

# WAFER BUTTERFLY VALVE Z 411-A



Resilient seated, centrally mounted wafer type valve with reduced inside diameter for PE/PP piping systems

## TECHNICAL DATA

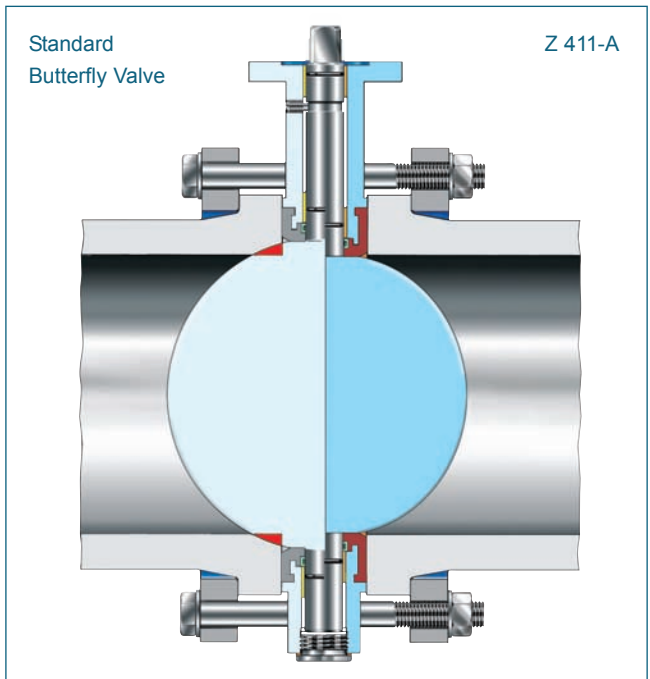
Nominal diameter:	da 50 (1 1/2 in) - da 630 (24 in) (SDR 11) da 50 (1 1/2 in) - da 500 (20 in) (SDR 17/ SDR17.6 / SDR 33)
Face-to-face:	EN 558 Series 20 (DIN 3202 T3 K1) ISO 5752 Series 20 API 609 Table 1 BS 5155 Series 4 NF E 29-305.1
Flange accommodation:	DIN 2501 PN 10
Top flange:	EN ISO 5211
Marking:	DIN EN 19
Tightness check:	DIN 3230 T3 BO. BN (Leakage Rate 1)
Temperature range:	14 °F to +320 °F (depending on pressure, medium and material)
Operating pressure:	max. 145psi SDR 11.0 (PE-80) max. 145psi SDR 17.0 (PE-100) max. 90psi SDR 17.6 (PE-80) max. 70psi SDR 33.0 (PE-100)
Vacuum:	3 psi absolute (depending on medium and temperature)

## FEATURES

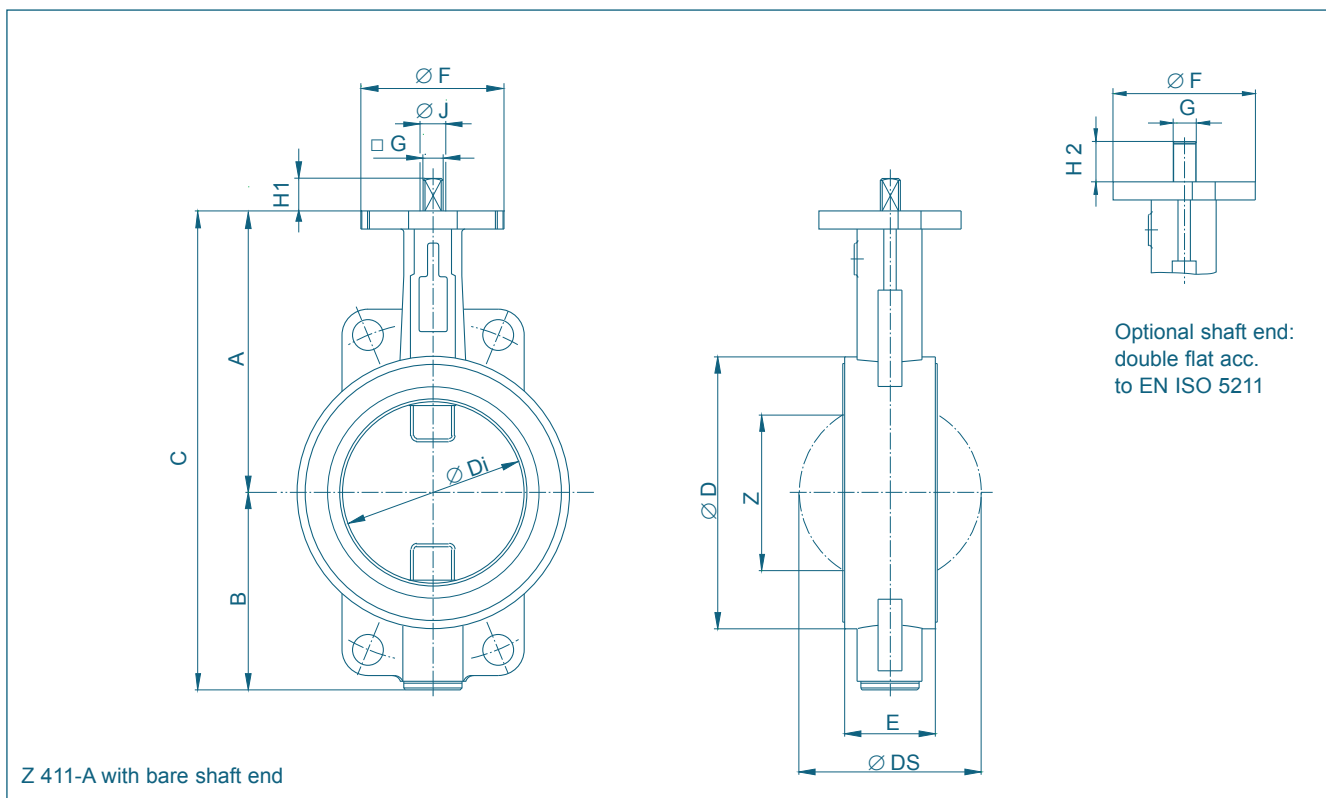
- Butterfly valve for PE/PP piping systems.
- The disc diameter corresponds to the inside diameter of PE HD and PP pressure pipes. (SDR 11/SDR 17/SDR 17.6/SDR 33)
- There is no need to manufacture and install complicated spacers.
- Can be mounted in any desired position.
- Triple shaft bearings prevent shaft deflection and guarantee optimum guidance even after many years of operational service.
- Interchangeable seat
- Maintenance-free
- Can be disassembled, material-specific recycling possible.
- For max. pressure, a through-going shaft (TS) is mounted for sizes  $\geq 400$ .

## GENERAL APPLICATIONS

Where PE/PP pipes are used.



# WAFER BUTTERFLY VALVE Z 411-A SDR 11



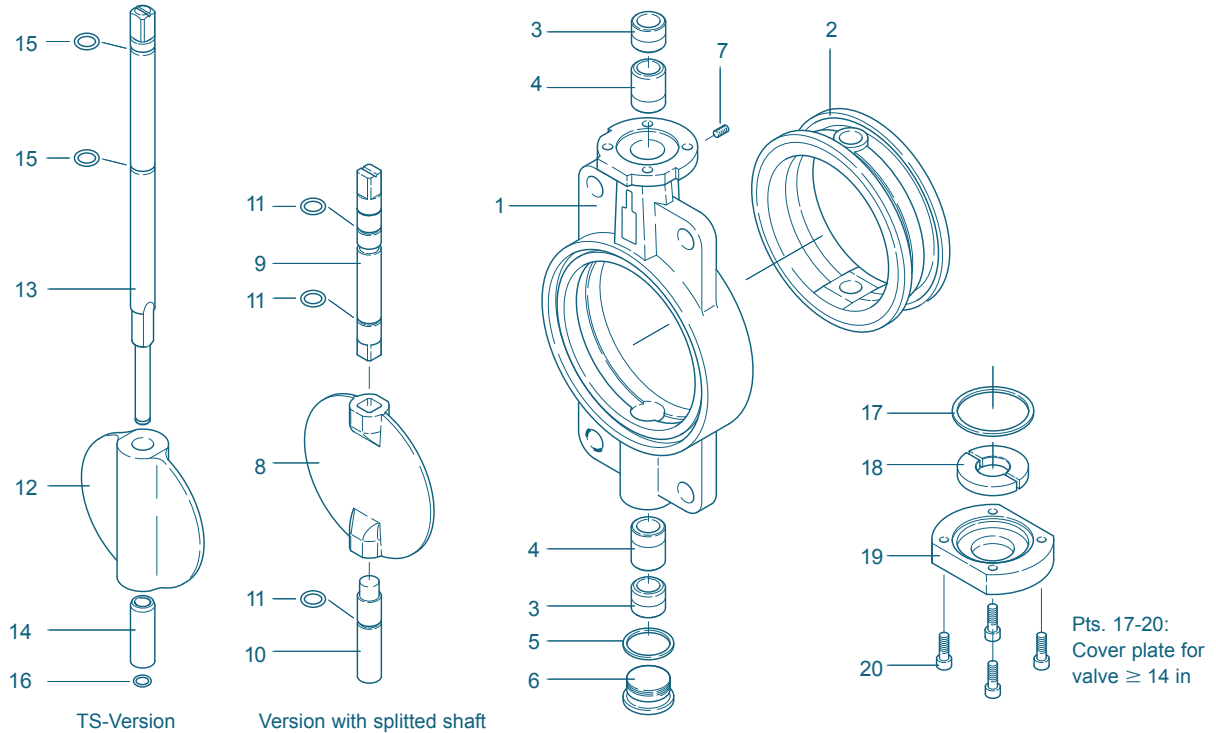
DN [mm]	Ø = da [mm]	Dimensions [in]													Weight [lb]			
		A	B	C	D	Di	DS	E	F	Flange	G	H1	H2	J	Z	GGG40 Split Shaft	AI TS- Shaft	Split Shaft
40	50	4.5	2.6	7.1	3.2	1.5	1.5	1.3	2.1	F04	0.4	0.5	0.7	0.6	0.9	4	-	-
50	63	5.0	3.3	8.3	3.7	1.9	2.0	1.7	2.1	F04	0.4	0.5	0.7	0.6	1.0	4	-	3
65	75	5.3	3.7	8.9	4.5	2.5	2.5	1.8	2.1	F04	0.4	0.5	1.0	0.6	1.8	6	-	4
80	90	6.2	4.1	10.3	5.4	3.1	3.1	1.8	2.6	F05	0.6	0.6	1.0	0.7	2.6	8	-	4
100	110	6.6	4.5	11.1	6.2	3.9	3.9	2.0	2.6	F05	0.6	0.6	1.0	0.7	3.3	11	-	5
100	125	6.6	4.5	11.1	6.2	3.9	3.9	2.0	2.6	F05	0.6	0.6	1.0	0.7	3.3	16	-	5
125	140	7.1	5.0	12.1	6.5	4.4	4.4	2.2	2.6	F05	0.6	0.6	1.2	0.7	3.9	18	-	6
150	160	8.0	5.9	13.9	7.3	4.9	4.9	2.2	3.5	F07	0.7	0.7	1.2	0.9	4.4	22	-	10
150	180	8.0	5.9	13.9	8.4	5.8	5.9	2.2	3.5	F07	0.7	0.7	1.2	0.9	5.5	23	-	13
200	200	9.0	6.9	15.9	8.9	6.4	6.4	2.4	3.5	F07	0.7	0.7	1.2	0.9	5.9	24	-	14
200	225	9.0	6.9	15.9	9.9	7.2	7.2	2.4	3.5	F07	0.7	0.7	1.2	0.9	6.8	27	-	15
250	250	10.5	8.4	18.8	10.6	7.8	7.8	2.7	3.5	F07	0.7	0.7	1.5	0.9	7.4	41	-	16
250	280	10.5	8.4	18.8	12.4	8.8	8.9	2.7	4.9	F10	0.9	0.9	1.5	1.2	8.5	45	-	26
300	315	11.5	9.3	20.8	14.1	10.0	10.1	3.1	4.9	F10	0.9	0.9	1.5	1.2	9.6	61	-	39
350	355	13.1	10.6	23.7	14.4	11.3	11.3	3.6	4.9	F10	0.9	0.9	-	1.2	10.7	79	-	41
400	400	14.3	12.4	26.7	16.9	12.9	12.9	4.0	5.9	F12	*	*	-	1.6	12.3	-	149	-
500	450	17.2	16.0	33.2	17.9	14.4	14.5	5.0	5.9	F12	*	*	-	1.6	13.6	-	213	-
500	500	17.2	16.0	33.2	20.0	16.1	16.2	5.0	5.9	F12	*	*	-	1.6	15.4	-	231	-
600	560	18.7	16.5	35.2	20.9	16.8	16.8	4.5	8.3	F16	*	*	-	2.0	16.2	-	264	-
600	630	18.7	16.5	35.2	22.6	19.2	19.3	5.0	8.3	F17	*	*	-	2.0	18.6	-	297	-

\* according to the mounted actuator

Subject to change without notice.

# WAFER BUTTERFLY VALVE Z 411-A

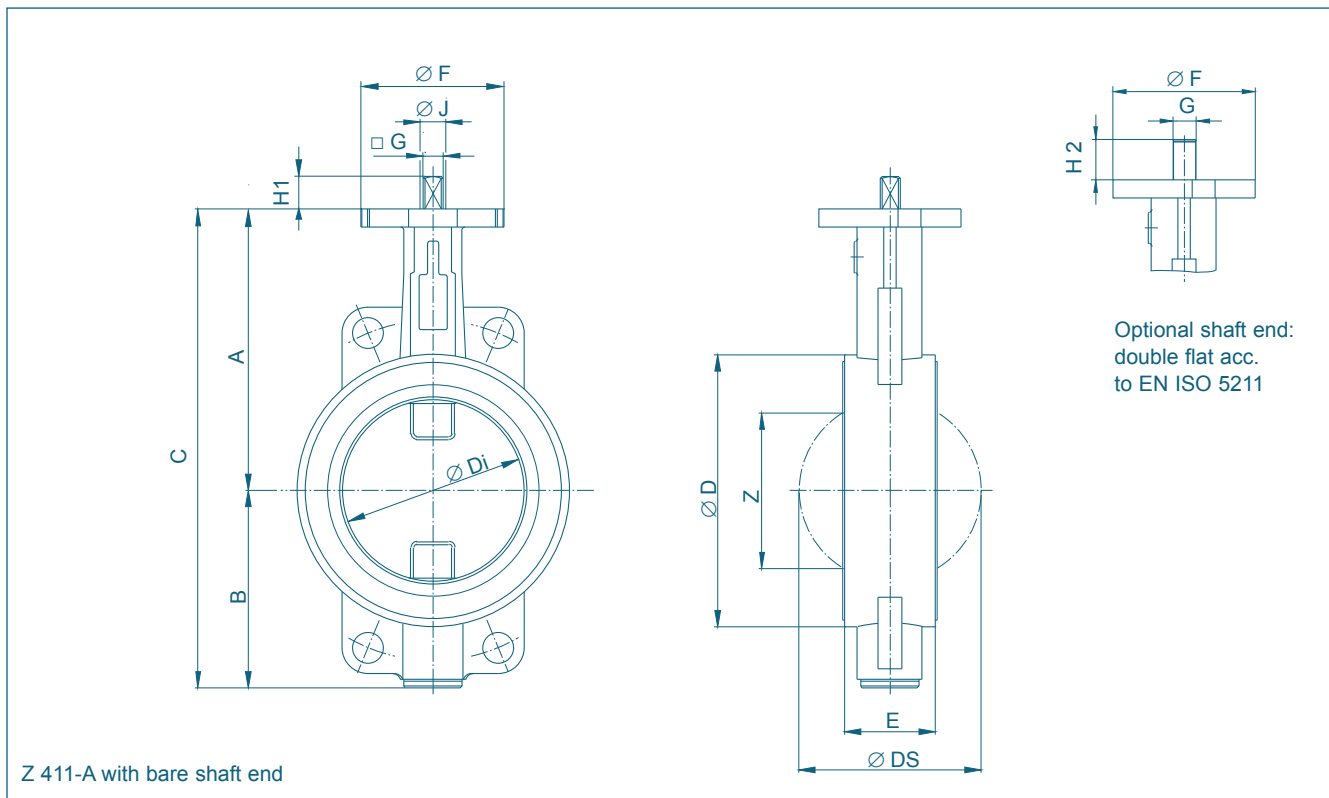
## MATERIAL SPECIFICATION AND PARTS LIST



Pt.	Description	Material	Material-No.	ASTM	Pt.	Description	Material	Material-No.	ASTM
<b>1</b>	<b>Body</b>				<b>12</b>	<b>TS-disc da250-da630</b>			
	da63-da355					Nodular Cast Iron	GGG-40	0.7040	60-40-18
	Aluminiumalloy	G-AISI9Cu3	3.2163	B 380.1		Stainless Steel	X6CrNiMo10-20	1.4408	CF8M
	da63-da630					Aluminium Bronze	CuAl10Ni	2.0975	C 95800
	Nodular Cast Iron	GGG-40	0.7045	60-40-18		Coating	Halar. Rilsan		
<b>2</b>	<b>Seat</b>					Surface			
	NBR	Acrylonitrile butadiene rubber				Quality	electropolished. mirror finished		
	EPDM	Ethylene propylene caoutchouc			<b>13</b>	<b>TS-shaft da250-da630</b>			
	FPM	Fluorocarbon caoutchouc				Stainless Steel	X14CrMoS17	1.4104	430F
<b>3/4</b>	<b>Bearing bush</b>						X39CrMo17-1	1.4122	
	Brass	MS 58	2.0401	B 45			X5CrNiMo17-12-2	1.4401	316
	Polyamide				<b>14</b>	<b>Sleeve</b>			
<b>5</b>	<b>Seal DIN 7603</b>					Stainless Steel	X5CrNi18-10	1.4301	304
	Stainless Steel	X5CrNiMo17-12-2	1.4401	316	<b>15</b>	<b>O-ring</b>			
	PTFE					NBR	Acrylonitrile butadiene rubber		
	Copper	Cu		Copper		FPM	Fluorocarbon caoutchouc		
<b>6</b>	<b>Plug screw DIN 908</b>				<b>16</b>	<b>Retainin ring</b>			
	Stainless Steel	G-X6CrNiMo 18-10	1.4408	CF8M		Stainless Steel	X39CrMo17-1	1.4122	
<b>7</b>	<b>Set screw DIN 915</b>				<b>17</b>	<b>O-ring da400-da630</b>			
	Steel	45 H galvanized				NBR	Acrylonitrile butadiene rubber		
	Stainless Steel	A4-70		B8M	<b>18</b>	<b>Shaft retainer da400-da630</b>			
<b>8</b>	<b>Disc</b>					Brass	MS 58	2.0401	B45
	Stainless Steel	X5CrNi18-10	1.4301	304	<b>19</b>	<b>Cover plate da400-da630</b>			
		X5CrNiMo18-10	1.4401	316		Grey Cast Iron	GG-25	0.6025	40 B
		G-X6CrNiMo18-10	1.4408	CF8M	<b>20</b>	<b>Screw da400-da630</b>			
	Coating	Halar. Rilsan				Steel	45 H galvanized		
	Surface					Stainless Steel	A2-70		B8
	Quality	electropolished. mirror finished					A4-70		B8M
<b>9/10</b>	<b>Shafts</b>								
	Stainless Steel	X14CrMoS17	1.4104	430F					
		X5CrNiMo17-12-2	1.4401	316					
<b>11</b>	<b>O-ring</b>								
	NBR	Acrylonitrile butadiene rubber							
	FPM	Fluorocarbon caoutchouc							Other materials upon request.

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# WAFER BUTTERFLY VALVE Z 411-A SDR 17 / 17.6

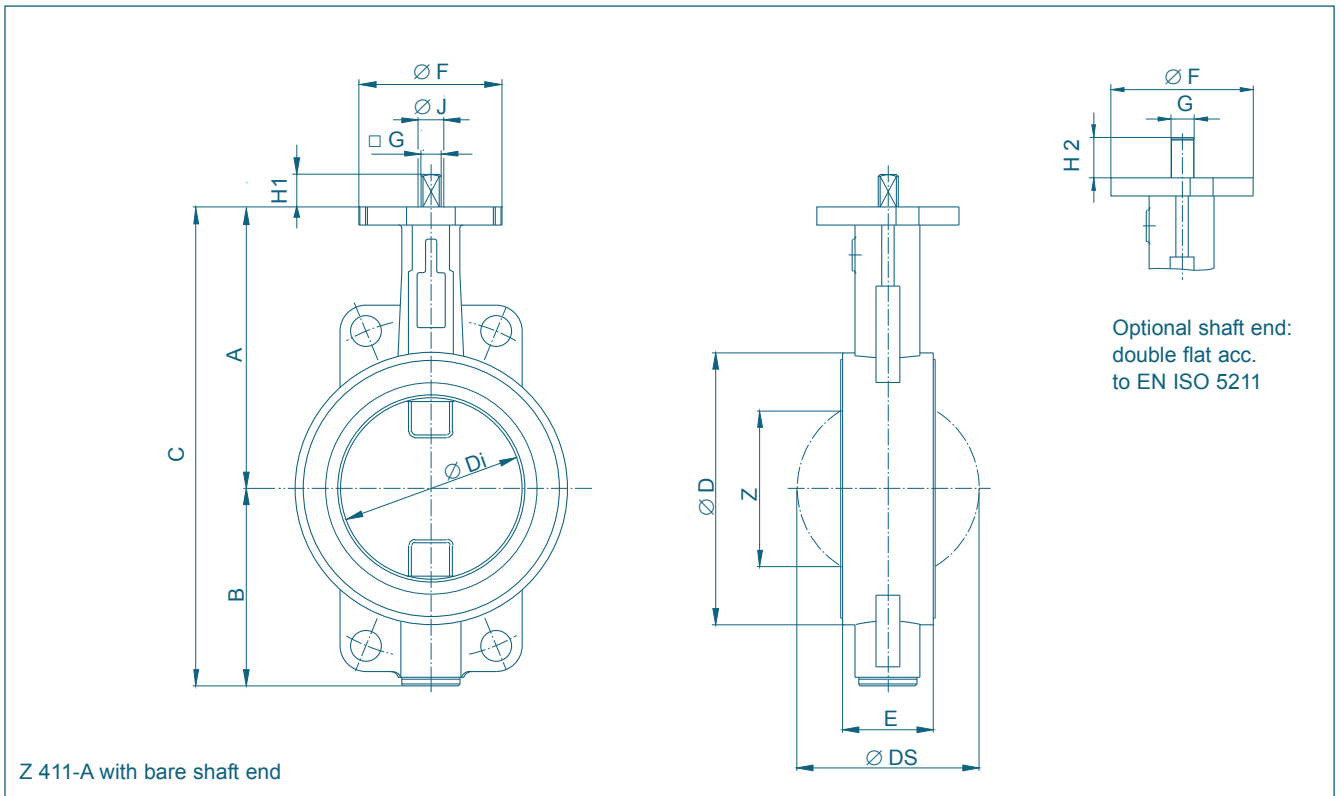


DN [mm]	Ø = da [mm]	Dimension [in]													Weight [lb]			
		A	B	C	D	Di	DS	E	F	Flange	G	H1	H2	J	Z	GGG40 Split Shaft	TS- Shaft	AI Split Shaft
40	50	4.5	2.6	7.1	3.2	1.5	1.5	1.3	2.1	F04	0.4	0.5	0.7	0.6	0.9	4	-	-
50	63	5.0	3.3	8.3	3.7	1.9	2.0	1.7	2.1	F04	0.4	0.5	0.7	0.6	1.0	4	-	3
65	75	5.3	3.7	8.9	4.5	2.5	2.5	1.8	2.1	F04	0.4	0.5	0.7	0.6	1.8	6	-	4
80	90	6.2	4.1	10.3	5.4	3.1	3.1	1.8	2.6	F05	0.6	0.6	1.0	0.7	2.6	8	-	4
100	110	6.6	4.5	11.1	6.2	3.9	3.9	2.0	2.6	F05	0.6	0.6	1.0	0.7	3.3	11	-	5
100	125	6.6	4.5	11.1	6.2	3.9	3.9	2.0	2.6	F05	0.6	0.6	1.0	0.7	3.3	16	-	5
125	140	7.1	5.0	12.1	7.4	4.9	4.9	2.2	2.6	F05	0.6	0.6	1.0	0.7	4.4	20	-	7
150	160	8.0	5.9	13.9	7.3	4.9	4.9	2.2	3.5	F07	0.7	0.7	1.2	0.9	4.4	22	-	10
150	180	8.0	5.9	13.9	8.4	5.8	5.9	2.2	3.5	F07	0.7	0.7	1.2	0.9	5.5	23	-	13
200	200	9.0	6.9	15.9	8.9	6.4	6.4	2.4	3.5	F07	0.7	0.7	1.2	0.9	5.9	24	-	14
200	225	9.0	6.9	15.9	10.6	7.8	7.8	2.4	3.5	F07	0.7	0.7	1.2	0.9	7.5	30	-	16
250	250	10.5	8.4	18.8	10.6	7.8	7.8	2.7	3.5	F07	0.7	0.7	1.2	0.9	7.4	41	-	16
250	280	10.5	8.4	18.8	12.6	9.8	9.8	2.7	4.9	F10	0.9	0.9	1.5	1.2	9.5	50	-	28
300	315	11.5	9.3	20.8	14.1	10.0	10.1	3.1	4.9	F10	0.9	0.9	1.5	1.2	9.6	61	-	39
350	355	13.1	10.6	23.7	15.4	12.3	12.3	3.6	4.9	F10	0.9	0.9	1.5	1.2	11.8	83	-	44
400	400	14.3	12.4	26.7	17.2	13.8	13.8	4.0	5.9	F12	*	*	-	1.6	13.2	-	165	-
500	450	17.2	16.0	33.2	17.9	14.4	14.5	5.0	5.9	F12	*	*	-	1.6	13.6	-	213	-
500	500	17.2	16.0	33.2	21.5	17.3	17.4	5.0	5.9	F12	*	*	-	1.6	16.6	-	247	-
600	560	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
600	630	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\* according to the mounted actuator

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# WAFER BUTTERFLY VALVE Z 411-A SDR 33



DN [mm]	Ø = da [mm]	Dimensions [in]														Weight [lb]		
		A	B	C	D	Di	DS	E	F	Flange	G	H1	H2	J	Z	GGG40 Split Shaft	TS- Shaft	AI Split Shaft
40	50	4.5	2.6	7.1	3.2	1.5	1.5	1.3	2.1	F04	0.4	0.5	0.7	0.6	0.9	4	-	-
50	63	5.0	3.3	8.3	3.7	1.9	2.0	1.7	2.1	F04	0.4	0.5	0.7	0.6	1.0	4	-	3
65	75	5.3	3.7	8.9	4.5	2.5	2.5	1.8	2.1	F04	0.4	0.5	0.7	0.6	1.8	6	-	4
80	90	6.2	4.1	10.3	5.4	3.1	3.1	1.8	2.6	F05	0.6	0.6	1.0	0.7	2.6	8	-	4
100	110	6.6	4.5	11.1	6.2	3.9	3.9	2.0	2.6	F05	0.6	0.6	1.0	0.7	3.3	11	-	5
100	125	6.6	4.5	11.1	6.2	3.9	3.9	2.0	2.6	F05	0.6	0.6	1.0	0.7	3.3	16	-	5
125	140	7.1	5.0	12.1	7.4	4.9	4.9	2.2	2.6	F05	0.6	0.6	1.0	0.7	4.4	20	-	7
150	160	8.0	5.9	13.9	8.4	5.8	5.9	2.2	3.5	F07	0.7	0.7	1.2	0.9	5.5	24	-	11
150	180	8.0	5.9	13.9	8.4	5.8	5.9	2.2	3.5	F07	0.7	0.7	1.2	0.9	5.5	23	-	13
200	200	9.0	6.9	15.9	9.9	7.2	7.2	2.4	3.5	F07	0.7	0.7	1.2	0.9	6.8	30	-	15
200	225	9.0	6.9	15.9	10.6	7.8	7.8	2.4	3.5	F07	0.7	0.7	1.2	0.9	7.5	35	-	16
250	250	10.5	8.4	18.8	12.1	8.8	8.9	2.7	3.5	F07	0.7	0.7	1.2	0.9	8.5	48	-	17
250	280	10.5	8.4	18.8	12.6	9.8	9.8	2.7	4.9	F10	0.9	0.9	1.5	1.2	9.5	50	-	28
300	315	11.5	9.3	20.8	14.1	11.0	11.1	3.1	4.9	F10	0.9	0.9	1.5	1.2	10.6	66	-	43
350	355	13.1	10.6	23.7	15.4	12.3	12.3	3.6	4.9	F10	0.9	0.9	1.5	1.2	11.8	83	-	44
400	400	14.3	12.4	26.7	17.2	13.8	13.8	4.0	5.9	F12	*	*	-	1.6	13.2	-	165	-
500	450	17.2	16.0	33.2	20.0	16.1	16.2	5.0	5.9	F12	*	*	-	1.6	15.4	-	231	-
500	500	17.2	16.0	33.2	21.5	17.3	17.4	5.0	5.9	F12	*	*	-	1.6	16.6	-	247	-
600	560	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
600	630	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\* according to the mounted actuator

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# WAFER BUTTERFLY VALVE Z 411-A

## TORQUE

- The torque values specified (Md) are based on liquid and lubricant media.
  - Powdery (non-lubricant) media  
Md x 1.3
  - Dry gases/high viscous media  
Md x 1.2
  - The values specified are based on the initial breakaway torque.
  - Dynamic torque specification available upon request.
- Regarding the dimensioning of actuators please contact our engineers.

da [mm]	Size [in]	Operating pressure		
		SDR 11 145 psi	SDR 17 / 17.6 145 psi	SDR 33 90 psi
50	1½	53	53	53
63	2	62	62	62
75	2½	133	133	80
90	3	160	160	87
110	4	248	248	160
125	4	248	248	160
140	5	399	399	195
160	6	975	975	399
180	6	975	975	399
200	8	1240	1240	673
225	8	1240	1240	673
250	10	1772	1772	1595
280	10	1772	1772	1595
315	12	1949	1949	1772
355	14	3190	3190	2747
400	16	5493	5493	4784
450	20	6468	6468	5759
500	20	8506	8506	7885
560	24	13999	-	-
630	24	17720	-	-

All Values in Inch Lbs.

## C<sub>v</sub>-VALUES

- The C<sub>v</sub>-values specified are based on tests carried out by the Delfter Hydraulics Laboratories, the Netherlands.
  - Permissible velocity of flow  
Vmax 15 ft/s for liquids and  
Vmax 230 ft/s for gases.
  - The throttle function is linear at an angle 30° to 70°.
  - Avoid cavitation!
- For further values, please contact our engineers.

da [mm]	DN [mm]	Size [in]	SDR	Opening angle α °								
				20°	30°	40°	50°	60°	70°	80°	90°	
50	40	1½	11	3	3	9	17	24	38	50	58	
			17	3	9	17	24	38	50	58		
			33	3	9	17	24	38	50	58		
63	50	2	11	1	9	15	26	44	58	76	99	
			17	1	9	15	26	44	58	76	99	
			33	1	9	15	26	44	58	76	99	
75	65	2½	11	2	10	26	49	90	138	198	250	
			17	2	10	26	49	90	138	198	250	
			33	2	10	26	49	90	138	198	250	
90	80	3	11	9	28	58	110	174	279	384	488	
			17	9	28	58	110	174	279	384	488	
			33	9	28	58	110	174	279	384	488	
110	100	4	11	15	33	65	151	209	395	640	930	
			17	15	33	65	151	209	395	640	930	
			33	15	33	65	151	209	395	640	930	
125	100	4	11	15	33	65	151	209	395	640	930	
			17	15	33	65	151	209	395	640	930	
			33	15	33	65	151	209	395	640	930	
140	125	5	11	22	53	98	212	316	517	837	1105	
			17	30	76	151	267	407	616	1012	1175	
			33	30	76	151	267	407	616	1012	1175	
160	150	6	11	30	76	151	267	407	616	1012	1175	
			17	30	76	151	267	407	616	1012	1175	
			33	41	105	232	419	744	1047	1570	2442	
180	150	6	11	41	105	232	419	744	1047	1570	2442	
			17	41	105	232	419	744	1047	1570	2442	
			33	41	105	232	419	744	1047	1570	2442	
200	200	8	11	43	120	279	511	861	1279	2175	3082	
			17	43	120	279	511	861	1279	2175	3082	
			33	48	186	360	605	1047	1651	2884	3943	
225	200	8	11	48	186	360	605	1047	1651	2884	3943	
			17	50	209	407	674	1163	1861	3489	4652	
			33	50	209	407	674	1163	1861	3489	4652	
250	250	10	11	50	209	407	674	1163	1861	3489	4652	
			17	50	209	407	674	1163	1861	3489	4652	
			33	99	314	593	977	1640	2791	4826	6048	
280	250	10	11	99	314	593	977	1640	2791	4826	6048	
			17	145	418	767	1279	2093	3605	6164	7443	
			33	145	418	767	1279	2093	3605	6164	7443	
315	300	12	11	155	454	825	1349	2210	3954	6396	7676	
			17	155	454	825	1349	2210	3954	6396	7676	
			33	198	558	1012	1640	2675	5233	7734	8943	
355	350	14	11	215	581	1070	1721	2814	5233	8141	9304	
			17	279	709	1291	2117	3489	6687	9769	10839	
			33	279	709	1291	2117	3489	6687	9769	10839	
400	400	16	11	331	791	1430	2384	2923	7769	10816	11863	
			17	407	907	1628	2791	3954	9304	12560	13374	
			33	407	907	1628	2791	3954	9304	12560	13374	
450	500	20	11	459	1012	1779	3059	4652	10350	12909	14537	
			17	459	1012	1779	3059	4652	10350	12909	14537	
			33	558	1198	2093	3629	6396	12444	14770	18608	
500	500	20	11	558	1198	2093	3629	6396	12444	14770	18608	
			17	581	1244	2326	3838	6862	13142	16282	21864	
			33	581	1244	2326	3838	6862	13142	16282	21864	
560	600	24	11	628	1302	2442	4070	7327	13491	17445	24423	
			17									
			33									
630	600	24	11	709	1512	2791	4768	8374	14537	20469	27912	
			17									
			33									

Subject to change without notice.