



BUTTERFLY VALVES

TECHNICAL CATALOGUE



2. TECHNICAL DATA

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2. TECHNICAL DATA

2.1 Component materials

2.1.1 Body materials



Material	Designation
Grey Cast Iron	EN 1561 GJL-250 (GG 25)
Ductile Cast Iron	EN 1563 GJS-400-15 (GGG 40)
Ductile Cast Iron	EN 1563 GJS-400-18LT (GGG 40.3)
Cast Carbon Steel	A 216 Gr. WCB
Cast Carbon Steel	A 352 Gr. LCB/LCC
Carbon Steel fabricated	EN 10025 S 275 JR
Cast Stainless Steel	A 351 Gr. CF8/CF8M
Cast Stainless Steel	A 351 Gr. CF3/CF3M
Stainless Steel fabricated	AISI 304/316
Stainless Steel fabricated	AISI 304L/316L
Cast Bronze-Tin	EN 1982 CuSn10-C (CC480K)
Cast Bronze-Aluminium	EN 1982 CuAl10Fe5Ni5-C (CC333G)
Cast Aluminium	AC-47100 DN > 125
Cast Aluminium	AC-46100 DN < 125

*** Bodies with standard Epoxy coating 120 microns, except in Stainless steel And Bronze castings.*

Note: Contact our technical department for other materials.



2. TECHNICAL DATA

2.1 Component materials

2.1.2 Disc materials



Casting Material	Standard	Code	Characteristics	Applications
Stainless steel	A 351 Gr. CF8	1	Very good chemical resistance and corrosion resistance	Chemical products. Nourishing products
Aluminium	EN-AC-44100	2*	Moderate corrosion resistance	Cold water/ Air.
Ductile Iron	EN GJS-400-15 (GGG 40)	3*	Good mechanical strength similar to carbon steel	Hot water (Max. 90°C) Air and Gas
Bronze-Tin	CuSn10-C (CC480K) DN≤300	4	Good chemical resistance and corrosion resistance	Sea water
Bronze-Aluminium	CuAl10Fe5Ni5-C (CC333G) DN≥350	4	Good chemical resistance and corrosion resistance	Sea water
Stainless steel	A 351 Gr. CF8M	5	Very good chemical resistance and corrosion resistance	Demineralized water. Chemical products. Nourishing products
Carbon steel	A 216 Gr. WCB	6*	Good mechanical resistance	Water and Gas
Ductile Iron vulcanized	EN GJS-400-15 (GGG 40) + EPDM	7	Very good abrasion resistance	Powdery products. Pneumatic transport. Sea water
Duplex	A 351 Gr. CD4MCu-N (Noridur)	8	Very good abrasion and corrosion resistance	Chemical products.
Stainless steel	A 351 Gr. CF3M	9	High chemical resistance and corrosion resistance	Chemical and Nourishing products. Sea water and Demineralized water
Stainless steel	1.4539 Uranus B6 (904L)	10	Very good chemical resistance and corrosion resistance	Chemical products.
Super Duplex	1.4469	11	Very good chemical resistance and corrosion resistance	Sea water and corrosive atmospheres
Stainless steel	A 351 Gr. CF8M Polished Mirror	12	Very good chemical resistance and corrosion resistance	Chemistry Industry and powdery products.
Stainless steel	A 351 Gr. CF8M + Halar	13	Very good chemical resistance and corrosion resistance	Chemical products and sea water.
Ductile Iron	EN GJS-400-15 (GGG 40) + Rilsan	14	Good mechanical strength similar to carbon steel	Hot water (Max. 90°C) Air and Gas

* Standard coating Epoxy 150 microns

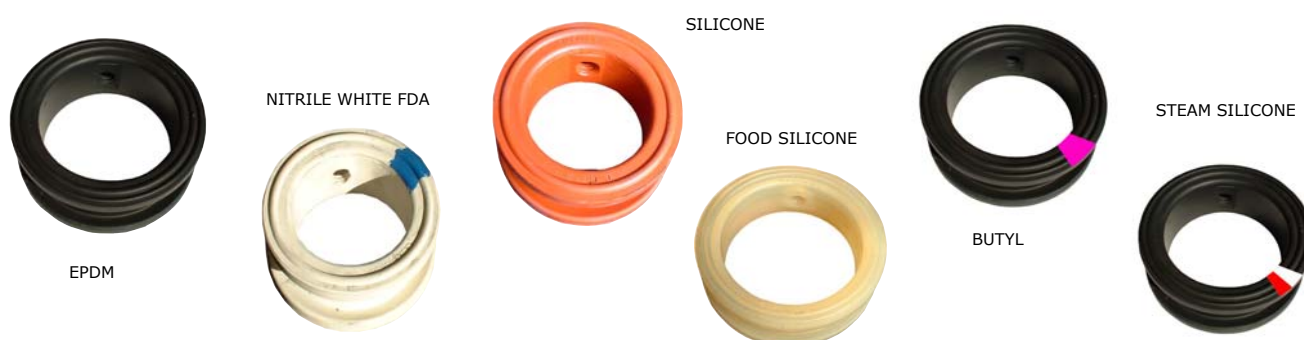
Note: Contact our technical department for other materials.



2. TECHNICAL DATA

2.1 Component materials

2.1.3 Seat materials. Properties



Material	Designation ISO 1629	Sigeval Code	Color Code	Range Temperatures	Applications
Ethylene Propylene	EPDM	E	-	-20°C +110°C	Water / Sea water Weak acids and basis
Ethylene Propylene High Temperature	EPDM	HT	Grey	+80°C +130°C	Heating without Steam Water
Food EPDM FDA	EPDM	EF	Green White	-20°C +110°C	Nourishing products
Food White EPDM FDA	EPDM	EB	-	-20°C +95°C	Nourishing products
EPDM DVGW (ACS, WRAS, KTW, W270)	EPDM	EW	Orange	-20°C +95°C	Water / Sea water Weak acids and basis
EPDM KP	EPDM	EK	-	-20°C +130°C	Water / Sea water Weak acids and basis
Nitrile	NBR	N	Blue	-10°C +90°C	Mineral or vegetables Oils and greases
Food White NBR FDA	NBR	NB	Blue	-10°C +90°C	Nourishing products
Nitrile Carboxylic	NBR	NC	Blue Yellow	-10°C +90°C	Mineral or vegetables Oils and greases Abrasives.
Nitrile Hydrogenated	NBR	NH	Blue Red	-10°C +90°C	Mineral or vegetables Oils and greases and gases with SH ₂ (Biogas)
Flucast AB/P	-	AP	Red	-10°C + 70°C	Abrasive powdered products
Flucast AB/E	-	AE	Red Yellow	-20°C + 95°C	Oxygenated solvents Ketones Esters with abrasion
Flucast AB/N	-	AN	Brown	-10°C + 100°C	Mineral or vegetables Oils and greases Abrasives.
Silicone	MVQ	S	-	-60°C +200°C	Air and Hot water without steam. High and Low temperatures
Food Silicone	MVQ	SA	-	- 60°C +200°C	Nourishing and milky products
Steam Silicone	MVQ	SV	Red White	-60°C +140°C	Low pressure steam water
Viton	FPM	V	Yellow	-15°C +210°C	Acids / High temperature
Viton Biodiesel	FPM	VB	Yellow Orange	-5°C +210°C	Biodiesel / Acids / Steam water
Viton GF Gasoline	FPM	VF	Yellow Green	-5°C +210°C	Oxygenated Gasoline
Hypalon	CSM	H	Green	-25°C +125°C	Water / Diluted bases Diluted non oxidation acids
Epichlorhydrine	ECO	EP	-	-40°C +125°C	Brine systems, low temperature and resistance to gas, oil and fuel
Neoprene	CR	NP	White	-25°C + 80°C	Sea water. Moderate resistance to oils and greases
Butyl	IIR	B	Violet	-10°C + 95°C	Low Permeability to inert gases: Nitrogen, Air, Oxygen

Note: : Temperatures and fields of application of the seats are approximate. Temperatures and fluid resistance have been supplied from rubber suppliers, for predetermined conditions, contact our Technical Department. SIGEVAL, S.A. Doesn't accept no liability of damages caused by bad interpretation or use in the information included in this table. Work temperatures are calculated in static conditions and don't involve the correct service of the butterfly valve.



2. TECHNICAL DATA

2.1 Component materials

2.1.3 Seat materials. Properties

ATTRIBUTES AND BEHAVIOUR OF THE ELASTOMERS

		SIGEVAL CODE										
		E	HT	N	AP	AE	S	V	H	NP	B	A
Static mechanical properties	Tension	B	B	B	MB	B	M	S	B	MB	S	MB
	Tearing	B	B	B	MB	MB	S	S	S	MB	B	B
	Abrasion	B	B	B	E	E	S	B	B	B	B	MB
	Permanent compression deformation	B	B	B	B	B	B	B	M	B	S	B
	Resilience	S	S	S	MB	S	B	D	M	B	S	B
Dynamic mechanical properties	Bending	MB	MB	B	MB	MB	S	B	B	MB	B	B
	Air. Oxidation.	E	E	S	B	E	MB	E	E	MB	MB	E
Age strength due to:	Light. Sun	MB	MB	M	B	MB	E	MB	E	MB	MB	E
	Open air. Ozone	E	E	B	S	E	D	MB	E	E	MB	E
	Heat	MB	E	B	S	MB	E	E	B	S	S	E
	Cold	N	M	S	MB	B	MB	M	MB	MB	S	D
	Flame penetration	N	N	N	N	N	S	MB	MB	MB	N	MB
Strength against	Water absorption	MB	MB	B	MB	MB	E	MB	MB	B	MB	E
Behaviour and strength against different fluids	Mineral Oil, petroleum products	D	D	MB	N	N	D	E	S	S	D	MB
	Aliphatic hydrocarbon solvents	N	N	MB	N	N	N	E	B	D	N	B
	Aromatic hydrocarbon solvents	M	M	S	N	N	N	E	D	D	N	N
	Oxygenated solvents ketones and esters	MB	MB	N	S	MB	D	N	S	B	MB	N
	Chlorinated solvents	N	N	M	N	N	N	B	N	D	N	D
	Water, diluted nonoxidating acids, diluted basis	E	E	B	B	E	B	E	MB	B	B	E
	Gas resistance	D	D	B	M	D	N	B	S	S	E	E
	Strong acids	B	B	M	N	B	M	MB	B	M	D	E
	Oxidating strong acid	M	M	N	N	M	N	B	S	N	N	E

Suitability Grades
 E = Excellent
 MB = Very good
 B = Good
 S = Sufficient
 M = Mediocre
 D = Weak
 N = Not Satisfactory



2. TECHNICAL DATA

2.1 Component materials

2.1.4 Shaft and bushings materials



Shaft Material	Designation
Stainless Steel	AISI 420 *
Stainless Steel	AISI 316
Stainless Steel	AISI 316 L
Duplex	1.4462
Super Duplex	1.4410
Alloy Nickel-Copper	MONEL K 500
Alloy Aluminium-Bronze	QAL-10 Cu Al10 Fe Ni S-C
Alloy Nickel-Chromium-Molybdenum	INCONEL 625
	* Standard

Bushing Material	Range
Acetal Delrin	DN 0032-0200
Steel-Bronze-PTFE	DN 0250-1100
Bronze Rg-07	DN 1200-1600

Note: Contact our technical department for other materials.



2. TECHNICAL DATA

2.1 Component materials

2.1.5 Coating and surface treatments



RESICOAT



EPOXY



HALAR



INSTALLATIONS FOR SURFACE TREATMENT AND COATING

Coating	Thickness	Properties / Applications	Remarks
Epoxy	120-300 microns	Protection against corrosion	Other colors: RAL 5005/5015/5021/1004/9005 ** Standard Body RAL3000 120 microns
Resicoat RT 9000 R4	150-300 microns	Very Good heat resistance (tested at 90°C with excellent results).	KTW: Water approval (Germany) WRC: Water approval (U.K.) KIWA: Water approval (Holland) ** Standard Disc RAL9005 150 microns
Halar (Fluorine Resin)	500-800 microns	Excellent corrosion and temperature (150°C) resistance.	
Rilsan	150-300 microns	High resistance to organic acids , salt, bases, solvents e hydrocarbons High waste resistance, abrasion and impacts.	
Cataphoresis	20 microns		
Ebonite		Protection against sea water	
Special Applications	150-300 microns	Protection against aggressive atmospheres	Several lawyers, Polyurethanes, Primer lawyers, etc
Surface treatments	Thickness	Properties / Applications	
Polished Mirror		Pharmaceutical industry Food Industry	
Chrome		Protection against aggressive atmospheres	
Special cleaning		Properties / Applications	
Labs Free		Coating installations Automobile industry	
Oil and Grease Free		Oxygen transport	

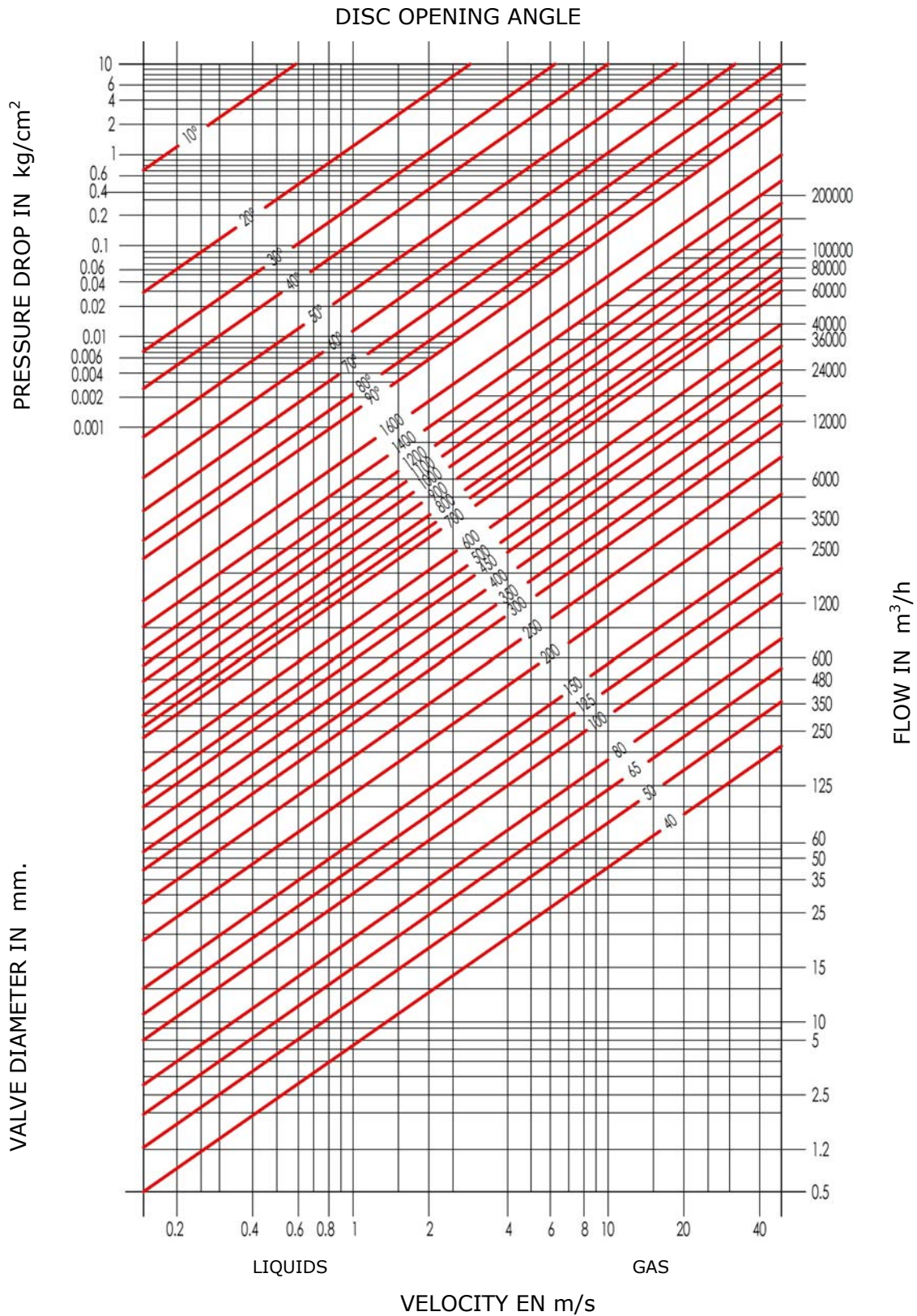
Note: Contact our technical department for other materials.

2. TECHNICAL DATA



2.2 Butterfly valves technical data

2.2.1 Pressure drop



Note: Conditions for liquids, density = 1 and temperature 20°C



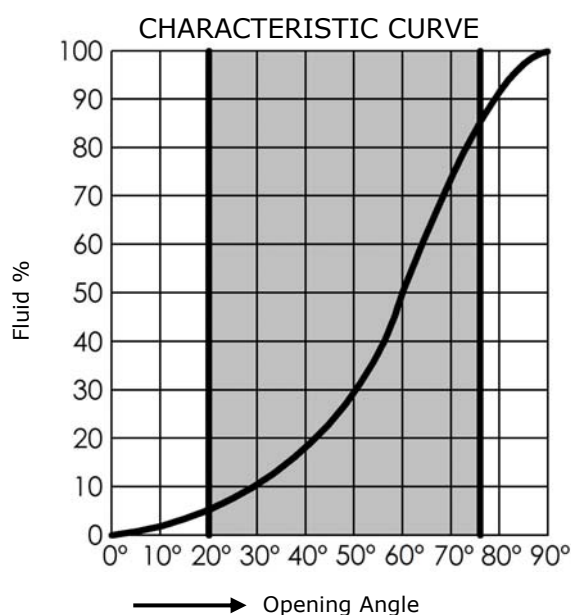
2. TECHNICAL DATA

2.2 Butterfly valves technical data

2.2.2 Flow coefficient

FLOW COEFFICIENT KV IN m³ /h DEPENDING ON ANGLE OF OPENING THE DISC

DN	90°	80°	70°	60°	50°	40°	30°	25°
25/32	45	37	29	19	12	6	2	-
40	68	60	38	22	15	9	4.3	2.5
50	112	90	60	45	23	14	7.7	5
65	172	138	90	70	36	22	12.9	8.6
80	258	207	138	110	54	33	19	13
100	474	410	260	200	103	63	36	24
125	970	860	540	420	215	133	76	52
150	1680	1420	890	690	353	215	146	125
200	2800	2350	1510	1120	603	360	215	146
250	4310	3700	3190	1850	990	580	336	224
300	6465	5215	3490	2670	1380	860	475	327
350	8620	6980	4395	3535	1896	1120	645	430
400	10775	9310	5600	4395	2285	1465	775	560
450	15086	12700	7930	6120	3190	1980	1077	775
500	18965	15085	9900	7500	3965	2415	1380	970
600	24137	20700	14225	10130	5260	3275	1895	1293
700	36000	25300	17100	10600	5980	3860	1990	1350
750	40500	27400	18400	11450	7150	4350	2125	1560
800	44000	29000	20000	12500	8200	4500	2200	1600
900	58000	42000	29000	17500	10400	6100	2300	1800
1000	80500	59200	37500	23000	13500	8700	3800	2500
1100	97586	72540	54560	28650	18210	10560	6350	4450
1200	110500	82000	61500	35500	22600	12500	7800	5400
1400	170500	145800	85700	45685	28950	15256	8568	5680
1500	195400	176450	101675	54560	34230	18850	9755	6154
1600	220350	198450	110325	59452	37850	20568	10952	6456





2. TECHNICAL DATA

2.2 Butterfly valves technical data

2.2.3 Operation torques

OPERATION TORQUE IN Nm FOR CLOSING DE VALVE DEPENDING OF THE DIFFERENTIAL PRESSURE ΔP

DN	3 bar	6 bar	10 bar	16 bar
25/32	5	6	9	15
40	5	6	9	15
50	5	7	13	17
65	15	16	20	25
80	17	20	23	28
100	22	29	42	50
125	39	46	72	85
150	48	75	90	110
200	90	120	140	215
250	126	210	270	350
300	161	270	390	560
350	245	300	500	950
400	520	600	700	1000
450	590	1120	1450	1950
500	840	1390	1800	2500
600	1000	2200	3450	3800
700	1650	3300	5000	5860
750	1800	3500	5500	6000
800	2300	4600	6500	9500
900	4700	6800	8500	11500
1000	6500	8500	11500	15000
1100	7000	9000	12000	16000
1200	8500	12000	15500	22000
1400	14000	17000	19500	
1500	20000	24000	28000	
1600	22000	26000	30000	

In order to determinate torques for standard valves follow this criteria:

- DN 0025 -0150 $\Delta P = 16 \text{ Kg/cm}^2$
- DN 0200-1600 $\Delta P = 10 \text{ Kg/cm}^2$

Note: These torques are for valves mounted with butterfly and EPDM standard seat (water 20°C and optimum assembling conditions). For others seats, please contact with our technical department, because torques could be so differents.



2. TECHNICAL DATA

2.3 Test procedures

OPERATION TEST

Every valve (complete with its controls) is dry-tested for several operations from fully open to fully closed position and vice versa. The test procedures include full operational checks of all components of the valve and its controls (position indicator, limit switches, regulation system, etc). These test can be in accordance with the technical specifications of **SIGEVAL S.A.** or, when accepted by the manufacturer beforehand, in accordance with customer's requirements.



HYDROSTATICS TEST

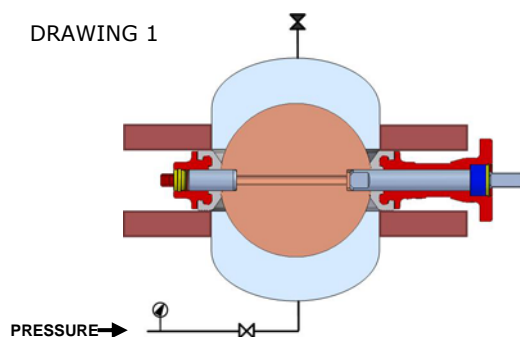


Valves are tested in the factory as per as nominal pressure, following the internal procedure based on standard EN 12266-1, guarantee its total tightness. This test is done with water at room temperature.

For the hydrostatic test the valve is placed (in open position) between duly tightened flanges.

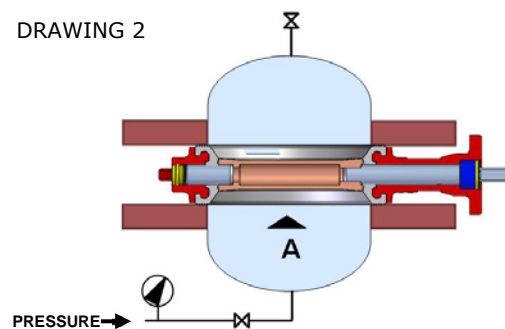
1) Shell Test (Drawing 1)

The test valve will be clamped between flanges and the disc is placed in a slightly open position so that a test pressure of 1.5 times the nominal pressure of the valve can be applied to both sides of the disc at the same time. This is in order to be able to detect any possible external leakage via the shafts or body. The test chamber between flanges is filled with water and the air is expeller. Via the hydraulic pump the test chamber will be pressurised to the required test pressure. For a test period of 15 to 180 seconds (as defined) the chamber is kept under pressure monitoring the test gauge. The test valve will be accepted when the pressure as shown on the test gauge remains constant and no leakage occurs via the shaft or body.



2) Tightness Test (Drawing 2)

For the tightness test the valve is closed. In order to check possible leakage between the closed disc and the rubber seat. Via the lower end of the test system a test pressure of 1.1 times the nominal pressure of the valve is applied to one side of the disc. Using water from a hydraulic pump does this. For a test period of 15 to 60seconds (as defined) the valve is kept under pressure while monitoring the test gauge. The test valve will be accepted when the pressure as shown on the test gauge remains constant without leakage occurring. When the valve and/or its controls have been dismantled test procedure as above should be repeated.





2. TECHNICAL DATA

2.4 ATEX Information

Directive 94/9/CE (Explosive atmospheres)

The butterfly valves model Sigeval XC (special version) fulfill the Directive for Equipment and protection systems, to use in explosive atmospheres 97/9/CE. This directive is only applicable in the following atmospheric conditions: $-20^{\circ}\text{C} < \text{T} < +60^{\circ}\text{C}$ and $0,8 \text{ bar} < \text{P} < 1,2 \text{ bar}$

The fluid being carried is not taken into account in the risk analysis of the valve made in this directive, even if the fluid brings about deliberate internal explosive atmospheres. It is the user's responsibility to take into account the risks generated by the fluid for example.

- Heating of the valve surface, the temperature of the valve surface should be considered as equivalent to the temperature of the fluid which passes through the pipe (in an environment normally ventilated). Considering the temperature of the fluid which passes through the pipe.
- Generation of electrostatic charges due to fluid displacement.
- Internal shocks generated by granular substances, shock waves present in the installation (water hammer) or risks from foreign objects which may be present in the installation.

In the label given by SIGEVAL, includes the most important parameters in the valves: Logo of the Manufacturer, Works reference, Model, maximum working pressure, Diameter, name of the technical file deposited in a certified company, CE marking and ATEX Category.

Valve Classification:

II : Group

2 : Category

G : Explosive atmospheres due to the presence of gas, vapours or mists.

D : Explosive atmospheres due to the presence of dust.



Note: "c" meanings Protection by safety design.

Note: "X" meaning that external surface heating of the valve, only depends of room temperature and internal fluid temperature. For this case, any temperature class is indicated at the label.

Our products are designed to be used in external explosive atmospheres, zone 1 & 2 Gas y 21 & 22 Dust, and gas / vapor atmospheres groups IIA, IIB y IIC, with a coating thickness maximum of 0,2 mm.

Our valves will be marked: **II 2 GD c X**.

In case that coatings will be a thickness between: 0.2 and 2 mm marking will be : **II 2 GD IIB c X**

In the ATEX butterfly valves, it's included the earth link that will be connected conveniently to the screw flange (in the instruction ATEX manual it's give more information about it).

