PN16 Fully Lugged		
	Ductile Iron Body	Extended Neck
Disc	DI Nickel Plated	316SS
Liner	NBR, EPDM	Bonded
Size	50mm-200mm lever 250mm-300mm gear	

With lever

PN16 Semi-lugged		
	Ductile Iron Body	Extended Neck
Disc	DI Nickel Plated	316SS
Liner	NBR, EPDM	Bonded
Size	50mm-200mm lever 250mm-300mm gear	

With lever

With gear

With gear

Butterfly Valves
Ductile Iron Butterfly Valves

Resilient Liner Materials

EPDM

EPDM is a terpolymer elastomer made from ethylene-propylene diene monomer. EPDM has good abrasion and tear resistance and offers excellent chemical resistance to a variety of acids and alkalis. It is susceptible to attack by oil and is not recommended for applications involving petroleum oils, strong acids, or strong alkalis. It should not be used for compressed air lines. It has exceptionally good weather ageing and ozone resistance and has fairly good resistance to ketones and alcohols.

BUNA-N (Nitrile) (NBR)

Buna-N is a general-purpose oil resistant polymer known as Nitrile rubber. It is a copolymer of butadiene and acrylonitrile. It has good resistance to hydraulic fluid, oil, water, and solvents. It shows good tensile strength and abrasion resistance while displaying good compression set. It is not recommended for highly polar solvents such as acetone and methyl ethyl ketone nor in chlorinated hydrocarbons, ozone or nitro hydrocarbons.

Liner Material Temperature Range

Liner Material	Temperature
EPDM	-20 to +120ºC*
BUNA-N (Nitrile)	0 to +70ºC

**Continuous service temperature range 0 to +90ºC*

BOSS™ designs utilise proprietary compound formulas for each elastomer. They provide the right combination of seat compression, abrasion and chemical resistance to match a broad range of applications.

Note: Elastomeric seat materials are not suitable for steam service

Specifications

BOSS™ Butterfly valves are designed and manufactured to provide maximum performance on recommended service applications at the lowest possible initial and life cycle cost. They meet or exceed the following standards developed through research, laboratory tests and years of experience.

Manufacturing Specifications

• Industrial Butterfly Valves	BSEN 593 : 2009 (Old Standard BS5155)
• Face-to-Face	BSEN 558 : 2008
• Flanges	BSEN 1092 - 2 : 1999

WRAS Approval

All EPDM seat BOSS™ butterfly valves with stainless steel discs have WRAS approval for sizes 2in (50mm) through to 12in (300mm) inclusive.

General Index - BOSS™ Ductile Iron Butterfly Valves

Size	LUGGED		SEMI-LUGGED	
	BOSS™ Code	BSS Code	BOSS™ Code	BSS Code
50mm	16LNB	36530509	16SNB	36530103
65mm	16LNB	36530520	16SNB	36530114
80mm	16LNB	36530531	16SNB	36530125
100mm	16LNB	36530542	16SNB	36530136
125mm	16LNB	36530553	16SNB	36530147
150mm	16LNB	36530564	16SNB	36530158
200mm	16LNB	36530575	16SNB	36530169
200mm	G16LNB	36532107	G16SNB	36532118
250mm	G16LNB	36530586	G16SNB	36532129
300mm	G16LNB	36530597	G16SNB	36532140
50mm	16LNBY	36531201	–	–
65mm	16LNBY	36531212	–	–
80mm	16LNBY	36531223	–	–
100mm	16LNBY	36531234	–	–
125mm	16LNBY	36531245	–	–
150mm	16LNBY	36531256	–	–
200mm	16LNBY	36531267	–	–
200mm	G16LNBY	36532151	–	–
250mm	G16LNBY	36532162	–	–
300mm	G16LNBY	36532173	–	–
50mm	16LSB	36530701	16SSB	36530306
65mm	16LSB	36530712	16SSB	36530317
80mm	16LSB	36530723	16SSB	36530328
100mm	16LSB	36530734	16SSB	36530339
125mm	16LSB	36530745	16SSB	36530350
150mm	16LSB	36530756	16SSB	36530361
200mm	16LSB	36530767	16SSB	36530372
200mm	G16LSB	36532214	G16SSB	36532184
250mm	G16LSB	36530778	G16SSB	36532195
300mm	G16LSB	36530789	G16SSB	36532203
50mm	16LSE	36530605	16SSE	36530210
65mm	16LSE	36530616	16SSE	36530221
80mm	16LSE	36530627	16SSE	36530232
100mm	16LSE	36530638	16SSE	36530243
125mm	16LSE	36530649	16SSE	36530254
150mm	16LSE	36530660	16SSE	36530265
200mm	16LSE	36530671	16SSE	36530276
200mm	G16LSE	36532258	G16SSE	36532225
250mm	G16LSE	36530682	G16SSE	36532236
300mm	G16LSE	36530693	G16SSE	36532247

Code Number System

1	2	3	4	5	6
	16	L	S	E	

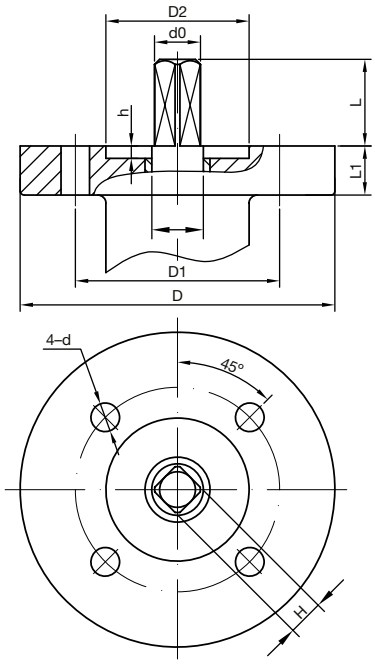
	Code
1 Operator	
Lever	None
Gear	G
2 Pressure	
16 bar	16
3 Series Style	
Lugged	L
Semi-lugged	S
4 Disc/Stem	
Nickel Plated	N
316 Stainless Steel	S
5 Liner	
BUNA	B
EPDM	E
6 Lever Colour	
Blue	None
Yellow	Y

Butterfly Valves
Ductile Iron Butterfly Valves

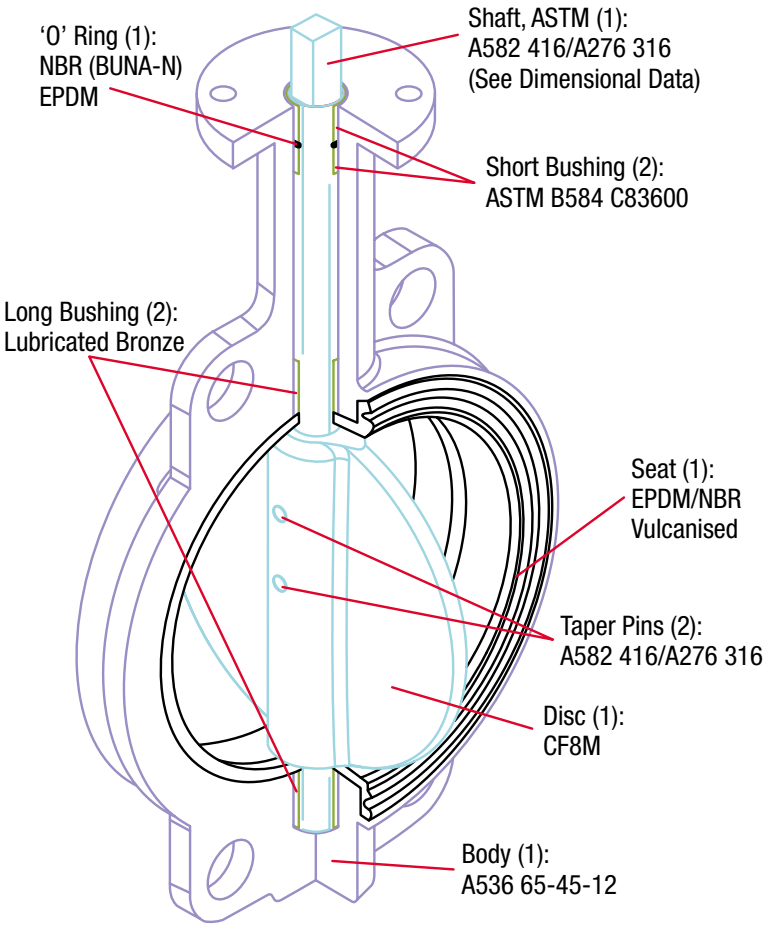
Chemical Resistance Guide				
Fluid/Material	**Disc**		**Seat**	
	Ductile	**316**	**NBR**	**EPDM**
Acetic Acid (10%)	Poor	Excellent	Very Poor	Good
Air	Excellent	Excellent	Excellent	Excellent
Ammonia (anhydrous liquid)	Good	Excellent	Poor	Good
Ammonia (solution)	Very Poor	Excellent	Good	Good
Ammonium Sulphate	Very Poor	Good	Good	Good
Animal Oil	Excellent	Excellent	Excellent	Good
Calcium Carbonate	Poor	Excellent	Good	Good
Carbonic Acid	Poor	Excellent	Good	Good
Chlorinated Water <3500 ppm	Very Poor	Excellent	Poor	Poor
Deionised Water	Very Poor	Excellent	Good	Good
Ethane	Good	Good	Excellent	Very Poor
Ethyl Alcohol (Ethanol)	Good	Excellent	Good	Good
Freon 12	Good	Excellent	Good	Good
Gasoline (refined/unleaded)	Good	Excellent	Poor	Very Poor
Glycols	Excellent	Excellent	Excellent	Excellent
Hydrochloric Acid	Very Poor	Very Poor	Poor	Poor
Hydrogen Gas (cold)	Excellent	Excellent	Good	Good
Lubricating Oil (petroleum based)	Excellent	Excellent	Excellent	Very Poor
Methyl Alcohol (Methanol)	Good	Excellent	Good	Excellent
Mineral Oil	Good	Excellent	Excellent	Very Poor
Natural Gas	Excellent	Excellent	Good	Very Poor
Oxygen Gas (cold)	Good	Excellent	Poor	–
Petroleum Oil (refined)	Good	Good	Good	Very Poor
Propane Gas	Good	Excellent	Excellent	Very Poor
Sea Water	Very Poor	Good	Excellent	Excellent
Sodium Hypochlorite	Very Poor	Very Poor	Very Poor	Very Poor
Soybean Oil	Poor	Excellent	Excellent	Poor
Sulphuric Acid <30%	Very Poor	Good	Poor	Good
Sulphuric Acid (50%)	Very Poor	Poor	Very Poor	Poor
Sulphuric Acid (70%)	Very Poor	Poor	Very Poor	Poor
Sulphurus Acic Sat'd	Very Poor	Good	Very Poor	Very Poor
Steam Low and Med. Pressure	Excellent	Excellent	Very Poor	Very Poor
Vegetable Oil	Very Poor	Excellent	Good	Very Poor
Water (hot 100ºC)	Poor	Excellent	Very Poor	Good

These performance data have been developed from testing, customer field reports and/or in-house testing. Properties/applications shown are typical. Your specific application should not be undertaken without independent study and evaluation for suitability. While the utmost care has been used in compiling this data, we assume no responsibility for error.

BOSS™ Butterfly Valves PN16



Size 50mm~300mm



Semi-lugged Style

Bare Stem Dimensional Data for Actuation

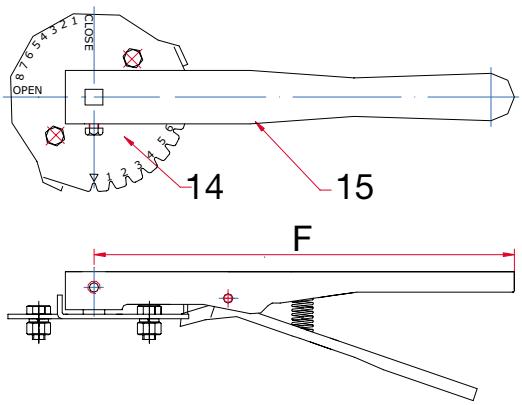
Dimensions 50mm-300mm

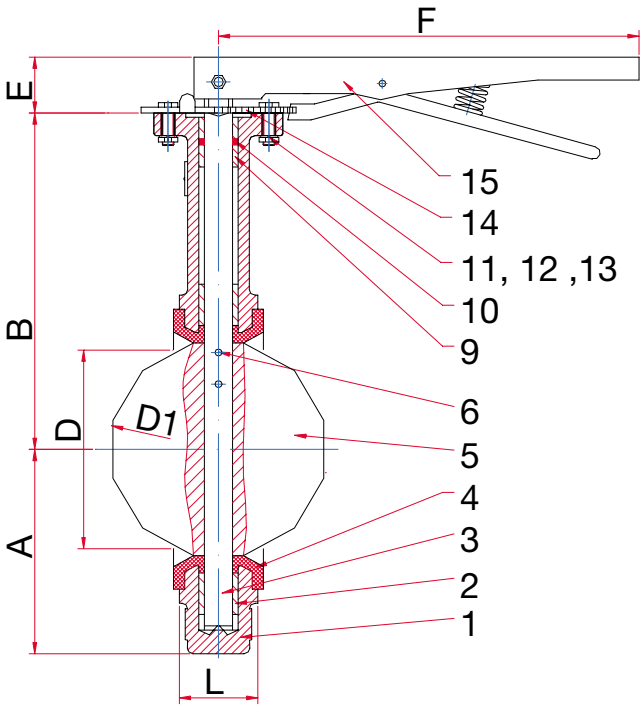
Mounting	Size DN	Size in	D	D1	D2	d0	H	L	L1	h	d	Bolt
F05	50	2	65	50	35	12.1	9	32	12	4	7	M6
	65	2½	65	50	35	12.1	9	32	13	4	7	
	80	3	65	50	35	12.1	9	32	14	4	7	
F07	100	4	90	70	55	14.1	11	32	16	4	10	M8
	125	5	90	70	55	18.1	14	32	14	4	10	
	150	6	90	70	55	18.1	14	32	14	4	10	
F10	200	8	125	102	70	22.2	17	45	14	4	12	M10
	250	10	125	102	70	28.2	22	45	16	4	12	
F12	300	12	150	125	85	28.2	22	45	20	4	14	M12

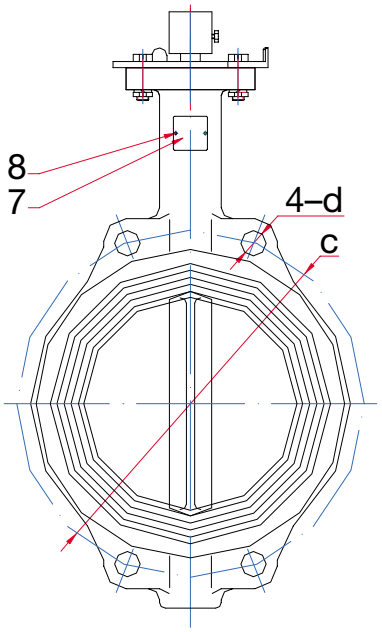
Butterfly Valves
Ductile Iron Butterfly Valves

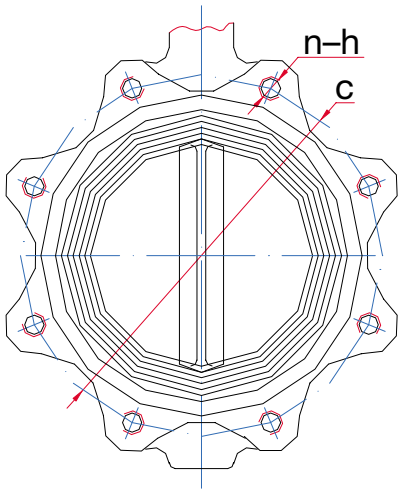
BOSS™ PN16 Butterfly Valves – Exploded View

Ductile iron body, extended neck, ISO mounting pad, bonded seatline, lever operated, 50-200mm lugged or semi-lugged.









Dimensions mm							
Size	A	D1	E	B	F	L	D
50	80	52.88	32	161	267	43	32.3
65	89	64.49	32	175	267	46	46.1
80	95	78.84	32	181	267	46	64.4
100	114	104.04	32	200	267	52	86.3
125	127	123.32	32	213	267	56	110.6
150	139	155.58	32	226	267	56	134.8
200	175	202.46	45	260	359	60	192.4

Flange Bolting Data/Weights									
Size mm	c	d	h	n	Semi-lugged length	Lug length	Stud bolt length	Lug kg	Semi lug kg
50	125	19	M16	4	110	40	130	4.6	3.9
65	145	19	M16	4	120	45	140	5.9	4.7
80	160	19	M16	8	120	45	140	6.1	5.1
100	180	19	M16	8	130	50	150	10	6.9
125	210	19	M16	8	130	50	150	12.6	9.7
150	240	23	M20	8	140	50	165	16.1	11
200	295	23	M20	12	150	55	175	25	19.5

Note
BOSS™ fully lugged style butterfly valves are rated for deadend service to full working pressure of the valve with the downstream flange removed. In deadend service exceeding 96 hours, a downstream flange is recommended.

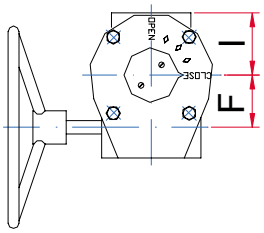
Material List		
Item	Part Name	Specification
1	Body	Ductile Iron (A536Gr.65-45-12)
2	Long Bushing	ASTM B584 C83600
3	Stem	ASTM A582 416/A276 316
4	Seat	EPDM/NBR, vulcanised
5	Disc	ASTM A351 CF8M
6	Taper Pin	ASTM A582 416/A276 316
7	Nameplate	Aluminium
8	Rivet	Aluminium
9	Short Bushing	ASTM B584 C83600
10	'O' Ring	NBR
11	Bolts	Steel
12	Nuts	Steel
13	Spacer	AISI1566
14	Latchplate	Steel
15	Handle	Ductile Iron

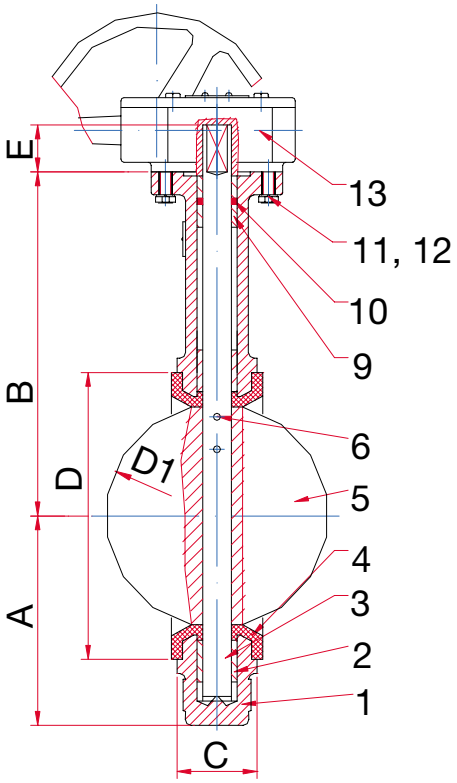
The rubber of seat is vulcanised to the body

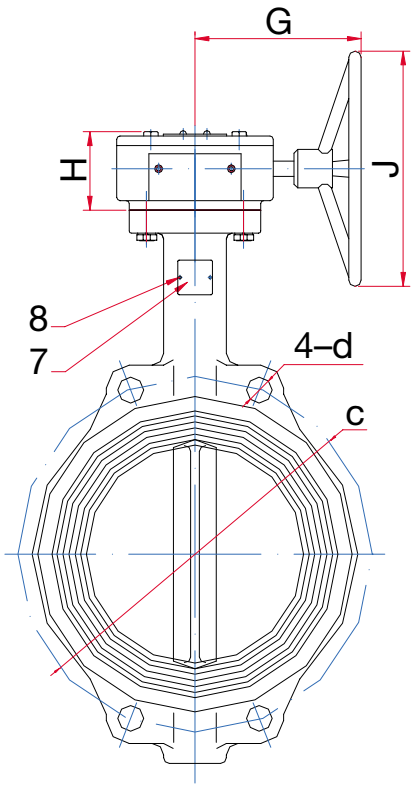
Butterfly Valves
Ductile Iron Butterfly Valves

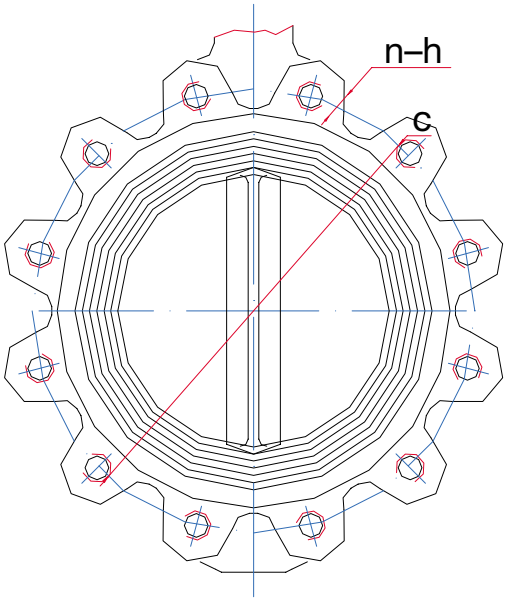
BOSS™ PN16 Butterfly Valves – Exploded View

Ductile iron body, extended neck, ISO mounting pad, bonded seatline, lever operated, 200-200mm lugged or semi-lugged.









Dimensions (mm)											
Size	**A**	**B**	**C**	**D**	**D1**	**E**	**F**	**G**	**H**	**I**	**J**
200	175	260	60	192.4	202.46	45	90	238	85	87	300
250	203	292	68	241.7	250.47	45	90	238	85	87	300
300	242	337	78	291.8	311.55	45	116	227	86	82	300

Flange Bolting Data/Weights									
Size mm	**c**	**d**	**h**	**n**	**Semi-lugged length**	**Lug length**	**Stud bolt length**	**Lug kg**	**Semi lug kg**
200	295	22.1	M20	12	150	55	175	44.9	37.6
250	355	28.2	M24	12	160	60	185	44.9	37.6
300	410	28.2	M24	12	170	65	200	61.5	50.7

Note
BOSS™ fully lugged style butterfly valves are rated for deadend service to full working pressure of the valve with the downstream flange removed. In deadend service exceeding 96 hours, a downstream flange is recommended.

Material List		
Item	**Part Name**	**Specification**
1	Body	Ductile Iron (A536Gr.65-45-12)
2	Long Bushing	ASTM B584 C83600
3	Stem	ASTM A582 416/A276 316
4	Seat	EPDM/NBR, vulcanised
5	Disc	ASTM A351 CF8M
6	Taper Pin	ASTM A582 416/A276 316
7	Nameplate	Aluminium
8	Rivet	Aluminium
9	Short Bushing	ASTM B584 C83600
10	'O' Ring	NBR
11	Bolts	Steel
12	Nuts	Steel
13	Spacer	AISI1566
14	Latchplate	Steel
15	Handle	Ductile Iron

The rubber of seat is vulcanised to the body

Butterfly Valves
Ductile Iron Butterfly Valves

Flow Data - Cv Values for BOSS™ Butterfly Valves

TEDA – Standard Butterfly Valve Flow Rate Cv* Values

Size		Cv value when valve at different opening angle								
inch	mm	10º	20º	30º	40º	50º	60º	70º	80º	90º
2	50	0.4	18.9	45.4	90.8	170.3	242.3	340.7	473.2	511.0
2½	65	0.8	30.3	75.7	140.1	246.1	371.0	545.1	772.2	832.8
3	80	1.1	45.4	83.3	147.6	265.0	439.1	692.7	1041.0	1143.2
4	100	1.9	64.4	136.3	295.3	526.2	870.6	1377.9	2066.8	2271.2
5	125	3.0	109.8	230.9	503.5	897.1	1483.9	2347.0	3520.4	3868.7
6	150	7.6	170.3	359.6	776.0	1385.5	2290.2	3626.4	5439.6	6045.3
8	200	11.4	336.9	711.7	1544.4	2752.0	4550.1	7203.6	10803.6	11871.0
10	250	15.1	571.6	1211.3	2627.1	4682.6	7748.7	12264.7	18393.3	20214.1
12	300	18.9	885.8	1873.8	4058.0	7233.9	11969.5	18946.0	28417.1	31229.6

Note:
1. The volume calculated by adjacent Cv data is litres per minute
2. The calculation for adjacent Cv value is based on the following unit:
   Pressure Difference between inlet and outlet of the valve in psi

Flow Coefficiency of Butterfly Valve: Cv Value
Cv Value is calculated and defined as follows:

$$Cv = Q\sqrt{\frac{G}{\Delta P}}$$

Where:
- Q = fluid volume that passes through the valve per minute (litres/min)
- ΔP = pressure difference between import and export of the valve (psi)
- G = density of fluid.

With the above expression, you may calculate the flow volume that passes through the valve or pressure loss between the two ends of the valve.

Example 1
A 6in butterfly valve at 70% opening with a fluid density of 0.8 passing through the valve and a volume of 4542.8 litres/min, gives a pressure loss between the two ends of

$$\Delta P = \frac{GQ^2}{Cv^2} = \frac{0.8 \times 4542.8^2}{3626.4^2} = 1.26\text{psi}$$

Example 2
A 10º butterfly valve at 90% opening, with a pressure loss of 0.6psi between the two ends of the valve, and with a fluid of 0.8 density, the flow volume passing through the valve would be

$$Q = Cv\sqrt{\frac{\Delta P}{G}} = 20214.1 \times \sqrt{\frac{0.6}{0.8}} = 20214.1 \times 0.866 = 17505.41 \text{ litres}$$