	640	700	70	699
1000	40	960	216	90	250	300	6	22	700	750	70	977

LUGGED TYPE BUTTERFLY VALVES (HS-Series)



Unit : mm

Size		d	L	D	C1	D1	n1	h1	H1	H2	H3	Weight (Kg)
mm	inch											
40	1 1/2	40	40	14	70	90	4	9	54	122	35	3.1
50	2	52	43	14	70	90	4	9	57	129	35	3.7
65	2 1/2	65	46	14	70	90	4	9	67	139	35	4
80	3	80	46	14	70	90	4	9	78	156	35	4.4
100	4	100	52	16	70	90	4	9	100	164	35	5.9
125	5	125	56	19	70	90	4	9	107	187	35	8.9
150	6	150	56	19	70	90	4	9	122	200	35	9
200	8	198	60	22	70	90	4	9	160	238	35	11
250	10	248	68	22	102	125	4	12	215	283	45	20
300	12	298	78	28	102	125	4	12	245	316	45	31.5
350	14	327	78	32	102	125	4	12	285	341	45	43
400	16	387	102	38	140	175	4	18	304	382	70	63.5
450	18	438	114	38	140	175	4	18	330	403	70	99
500	20	477	127	45	165	230	4	22	370	442	70	114.5
550	22	518	140	50	165	230	4	22	410	475	70	149.5
600	24	560	154	55	165	230	4	22	420	510	70	214.5
650	26	585	165	55	165	230	4	22	455	530	70	260
700	28	690	165	65	165	230	4	22	480	580	70	377
750	30	729	180	65	250	300	4	22	535	585	70	460
800	32	785	180	70	250	300	6	22	570	630	70	542
850	34	820	200	80	250	300	6	22	590	660	70	542
900	36	870	203	80	250	300	6	22	640	700	70	699
1000	40	960	216	90	250	300	6	22	700	750	70	977

 TORQUES REQUIRED TO OPERATE HS SERIES BUTTERFLY VALVE

Size		Working Pressure (bar)							
		3.5 bar		5 bar		10 bar		16 bar	
mm	inch	kg-m	N-m	kg-m	N-m	kg-m	N-m	kg-m	N-m
50A	2	1	12	2	15	2	18	2	22
65A	2 1/2	2	15	2	18	3	25	3	26
80A	3	3	25	3	31	4	29	4	34
100A	4	4	34	4	43	5	49	5	49
125A	5	5	49	6	61	7	64	8	78
150A	6	8	78	10	98	10	98	11	107
200A	8	14	137	16	157	18	176	24	235
250A	10	23	225	22	215	29	284	36	352
300A	12	31	303	34	333	53	519	72	705
350A	14	45	441	50	490	63	617	115	1,127
400A	16	61	597	70	686	80	784	144	1,411
450A	18	81	794	92	901	117	1,146	190	1,862
500A	20	106	1,039	120	1,176	150	1,470	220	2,156
550A	22	130	1,274	162	1,592	181	1,773	295	2,891
600A	24	221	2,165	240	2,352	260	2,548	355	3,479
650A	26	182	1,783	245	2,401	288	2,822	345	3,386
700A	28	215	2,107	315	3,087	355	3,479	426	4,174
750A	30	255	2,499	342	3,351	390	3,822	468	4,586
800A	32	290	2,842	405	3,969	460	4,508	552	5,409
850A	34	325	3,185	495	4,851	538	5,272	645	6,326
900A	36	405	3,969	578	5,664	660	6,468	792	7,761
1000A	40	565	5,537	880	8,624	1,050	10,290	1,260	12,348

The torques listed are applicable to sea water, lubricating type of hydro carbons and most media at temperature 0~82°C. The operating speed of the actuator must be considered in order to avoid water hammer when the valve is closed in junction with Liquid.

The factors affect the torque required to operate Butterfly Valves

- Valve Diameter
- Shaft Diameter
- Bearing Friction Coefficient
- Type of Seat Material
- Shut off Pressure
- Velocity
- Shape of Disc
- System Head Characteristics
- Piping Arrangement

Actuator torques can be calculated using the following formulas.

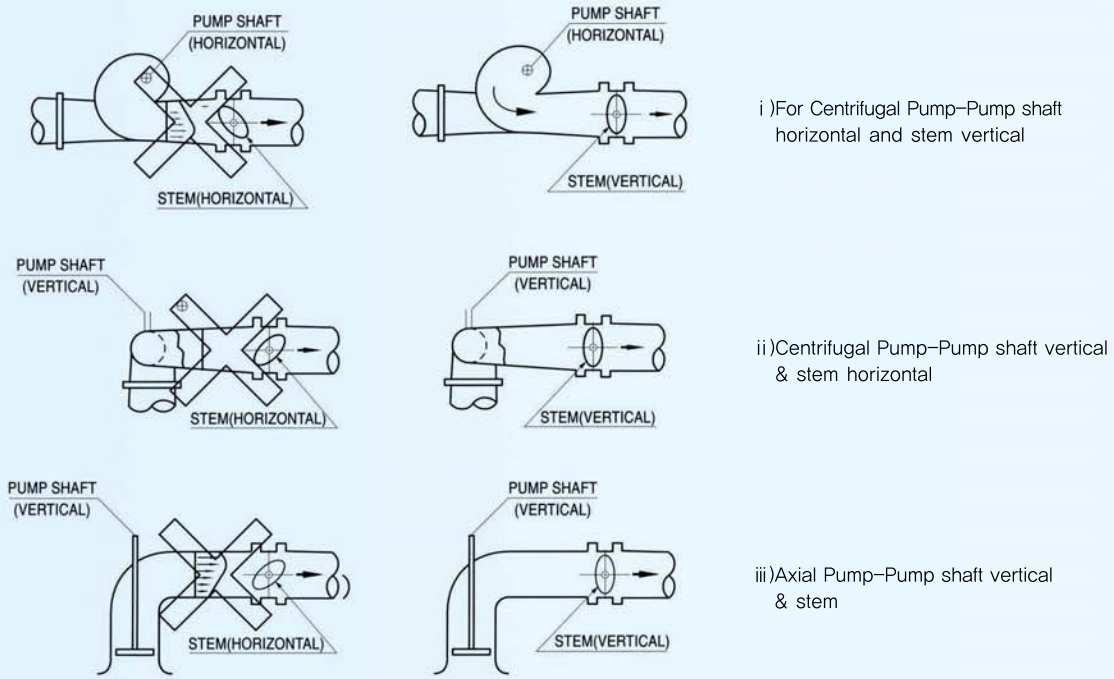
- $T_a = T_b + T_s + T_h = 1.2T_b \pm T_d$
- $T_s = C_s D^2$
- $T_b = 4.17 D^2 d f p$
- $T_d = C_t D^3 P$
- $T_h = 3.06 D^4$

- $V = C_f \sqrt{p} = \frac{Q}{0.785 D^2}$

- Ta : The required actuator torque(lb-ft)
- Ts : Seating or unseating torque(lb-ft)
- Td : Dynamic torque(lb-ft)
- Th : Hydrostatic torque(lb-ft)
- Q : Flow (cubic for per second)
- V : Velocity (feet per second)
- D : Diameter of valve (feet)
- d : Diameter of Shaft (inch)
- P : Pressure drop across valve(psi)
- Cs : Coefficient of Seating or unseating torque
- Ct : Coefficient of dynamic torque
- Cf : Coefficient of flow
- f : Bearing friction coefficient

☐ INSTALLATION PROCEDURES

A. Butterfly valves located at the discharge of a pump should be orientated as follows:

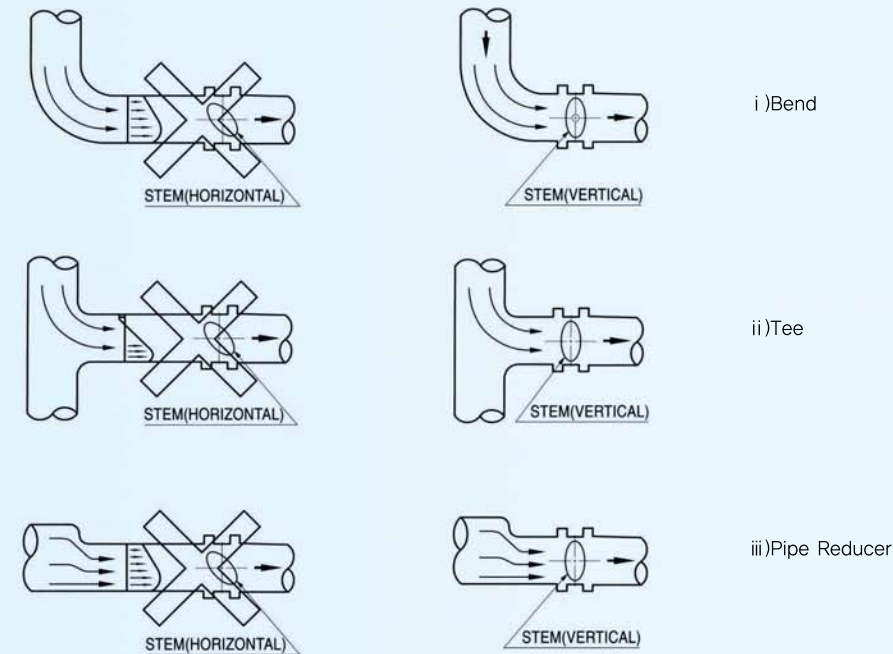


i) For Centrifugal Pump—Pump shaft horizontal and stem vertical

ii) Centrifugal Pump—Pump shaft vertical & stem horizontal

iii) Axial Pump—Pump shaft vertical & stem

B. Butterfly valves located down stream of a bend or pipe reducer should be orientated as follows:



i) Bend

ii) Tee

iii) Pipe Reducer

C. Butterfly valves in combination for control isolation applications should be as UP:



3-2 Installation with Flange Welding—When butterfly valves are to be installed between ANSI welding type flanges, care should be taken to abide by the following procedure to ensure no damage will occur to the seat:

- A. Place the valve between the flanges with the flange bores and valve body bore aligned properly. The disc should be in the 10° open position.
- B. Span the body with the bolts.
- C. Take this assembly of flange–body–flange and align it properly to the pipe.
- D. Take weld the flanges to the pipe.
- E. When tack welding is complete, remove the bolts and the valve from the pipe flanges and complete the welding of the flanges. Be sure to let the pipe and flanges cool before installing the valve. NOTE : Never complete the welding process(after tacking)with the valve between the pipe flanges. This causes severe seat damage due to heat transfer.

Figure 1 - Insert Butterfly Valve Between Flanges

Figure 2 - Recommended Bolt Tightening Sequence

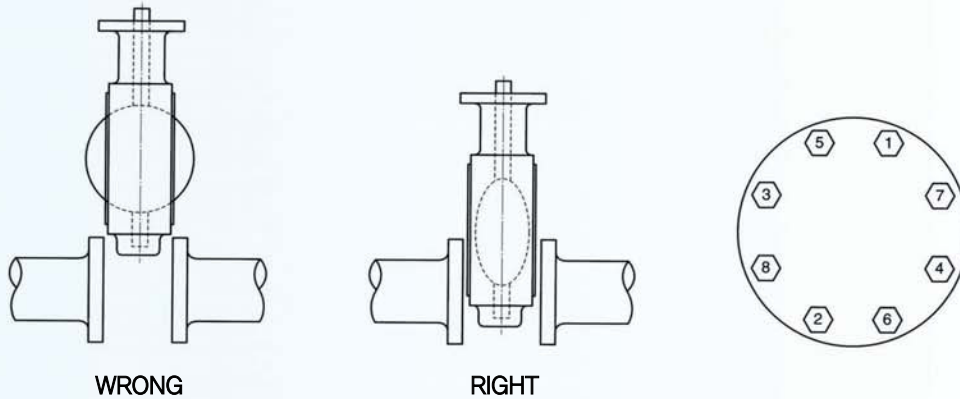
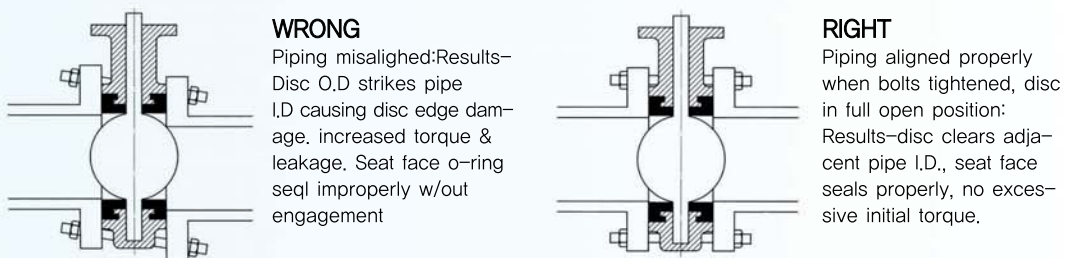


Figure3 - Final Aligning of Flange bolts



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