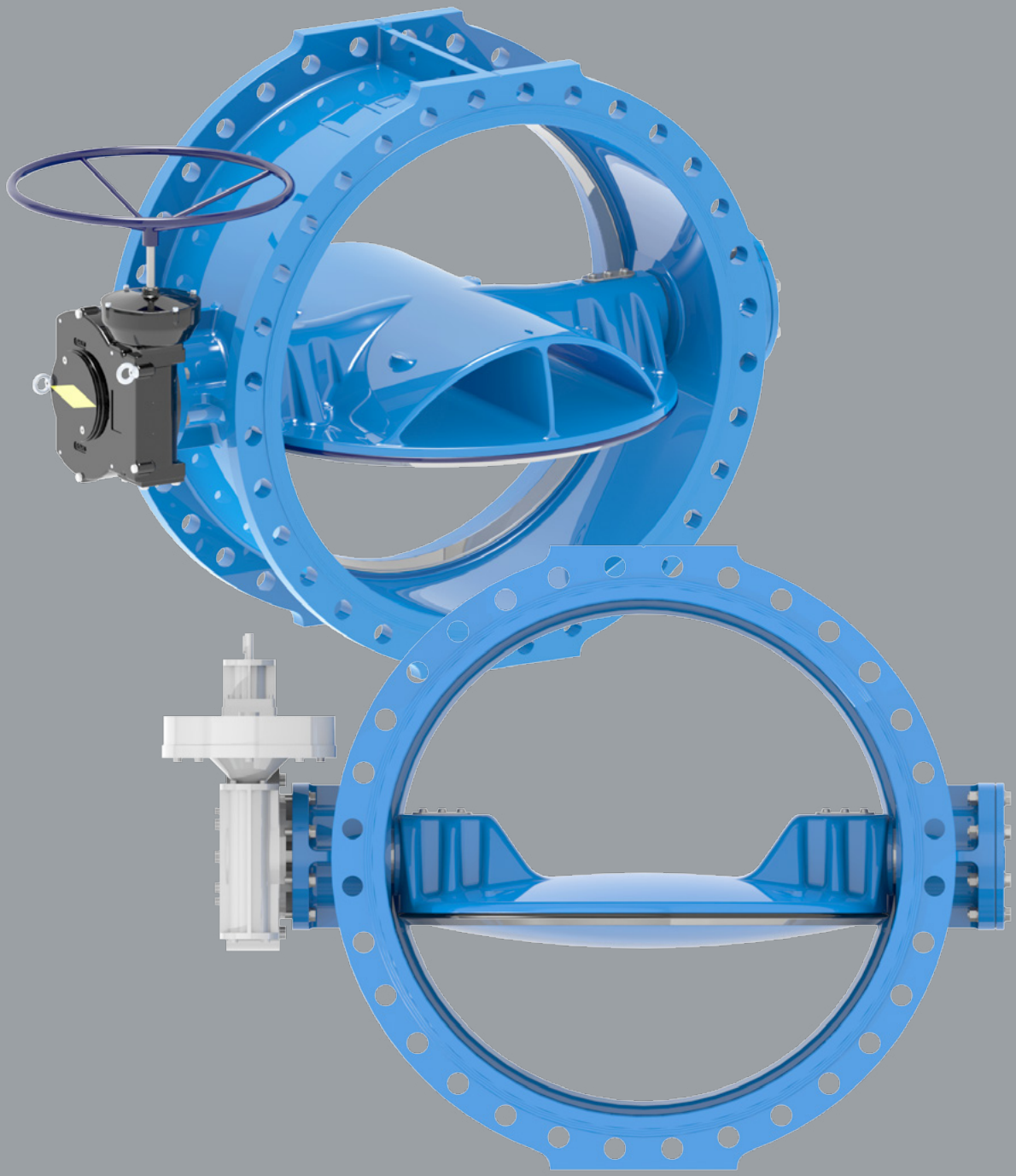
AVK DOUBLE ECCENTRIC BUTTERFLY VALVE S756



EXPECT HIGH DURABILITY

Expect... AVK

PRODUCT DESCRIPTION

S756

AVK double eccentric butterfly valves are designed with tilted and fixated disc for extended service life and easy operation. The disc seal is made of AVK's drinking water approved EPDM rubber featuring an excellent compression set and thus ability to regain its original shape. The DVGW/WRAS approved epoxy coating and fully encapsulated shaft/disc connection ensure high durability. The valves are suitable for bi-directional application.

Applications:

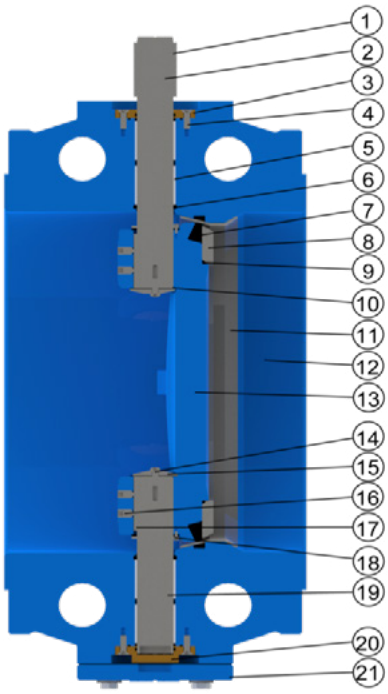
Water supply – Distribution

Water supply – Plant work

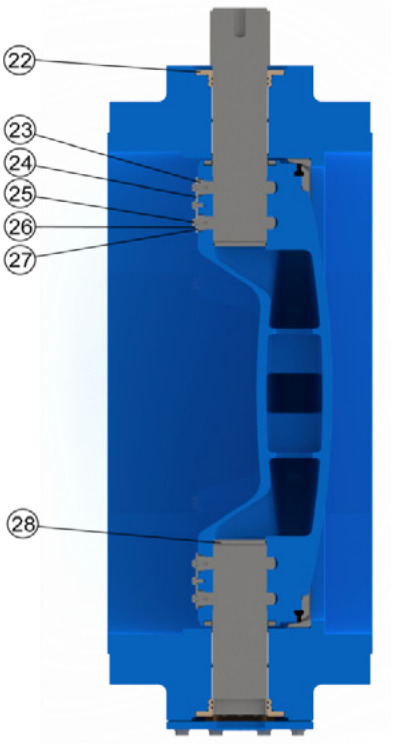
Water supply – Transmission

Approved for drinking water by:

PRODUCT FEATURES



PN16: DN200-600



PN16: DN700 and above
PN25: DN200-1200

Product type	Double eccentric, double flanged, resilient seated butterfly valve
Design standard	EN 593
Size range	DN200-4000
Pressure range	P10/16/25
Face to face dimension	EN 558 table 2 Series 13 (short) and Series 14 (long)
Top flange	EN ISO 5211
Medium	Drinking water and neutral liquids
Max. working temperature	70 degrees centigrade
Hydraulic test	According to EN 1074-1 and 2 / EN 12266 Rate A Seat: 1.1 x PN. Body: 1.5 x PN
Approvals & Certificates:	WRAS (UK), DVGW (Germany), GSK (Germany)
Actuation:	Wormgear, Electric, Pneumatic
Accessories:	Locking device, Extension spindle

Material specification

1.	Key	Stainless steel	12.	Body	Ductile iron	23.	Dowel PIN	Stainless steel
2.	Drive shaft	Stainless steel	13.	Disc	Ductile iron	24.	Security plate	Stainless steel
3.	Spacer	Bronze	14.	Screw	Stainless steel	25.	Screw	Stainless steel
4.	Screw	Stainless steel	15.	Endcover	Stainless steel	26.	Spring washer	Stainless steel
5.	Bearing	Lead free PTFE sliding face	16.	Set screw	Stainless steel	27.	Zinc washer	Zinc pure
6.	O-ring	EPDM	17.	Key	Stainless steel	28.	Plug	Steel
7.	Seal ring	EPDM	18.	Cover	Stainless steel			
8.	Seal retaining ring	Stainless steel or Ductile iron	19.	Stub shaft	Stainless steel			
9.	O-ring	EPDM	20.	Axial bearing	Bronze			
10.	Gasket	EPDM	21.	End plate	Ductile iron			
11.	Seat ring	Stainless steel	22.	Seal housing	Bronze			

PRODUCT BENEFITS

High quality coating & Excellent rubber quality

All castings are blast cleaned according to ISO 12944-4. Any unevenness of the product surface is cleaned to provide perfect adhesion of the coating. Internal and external epoxy coating to DIN 30677-2 and GSK guidelines. Thorough control measures ensure **optimum corrosion protection.**

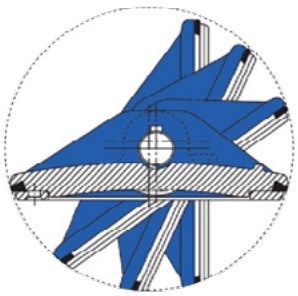
The rubber materials for sealings are developed and manufactured by AVK GUMMI A/S with the use of highly advanced technologies.

- Approved for drinking water
- EPDM resistant to ozone and chlorine with no building of biofilm
- Features an excellent compression set (regains shape)

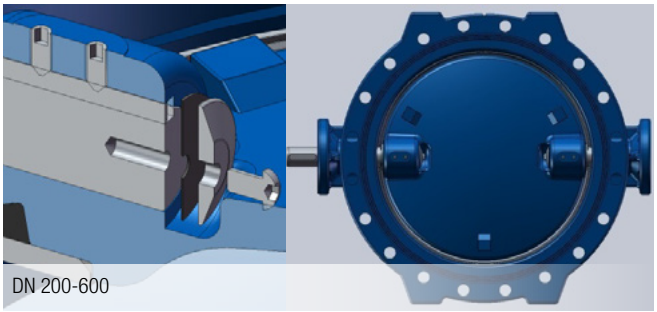
Tilted and fixated disc extends service life and eases operation

The tension on the disc is released after a few degrees of opening hich gives only insignificant wear of the disc seal.

- Minimum compression of the disc sealing
- Low operating torques
- Reduced wear of the sealing

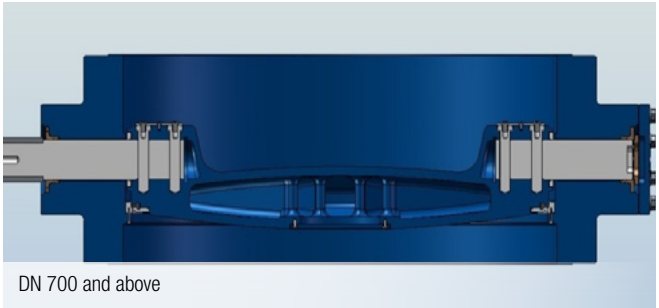


Double eccentric principle
The shaft is placed offset the centre line in both directions. Eccentricity relates to the centre of the pipeline. Double eccentricity relates to the valve centre (approx. 3-5 mm). The disc swings open/closed like a door.



DN 200-600

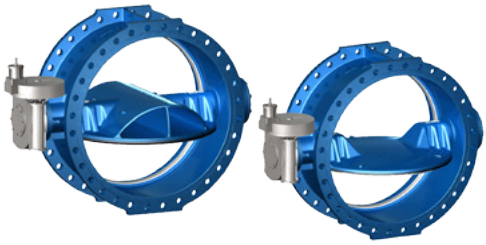
The disc is fixated with two set screws to prevent wear of the keyway and thus to avoid fluttering caused by flow velocity and play in the key and keyway connection.



DN 700 and above

In larger dimensions the disc is fixated with two stainless steel drive dowels, with key and keyway as back-up. The dowels are mounted with press fit leaving no play between disc and shaft.

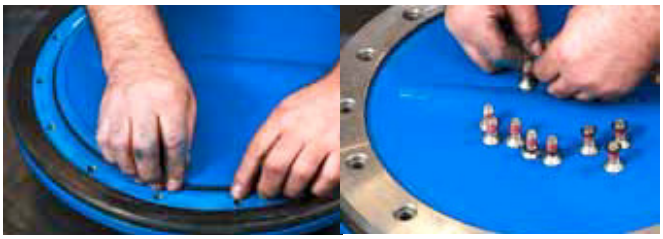
Pick your favourite disc and seat design



Flow-through disc

Plate disc

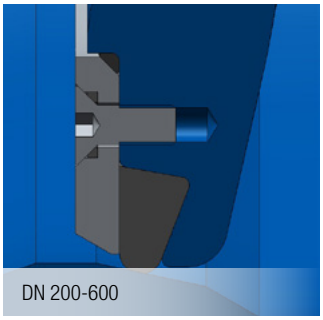
Flow-through disc design is less sensitive to cavitation at high flow velocities. The design is available for DN 700-1200 butterfly valves.



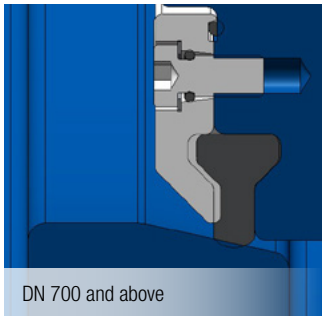
Disc seal optimised for high performance

The disc seal is shaped to secure fixation in correct position providing a very reliable function.

- Threaded holes in disc protected by O-rings
- Bolts coated with precoat 80 to prevent loosening
- Excellent rubber quality of disc sealing ring secures low torques

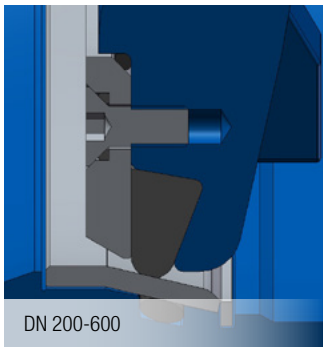


DN 200-600

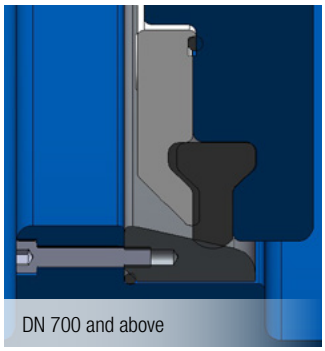


DN 700 and above

Integral seat design has a machined and epoxy coated ductile iron seat integrated in the body.



DN 200-600



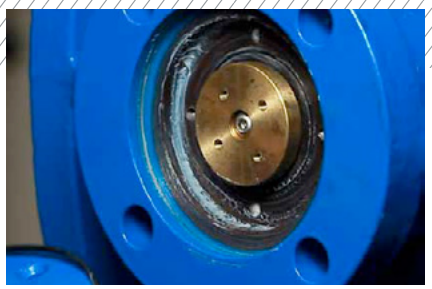
DN 700 and above

Stainless steel seat design has a replaceable seat ring of stainless steel sealed with an O-ring. For DN 200-600 valves the ring is pressed into the body, for larger dimensions the ring is fixed with bolts sealed with epoxy.

Protected shaft end zones secure durability

There are no uncoated ductile iron surfaces exposed to the media.

- In DN 200-600 the shaft ends are protected with stainless steel plates with gaskets.
- In larger dimensions the shaft ends are fully encapsulated in the disc and fixed to the disc with dowels.
- The low friction PTFE shaft bearings ensure low operating torques for the complete range.

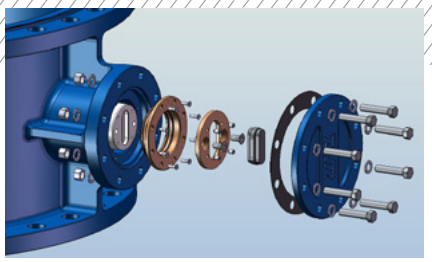


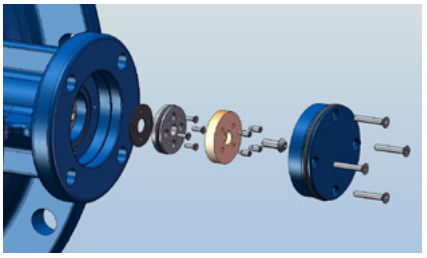
Replaceable shaft sealing and optional locking

The shaft sealing is replaceable under pressure to enable easy maintenance. Sealings of EPDM secure tightness from inside and out, and NBR sealings protect against impurities from outside.

- DN 200-600: An EPDM O-ring on a stainless steel ring, a back-up EPDM O-ring in the housing, a flat EPDM gasket, and an NBR O-ring.
- DN 700 and above: Two EPDM O-rings on each side of the bronze bushing, and a flat NBR gasket.

We offer an optional locking device which makes it possible to lock the disc in open/closed position.





AVK DOUBLE ECCENTRIC BUTTERFLY VALVES

Series 756/118

Long body
Integral seat
Plate disc
IP67 standard gearbox
DN200-2800
PN10/16

Options:
- Stainless seat
- PN25 in DN200-1200

Datasheets:
- 756/118-001 (DN700-1200, PN10/16)
- 756/118-002 (DN700-1200, PN25)
- 756/118-005 (DN200-600, PN10/16)

Series 756/1

Long body
Integral seat
Plate disc
IP67 premium gearbox
DN200-2800
PN10/16

Options:
- Stainless seat
- PN25 in DN200-1200

Datasheets:
- 756/100-671 (DN700-2800, PN10/16)
- 756/100-672 (DN700-2400, PN10/16 SS seat)
- 756/100-771 (DN200-1200, PN25)
- 756/100-772 (DN200-1200, PN25 SS seat)

Series 756/106

Long body
Integral seat
Plate disc
IP68 premium gearbox
DN200-2800
PN10/16

Options:
- Stainless seat
- PN25 in DN200-1200

Datasheets:
- 756/106-681 (DN700-2800, PN10/16)
- 756/106-682 (DN700-2400, PN10/16 SS seat)
- 756/106-781 (DN200-1200, PN25)
- 756/106-782 (DN200-1200, PN25 SS seat)

Series 756/102

Long body
Stainless steel seat
Plate disc
ISO input premium gearbox
DN200-2800
PN10/16

Options:
- Integral seat
- PN25 in DN200-1200

Datasheets:
- 756/102-IS1 (DN700-2800, PN10/16)
- 756/102-IS2 (DN700-2400, PN10/16 SS seat)
- 756/102-IS3 (DN200-1200, PN25)
- 756/102-IS4 (DN200-1200, PN25 SS seat)

Series 756/3

Long body
Integral seat
Flow through disc
IP67 premium gearbox
DN700-1200
PN10/16

Options:
- Stainless seat

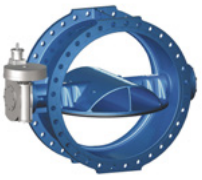
Datasheets:
- 756/3-001 (DN700-1200, PN10/16)
- 756/3-003 (DN700-1200, PN10/16 SS seat)

Series 756/306

Long body
Integral seat
Flow through disc
IP68 premium gearbox
DN700-1200
PN10/16

Options:
- Stainless seat

Datasheets:
- 756/306-001 (DN700-1200, PN10/16)
- 756/306-003 (DN700-1200, PN10/16 SS seat)



Series 756/302

Long body
Stainless steel seat
Flow through disc
ISO input premium gearbox
DN700-1200
PN10/16

Options:
- Integral seat

Datasheets:
- 756/302-001(DN700-1200, PN10/16)
- 756/302-003 (DN700-1200, PN10/16 SS seat)

Series 756/218

Short body
Integral seat
Plate disc
IP67 standard premium gearbox
DN200-2800
PN10/16

Options:
- Stainless seat
- PN25 in DN200-1200

Datasheets:
- 756/218-001 (DN700-1200, PN10/16)
- 756/218-005 (DN200-600, PN10/16)
- 756/218-008 (DN200-1200, PN25)

Series 756/2

Integral seat
Plate disc
IP67 premium gearbox
DN200-2800
PN10/16

Options:
- Short body
- Stainless seat
- PN25 in DN200-1200

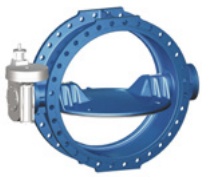
Datasheets:
- 756/2-001 (DN700-2200, PN10/16)
- 756/2-005 (DN700-2200, PN10/16 SS seat)

Series 756/206

Integral seat
Plate disc
IP68 premium gearbox
DN200-2800
PN10/16

Options:
- Short body
- Stainless seat
- PN25 in DN200-1200

Datasheets:
- 756/206-001 (DN700-2200, PN10/16)
- 756/206-005 (DN700-2200, PN10/16 SS seat)



Series 756/202

Stainless steel seat
Plate disc
ISO input premium gearbox
DN200-2800
PN10/16

Options:
- Short body
- Integral seat
- PN25 in DN200-1200

Datasheets:
- 756/202-002 (DN700-2200, PN10/16)
- 756/202-006 (DN700-2200, PN10/16 SS seat)

Series 756/4

Integral seat
Flow through disc
IP67 premium gearbox
DN700-1200
PN10/16

Options:
- Short body
- Stainless seat

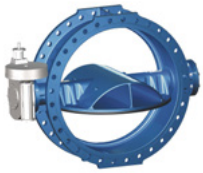
Datasheets:
- 756/4-001 (DN700-1200, PN10/16)
- 756/4-003 (DN700-1200, PN10/16 SS seat)

Series 756/406

Integral seat
Flow through disc
IP68 premium gearbox
DN700-1200
PN10/16

Options:
- Short body
- Stainless seat

Datasheets:
- 756/406-001 (DN700-1200, PN10/16)
- 756/406-003 (DN700-1200, PN10/16 SS seat)



Series 756/402

Stainless steel seat
Flow through disc
ISO input premium gearbox
DN700-1200
PN10/16

Options:
- Short body
- Integral seat

Datasheets:
- 756/402-001 (DN700-1200, PN10/16)
- 756/402-003 (DN700-1200, PN10/16 SS seat)

Note: Datasheets only show part of variants. More variants are available, please contact AVK if required.

TECHNICAL APPENDIX - COATING

Blast cleaning
All cast components are blast cleaned according to ISO 12944-4, SA 2½. The components are cleaned in a shot-blasting plant. The cleaned parts are held with fibre-free gloves and are
transported to the oven without delay according to GSK specifications. When viewed, the surface shall be visibly free from oil, grease, dirt, mill scale, rust, paint and foreign objects. Any
remaining traces of contamination shall show only as slight stains in the form of spots or stripes. The surface
shall have a uniform metallic colour, visually and compared with test plates. The process ensures an optimum bonding of the coating, which is essential for corrosion resistance.

Epoxy coating
The valve bodies and bonnets are epoxy coated according to DIN 30677-2 and GSK guidelines.
The epoxy coating is electrostatically applied in an enclosed coating booth, max. 4 hours after the valve components
were blast cleaned. The epoxy powder melts between 200-230ºC, and cures when in contact with the
cleaned and preheated component, ensuring an optimal bonding.

Test procedure
Coating thickness
The coating layer thickness shall be no less than 250 µ.
• Pore-free coating
The coating must be completely free of penetrating pores to avoid subsequent corrosion of the casting
underneath. A 3V holiday detector with a brush electrode is used to electrically reveal and locate any pores in
the coating.
• Impact resistance
The impact resistance test is carried out at least 24 hours after the coating process by means of a stainless
steel cylinder dropped on the coating surface through a one meter long tube corresponding to an impact energy of
5 Nm. After each impact the component is electrically tested, and no electrical breakthrough shall occur.
• Cross linkage
Several drops of methyl isobutyl ketone are put on a horizontal epoxy resin coated surface of the test piece
at room temperature. After 30 seconds the test area is wiped with a clean white cloth. It is checked that the
test surface has not become neither matt nor smeared, and that the cloth remains clean. The test is carried out
24 hours after the coating process.
• Adhesion
The adhesion of the powder coating on one of each type of component is tested at least four times a year
using the punch separation method according to DIN 24624. The coating thickness over a dispersed area of
the test item shall be within the range 250 µ to 400 µ.
The test pieces are immersed for seven days in deionised water at 90ºC, and then dried in an oven for 3 hours.
A conditioning phase of 3 to 5 days in normal atmosphere is then allowed to elapse. No blisters may arise
during the period immersed in the water bath.
The surface of the test piece is degreased and then roughened with abrasive paper. The roughened surface is
cleaned from dust with oil-free compressed air and recleaned. The adhesion on both the core and the mould
ing sand sides is tested with a minimum pulling force of >12 N/mm².
• Cathodic disbonding
Cathodic disbonding tests are carried out on one of each type of component at least twice a year.
No bubbles in the coating may develop during the test for cathodic disbonding.
For this test, the coating thickness over a dispersed area of the test item shall be within the range 250 µ to 400 µ.

Approvals:
The coating is approved for use in drinking water systems, meeting all specified toxicological
conditions, by the following institutes:
• Hygiene Institute, Germany
• KIWA, the Netherlands
• WRC, UK
• CARSO L.S.E.H.L., France

TECHNICAL APPENDIX - RUBBER

Rubber specifications:

Rubber quality	**EUW-70**	**EUW-75**	**EUW-80**	**EAW-70**	**EAW-75**	**EDK-55**	**EDK-70**	**EDK-80**
Rubber type	EPDM	EPDM	EPDM	EPDM	EPDM	EPDM	EPDM	EPDM
Hardness (ShA)	70	76	80	70	76	56	70	80
Tensile strength (Mpa)	14.0	15.0	13.0	12.0	10.1	10.0	13.0	13.0
Elongation at break (%)	370	353	350	400	361	500	300	290
Density (g/cm³)	1.10	1.18	1.21	1.23	1.31	1.19	1.12	1.17
Temperature range in dry atmospheric air:								
Minimum temperature (°C) *)	-40	- 40	-40	-40	-40	-40	-40	-40
Maximum temperature (°C) *)	+120	+120	+120	+120	+120	+120	+120	+120
Compression set DIN 53517, 24 hours /70 °C (%)	15.0	12.0	15.0	15.0	12.5	12.0	8.0	17.0
Characteristics:								
Wear resistance	3	3	3	2	2	2	3	3
Tear resistance	4	4	4	3	3	2	3	3
Resistance to weather and ozone	4	4	4	4	4	4	4	4
Resistance to hydrolysis (water and steam)	4	4	4	4	4	4	4	4
Resistance to chemicals (acids/bases)	3	3	3	3	3	3	3	3
Resistance to mineral oil and gas	0	0	0	0	0	0	0	0
Permebility	1	1	1	1	1	1	1	1

0: Low 1: Limited 2: Medium 3: Considerable 4: High

Rubber quality	**NDG-80**	**NGW-70**	**SAK-70**
Rubber type	NBR	NBR	SBR
Hardness (ShA)	80	70	70
Tensile strength (Mpa)	18.0	15.0	15.0
Elongation at break (%)	220	320	300
Density (g/cm³)	1.26	1.23	1.17
Temperature range in dry atmospheric air:			
Minimum temperature (°C) *)	-35	-40	-50
Maximum temperature (°C) *)	+110	+110	+100
Compression set DIN 53517, 24 hours /70°C (%)	8.0	8.0	13.0
Characteristics:			
Wear resistance	3	3	4
Tear resistance	3	3	3
Resistance to weather and ozone	3	3	3
Resistance to hydrolysis - water/steam	3	3	3
Resistance to chemicals - acids/bases	2-3	2-3	2
Resistance to mineral oil and gas	4	4	0
Permebility	4	4	2

0: Low 1: Limited 2: Medium 3: Considerable 4: High

Approvals/remarks:

EUW-70: KTW D1/D2, W270, WRAS (60˚C), ACS XP P 41-250, AS/NZS 4020, NSF-61, EN 681-1, AS 1646-2007, Önorm B5014
EUW-75: KTW D1/D2, W270, WRAS (50˚C), ACS XP P 41-250, EN 681-1
EUW-80: KTW D1/D2, W270, WRAS, ACS XP P 41-250, EN 681-1
EAW-70: KTW D1/D2 (warm 60˚C), W270
EAW-75: KTW D1/D2, W270
EDK-55: ACS XP P41-250
EDK-70: KTW D1/D2 (60˚C), ACS XP P 41-250, CSN 75 7111, NBN S 29003, Hydrochek
EDK-80: KTW D1/D2
NGW-70: EN 682 type GBL, KTW D2
SAK-70: UL-listed 22.06.1993

Above mentioned results are based on laboratory tests and must be evaluated for specific articles and applications.
Fire may create small amounts of hydrogen sulphide, and carbon dioxide. Disposal by incineration in compliance with local regulations.
*) Different temperature restrictions may apply to valves due to bonding between metal and rubber

TECHNICAL APPENDIX
- FLOW, KV VALUES AND ZETA VALUES

Calculated flow (m³/hr) going through a nominal valve size (DN 200 = inside dia of 200 mm) at different flow velocities

Water velocity (m/sec)	DN 200	DN 250	DN 350	DN 400	DN 450	DN 500	DN 600	DN 700	DN 800	DN 900	DN 1000	DN 1200	DN 1400	DN 1500	DN 1600	DN 1800	DN 2000	DN 2200	DN 2400	DN 2800
1	113	177	346	452	573	707	1018	1385	1810	2290	2827	4072	5542	6362	7238	9161	11310	13685	16286	22167
1,5	170	265	520	679	859	1060	1527	2078	2714	3435	4241	6107	8313	9543	10857	13741	16965	20527	24429	33251
2	226	353	693	905	1145	1414	2036	2771	3619	4580	5655	8143	11084	12723	14476	18322	22619	27370	32572	44334
2,5	283	442	866	1131	1431	1767	2545	3464	4524	5726	7069	10179	13854	15904	18096	22902	28274	34212	40715	55418
3	339	530	1039	1357	1718	2121	3054	4156	5429	6871	8482	12215	16625	19085	21715	27483	33929	41054	48858	66501
3,5	396	619	1212	1583	2004	2474	3563	4849	6333	8016	9896	14250	19396	22266	25334	32063	39584	47897	57001	77585
4	452	707	1385	1810	2290	2827	4072	5542	7238	9161	11310	16286	22167	25447	28953	36644	45239	54739	65144	88668
4,5	509	795	1559	2036	2576	3181	4580	6234	8143	10306	12723	18322	24938	28628	32572	41224	50894	61581	73287	99752
5	565	884	1732	2262	2863	3534	5089	6927	9048	11451	14137	20358	27709	31809	36191	45804	56549	68424	81430	110835

Hydralic values, fully open valve

	DN 200	DN 250	DN 300	DN 350	DN 400	DN 450	DN 500	DN 600	DN 700	DN 800	DN 900	DN 1000	DN 1200	DN 1400	DN 1500	DN 1600	DN 1800	DN 2000	DN 2200	DN 2400	DN 2800
Kv (m³/hr - 1 bar)	2460	4360	6120	10195	13335	17320	22460	34330	37845	57665	69930	90720	13345	196585	207335	247675	332095	432320	524915	533425	798585
Cv (Usg/min - 1 psi)	2878	5101	7160	11928	15602	20264	26278	40166	44279	67468	81818	106142	15614	230004	242582	289780	388551	505814	614151	624107	934344
Zeta (K)	0,42	0,33	0,33	0,23	0,23	0,22	0,20	0,18	0,27	0,20	0,21	0,19	0,19	0,16	0,19	0,17	0,15	0,14	0,14	0,19	0,15

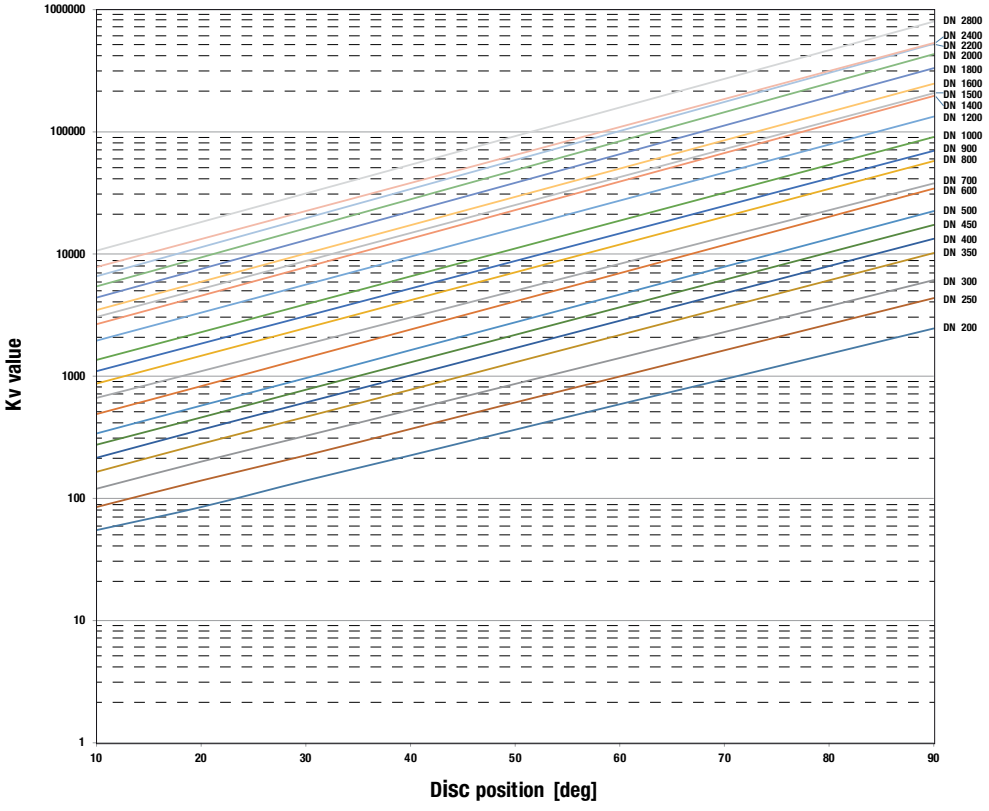
NOTE: Hydraulic figures are based on tests or calculations, depending on size. Value uncertainty as per ref EN1267

Definitions / formulas:
Kv-value: Actual flow of water (m³/ hr) creating pressure loss of 1 bar.
Pressure loss coefficient Zeta (K) value: Ratio of static and dynamic pressure loss.

Zeta (K) = Diff pressure / (500 X V²)
Diff pressure (Pa)
V: Water flow velocity (m/sec)

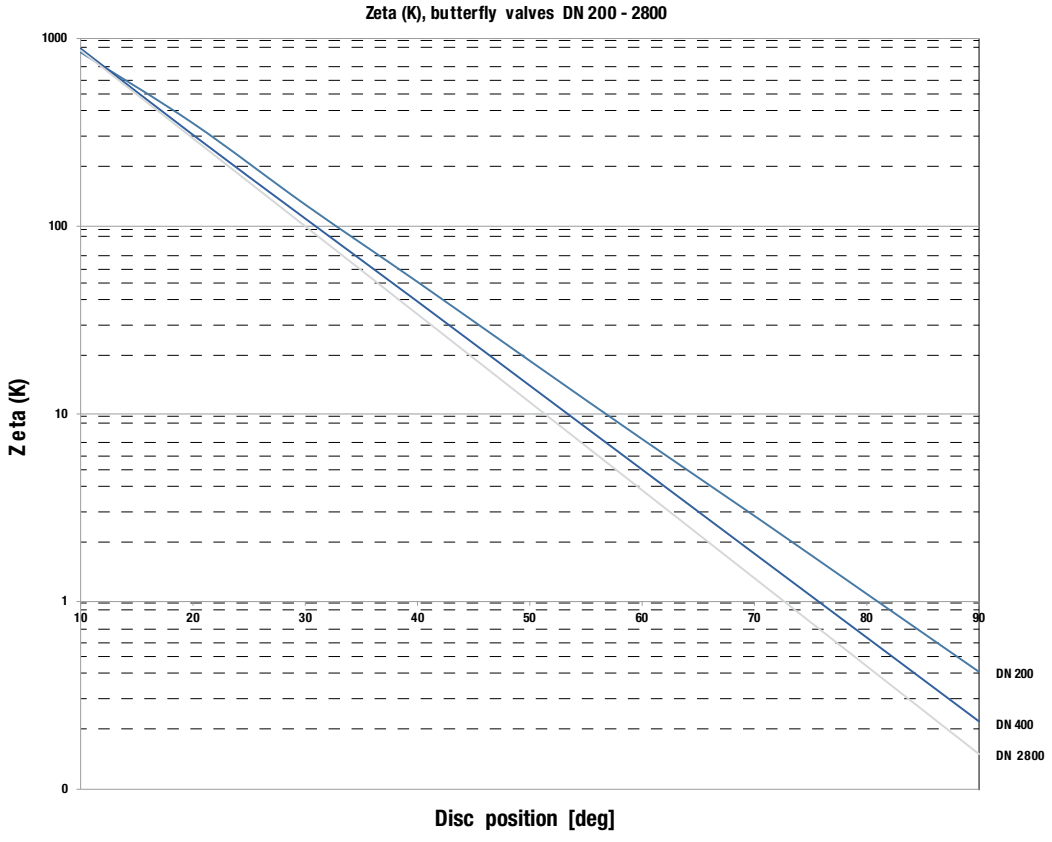
Actual diff pressure (bar) = (Q / Kv)²
Q: Actual water flow (m³/hr)

Kv values for butterfly valves DN 200 - 2800



	Dimension	Angle								
		10°	20°	30°	40°	50°	60°	70°	80°	90°
Kv	200	55	85	140	225	365	590	945	1525	2460
Zeta (K)		845	354	130	50	19	7	3	1	0.42
Kv	250	85	140	225	370	610	995	1630	2665	4360
Zeta (K)		863	318	123	46	17	6	2	0.88	0.33
Kv	300	120	200	325	530	865	1410	2300	3750	6120
Zeta (K)		898	323	122	46	17	7	2	0.92	0.35
Kv	350	165	280	465	775	1300	2175	3640	6090	10195
Zeta (K)		880	306	111	40	14	5	2	0.65	0.23
Kv	400	215	365	610	1015	1700	2845	4765	7970	13335
Zeta (K)		884	307	110	40	14	5	2	0.64	0.23
Kv	450	275	460	775	1300	2180	3665	6150	10320	17320
Zeta (K)		866	309	109	39	14	5	2	0.61	0.22
Kv	500	340	575	965	1635	2760	4660	7870	13295	22460
Zeta (K)		863	302	107	37	13	5	2	0.56	0.20
Kv	600	490	830	1415	2410	4095	6970	11860	20175	34330
Zeta (K)		862	300	103	36	12	4	1	0.51	0.18
Kv	700	665	1100	1825	3025	5015	8315	13780	22835	37845
Zeta (K)		867	317	115	42	15	6	2	0.74	0.27
Kv	800	870	1470	2480	4190	7080	11960	20205	34135	57665
Zeta (K)		864	303	106	37	13	5	2	0.56	0.20
Kv	900	1100	1850	3105	5220	8770	14740	24765	41615	69930
Zeta (K)		866	306	109	38	14	5	2	0.60	0.21
Kv	1000	1360	2295	3880	6565	11100	18765	31730	53655	90720
Zeta (K)		863	303	106	37	13	5	2	0.55	0.19
Kv	1200	1955	3315	5620	9525	16150	27375	46405	78665	133345
Zeta (K)		866	301	105	36	13	4	2	0.54	0.19
Kv	1400	2665	4560	7805	13365	22880	39175	67065	114825	196585
Zeta (K)		864	295	101	34	12	4	1	0.47	0.16
Kv	1500	3055	5180	8775	14860	25175	42650	72250	122390	207335
Zeta (K)		866	301	105	37	13	4	2	0.54	0.19
Kv	1600	3480	5930	10105	17220	29350	50025	85260	145315	247675
Zeta (K)		864	298	102	35	12	4	1	0.50	0.17
Kv	1800	4400	7555	12975	22270	38235	65640	112685	193445	332095
Zeta (K)		866	294	100	34	11	4	1	0.45	0.15
Kv	2000	5435	9390	16230	28050	48475	83770	144760	250170	432320
Zeta (K)		865	290	97	32	11	4	1	0.41	0.14
Kv	2200	6575	11370	19660	33985	58755	101580	175620	303620	524915
Zeta (K)		865	289	97	32	11	4	1	0.41	0.14
Kv	2400	7825	13265	22490	38120	64615	109525	185655	314695	533425
Zeta (K)		865	301	105	36	13	4	2	0.53	0.19
Kv	2800	10655	18275	31345	53770	92235	158215	271400	465550	798585
Zeta (K)		864	294	100	34	12	4	1	0.45	0.15

NOTE: Above hydraulic figures are based on tests or CFD calculations, depending on size. Value uncertainty as per ref EN1267



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