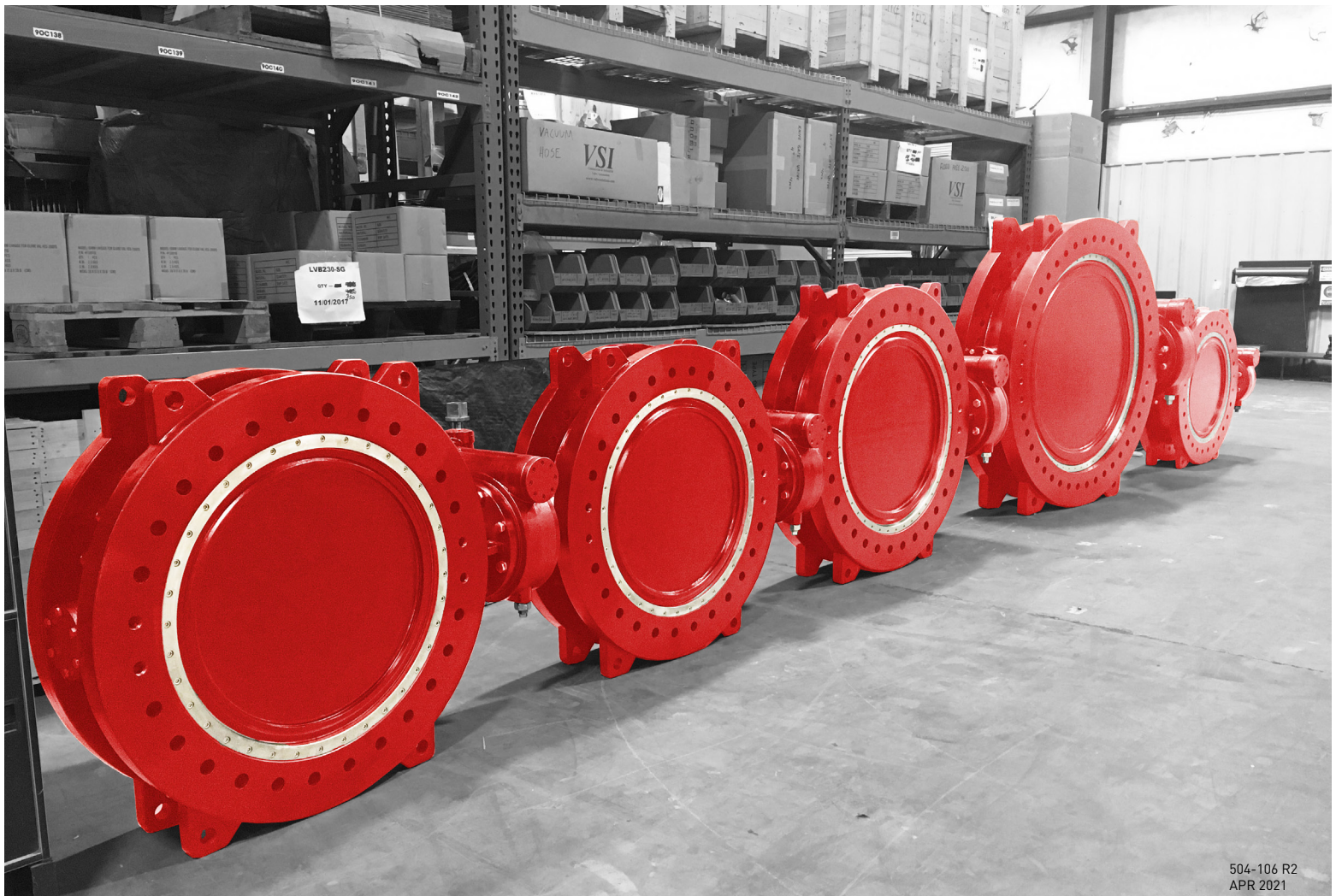




**SERIES BFII
AWWA C504
BUTTERFLY VALVES
24" AND LARGER**



Series BFII

Resilient Seated Butterfly
Valves to AWWA C504

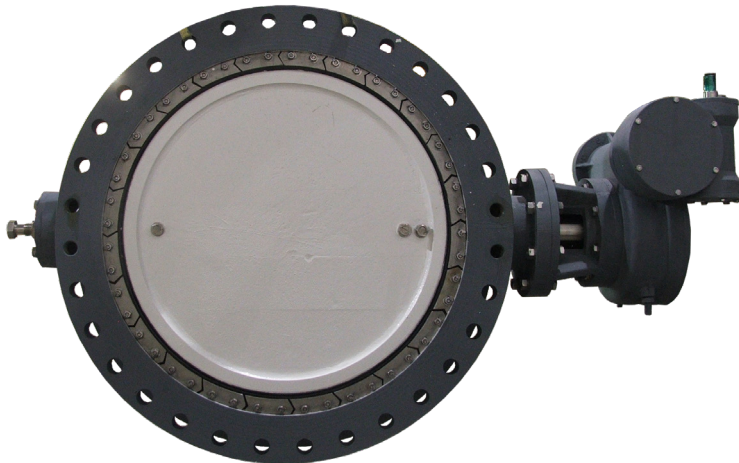


WELDED DISC EDGE

The disc edge of each Series BFII is a machine welded and ground spherical disc edge of Stainless 316 or Nickel. The wide seating surface width ensures if minor damage is inflicted on the rubber seat the valve is still capable of sealing off the line. The wide seating width also allows for a forgiving seat angle tolerance, making the valve forgiving for field retrofits or updates of electric or other types of actuators. The spherical machined shape reduces operating torque through the entire valve rotation range.

FLOW THROUGH TYPE DISC

The flow through design disc has a greater strength than lens or concave type discs while still maintaining free flow, high Cv values, and low head loss. The spherical machined shape reduces operating torque through the entire valve rotation range.



ADJUSTABLE SEAT DESIGN

The Series BFII features a tried and true seat on the body design. The resilient seat is retained by corrosion resistant segments held in place by adjustable hardware that penetrates and clamps the seat in place. Adjustment can be made with the valve in-line. No special tools are required.



TWO-PIECE SHAFT

The two piece shaft reduces flow interference in the valve to provide better flow characteristics.

ADJUSTABLE/REPLACEABLE PACKING

The packing of the Series BFII consists of multiple v-type packing rings and adjustable gland. The open bonnet on above ground valves allows for the adjustment and replacement of packing without removing the gearbox/operator

FLOW THROUGH TYPE DISC

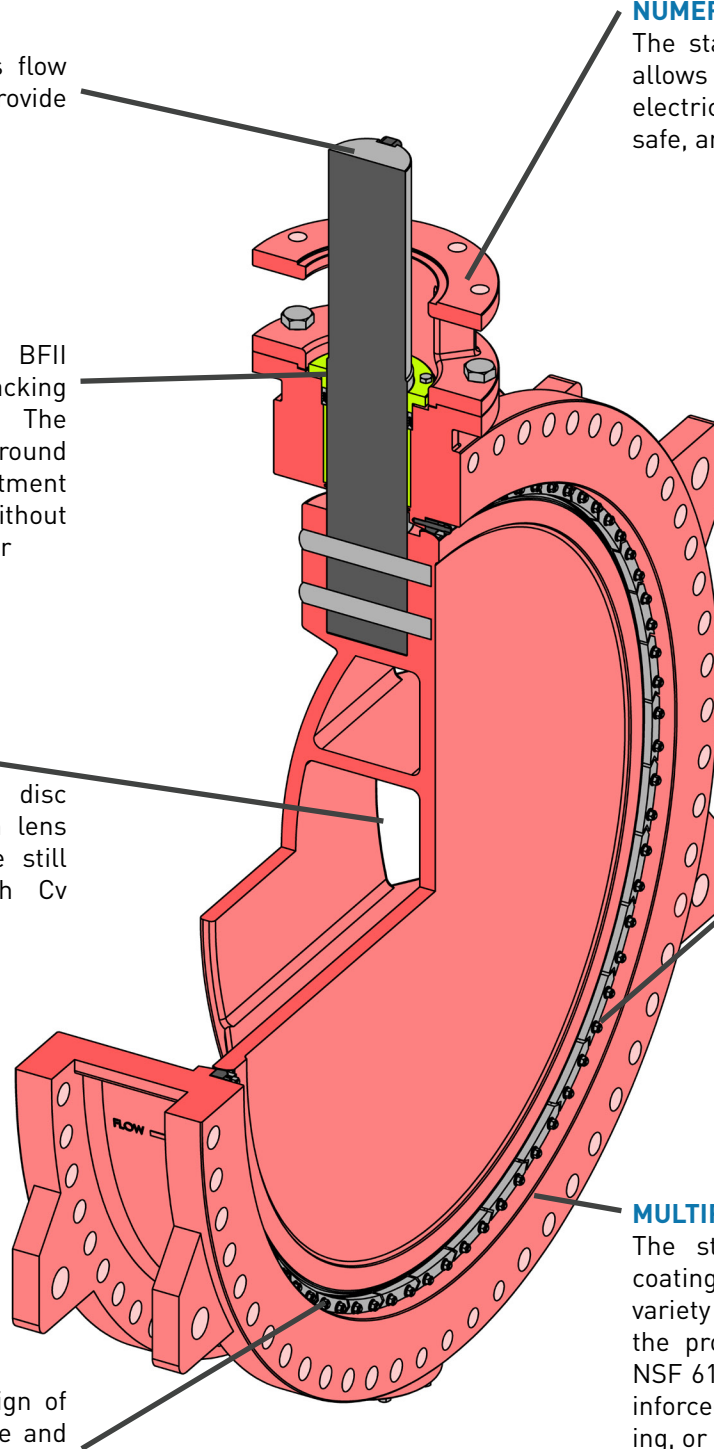
The flow through design disc has a greater strength than lens or concave type discs while still maintaining free flow, high Cv values, and low head loss.

ADJUSTABLE SEAT

The reliable time tested design of the Series BFII seat is simple and adjustable. No complicated epoxy injection or shims are needed - adjustment and replacement can be achieved with a common wrench.

NUMEROUS ACTUATION OPTIONS

The standard ISO 5211 top mount allows VSI to offer a wide range of electric, pneumatic, hydraulic, fail-safe, and other actuation packages



BODY MOUNTED SEAT

The body mounted seat design ensures long term performance and extended life, minimizing the effects of abrasive corrosion and tuberculation buildup.

MULTIPLE COATING OPTIONS

The standard 2-part heavy duty coating can be optioned to a wide variety of coatings as required by the project requirements such as NSF 61 listed coatings, ceramic reinforced resin, glass or rubber lining, or coal-tar epoxy



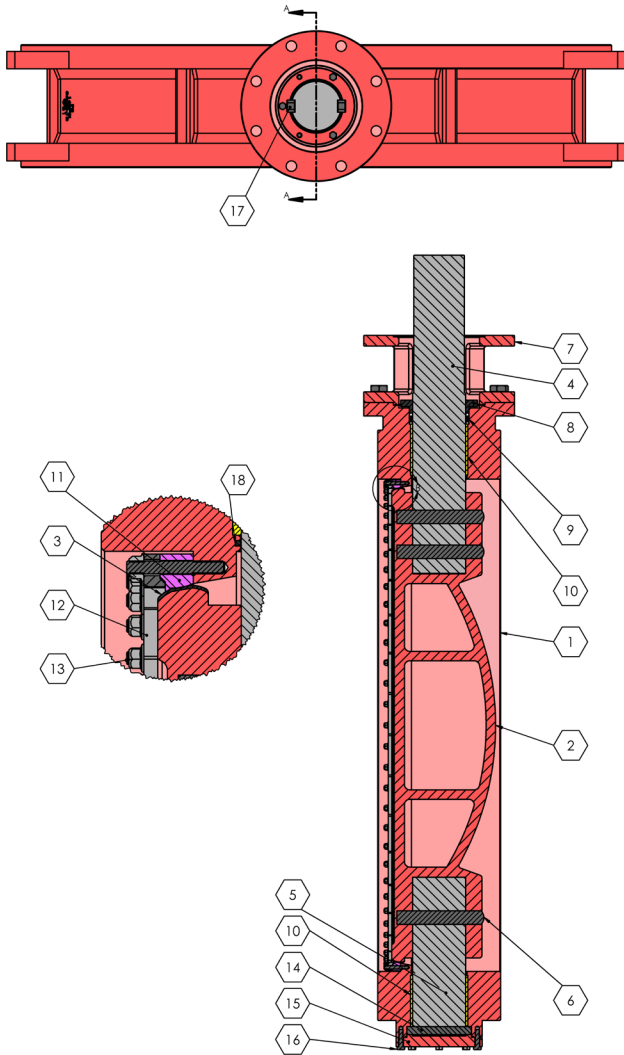
Sample Specification

24 Inch and Larger Butterfly Valves for Waterworks Service

1. SCOPE
 - 1.1. This specification covers the design, manufacture, and testing of cast butterfly valves 24 inch (600 mm) and larger under service pressure of up to 250 psig (1725 kPa).
 - 1.2. Butterfly valves shall be resilient seated and of the quarter turn, single offset, mechanically retained seal in body type.
2. GOVERNING STANDARDS
 - 2.1. All butterfly valves shall be in full conformance with the design, manufacturing, and testing standards set forth by the American Water Works Association (AWWA) in Standard ANSI/AWWA C504.
 - 2.2. When requested, manufacturer shall provide an Affidavit of Proof of Design Testing in accordance with AWWA C504.
3. CONNECTIONS
 - 3.1. Flanged valves shall conform to all standards of ANSI B16.1, Class 125 or Class 250.
 - 3.2. Flanged valves' lay length shall conform to AWWA C504 Table 1, Short Body.
 - 3.3. Mechanical joint valves shall conform to all standards of ANSI/AWWA C111/A21.11.
4. MARKINGS
 - 4.1. Each valve shall be marked with the manufacturer's name, valve size, body material, and pressure rating cast into the body of the valve. Lettering shall be a minimum of 1/2 inch tall and project 1/10 inch from body.
 - 4.2. All butterfly valves, except buried or submerged valves, shall be equipped with a type 304 or 316 stainless steel tag identifying body, disc, resilient seat, and stem material in addition to manufacturer's name, pressure rating, size, date of manufacturer, and date of testing.
5. DESIGN
 - 5.1. Valves shall be equipped with a seat directly bonded to a machined finished surface on valve disc. Plated or removable seats are not acceptable.
 - 5.2. Valve shall have a field replaceable and adjustable body mounted resilient seal. The seal should be retained to the body by ring segments and hardware that pierces the seal in a clamping manner.
 - 5.3. Valve shall be equipped with a set of V-type stem packing with an adjustable gland. Valve stem packing shall be replaceable without removing the bonnet of the valve.
 - 5.4. Radial shaft bushings shall be supplied in the upper and lower bearing journals. A thrust bearing shall be supplied acting on lower shaft section to center disc in valve body.
 - 5.5. The valves shall be equipped with a mounting area for operators conforming to Manufacturers Standard Society(MMS) 101 or International Organization of Standardization(ISO) 5211. There shall be sufficient clearance to directly mount standardized operators with easily accessible fasteners.
 - 5.6. Stem diameter shall be the preferred dimension stated in ISO 5211 Table 4.
 - 5.7. Drive keys shall comply with ISO R773, unless specifically stated otherwise. Preferred tolerance is D10. Tolerance of Js9 is acceptable for motor operated valves.
 - 5.8. Valves shall provide a bubble-tight shutoff bi-directionally at rated working pressure.
6. MATERIALS
 - 6.1. The valve body, disc, and bonnet if equipped shall be constructed of ASTM A536 Ductile Iron.
 - 6.2. The valve seat shall be manufactured from a minimum of 95% nickel, type 316 stainless steel, or stellite.
 - 6.3. The valve seal shall be made from resilient NBR, EPDM, or FPM as specified.
 - 6.4. Radial and thrust bearings shall be made of permanently lubricated RTFE or lead free Bronze.
 - 6.5. All submerged coatings shall conform to AWWA C550, be holiday free, and have a minimum total dry film thickness of 10 mils.
 - 6.6. All wetted hardware should be of corrosion resistant type 304 or 316 stainless steel as specified.
 - 6.7. All uncovered, submerged, or buried valves shall have type 304 or 316 stainless steel exterior hardware. All others shall have zinc plated carbon steel hardware unless specified.
7. OPERATORS
 - 7.1. All manually operated valves shall be equipped with a worm gear actuator with position indicator. Operator should be designed to hold the valve in any intermediate position without creeping or fluttering.
 - 7.2. All actuators shall be permanently sealed and suitable for buried service.
 - 7.3. All 2 inch square operating nuts, exposed hardware and shafts shall be made of corrosion resistant stainless steel.
 - 7.4. All actuators equipped with handwheels shall have a maximum rim pull of 50lbs plus 5%.
8. MANUFACTURER
 - 8.1. Single offset butterfly valves shall be VSI Series AWWAC504 as manufactured by Valve Solutions, Inc., Alpharetta, GA USA.
 - 8.2. All valves shall be warranted by manufacturer for a minimum of 12 months.



Materials of Construction



Item	Description	Materials Available	Standard
1	Body	Ductile Iron* ⁽¹⁾	ASTM A536 65-45-12
		Cast Iron	ASTM A126 Class B
		Stainless Steel 304	ASTM A351 CF8
		Stainless Steel 316	ASTM A351 CF8M
2	Disc	Ductile Iron* ⁽¹⁾	ASTM A536 65-45-12
		Cast Iron	ASTM A126 Class B
		Stainless Steel 304	ASTM A351 CF8
		Stainless Steel 316	ASTM A351 CF8M
3	Disc Edge	Welded SS316*	
		Welded ≥95% Nickel	
4	Upper Shaft	Stainless Steel 304*	ASTM A276 304
		Stainless Steel 316	ASTM A276 316
		Stainless Steel 17-4PH ⁽¹⁾	ASTM A693 17-4PH
5	Lower Shaft	Same as Upper Shaft	
6	Shaft Pins	Same as Upper Shaft	
7	Bonnet	Same as Body	
8	Packing Gland	Same as Body	
9	V-Packing Set	Same as Seat	
10	Radial Bearings	SS316 Reinforced PTFE*	
		Bronze	ASTM B584
11	Seat	EDPM*	
		Buna-N (NBR)	
		Viton (FPM)	
12	Seat Retainers	Stainless Steel 304*	ASTM A276 304
		Stainless Steel 316	ASTM A276 316
13	Wetted Hardware	Steel	ASTM A36
		Stainless Steel 304*	ASTM F593 Group 1
		Stainless Steel 316	ASTM F539 Group 2
14	Thurst Plate	Zinc Plated Steel	ASTM A325 Type 1
		Same as Shaft	
15	Lower Cover	Same as Body	
16	Exterior Hardware	Stainless Steel 304*	ASTM F593 Group 1
		Stainless Steel 316	ASTM F539 Group 2
		Zinc Plated Steel	ASTM A325 Type 1
17	Shaft O-Rings ⁽²⁾	Same as Seat	
NS	Coating/Lining	Two-Part Epoxy*	
		As Specified	
NS	Tag	Aluminum*	
		Stainless Steel	
NS	Assembly Lubricant	ANSI/NSF 61 Listed Silicone Lubricant	
NS	Operator	Varies	

Additional material options available as special order.
* Standard Material

(1) When equipped with DI body/disc and 17-4PH shaft valves conform with AWWA Class 250B

(2) Optionally Available, not equipped as standard



Design Standards

Size Range	24"-144" Flanged End 24"-48" MJ End
Construction	AWWA C504 ASME B16.34 API 609
Coatings	AWWA C550* ANSI/NSF 61 Compliant
Connections	ANSI B16.1 Class 125/ANSI B16.5 Class 150* ANSI B16.1 Class 250/ANSI B16.5 Class 300 ANSI/AWWA C111/A21.11 (MJ)*
Lay Length	AWWA C504 Short* ISO 5752
Bonnet	MSS SP-101* ISO 5211
Classifications	150A 150B* 250B

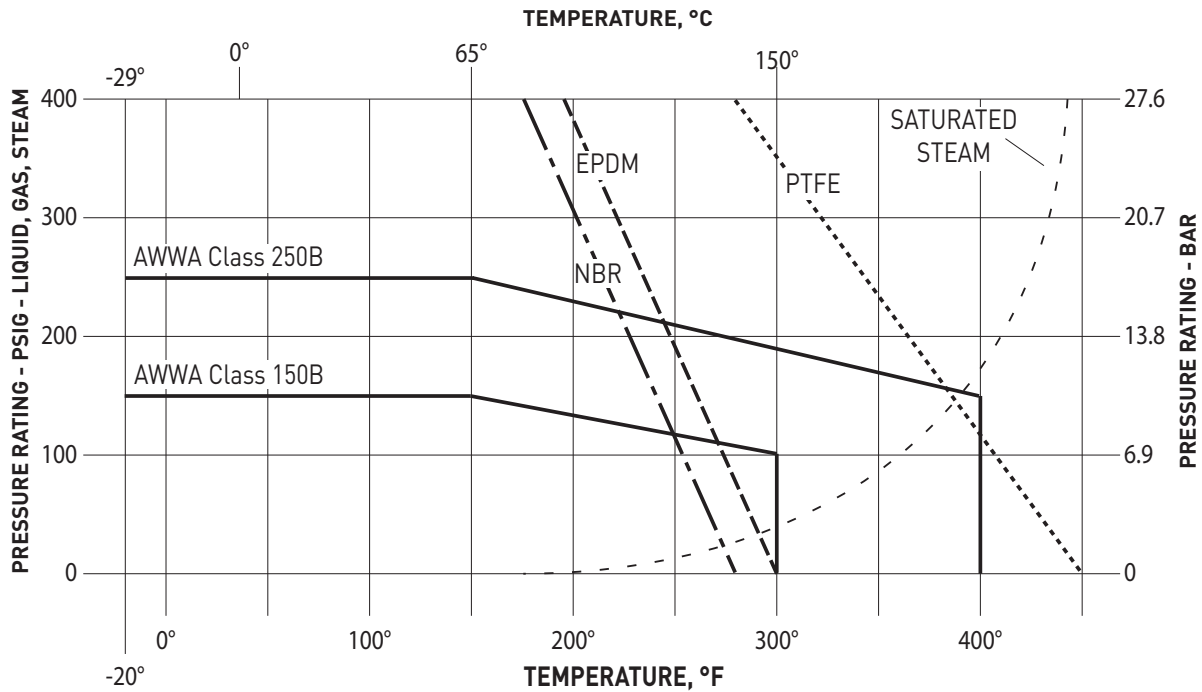
*Standard Option

Resistance Guide

Designation	Common Names	Composition	Min/Max Temperature Range	General Properties	Resistant to:	Attacked by:
EPDM	EPDM, EPM	Ethylene-propylene-diene Monomer	-40F/250F	Excellent ozone, chemical, and aging resistance. Poor resistance to petroleum-based fluids	Animal and vegetable oils, ozone, strong and oxidizing chemicals.	Mineral oils and solvents, aromatic hydrocarbons
NBR	NBR, Buna-N	Nitrile-butadiene	-30F/225F	Excellent resistance to petroleum-based fluids. Good physical properties	Many hydrocarbons, fats, oils, greases, hydraulic fluids, chemicals	Ozone, ketones, esters, aldehydes, chlorinated and nitro hydrocarbons
FPM	FPM, Viton®	Hexafluoropropylene-vinylidene fluoride	-10F/400F	Excellent oil and air resistances both at low and high temperatures. Very good chemical resistance	All aliphatic, aromatic, and halogenated hydrocarbons, acids, animal and vegetable oils	Ketones, low molecular weight esters and nitro containing compounds
PTFE	PTFE, Teflon®	Polytetrafluoro-ethylene	-100F/450F	Excellent abrasion resistance and chemically inert	Acids, harsh inorganic and organic chemicals, oils, oxidizing agents, and solvents	Molten alkali metals and fluorine at high temperatures



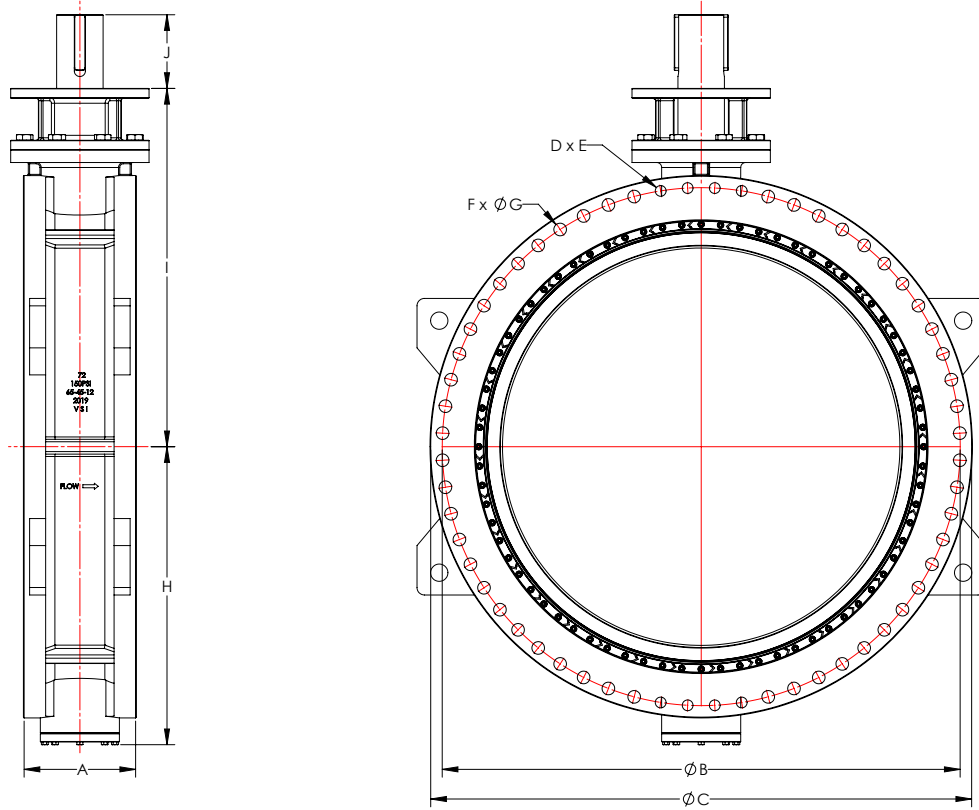
Pressure/Temperature Ratings



In determining field pressure ratings for Series BFII Butterfly Valves that are constructed of Ductile Iron the above chart should be used. Pressure cast on valve represents maximum seating pressure; maximum hydrostatic pressure is temperature dependent, and may be higher than nominal pressure rating.



24"-96" FLANGED BARESTEM CL125

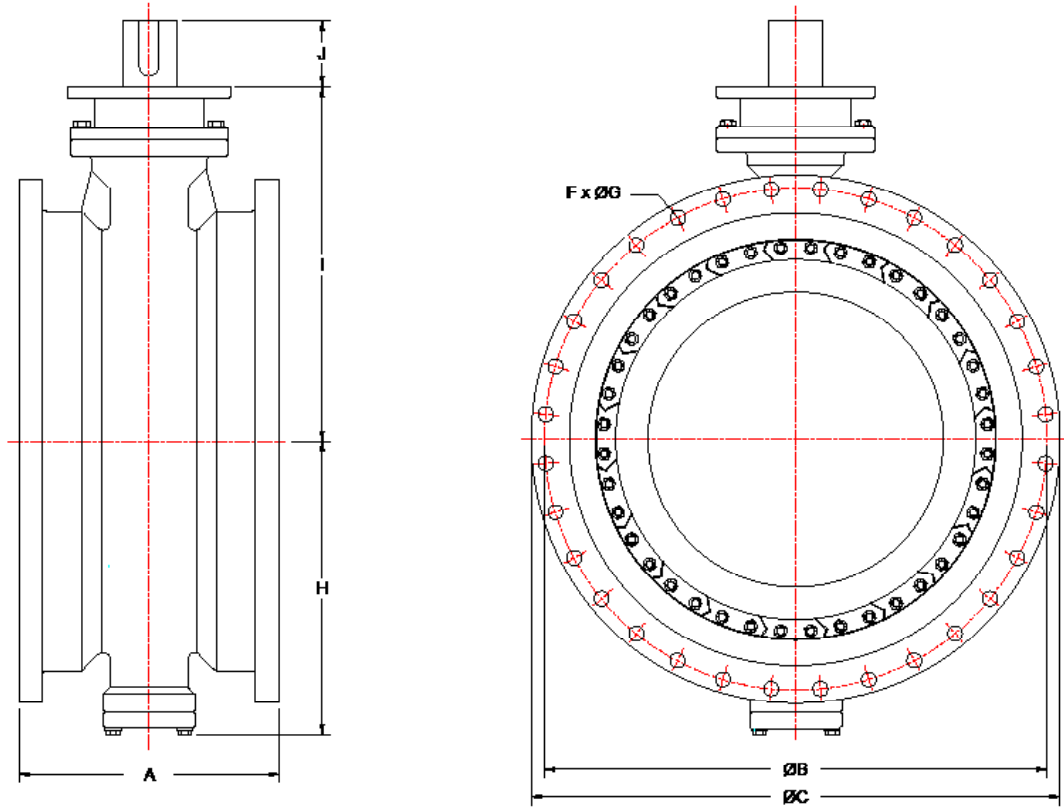


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SIZE	A	B	C	D	E	F ⁽¹⁾	G	H ⁽²⁾	I ⁽²⁾	J ⁽²⁾
24"	8.00	29.50	32.0	4	1.25-7UNC	16	1.38	-	-	-
30"	12.00	36.00	38.8	8	1.25-7UNC	20	1.38	-	-	-
36"	12.00	42.75	46.0	8	1.5-6UNC	24	1.63	-	-	-
42"	12.00	49.50	53.0	8	1.5-6UNC	28	1.63	-	-	-
48"	15.00	56.00	59.5	8	1.5-6UNC	36	1.63	-	-	-
54"	15.00	62.75	66.3	8	1.75-5UNC	36	2.00	-	-	-
60"	15.00	69.25	73.0	8	1.75-5UNC	44	2.00	-	-	-
66"	18.00	76.00	80.0	8	1.75-5UNC	44	2.00	-	-	-
72"	18.00	82.50	86.5	8	1.75-5UNC	52	2.00	-	-	-
78"	18.00	89.00	93.0	8	2-4.5UNC	56	2.25	-	-	-
84"	24.00	95.50	99.8	12	2-4.5UNC	52	2.25	-	-	-
96"	24.00	108.5	113.3	12	2.25-4.5UNC	56	2.50	-	-	-

(1) Count for thru bolts ONLY, does not include tapped bolts. Bolt pattern per ANSI CL125
 (2) Apply to factory - subject to change
 - Flanges drilling/bolting per ASTM/ANSI B16.1 Class 125 and AWWA C207 Class E

24"-48" MECHANICAL JOINT BARESTEM



SIZE	A	B	C	F	G ⁽¹⁾	H ⁽²⁾	I ⁽²⁾	J ⁽²⁾
24"	13.25	30.00	31.5	16	0.88	-	-	-
30"	18.00	36.88	39.1	20	1.13	-	-	-
36"	22.00	43.75	46.0	24	1.13	-	-	-
42"	22.00	50.62	53.1	28	1.38	-	-	-
48"	24.00	57.50	60.0	32	1.38	-	-	-

(1) Hole size shown, bolt size is 1/8" smaller

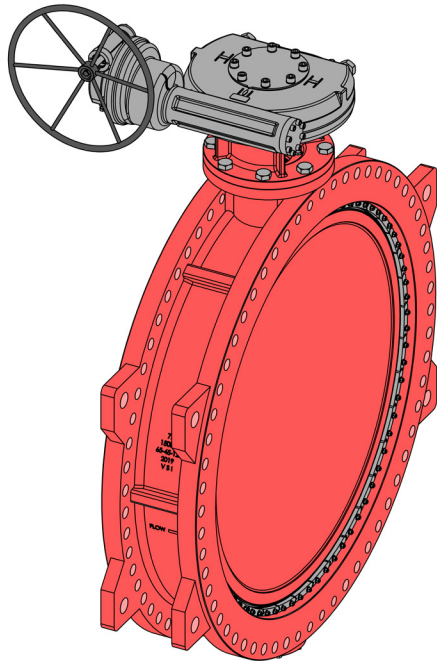
(2) Apply to factory - subject to change

- Flanges drilling/bolting and bell end dimensions per AWWA C111

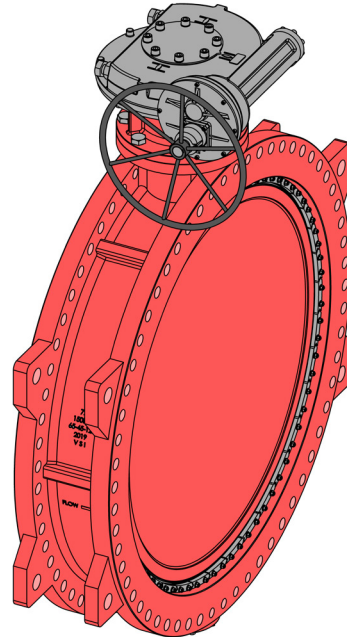


STANDARD OPERATOR TYPES

2-STAGE WORM GEAR

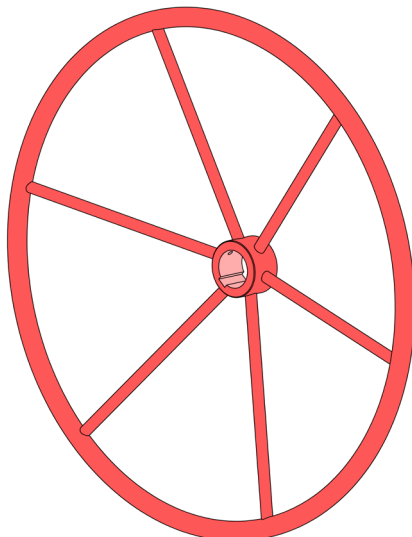


SINGLE STAGE WORM GEAR

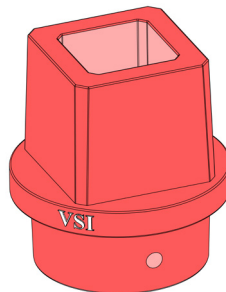


Single stage worm gear or worm gear
with spur secondary gear

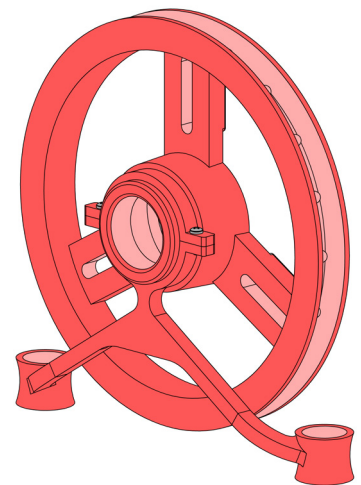
HANDWHEEL



2-INCH NUT OP.



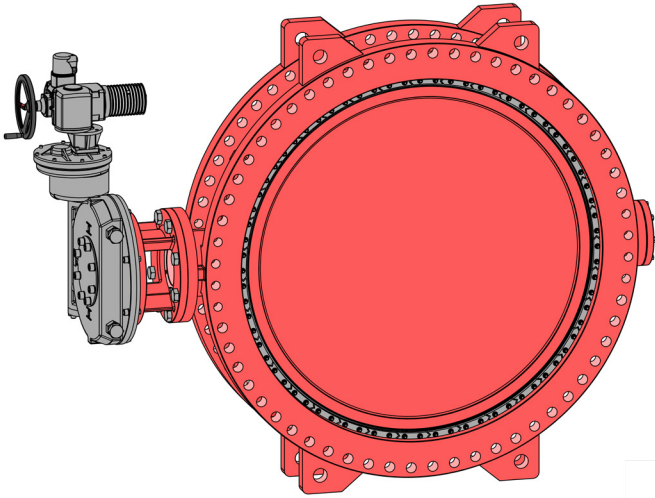
CHAINWHEEL



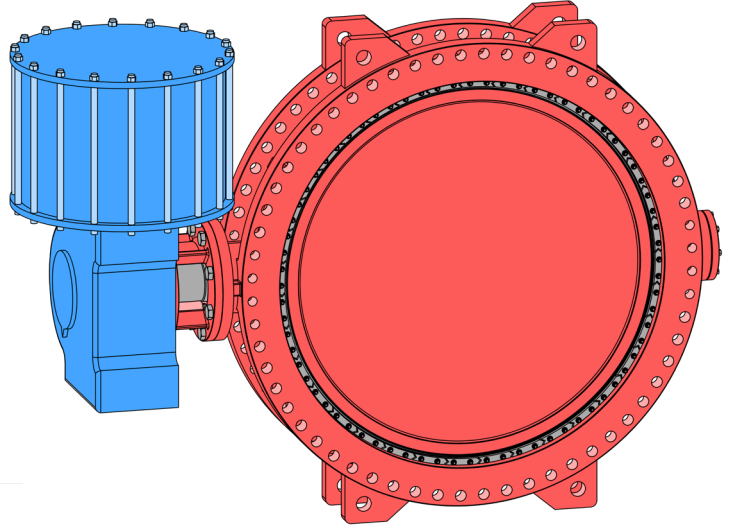


SPECIAL CONFIGURATIONS

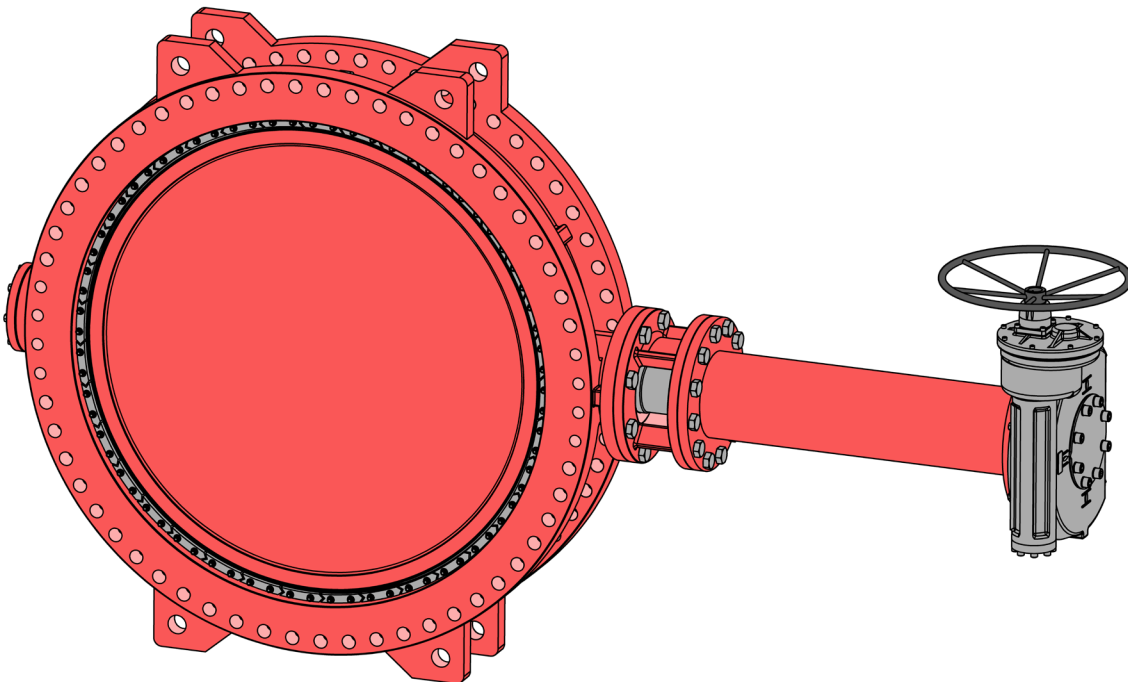
ELECTRIC ACTUATORS



PNEUMATIC/HYDRAULIC ACTUATORS



BONNET EXTENSIONS





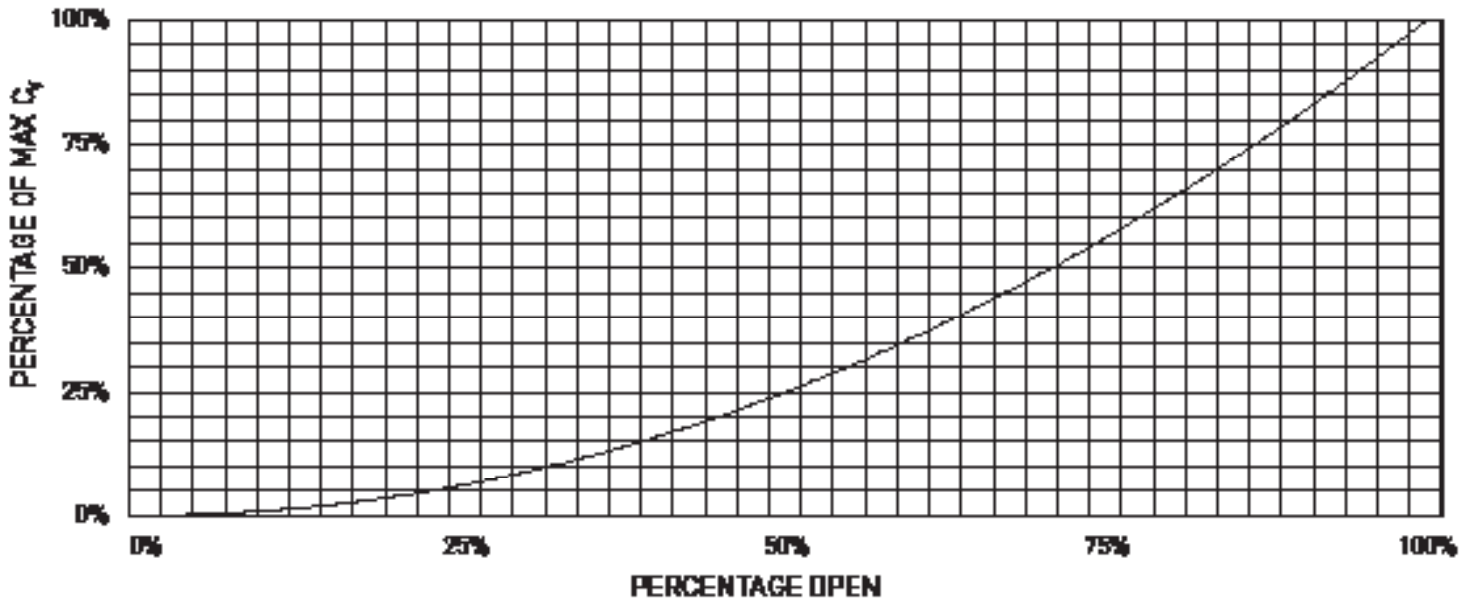
OPERATING TORQUES AND Cv VALUES

Torque Chart (in-lb)					
Size		PN (psi)			
DN	NPS	25psi	50psi	75psi	150psi
600	24"	14125	15134	27612	35843
750	30"	25709	27541	47790	63189
900	36"	53029	56817	84252	110846
1050	42"	64428	69030	135405	150274
1200	48"	94784	101554	205320	235631
1350	54"	143724	153990	293820	407543
1500	60"	205674	220365	381435	505114
1650	66"	267005	286076	543390	616624
1800	72"	339486	363735	745170	816413
78" and Larger		Apply to VSI			

Cv Valve (100% Open)			
Size		C _v	K _v
DN	NPS		
600	24"	27889	23837
750	30"	39450	33720
900	36"	59520	50870
1050	42"	85740	73280
1200	48"	112000	95800
1350	54"	141700	121000
1500	60"	172800	147700
1650	66"	209100	178700
1800	72"	248900	212700
78" and Larger		Apply to VSI	

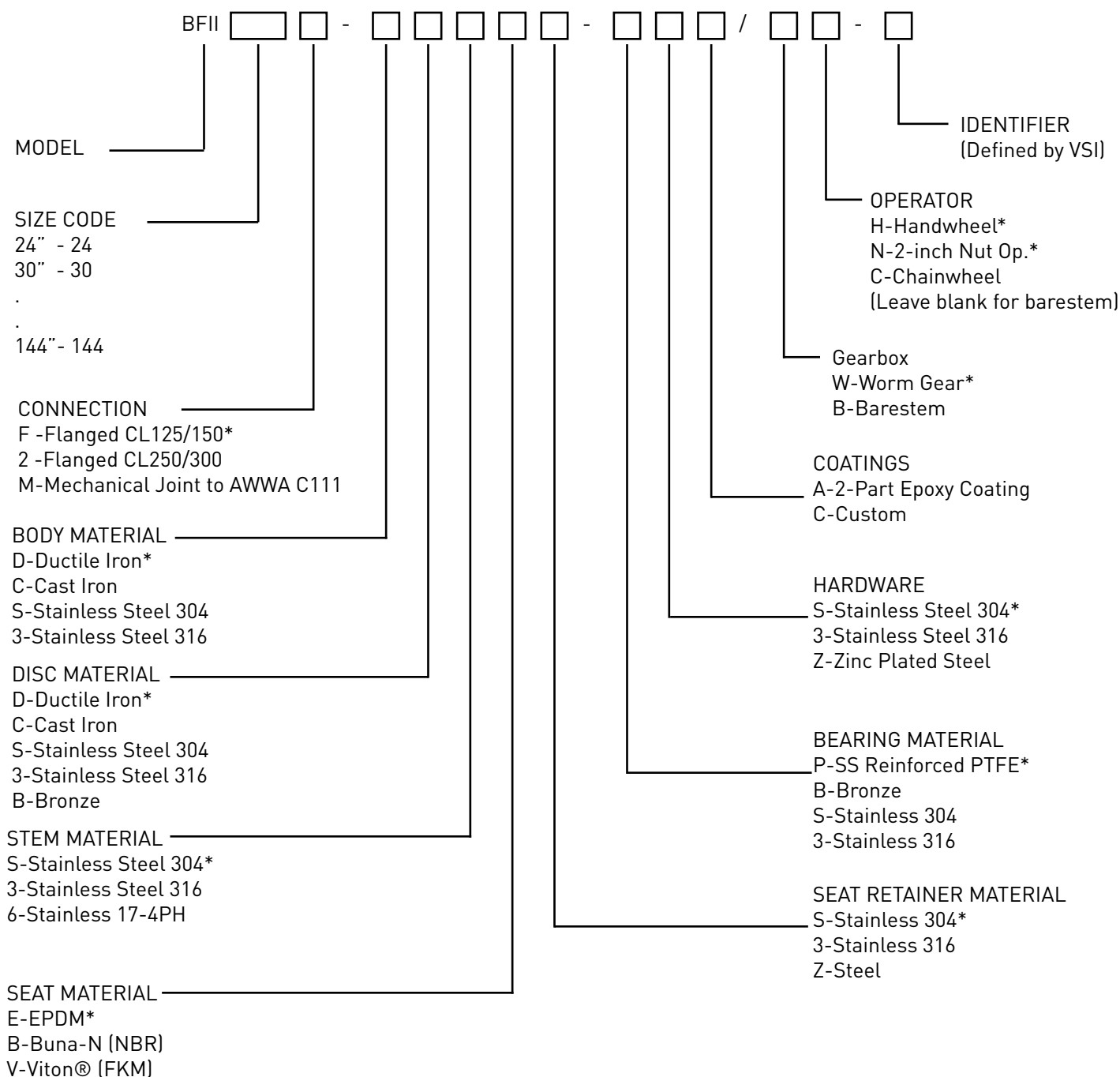
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BFII Flow Values (Cv)





PART NUMBER MATRIX

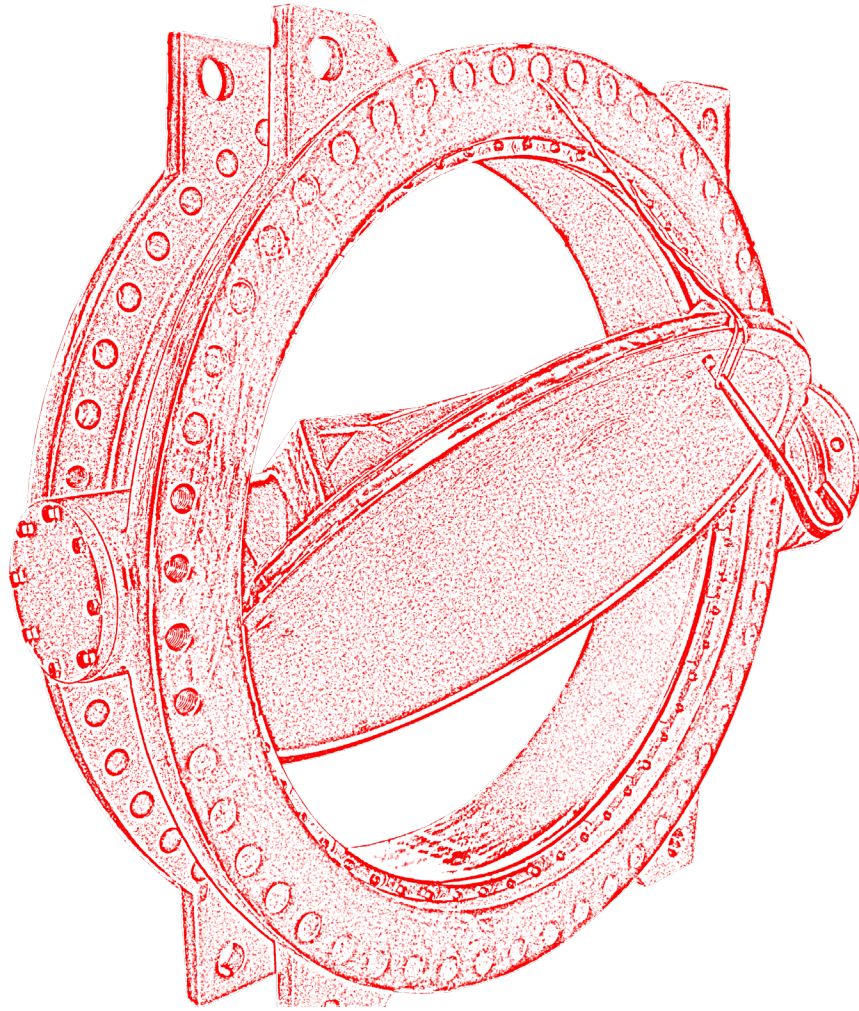


* Standard Material

EXAMPLE:

BFII30F-DDSES-PSA/WH-W

A 30" flanged butterfly valve with Ductile Iron body and disc, SS304 shaft, EPDM seat, SS304 seat retainers/hardware, PTFE bearings material, SS304 exterior hardware, 2-part epoxy coatings with worm gearbox, and handwheel operator



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