



# FORWARD ALLOYS & CASTINGS

EMFLO VALVE DIVISION



*Growth Through Total Customer Service*



Cert.No : IMB - 0362.09

014



6D-0297  
6A-0581  
600-0023



# Certificates



API-6D Monogram License



API-6A Monogram License



API-600 Monogram License



ISO 9001 : 2000 Certificate

# Facilities

New Ambarnath Facility





# Profile

Forward Alloys & Castings was founded in 1972 by a group of engineers, composed of highly dedicated and talented individuals with many years of experience in non-ferrous castings and engineering field. The company has developed indigenously critical casting components, marine valves, centrifugally-cast rudder bushes and sub-assemblies as 'import substitute' for Aircraft Carriers, Submarines, Leander Class Frigates, Destroyers, Coast Guards, Mine Sweepers and Warship Projects of Indian Navy.

The principal tenet of Forward Alloys & Castings is to provide solutions to customers problem by designing and developing special products. This tenet is fulfilled through manufacturing of products superior of workmanship, quality, reliability and price performance ratio.

## **Organizational Structure**

Over the past 29 years. Forward Alloys & Castings have succeeded in bringing out excellent products. It is recognized and well known in the non-ferrous casting and marine valves market in India. Based on the technical know-how and expertise gained so far, we formed two divisions, Non-ferrous Castings Foundry Division and Emflo Valve Division

## **Non-ferrous Castings - Foundry Division:**

We have been designed from the outset with the future in mind. The opportunity to work with Defense organizations in India for developing specially 'Import Substitutes', meeting the rigorous 'MIL Specifications', has played a vital role in the development of API-6D Oil & Gas Pipeline Valves by the company.

## **Emflo Valves Division:**

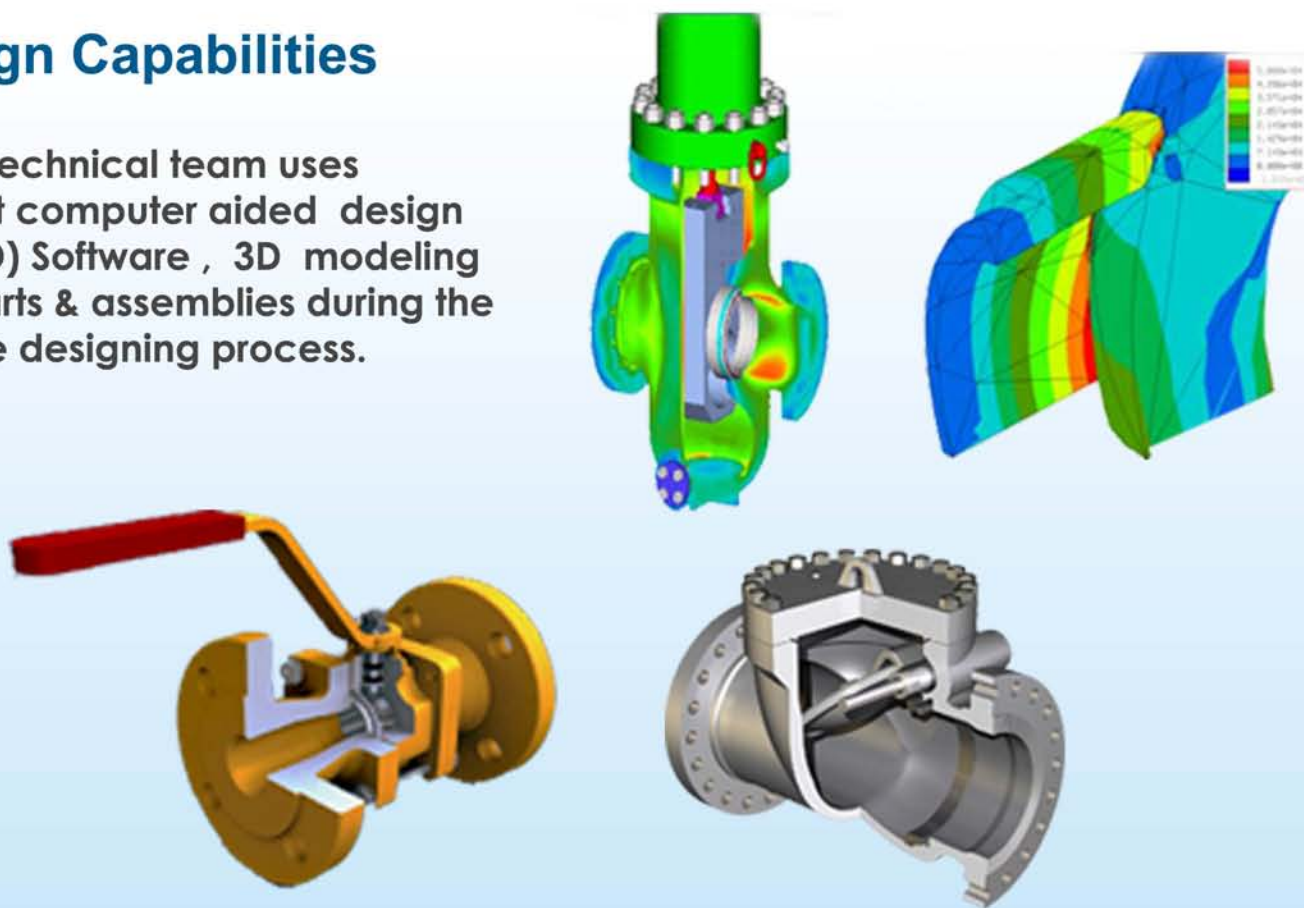
Emflo Valves Division has been successful in obtaining API License No. 6D-297 and authorization to use the official monogram of API on Ball Valves, Gate valves, Swing Check Valves and Plug Valves. The Ball Valves developed by the company were 'Fire-tested' as per API Spec. 6FA V Edition 1994. Fire test was carried out on metal seated ball Valves, Trunnion Mounted as per API specification 6FA II edition, 1994 and the same have been qualified from sizes 2" to 8", Class 150 to 1500. Both the fire testes were witnessed and certified by surveyors of DNV (Dorst Norske Veritas), Belgium. Further, Forward Alloys & Castings has been awarded ISO -9001 Certification by TUV (Registration No. 04100 10161).



# Design, Technical & Testing Facilities

## Design Capabilities

Our technical team uses latest computer aided design (CAD) Software , 3D modeling of parts & assemblies during the valve designing process.



## Valve Testing & Technical Facilities



- Fugitive Emission Testing (in accordance with MESC 77/312)
- Fire Testing (API 607 5th Edition)
- Energised Lip seals
- Double Piston Effect Sealing
- High Temperature Applications



# EMFLO VALVES

## 3PCS SOFT SEATED FLANGE END BALL VALVE



General Construction: B S5351/API 6D  
Face to Face Dimensions: ANSI B 16.10  
Inspection & Testing: BS-6755 part I  
Fire-Safe Testing : API 607/6 FA  
Material Construction:(As per ASTM A)  
Carbon steel: WCB/ A 105  
Stainless Steel : CF 8 M / CF 8  
Class : 150, 300, 600  
Size 1/2" to 2"  
Flanged ends: ANSI B 16.5  
Flange Drilling: ASA 150, 300, 600  
Other drilling BS 10 Table D, E, F or  
Din ND-10/16

## 3PCS SOFT SEATED BALL VALVE



General Construction: B S5351/API 6D  
Face to Face Dimensions: ANSI B 16.10  
Inspection & Testing: BS-6755 part I  
Fire-Safe Testing : API 607/6 FA  
Material Construction:(As per ASTM A)  
Carbon steel: WCB/ A 105  
Stainless Steel : CF 8 M / CF 8  
Class : 800  
Size 1/4" to 2"  
Screwed ends : ANSI B 2.1 / BS 21  
Screwed weld ends: ANSI 16.11  
Butt weld ends : ANSI B 16.25

## 2PCS SOFT SEATED FLANGED END BALL VALVE



General Construction: B S5351/API 6D  
Face to Face Dimensions: ANSI B 16.10  
Inspection & Testing: BS-6755 part I / API 6D  
Fire-Safe Testing : API 607/6 FA  
Material Construction:(As per ASTM A)  
Carbon steel: WCB/ A 105  
Stainless Steel : CF 8 M / CF 8  
Class : 150, 300, 600  
Size 1/2" to 12"  
Flanged ends: ANSI B 16.5  
Flange Drilling: ASA 150, 300, 600  
Other drilling BS 10 Table D, E, F or  
Din ND-10/16

## 2PCS TRUNNION MOUNTED FLANGED END BALL VALVE



General Construction: B S5351/API 6D  
Face to Face Dimensions: ANSI B 16.10  
Inspection & Testing: BS-6755 part I / API 6D  
Fire-Safe Testing : API 607/6 FA  
Material Construction:(As per ASTM A)  
Carbon steel: WCB/ A 105  
Stainless Steel : CF 8 M / CF 8  
Class : 150 to 1500  
Size 2" to 24"  
Flanged ends: ANSI B 16.5  
Flange Drilling: ANSI -150 to 1500  
Other drilling BS 10 Table D, E, F or  
Din ND-10/16

## CAST STEEL GATE VALVE



General Construction: API 600 / B. S. 1414  
Face to Face Dimensions: ANSI B 16.10  
Inspection & Testing: API 598 / B.S. 5146  
Material Construction:(As per ASTM A)  
Carbon steel: WCB/ A 105  
Stainless Steel : CF 8 M / CF 8  
Class : 150, 300, 600  
Size 2" to 30"  
Flanged ends: ANSI B 16.5  
Butt weld end : ANSI B 16.25

## CAST STEEL PRESSURE SEAL GATE VALVE



General Construction: ANSI B 16.34  
Face to Face Dimensions: ANSI B 16.10  
Inspection & Testing: API 598  
Material Construction:(As per ASTM A)  
Carbon steel: WCB/ A 105  
Stainless Steel : CF 8 M / CF 8  
Class : 900, 1500, 2500  
Size 2" to 12"  
Flanged ends: ANSI B 16.5  
Butt weld end : ANSI B 16.25



# EMFLO VALVES

## REGULAR DOUBLE-DISC GATE VALVE



6D 0297

**General Construction:** API 6D  
**Face to Face Dimensions:** API 6D  
**Inspection & Testing:** API 6D  
**Material Construction:** (As per ASTM A)  
**Carbon steel:** WCB  
**Stainless Steel:** CF 8 M / CF 8  
**Class:** 150 to 1500  
**Size:** 2" to 24"  
**Flanged ends:** ANSI B 16.5  
**Butt weld ends:** ANSI B 16.25

## THROUGH CONDUIT GATE VALVE



6D 0297

**General Construction:** API 6D  
**Face to Face Dimensions:** API 6D  
**Inspection & Testing:** API 6D  
**Material Construction:** (As per ASTM A)  
**Carbon steel:** WCB  
**Stainless Steel:** CF 8 M / CF 8  
**Class:** 150 to 2500  
**Size:** 2" to 36"  
**Flanged ends:** ANSI B 16.5  
**Butt weld ends:** ANSI B 16.25

## CAST STEEL SWING CHECK VALVE



6D 0297

**General Construction:** BS 1868 / API 6D  
**Face to Face Dimensions:** ANSI B 16.10  
**Inspection & Testing:** B. S. 6755 /  
 API 6 D  
**Material Construction:** (As per ASTM A)  
**Carbon steel:** WCB  
**Stainless Steel:** CF 8 M / CF 8  
**Class:** 150 to 1500  
**Size:** 2" to 24"  
**Flanged ends:** ANSI B 16.5  
**Butt weld ends:** ANSI B 16.25

## THROUGH CONDUIT FULL BORE GATE VALVE



6A0581

**General Construction:** API 6 A  
**Face to Face Dimensions:** API 2000,  
 3000, 5000, 10000  
**Inspection & Testing:** API 6  
**Alloy steel:** API 2 or API 3  
**Stainless Steel:** ASTM A 487 4C/ 4 A  
**Class:** 2,000 to 10,000  
**Size:** 21/16" to 71/16"  
**Flanged ends :** API 6A

## CAST STEEL GLOBE VALVE



6D 0297

**General Construction:** BS 1873  
**Face to Face Dimensions:** ANSI B16.10  
**Inspection & Testing:** BS 6755  
**Material Construction:** (As per ASTM A)  
**Carbon steel:** WCB  
**Stainless Steel:** CF 8 M/ CF 8  
**Class:** 150 to 1500  
**Size:** 2" to 24"  
**Flanged ends:** ANSI B 16.5  
**Butt weld Ends:** ANSI B 16.25

## Y-STRAINER



**General Construction:** Manufacturer  
 std.  
**Face to Face Dimensions:** ANSIB16.10  
**Inspection & Testing:** Manufacturer  
 std.5  
**Material Construction:** (As per ASTM A)  
**Carbon steel:** WCB  
**Stainless Steel:** CF 8 M/ CF 8  
**Class:** 150, 300  
**Size:** 1/4" to 12"  
**Flanged ends:** ANSI B 16.5  
**Butt weld Ends:** ANSI B 16.25  
**Screwed ends:** ANSI B 2.1/ BS 21

# EMFLO MARINE VALVES

## BUTTERFLY MARINE VALVES



**Size :** 2"-16" (50-400)

**Class :** PN20 #150

**Standard :** As per Specification NES 360/375

## GATE VALVE



**Size :** 2"-16" (50-400)

**Class :** PN 20 #150

**Standard :** As per Specification NES 360/375

## BALL VALVE



**Size :** 2"-16" (50-400)

**Class :** PN 20 #150

**Standard :** As per Specification NES 360/375

## CHECK VALVE



**Size :** 2"-16"

**Class :** PN20 #150

**Standard :** As per Specification NES 360/375

## GLOBE VALVE



**Size :** 2"-16"

**Standard :** As per Specification NES 360/375

## 3 PC BALL VALVE



**Size** 1/4" to 2"

**Class** -150, 300, 600

**Standard :** As per Specification NES 360/375



## DESIGN

FAC Trunnion Mounted bolted construction Ball Valves are designed and manufactured in accordance with the latest industry standards. Our split body design gives ease of maintenance on site. Trunnion Mounted Valves are available in both soft seated and metal seated design. Special face to face dimensions can be supplied. All valves are available in Full or Reduced Bore, with Raised Face, Ring Type Joint, Hub End, Butt Weld or Socket end connections. Pressure rating range from ANSI 150 thru ANSI 2500, compact flanges and higher pressure ratings are available on request. Valves are supplied as Lever Operated, Gear Operated or Actuated to customer's specification.

## MATERIAL SELECTION

Valves are manufactured in a range of materials such as Carbon Steel, Low Temp Carbon Steel, Stainless Steel, Duplex, Super Duplex, Monel, Inconel and other Special Alloys.

## BODY/CAP

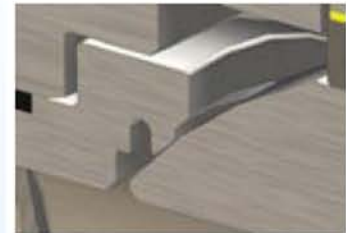
Sealing is by O-rings and Graphite rings. The Graphite ring continues to provide a seal in the event of a fire. O-rings can be supplied suitable for AED applications in a variety of materials.

## SEAT

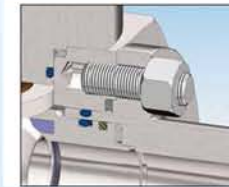
Independent seats with preloaded springs are always in contact with the Ball giving a perfect seal even at low pressure. The replaceable seat rings and soft inserts can be supplied in materials to suit most service conditions. For very high temperatures, sealing is ensured by metal to metal seats whereby the Ball and Seats are coated with Tungsten Carbide and lapped together. Most sizes and classes have Sealant Injection system fitted as standard. This allows emergency sealing to be carried out in the event of damage to the soft seat.

## STEM

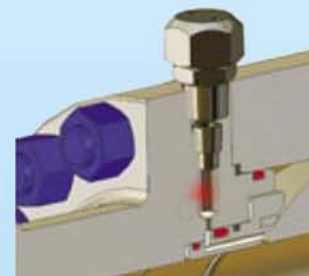
Stems are manufactured separately from the Ball and feature an anti blow-out design. Stems are supported by RPTFE lined bushes, which reduce valve torque. Stem sealing is by O rings and graphite rings. From 2" and above stems are supplied with sealant injection system.



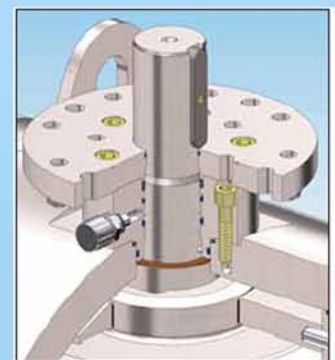
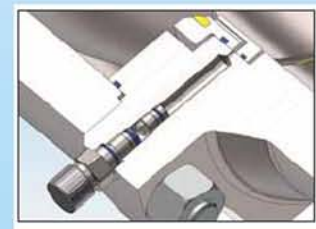
**Metal seated design**



**Double o-rings, or the combination of o-rings and gaskets, grant a perfect and safe sealing of body and trunnion.**



**Sealant injection detail**





# TECHNICAL FEATURES



6D-0297  
6A-0581  
600-0023



ADVANCED VALVE TECHNOLOGY

## BALL

Balls are supplied in Forged or Cast Stainless Steel, Duplex or Carbon Steel with ENP. The Trunnion Mounted design reduces operating torque and seat wear.

## ANTI STATIC DEVICE

Electrical conductivity is achieved by fitting a positive contact device between the Stem, Ball and Bonnet.

## DOUBLE BLOCK AND BLEED

Valves are equipped with a vent plug, which allows the cavity to be relieved when pressure is applied to both sides of the Ball simultaneously.

## TESTS

Valves are tested in accordance with BS EN 12266 Pt 1&2, API 6D, API 598 and ASME B16.34

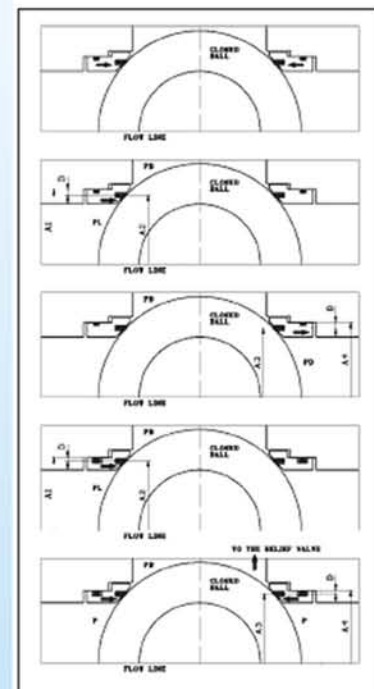
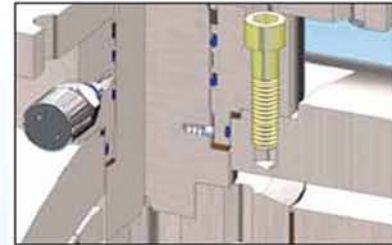
## FIRE TEST CERTIFICATION

Valves are designed and certified by an Independent Authority according to API 607 and API 6FA.

## EXTERNAL COATING

Carbon Steel valves are normally supplied with FAC standard paint finish. Valves can also be unpainted or finished to customers paint specification.

ACCESSORIES Include locking devices, pipe pups, extended bonnets and actuators. Suitable materials, components, seats and O rings can be supplied for Valves with Explosive Decompression or Cryogenic applications.





# Trunnion Mounted Ball Valves

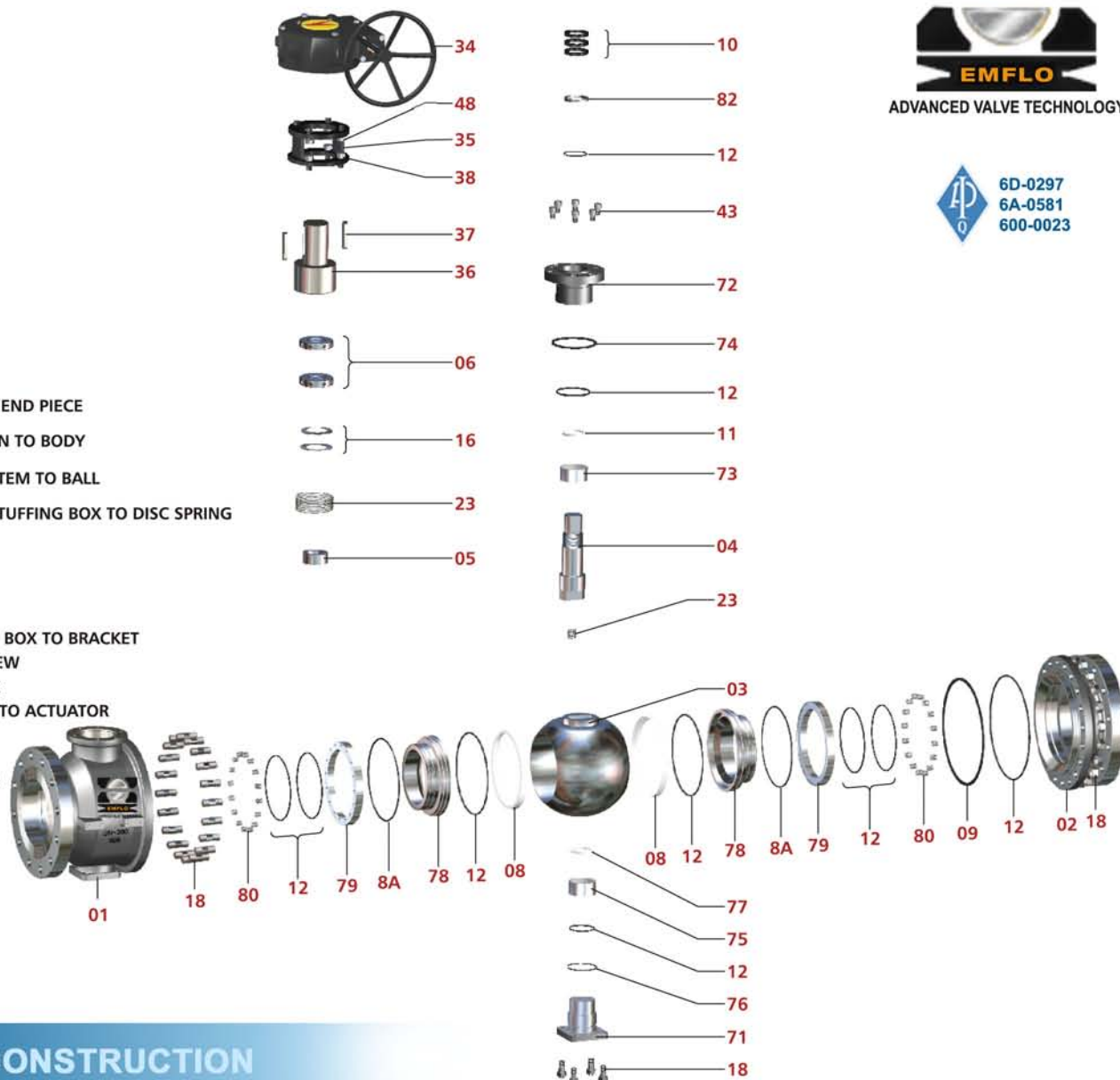
## VALVE PARTS



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### PART NO PART NAME

01	BODY
02	END PIECE
03	BALL
04	STEM
05	GLAND
06	GLAND NUT
08	SEAT
8A	SEAT SEAL
09	BODY SEAL
10	STEM SEAL
11	STEM WASHER
12	'O' RING
16	DISC SPRING
18	STUD / NUT
	BODY TO END PIECE
	TRUNNION TO BODY
23	ANTISTATIC SPRING
	STEM TO BALL
	STUFFING BOX TO DISC SPRING
34	GEAR ACTUATOR
35	BRACKET
36	ADAPTER
37	KEY
38	HEX. SCREW - STUFFING BOX TO BRACKET
43	HEX. SOC. HD. CAP SCREW
	BODY TO STUFFING BOX
48	HEX. SCREW - BRACKET TO ACTUATOR
71	TRUNNION
72	STUFFING BOX
73	STUFFING BOX BEARING
74	STUFFING BOX SEAL
75	TRUNNION BEARING
76	TRUNNION SEAL
77	THRUST WASHER
78	SEAT RETAINER
79	BACKUP RING
80	COIL SPRING
82	SUPPORT RING



## MATERIALS OF CONSTRUCTION

Body / End piece	Carbon Steel ASTM A216 Gr. WCB, A352 Gr. LCB, Stainless Steel ASTM A351 Gr. CF8 / CF8M / CN7M / Duplex
Ball	Carbon Steel ASTM A216 Gr. WCB+ENP / Stainless Steel ASTM A217 Gr. CA15 / ASTM A351 Gr. CF8 / CF8M / CN7M / Duplex
Stem / Trunnion	Stainless Steel ASTM A564 TYPE 630 (17-4PH) / UNS S31803
Seat / Seat Insert	PTFE / RPTFE / DELRIN / NYLON / PEEK / METAL
Metal Seat	Stainless Steel ASTM A276 Type 410 Hardened / ASTM A276 Type 316 Stellite
Seat Retainer	ASTM A276 Type 410 / A217 Gr. CA15 / A276 Type 316 / A351 Gr. CF8M
Coil Spring	INCONEL X-750
'O' Ring	Viton Gr. B
Stem / Thrust Washer	RPTFE (GFT)
Body Seal	SPIRAL WOUND SS With Graphite filler
Stem Seal	Grafoil
Trunnion / Stuffing Box Seal	PTFE / Grafoil / SPIRAL WOUND SS With Graphite filler
Stuffing Box	Carbon Steel ASTM A216 Gr. WCB, A352 Gr. LCB, Stainless Steel ASTM A351 Gr. CF8 / CF8M / CN7M
Stuf. Box & Trunnion Bearing	SS Backed PTFE
Gland Nut	Stainless Steel
Body Stud / Nut	ASTM A193 Gr. B7 / ASTM A194 Gr. 2H
Surface Protection for Carbon Steel Valves	Prime coat : Chlorine free with modified alkyd resin unobjectionable in Physiological and Toxicological respects with additional external coating of Machine varnish Smoke Gray

■ Other Materials not mentioned above are available on request.

■ Other Ball Materials with Electro Nickle Plating (ENP) available on request.



# Trunnion Mounted Ball Valves

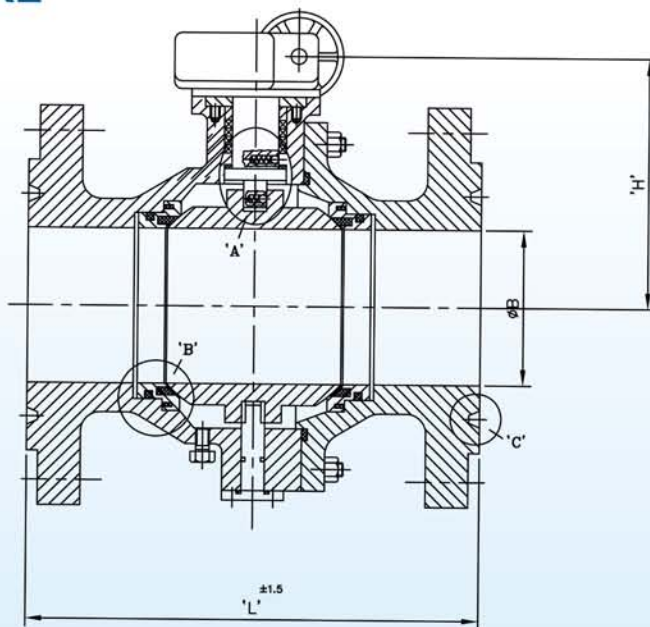
## FULL BORE



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6A-0581  
600-0023



ADVANCED VALVE TECHNOLOGY



## CLASS & DIMENSIONS

### ASME 150 Class

Size DN	150	200	250	300	350	400	450	500	600	650	700	750	800	900	1000	1050	1200
L - RF	394	457	533	610	686	762	864	914	1067	1143	1245	1295	1372	1524	1778	1854	2134
B	148	198	248	298	335	380	438	489	591	635	685	735	780	875	980	1020	1170
H (approx)	270	315	360	410	425	475	525	590	695	790	855	895	945	1025	1100	1150	1350
ØW	300	300	400	400	600	600	600	600	750	750	750	750	750	750	750	750	750

### ASME 300 Class

Size DN	150	200	250	300	350	400	450	500	600	650	700	750	800	900	1000	1050	1200
L - RF	403	501	568	635	762	838	914	991	1143	1245	1346	1397	1524	1727	1981	2083	2387
B	148	198	248	298	335	380	438	489	591	635	685	735	780	875	980	1020	1170
H (approx)	285	345	380	435	450	495	570	615	710	815	870	910	960	1040	1115	1175	1375
ØW	300	300	400	400	600	600	600	750	750	750	750	750	750	750	750	750	750

### ASME 600 Class

Size DN	50	65	80	100	150	200	250	300	350	400	450	500	600	650	700	750	800	900	1000	1050	1200
L - RF	292	330	356	432	559	660	787	838	889	991	1092	1194	1397	1448	1549	1651	1778	2083	2337	2438	2845
B	51	64	76	102	148	198	245	295	325	375	438	489	591	635	685	735	780	875	980	1020	1170
H (approx)	190	230	265	295	300	355	415	455	505	515	600	640	735	815	870	910	960	1040	1115	1175	1375
ØW	250	250	300	300	400	400	400	600	600	600	750	750	750	750	750	750	750	750	750	750	750

### ASME 900 Class

Size DN	50	65	80	100	150	200	250	300	350	400	450	500	600	650	750	900
L - RF	368	419	381	457	610	737	838	965	1029	1130	1219	1321	1549	1651	1880	2286
B	51	64	76	98	148	198	245	295	325	375	438	489	570	620	715	860
H (approx)	210	250	285	280	360	455	510	525	595	650	685	695	735	815	910	1040
ØW	250	300	300	400	400	600	600	600	750	750	750	750	750	750	750	750

### ASME 1500 Class

Size DN	50	65	80	100	150	200	250	300	350	400
L - RF	368	419	470	546	705	832	990	1130	1257	1384
B	51	64	76	102	146	194	241	290	320	360
H (approx)	230	260	290	305	370	470	520	575	635	700
ØW	300	300	400	400	600	600	750	750	750	750



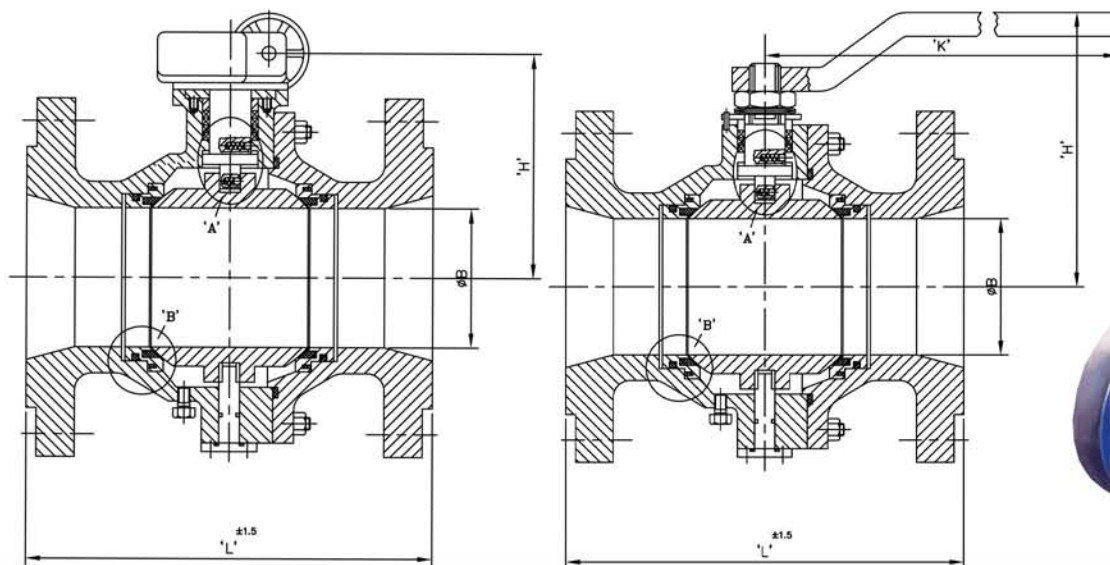
## REDUCED BORE



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6A-0581  
600-0023



ADVANCED VALVE TECHNOLOGY



## CLASS & DIMENSIONS

### ASME 150 Class

Size	DN	150	200	250	300	350	400	450	500	600	650	700	750	800	900	1000	1050	1200
L - RF		394	457	533	610	686	762	864	914	1067	1143	1245	1295	1372	1524	1778	1854	2134
B		98	144	187	228	266	305	387	438	489	591	635	685	735	780	875	980	1020
H (approx)		240	270	315	360	410	425	475	525	590	695	790	855	895	945	1025	1100	1150
ØW		300	300	300	400	400	600	600	600	600	750	750	750	750	750	750	750	750

### ASME 300 Class

Size	DN	150	200	250	300	350	400	450	500	600	650	700	750	800	900	1000	1050	1200
L - RF		403	501	568	635	762	838	914	991	1143	1245	1346	1397	1524	1727	1981	2083	2387
B		98	144	187	228	266	305	387	438	489	591	635	685	735	780	875	980	1020
H (approx)		245	285	345	380	435	450	495	570	615	710	815	870	910	960	1040	1115	1075
ØW		300	300	300	400	400	600	600	600	750	750	750	750	750	750	750	750	750

### ASME 600 Class

Size	DN	50	65	80	100	150	200	250	300	350	400	450	500	600	650	700	750	800	900	1000	1050	1200
L - RF		292	330	356	432	559	660	787	838	889	991	1092	1194	1397	1448	1549	1651	1778	2083	2337	2438	2845
B		36	50	57	75	98	144	187	228	266	305	387	438	489	591	635	685	735	780	875	980	1020
H (approx)		155	170	230	265	265	300	355	415	455	505	515	600	640	735	815	870	910	960	1040	1115	1175
ØW		250	250	250	300	300	400	400	400	600	600	600	750	750	750	750	750	750	750	750	750	750

### ASME 900 Class

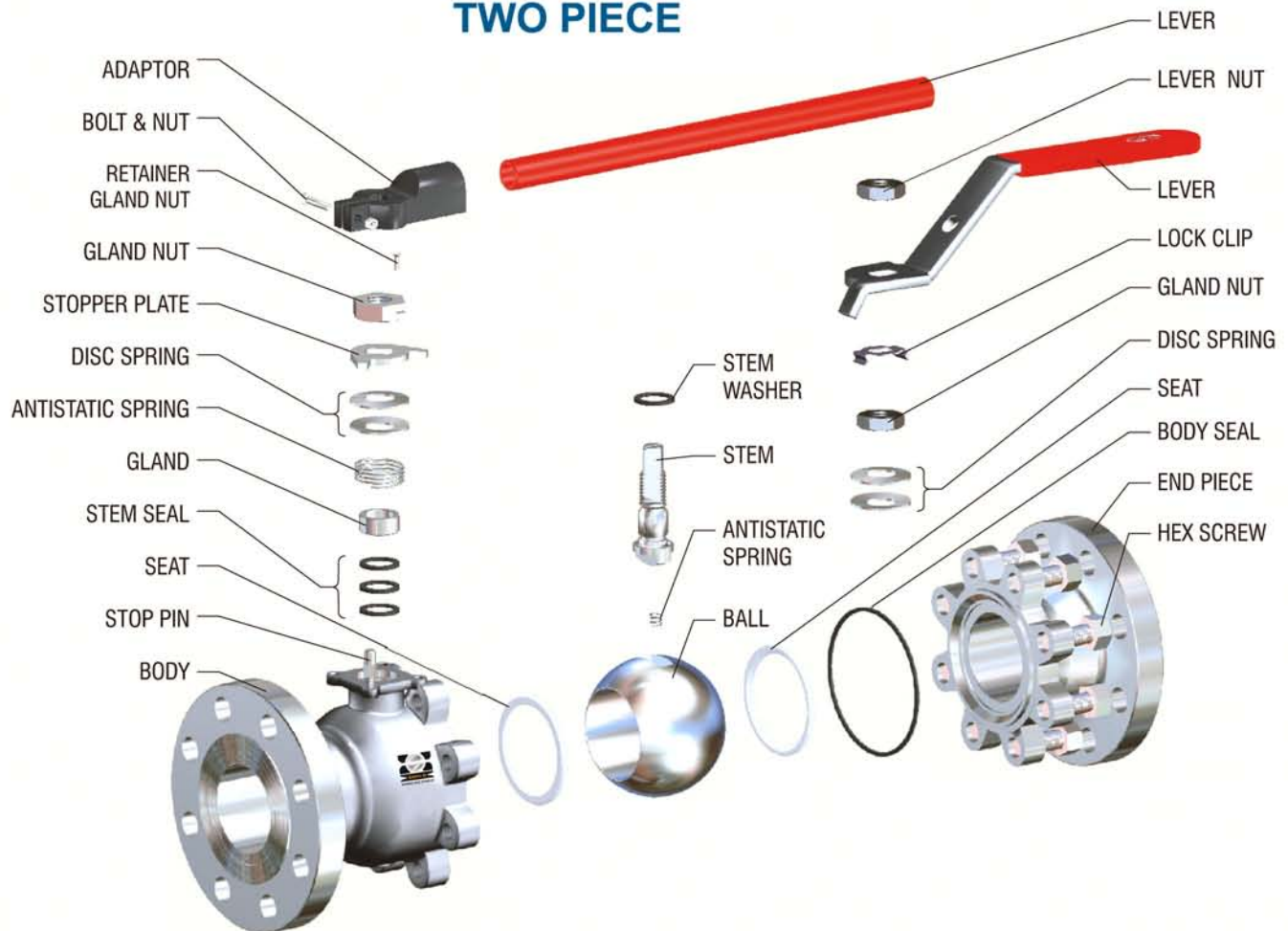
Size	DN	50	65	80	100	150	200	250	300	350	400	450	500	600	650	750	900
L - RF		368	419	381	457	610	737	838	965	1029	1130	1219	1321	1549	1651	1880	2286
B		36	50	57	75	98	144	187	228	266	305	387	438	489	570	620	715
H (approx)		190	210	250	285	280	310	360	455	510	525	595	650	685	695	735	815
ØW		250	250	300	300	400	400	400	600	600	600	750	750	750	750	750	750

### ASME 1500 Class

Size	DN	50	65	80	100	150	200	250	300	350	400
L - RF		368	419	470	546	705	832	990	1130	1257	1384
B		36	50	57	75	98	144	187	241	290	320
H (approx)		205	230	260	290	305	370	470	520	575	635
ØW		300	400	400	600	600	750	750	750	750	750



## TWO PIECE



## MATERIALS

### Materials

Body / End piece	Carbon Steel ASTM A216 Gr. WCB / Stainless Steel ASTM A351 Gr. CF8 / CF8M / CF3 / CF3M / CN7M / Duplex
Ball / Stem	Stainless Steel ASTM A217 Gr. CA15 / ASTM A351 Gr. CF8 / CF8M / CN7M / ASTM A276 Type 410 / 304 / 316 / Duplex
Seat	PTFE / CFT / GFT / DELRIN / NYLON / PEEK / METAL
Stem Washer	GFT / Grafoil
Stem Seal / Body Seal	Grafoil
Lever	Steel
Body Studs / Nuts	ASTM A193 Gr. B7/ ASTM A194 Gr. 2H
Surface Protection for Carbon Steel Valves	Base Phosphating. Additional External Coating : Smoke Grey Synthetic Enamel



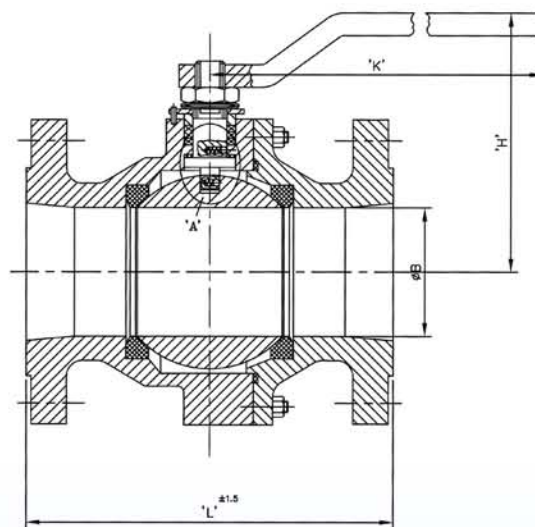
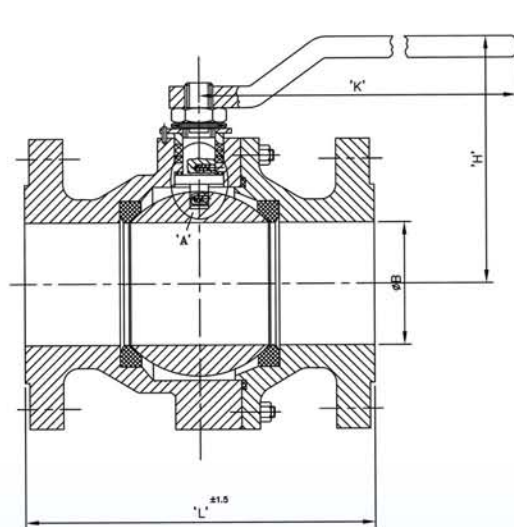
## FULL & REDUCED BORE



6D-0297  
6A-0581  
600-0023



ADVANCED VALVE TECHNOLOGY



## CLASS & DIMENSIONS

### FULL BORE

#### ISO DN 20 / ASME 150 Class

Size	DN	15	20	25	40	50	65	80	100	150	200
L - RF		108	118	127	165	178	190	203	229	267 (SP) / 394 (LP)	292 (SP) / 457 (LP)
B		12.5	17	24	37	49	64	75	98	148	198
H (approx.)		65	70	80	95	110	135	145	170	235	275
K		150	155	160	180	200	225	325	350	500	600

#### ISO DN 50 / ASME 300 Class

Size	DN	15	20	25	40	50	65	80	100	150	200
L - RF		140	152	165	190	216	241	282	305	403	502
B		12.5	17	24	37	49	64	75	98	148	198
H (approx.)		70	85	90	105	120	145	160	195	250	290
K		155	160	180	200	225	325	350	500	600	700

### REDUCE BORE

#### ISO DN 20 / ASME 150 Class

Size	DN	15	20	25	40	50	65	80	100	150	200
L - RF		108	118	127	165	178	190	203	229	292 (SP) / 457 (LP)	155 (SP) / 178 (LP)
B		9	12.5	17	28	36	50	57	75	98	144
H (approx.)		65	70	80	95	110	135	145	170	210	250
K		145	150	155	160	180	200	225	325	350	500

#### ISO DN 50 / ASME 300 Class

Size	DN	15	20	25	40	50	65	80	100	150	200
L - RF		140	152	165	190	216	241	282	305	403	502
B		9	12.5	17	28	36	50	57	75	98	144
H (approx.)		70	85	90	105	120	145	160	195	225	275
K		150	155	160	180	200	225	325	350	500	600



# GATE VALVE TECHNICAL FEATURES

## APPLICATION & FUNCTION

Gate valves are primarily used for stop valves fully opened or fully closed. They are not normally considered for throttling purposes, but more for slurries, viscous fluids, etc. Gate valves are characterized by a traveling wedge, which is moved with the operation of the stem nut. The wedge travels perpendicular to the direction of the flow. Gate valves usually have a minimum pressure drop when fully open, provide tight shut-off when fully closed, and remain relatively free of contamination buildup.

## BODY & BONNET

The design of the body and bonnet is calculated to achieve the most regular distribution of stress in all directions, as well as the minimum turbulence and resistance to flow. Valve bonnets are equipped with a backseat bushing. The yoke is integrally cast on Pressure Classes 150 and 300 up to 12" and up to 10" on Class 600 and higher ratings.

## BODY-BONNET JOINT

Standard body-bonnet joints of gate valves are machined as follows: **PRESSURE CLASS JOINT DESIGN** 150 Flat Faced 300, 600 Male-and-Female 900\* & over Ring Type Joint \*Pressure Class 600 also available in Ring Type Joint. EMFLO can supply any style of gasket required by customer.

## GATE

All gates are fully guided to the seats. As standard our valves are supplied with a solid flexible gate that has a tapered H cross-section. The flexible wedge is cast or machined with a circumferential groove to allow the seating surfaces to move independently and adjust to movement of the body seats. This design is beneficial where line loads or thermal expansion of the system is likely to distort the seat face in the valve. This design of gate is ideally suited for steam or other high temperature services and is especially useful to prevent sticking where valves are closed when hot and opened when cold.

## SEAT RING

Seat rings are designed to greatly reduce and/or prevent any turbulence and avoid damages due to the corrosion. The seat rings are forged or rolled in one piece, and then seal welded and overlaid, if required. After welding and all required heat treating, the seat ring faces are machined, thoroughly cleaned and inspected before leaving for assembly.

## STEM

The stem connection to the gate is a T-head design which is integral (without welding) with the stem. The accuracy in the dimensions and finishes assure a long life with a perfect tightness in the packing area, resulting in lower fugitive emissions. The stem-to-gate connection is designed to prevent the turning or the disengagement of stem from the wedge while the valve is in service. Through calculations and extreme testing, the strength of the stem-to-gate connection has proven to exceed the strength of the stem at the root of its operating thread.

## STEM PACKING

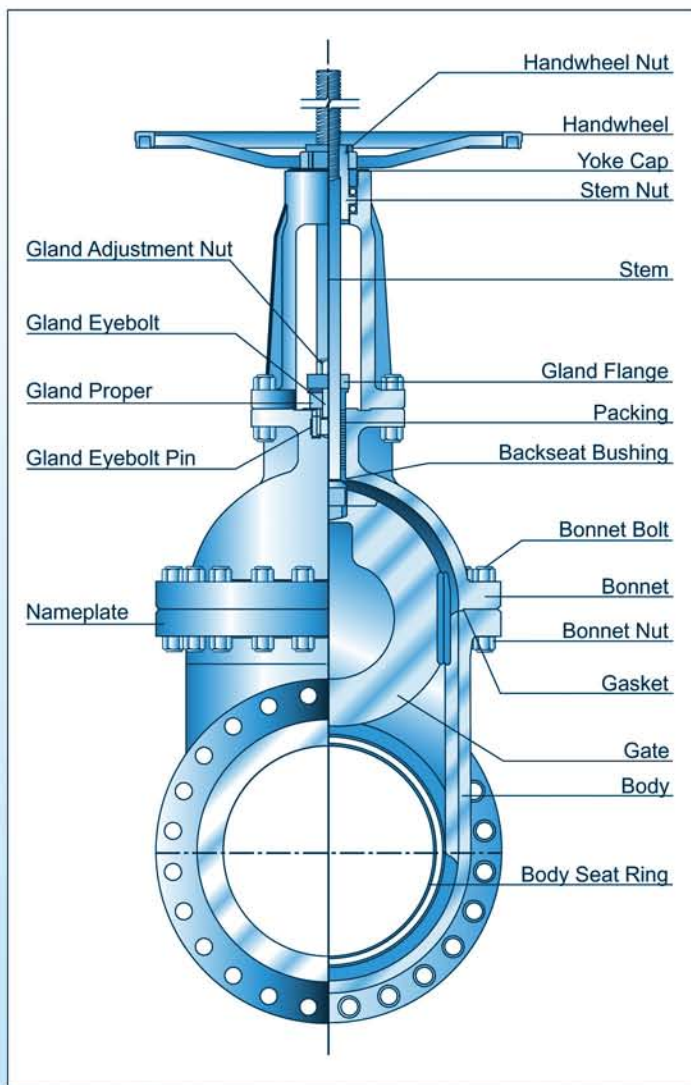
The stem packing is designed and arranged to ensure a maximum seal along the stem during operation or while at position, thus allowing for a greater reduction in fugitive emissions. Our packings are NON-ASBESTOS types. EMFLO can supply any style of packing required by our customer.



6D-0297  
6A-0581  
600-0023



ADVANCED VALVE TECHNOLOGY



EMFLO Gate Valves are manufactured to the latest edition of API Standard 600 and tested to API Standard 598.



# GATE VALVE TECHNICAL FEATURES



6D-0297  
6A-0581  
600-0023



ADVANCED VALVE TECHNOLOGY

## PACKING GLAND

The packing gland design is a two-piece self-aligning type. The gland proper has a spherical head that rides within the spherical joint of the gland flange. The gland proper has a shoulder, which restricts the complete entry into the stuffing box bore. This particular design assures a straight compression of the packing as the gland eyebolts are being equally adjusted, without injuring the stem.

## STEM NUT

The stem nut arrangement and design allows for the removal of the handwheel without allowing the stem and gate to drop into the closed position if the handwheel is removed while the valve is in the open position. Ball bearings are provided in the stem nut arrangement of Class 150 valves from NPS 14", on Class 300 valves from NPS 12", on Class 600 valves from NPS 6", and on Classes 900-1500 valves from NPS 2".

## HANDWHEELS

Handwheels are designed for easy operation and a comfortable grip. Our valves are also available with gearing, motor actuators or cylinder actuators for the more demanding services.

## BOLTS AND NUTS

For normal service conditions, ASTM A194 Class 2H and ASTM A193 Grade B7 nuts and stud bolts are furnished. If specified for high temperature service conditions, ASTM A194 Class 4 and ASTM A193 Grade B16 nuts and stud bolts are furnished. Standard bolting furnished for our stainless steel valves consists of ASTM A194 Class 8 and ASTM A193 Grade B8 nuts and stud bolts. EMFLO can supply any bolting as required by the customer.

## END CONNECTIONS

Our standard production covers valves with: • Flange ends with Raised Face (RF), Flat Face (FF) or Ring Type Joint (RTJ) that conform to ANSI B16.5. • Butt-welding ends (BW) that conform to ANSI B16.25. • All face-to-face/end-to-end dimensions conform to ANSI B16.10. • Other special end connections are supplied according to customer's requirements.

## ACCESSORIES

Accessories such as gear operators, actuators, bypasses, locking devices, chainwheels, extended stems and bonnets for cryogenic service and many others are available to meet the customers requirements.







## MATERIAL OF CONSTRUCTION

Part Name	Material Option
<b>Body</b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Bonnet</b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Wedge®</b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Stem</b>	ASTM A 276 410 / A 276 304 / A 276 304L / A 276 316L
<b>Seat Rings®</b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Back Seat Bushing</b>	ASTM A 276 410 / A 276 304 / A 276 304L / A 276 316L
<b>Gland</b>	ASTM A 276 410 / A 276 304 / A 276 304L / A 276 316L
<b>Gland Flange</b>	Carbon Steel / Stainless Steel
<b>Stem Nut</b>	ASTM A 439 Gr.D2 / Al. Bronze
<b>Lock Nut</b>	Carbon Steel / SS 304
<b>Gland Packing</b>	Graphite Asbestos / Graphoil / PTFE
<b>Bonnet Gasket</b>	Corrugated Soft Iron / Corrugated SS / Spiral Wound SS 304 with Asbestos or Graphoil / Octagonal Ring
<b>Gland Eye - Bolt &amp; Nut</b>	Carbon Steel / Stainless Steel
<b>Cross Bolts &amp; Nuts</b>	Carbon Steel / Stainless Steel
<b>Hand Wheel</b>	Carbon Steel
<b>Hand Wheel Nut</b>	Carbon Steel
<b>Grease Nipple</b>	Carbon Steel
<b>Grub Screw</b>	Carbon Steel
<b>Studs / Bolts</b>	ASTM A 193 B7 / A 193 B7M / A 193 BBM / A 320 L7
<b>Nut</b>	ASTM A 194 2H / A 194 8 / A 194 8M / A 194 4 / 7





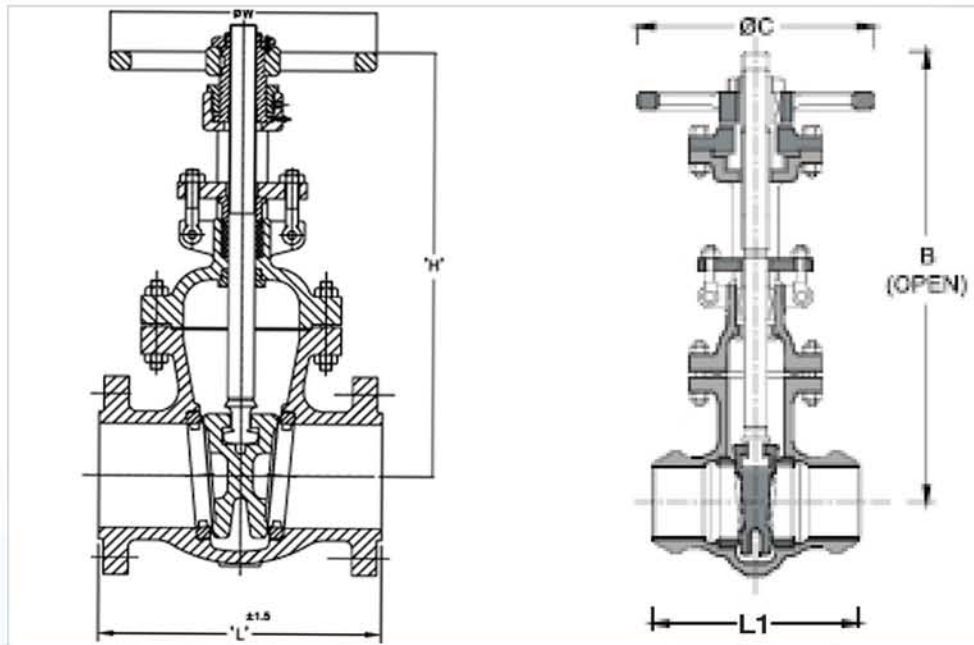
# GATE VALVE DIMENSIONS



6D-0297  
6A-0581  
600-0023



ADVANCED VALVE TECHNOLOGY



## ASME 150 Class

Size	DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	650	700	750	800	900	1000	1050
L-RF		178	191	203	228	254	267	292	330	355	381	406	432	457	508	559	609	609	660	711	812	860
**L1-BW		216	241	282	304	381	403	419	457	501	571	609	660	711	812	863	914	914	965	1016*	1066*	1143
H (approx)		425	435	535	600	705	800	1010	1250	1385	1575	1825	1950	2080	2425	2750	2825	3175	3473	3600	4100	4500
ØW		200	200	250	250	280	300	350	450	500	350*	350*	350*	400*	400*	450*	450*	500*	500*	500*	500*	550*

## ASME 300 Class

Size	DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600	650	700	750
**L-RF, LI-BW		0216	241	282	305	381	403	419	457	502	762	838	914	990	1143	1244	1346	1397
H (approx)		430	475	535	605	715	845	1075	1260	1425	1585	1845	1995	2175	2650	2850	3050	3270
ØW		200	200	250	300	300	350	450	500	500	350*	400*	450*	450*	500*	500*	500*	550*

## ASME 600 Class

Size	DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
**L-RF, LI-BW		292	330	356	432	508	559	660	787	838	889	991	1092	1194	1397
H (approx)		440	500	545	720	730	850	1200	1390	1580	1655	1905	2010	2275	2810
ØW		250	250	300	350	400	500	600	600	400*	450*	450*	500*	500*	550*

## ASME 900 Class

Size	DN	50	65	80	100	125	150	200	250	300	350	400	450	500
**L-RF, LI-BW		368	419	381	457	559	610	737	838	965	1029	1130	1219	1321
H (approx)		445	510	595	750	765	865	1225	1450	1625	1680	1925	2025	2310
ØW		300	300	300	400	450	300*	350*	400*	400*	450*	500*	500*	550*

## ASME 1500 Class

Size	DN	50	65	80	100	125	150	200	250	300	350	400	450
**L-RF, LI-BW		368	419	470	546	673	705	832	991	1130	1257	1384	1537
H (approx)		475	525	600	775	785	925	1250	1525	1725	1750	1950	2125
ØW		300	300	300*	300*	300*	350*	350*	400*	400*	450*	550*	550*



# GLOBE VALVE TECHNICAL FEATURES



6D-0297  
6A-0581  
600-0023



ADVANCED VALVE TECHNOLOGY

## APPLICATION & FUNCTION

Globe valves are primarily used as control valves where throttling or both throttling and shut-off are required. Globe valves can also be used for on-off service; however, because of the design, a pressure drop becomes inherent. This is generally confined to on-off applications where the valve is normally closed and pressure drop is not important when the valve is open. Normal applications will find the globe valve with the flow and pressure under the disc. EMFLO cast steel globe valves are commonly made in outside screw and yoke designs with full ports (including seat ring) and heavy-duty, conical plug type discs.

## BODY & BONNET

The body is full ported and spherical in form. The design utilizes large radiuses which allow for the stresses, flow resistance and turbulence to be kept to a minimum. Valve bonnets are equipped with a backseat bushing.

## BODY-COVER JOINT

Standard body-cover joints of our globe valves are machined as follows:

PRESSURE CLASS	JOINT DESIGN
150, 300, 600	Male-and-Female
900* & over	Ring Type Joint

\*Pressure Class 600 also available in Ring Joint Type

EMFLO can supply any style of gasket required by the customer.

**DISC** The valve is normally supplied with the conical plug type disc. The disc rotates freely on the stem and incorporates a differential angle from that on the seat ring. This design provides the maximum assurance of shut off, is less likely to stick in the body seat, and is considered the simplest design for field repair. The disc is held onto the stem utilizing the disc nut and a split-ring disc retainer on 2"-4" in pressure classes 150 and 300. Larger sizes as well as pressure classes 600 and higher utilize the disc nut and a button head design which is integral with the stem. Bottom guided discs are available.

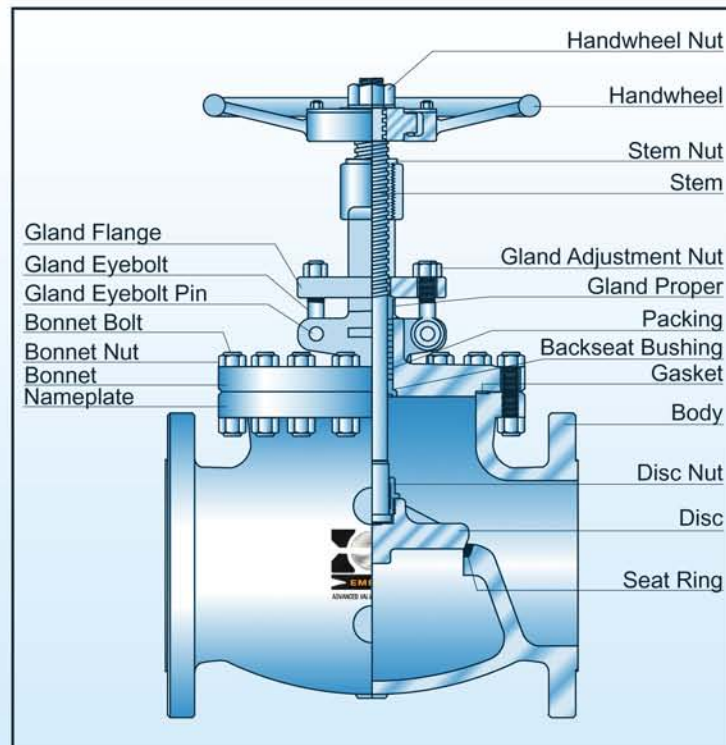
**SEAT RINGS** The seat ring design, which is normally supplied, is as follows: CLASS 150: 2"- 8"/ Integral 10" >/Seal Welded CLASS 300-900: 2"- 6"/ Integral 8" >/Seal Welded CLASS 1500 & >: 2"- 4"/ Integral 6" >/Seal Welded Other designs are available as specified by the customer. **STEM** As EMFLO's standard, all stems are rotating and rising; however, a non-rotating design is available when specified by the customer. The accuracy in the dimensions and finishes assure a long life with a perfect tightness in the packing area, resulting in lower fugitive emissions. All of our stems are designed with integral backseat features which provide an ultimate seal during packing changes.

## STUFFING BOX

The depth of the stuffing box allows for a sufficient amount of packing, which makes the stem seal. EMFLO's standard packing arrangement and stuffing box design meets <100 ppm fugitive emission requirements. If specified in the purchase order, lantern rings and/or grease injectors can be furnished.

## STEM PACKING

The stem packing is designed and arranged to ensure a maximum seal along the stem during operation or while at position, thus allowing for a greater reduction in fugitive emissions. Our packings are of non-asbestos types. EMFLO can supply any style of packing required by the customer.



EMFLO Globe Valves are manufactured and modified to the latest edition of API Standard 600 and tested to API Standard 598.



# GLOBE VALVE TECHNICAL FEATURES



6D-0297  
6A-0581  
600-0023



ADVANCED VALVE TECHNOLOGY

## PACKING GLAND

The packing gland design is a two-piece self-aligning type. The gland proper has a spherical head that rides within the spherical joint of the gland flange. The gland proper has a shoulder, which restricts the complete entry into the stuffing box bore. This particular design assures a straight compression of the packing as the gland eyebolts are being equally adjusted, without injuring the stem.

## STEM NUT

The stem nuts on EMFLO's standard rising stem globe valves are threaded into the top of the yoke where they are secured with a tack weld.

## OPERATION

Handwheels are designed with a comfortable grip for easy operation. As our standard, hammer-blow type handwheels are provided as listed in the next column: PRESSURE CLASS JOINT DESIGN 150 8" and larger 300 – 600 6" and larger 900 and over 4" and larger Our valves are also available with gearing, motor actuators or cylinder actuators for the more demanding services.

## BOLTS AND NUTS

For normal service conditions, ASTM A194 Class 2H and ASTM A193 Grade B7 nuts and stud bolts are furnished. If specified for high temperature service conditions, ASTM A194 Class 4 and ASTM A193 Grade B16 nuts and stud bolts are furnished. Standard bolting furnished for our stainless steel valves consists of ASTM A194 Class 8 and ASTM A193 Grade B8 nuts and stud bolts. EMFLO can supply any bolting as requested by the customer.

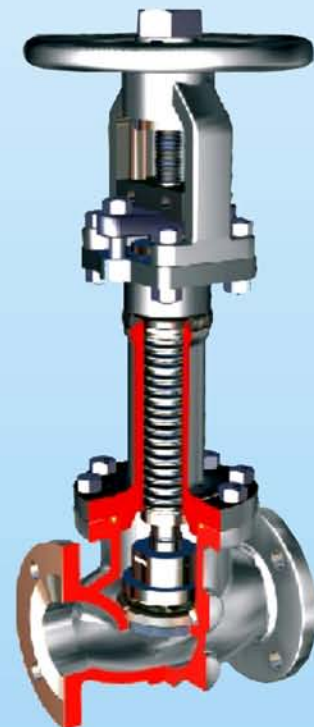
## END CONNECTIONS

Our standard production covers valves with:

- Flange ends with Raised Face (RF), Flat Face (FF) or Ring Type Joint (RTJ) that conform to ANSI B16.5.
- Butt-welding ends (BW) that conform to ANSI B16.25.
- All face-to-face/end-to-end dimensions conform to ANSI B16.10.
- Other special end connections are supplied according to customer's requirements.

## ACCESSORIES

Accessories such as gear operators, actuators, bypasses, locking devices, chainwheels, extended stems and bonnets for cryogenic service and many others are available to meet the customers requirements.







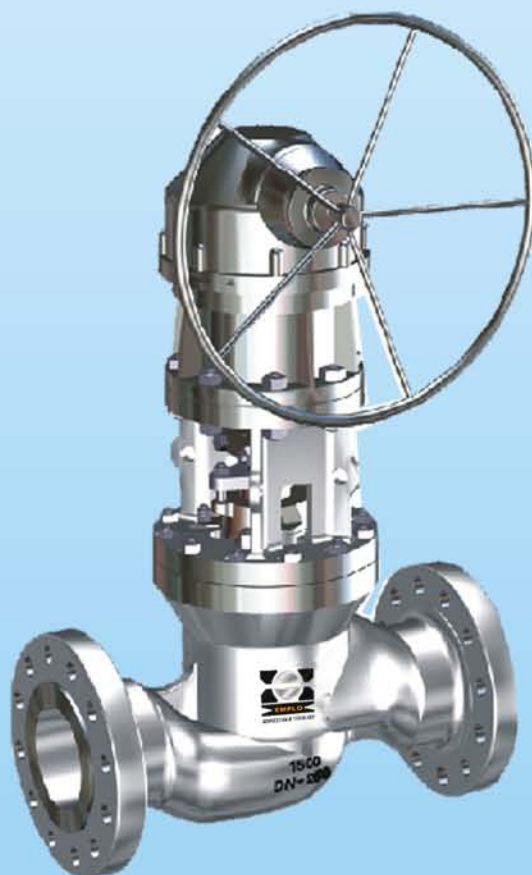
6D-0297  
6A-0581  
600-0023



ADVANCED VALVE TECHNOLOGY

## MATERIAL OF CONSTRUCTION

Part Name	Material Option
<b>Body</b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Bonnet</b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Disc ®</b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Disc Nut</b>	ASTM A 276 410 / A 276 304 / A 276 304L / A 276 316L
<b>Stem</b>	ASTM A 276 410 / A 276 304 / A 276 304L / A 276 316L
<b>Seat Rings ®</b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Back Seat Bushing</b>	ASTM A 276 410 / A 276 304 / A 276 304L / A 276 316L
<b>Gland</b>	ASTM A 276 410 / A 276 304 / A 276 304L / A 276 316L
<b>Gland Flange</b>	Carbon Steel / Stainless Steel
<b>Stem Nut</b>	ASTM A 439 Gr.D2 / Al. Bronze
<b>Gland Packing</b>	Graphite Asbestos / Graphoil / PTFE
<b>Bonnet Gasket</b>	Corrugated Soft Iron / Corrugated SS / Spiral Wound SS 304 with Asbestos or Graphoil / Octagonal Ring
<b>Gland Eye - Bolt &amp; Nut</b>	Carbon Steel / Stainless Steel
<b>Cross Bolts &amp; Nuts</b>	Carbon Steel / Stainless Steel
<b>Hand Wheel</b>	Carbon Steel
<b>Hand Wheel Nut</b>	Carbon Steel
<b>Grub Screw</b>	Carbon Steel
<b>Studs / Bolts</b>	ASTM A 193 Gr B7 / A 193 Gr B7M / A 193 Gr B8 / A 193 Gr B8M / A 320 Gr L7
<b>Nut</b>	ASTM A 194 Gr 2H / A 194 Gr 2HM / A 194 Gr 8 / A 194 Gr 8M / A 194 Gr 4/7





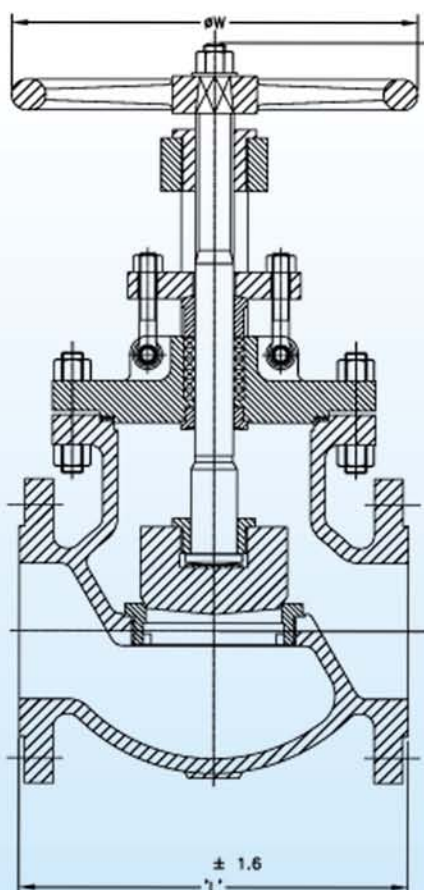
# GLOBE VALVE DIMENSIONS



6D-0297  
6A-0581  
600-0023



ADVANCED VALVE TECHNOLOGY



## ASME 150 Class

Size	DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
**L, L1-RFBW		203	216	241	292	356	406	495	622	699	787	914	977	977	1295
H (approx)		330	390	410	475	540	585	725	825	940	1200	1270	1300	1350	1450
ØW		200	250	250	300	350	350	450	500	600	600	650	650	700	750

## ASME 300 Class

Size	DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
**L, L1-RFBW		267	292	318	355	400	444	558	622	711	838	863	977	1016	1346
H (approx)		350	425	485	520	565	655	825	920	1155	1250	1295	1340	1385	1475
ØW		200	250	300	300	350	350	500	600	700	700	450*	500*	550*	550*

## ASME 600 Class

Size	DN	50	65	80	100	125	150	200	250	300
**L, L1-RFBW		292	330	355	431	508	558	660	787	838
H (approx)		420	490	550	590	620	700	950	1140	1320
ØW		250	300	300	350	500	500	600	600	400*

## ASME 900 Class

Size	DN	50	65	80	100	125	150	200	250	300
**L, L1-RFBW		368	419	381	457	559	610	737	838	965
H (approx)		495	540	600	655	670	780	1050	1300	1480
ØW		300	350	350	500	500	350*	350*	400*	450*

## ASME 1500 Class

Size	DN	50	65	80	100	125	150	200	250
**L, L1-RFBW		368	419	470	546	673	705	832	991
H (approx)		550	580	625	750	810	925	1225	1450
ØW		300	350	400	450	500	600*	450*	500*





# CHECK VALVE TECHNICAL FEATURES



6D-0297  
6A-0581  
600-0023



ADVANCED VALVE TECHNOLOGY

## APPLICATION & FUNCTION

Swing check valves are designed to close quickly and automatically with positive shut off in either horizontal or vertical (flow up) pipe runs. Inherently, swing check valves have a low pressure drop and are best suitable for velocity applications. Our closure design allows our swing check valve to close completely even and remain closed with no flow when installed in a horizontal pipe run.

## BODY

The body is full ported and spherical in form. The design utilizes large radiuses which allow for the stresses, flow resistance and turbulence to be kept to a minimum. Bosses are provided for optional drains.

## BODY-COVER JOINT

Standard body-cover joints of our swing check valves are machined as follows:

### PRESSURE CLASS

150, 300, 600  
900\* & over

### JOINT DESIGN

Male-and-Female  
Ring Type Joint

\*Pressure Class 600 also available in Ring Type Joint.  
EMFLO can supply any style of gasket required by customer.

**HINGE ASSEMBLY** The hinge arm pivots on the hinge pin which is located near the disc's center of gravity. Body penetration for the hinge pin is sealed with a soft steel gasket and flanged plug. The hinge arm is designed to withstand the shock load of quick closing to insure a longer life and continued shut-off. The hinge arm also has an integral disc stop that provides a positive stop in the open position.

## DISC

Each disc's seating surface is precision ground and mated to the seat ring for insurance of a positive shut off. The disc is secured to the hinge arm with the disc nut and pinned to prevent disengagement during service. We can provide either integral or overlaid seat facings at customer's request.

## SEAT RING

Seat rings are designed to greatly reduce and/or prevent any turbulence and avoid damages due to corrosion. The seat rings are forged or rolled in one piece and then seal welded and overlaid, if required. After welding and all required heat treating, the seat ring faces are machined, thoroughly cleaned and inspected before leaving for assembly.

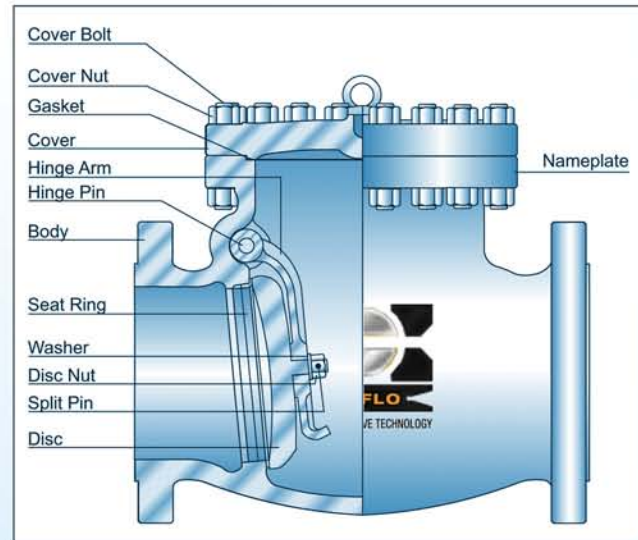
## BOLTS AND NUTS

For normal service conditions, ASTM A194 Class 2H and ASTM A193 Grade B7 nuts and stud bolts are furnished. If specified for high temperature service conditions, ASTM A194 Class 4 and ASTM A193 Grade B16 nuts and stud bolts are furnished. Standard bolting furnished for our stainless steel valves consists of ASTM A194 Class 8 and ASTM A193 Grade B8 nuts and stud bolts. EMFLO can supply any bolting as requested by the customer.

## END CONNECTIONS

Our standard production covers valves with: • Flange ends with Raised Face (RF), Flat Face (FF) or Ring Type Joint (RTJ) that conform to ANSI B16.5. • Butt-welding ends (BW) that conform to ANSI B16.25. • All face-to-face/end-to-end dimensions conform to ANSI B16.10. • Other special end connections are supplied according to customer's requirements.

## ACCESSORIES/OPTIONAL DESIGNS



**EMFLO Swing Check Valves are manufactured and modified to the latest edition of API Standard 600 and tested to API Standard 598.**





## MATERIAL OF CONSTRUCTION

Part Name	Material Option
<b>Body</b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Cover</b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Disc<sup>®</sup></b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Hinge</b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Hinge Bracket</b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Hinge Pin</b>	ASTM A 276 410 / A 276 304 / A 276 304L / A 276 316L
<b>Seat Rings<sup>®</sup></b>	ASTM A 216 WCB / A 217 WC6 / A 217 WC9 / A 217 C5 / A 217 C12 / A 351 CF8 / A 351 CF8M / A 351 CF3 / A 351 CF3M / A 352 LCB
<b>Disc Nut</b>	Carbon Steel / Stainless Steel
<b>Washer</b>	Carbon Steel / Stainless Steel
<b>Gasket</b>	Soft Iron / SS 304 / Graphoil
<b>Studs / Bolts</b>	ASTM A 193 Gr B7 / A 193 Gr B7M / A 193 Gr B8 / A 193 Gr B8M / A 320 Gr L7
<b>Nut</b>	ASTM A 194 Gr 2H / A 194 Gr B7M / A 194 Gr B / A 194 Gr 8M / A 194 Gr 4/7





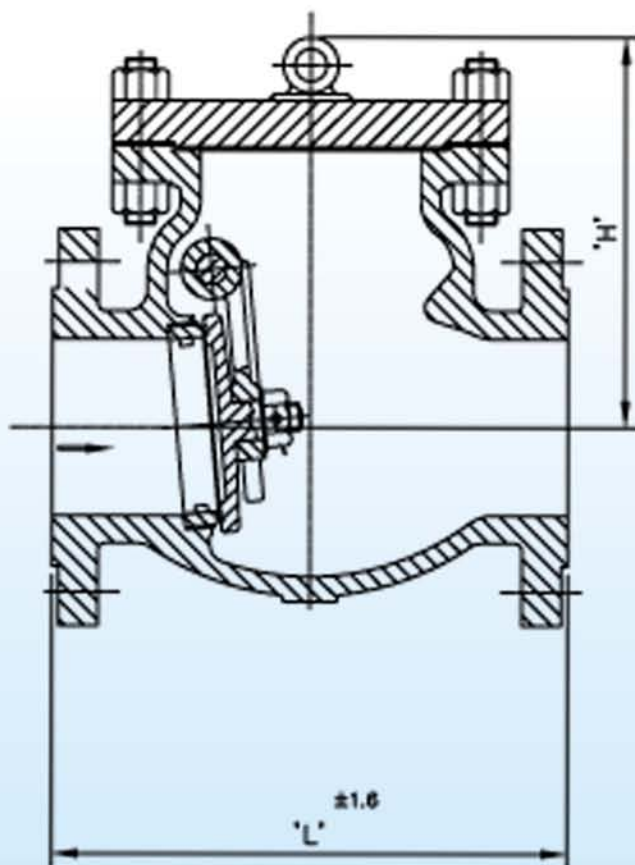
# CHECK VALVE DIMENSIONS



6D-0297  
6A-0581  
600-0023



ADVANCED VALVE TECHNOLOGY



## ASME 150 Class

Size	DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
**L-RF, LI-BW		203	216	241	292	330	356	495	622	699	787	864	977	977	1295
H (approx)		155	190	200	225	245	260	305	390	410	435	530	570	625	675

## ASME 300 Class

Size	DN	50	65	80	100	125	150	200	250	300	350	400	450	500	600
**L-RF, LI-BW		267	292	318	355	400	444	533	622	711	838	863	977	1016	1346
H (approx)		180	200	225	240	275	310	370	410	440	500	545	605	675	785

## ASME 600 Class

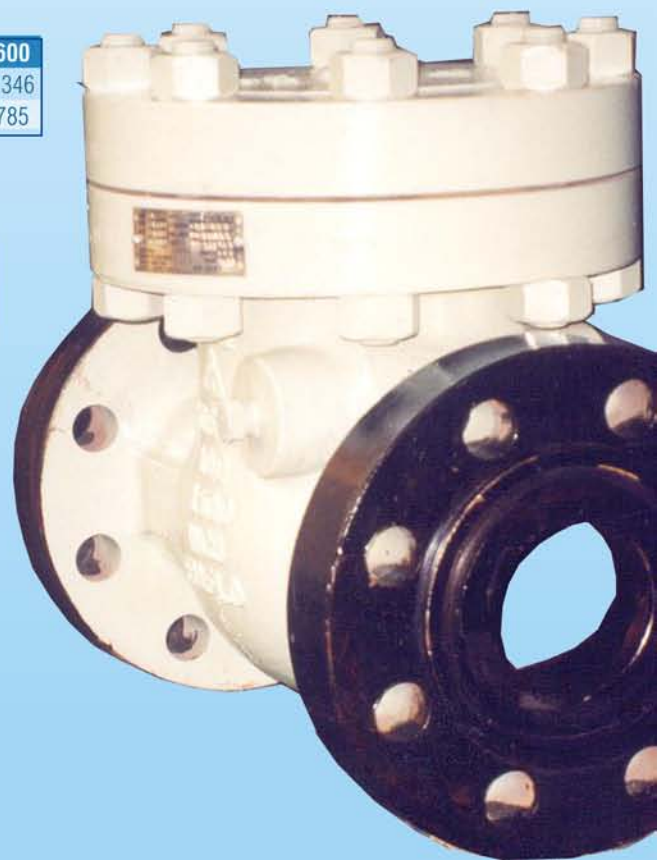
Size	DN	50	65	80	100	125	150	200	250	300	350	400	450	500
**L-RF, LI-BW		292	330	355	431	508	558	660	787	838	889	991	1092	1194
H (approx)		190	215	250	260	310	350	420	490	525	580	630	690	810

## ASME 900 Class

Size	DN	50	65	80	100	125	150	200	250	300	350
**L-RF, LI-BW		368	419	381	457	559	610	737	838	965	1029
H (approx)		195	235	260	275	320	370	435	520	530	580

## ASME 1500 Class

Size	DN	50	65	80	100	125	150	200
**L-RF, LI-BW		368	419	470	546	673	705	832
H (approx)		220	270	290	310	350	410	485





# MARINE VALVES

## GATE VALVE



### Design Standards :

- API600 / BS1414 / BSEN12288 / MSS- SP80 / BS5154 Series A BSENISO10434

### Design Configurations :

- Bolted / Union Bonnet
- Rising / Non-Rising Stem
- Inside / Outside Screw Stem
- Solid / Flexible Wedge

### Size Range:

- 2" - 24" DN50 - DN600

### Pressure Rating:

- ANSI 150

## GLOBE VALVE



### Design Standards :

- BS1873 / BS5154 Series A / MSS-SP80

### Design Configurations :

- Bolted / Union Bonnet
- Rising / Non-Rising Stem
- Inside / Outside Screw Stem

### Size Range:

- 2" - 24" DN50 - DN600

### Pressure Rating:

- ANSI 150

## BALL VALVE



### Design Standards :

- BS5351 / ENISO17292 / MSS-SP72

### Design Configurations :

- 2 piece, Constructions
- Blow out Proof Stem
- Floating and Trunnion Mounted Ball
- Firesafe Design / Anti-static

### Size Range:

- 2" - 24" DN16 - DN600

### Pressure Rating:

- ANSI 150 up to 600

## SWING CHECK



### Design Standards :

- BS1868 / BS5154 Series A / MSS-SP80

### Design Configurations :

- Bolted / Union / Screwed Bonnet
- Swing / Lift / Wafer

### Size Range:

- 2" - 24" DN50 - DN600

### Pressure Rating:

- ANSI 150

## BUTTERFLY



### Design Standards :

- API 609

### Design Configurations :

- Bidirectional
- Single / Double / Triple Offset
- Wafer / Wafer Lugged / Double Flanged
- Resilient Seat

### Size Range:

- 2" - 24" DN50 - DN600

### Pressure Rating:

- ANSI 150 & 300

## 3 PC BALL VALVE



- Design Standards : DS5351

- Design Configurations : 3 PC

### Size Range:

- 1/4" to 2"

### Pressure Rating:

- 150,300,600





**FORWARD ALLOYS & CASTINGS**  
**EMFLO VALVE DIVISION**



ADVANCED VALVE TECHNOLOGY

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