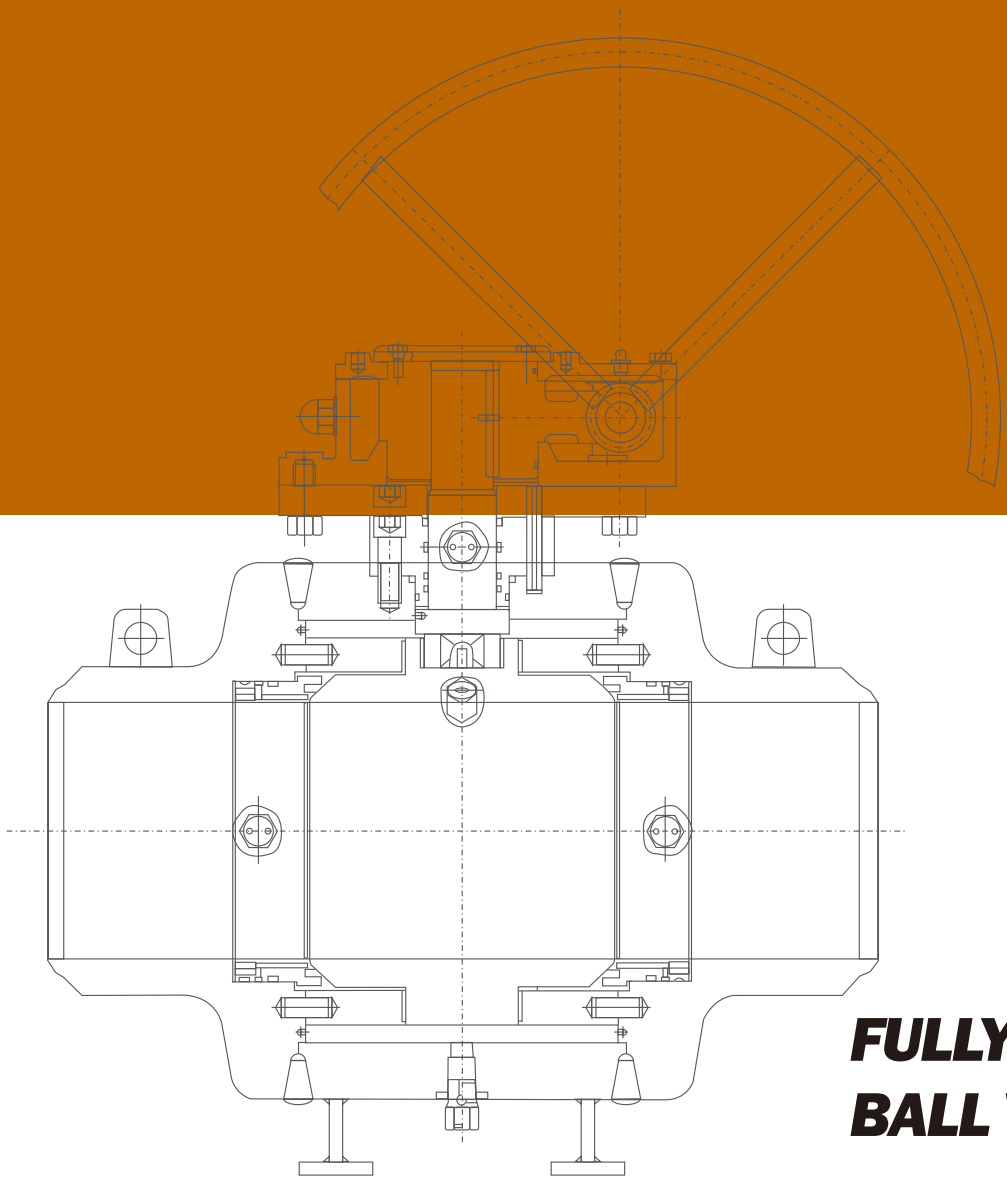
BallValve
Technology Co., Ltd.

Fullly welded body ball valve



FULLY WELDED BODY BALL VALVE

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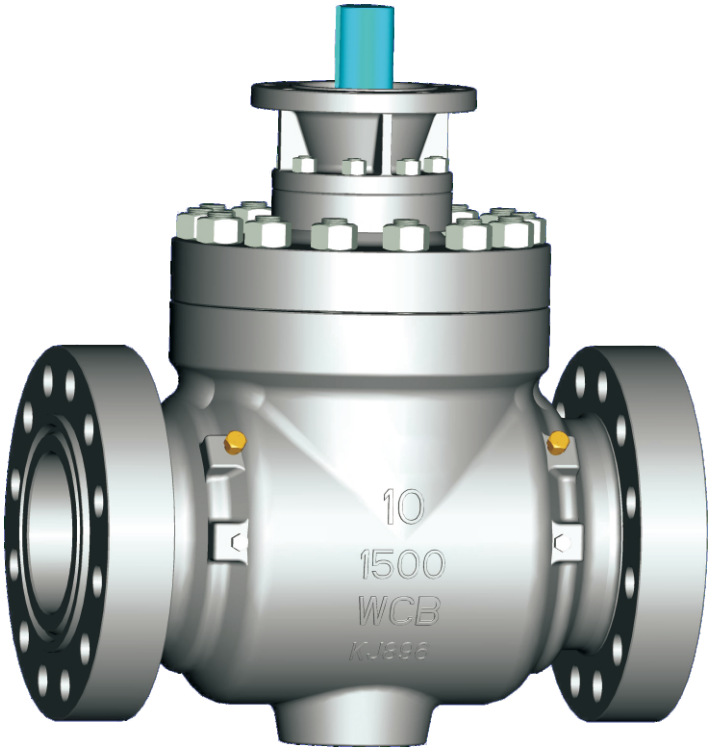
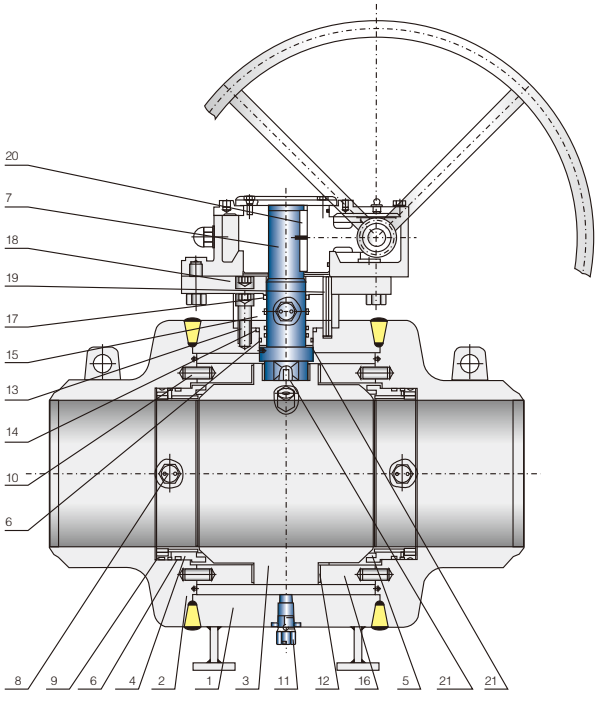
PRODUCTS CONTENTS



Ballvalve Union is committed to enhancing our customers' working site safety,system stability, and convevient operations through our valve product offerings,our diverse and innovative valves will have more safety design
longer working life and more reliable operation. located in the city with a more than forty years' history to make industrial valve,Ballvalve has carried on the mature valve manufacturing tradition of zigong city. by our advanced seat design and special workmanship,we are making high quality ball valve and through conduit gate valve,range from complete size and pressure for petroleum, chemica,and energy industrial use.to be a professional API6D valve company,we are making for reliability.

Fully welded body ball valve



RANGE OF PRODUCT

Valve size (INCH)	PRESSURE CLASS				
	ANSI150	ANSI300	ANSI600	ANSI900	ANSI1500
6					
8					
10					
12					
14					
16					
18					
20					
22					
24					
26					
28					
30					
32					
36					
40					
42					
48					

APPLICATIONS

A wide variety of body designs,materials,and trim make Ballvalve fully welded body ball vales exceptionally versatile and suitable for a multitude of liquid and gas fluid applications.

●Petroleum refining

Hydrogen
Cracking
Steam
Crude oil
Visbreakers
Naptha
Sulfur

●Oil and gas production

Oil/steam separation
Gas/oil gathering systems
Flowlines
Wellheads

●Petrochemicals

Tehylene
Propylene
Steam
Reboilers
Gases

●Marine

Oil tankers
Tanker loading terminals
Offshore platrorms
Sub–sea manifolds
Terminal transfer lines
Barge unloading lines
Shipboard services

●Chemicals

Chlorine
Phosgene
Aromatics
Polymers
Acids
Air separation
Cauctics

●Pulp and paper

Bleaching lines
Black liquor
Green liquor
White water
Steam
Chemical recovery

●Power generation

Steam
Condensate
Boiler feed pumps
Boiler feed pumps
Cooling towers
Service water recirculators
River water intake

●Steel/primary metals

Quench lines
De–scaling
Continuous casters
Steam
Condensate
Strippers
Electro–galvanizing

FULLY WELDED BODY BALL VALVE FEATURE

General design features

- Fully welded body
- Spring energized seats
- Metal or soft seated
- Double block and bleed
- Full or reduced bore
- Flanged or welded ends
- Anti blow out trunnion stem design
- Corrosion resistant low friction bearing
- Sealant injection fittings for emergency stem or seal sealing
- ISO5211 Mounting pad for actuator or gear operator
- Removalbe stem seals under full line pressure in fully opened or closed position
- Anti static device for grounding of the ball,stem and body
- Self lubricated bearings
- In accordance with API6D,API6FA,BS6755 and NACE01–75(lated edition)
- Trunnion supported design operating torque
- 8" & larger valves are equipped with lifting lugs
- Two sets of O–rings plus firesafe stem packing prevents leakage

Functions & features

1.Double block & bleed


2.Safe release


3.Reliable seal


4.Fire safe


5.Cleaning pipe


6.Emergency seal


7.Special seat


8.Bonnet combined seal


9.Draining


10.Extended stem


11.Various operations


12.Various end connections


13.Diversity of body materials


14.Diversity of seat materials

15.Various kinds of control systems


16.Reliable operation

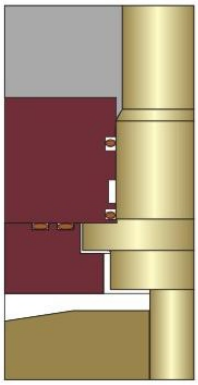

17.Bearing pipe stress safety

FULLY WELDED BODY BALL VALVE FEATURE

DESIGN FEATURES

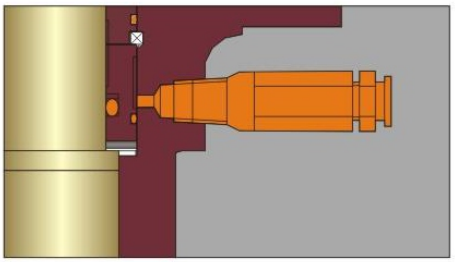
●Anti–blowout Stem design

Stem seal integrity is achieved by the use of three o–rings(or two o–rings and a graphite gasket). upper o–ring(or graphite gasket) can be replaced with the valve in line and under pressure.



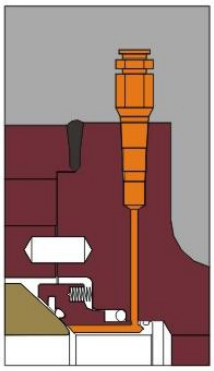
●Emergency sealant injection system

the sealant injection system loacted on the bonnet can be utilized in case of emergencies,O–ring damage,or if stem leakage occurs.



●Emergency Seat seal

special sealants may be injected thru fittings that are located on the adapter flanges to festore sealing integrity if damanged. A second internal check valve provides backup to the fitting.

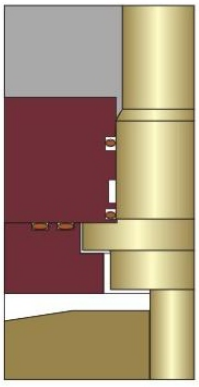


●Heavy duty bearing

Trunnion are supported by heavy duty teflon coated steel bearings.thrust load on the ball is supported by large trunnions mounted within captured trunnion blocks,resulting in low operating torque and seat wear.

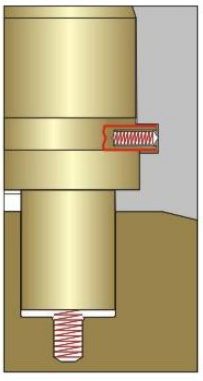
●Double sealed envelope connections

Double o–rings or a combination of an o–ring and fire safe gasket on body/ adapter connections to ensure positive sealing.this makes the p3 suitable for above or bellow ground service.



●Antistatic device

A spring between the trunnion and the ball or between the stem and the gland plate permits electrical continuity between all valve components.



TECHNICAL SEATING FEATURES

Technical seating features

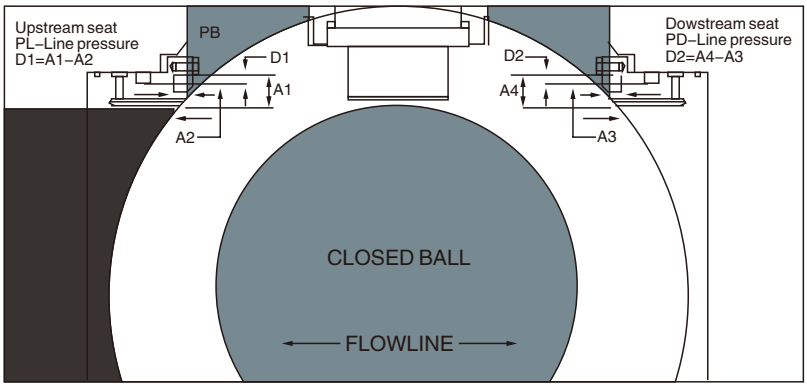
Double piston seat design

● Upstream seat:

Line pressure acting on the seat area(a1) does not equalize against the line pressure acting on the seat area(A2).The difference in the area(D1)times the line pressure creates "piston effect" force which pushes the seat against the ball surface resulting in a tight effective seal.

● Downstream seat:

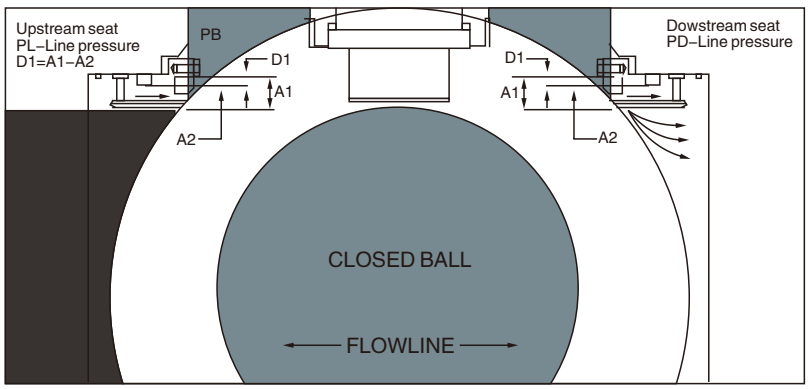
When the body cavity pressure is greater than the downstream pressure,the body cavity pressure acts on the seal area(A4).The net pressure difference, acting over area(D2),pushes the downstream seat tightly against the ball creating a positive seal.



PB=Body cavity pressure

THE ULTIMATE BENEFIT OF USING THE"DOUBLE PISTON SEAT"DESIGN:

In case of upstream seat leakage,the downstream seat maintains a pressure assiested tight shut off by sealing against the ball surface.



PB=Body cavity pressure

Self relieving seat design

● Upstream seat:

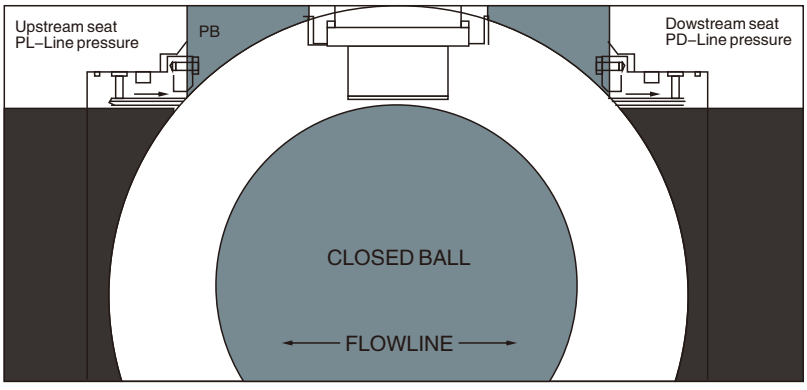
The difference in the area(D1) times the line pressure creates a "piston effect" which forces the seat against the ball surfaace, Also the springs behind the seat adds the force to the seat which keeps the seat in contact with the ball surface by providing the tight seal.

● Downstream seat:

when the body cavity pressure exceeds the spring pressure,automatic pressure relief will occur by relieving the body cavity pressure relief will occur by relieving the body cavity pressure past the downstream seat.this eliminates the need for the body relief valve.

● Double block and bleed:

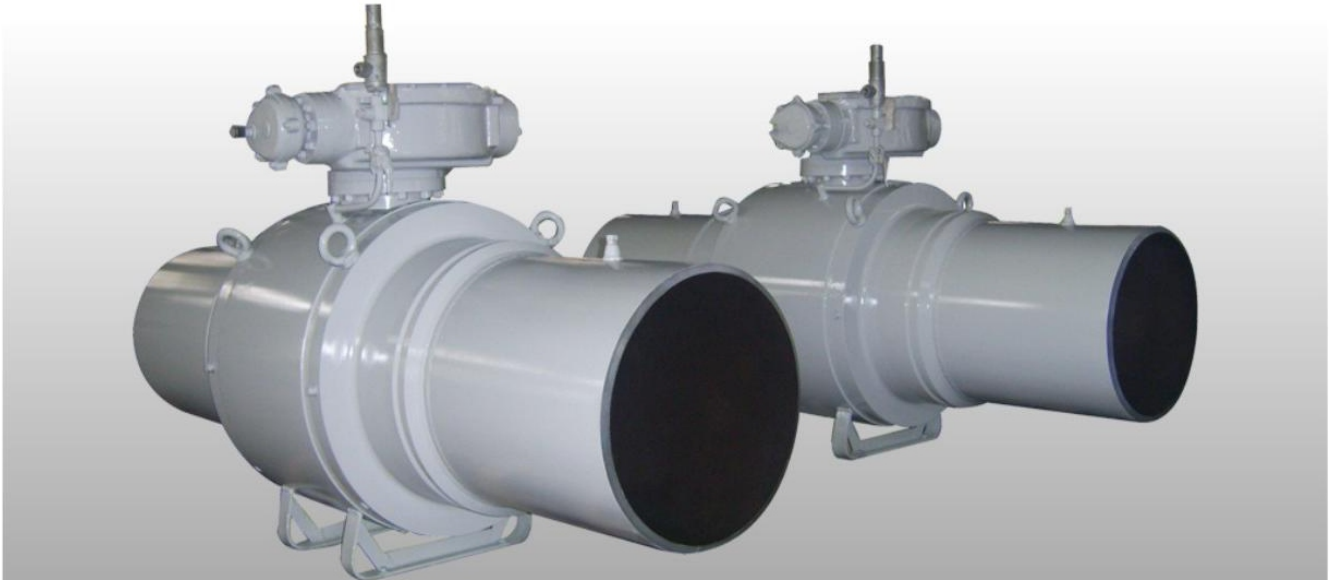
The double block and bleed condition is available in all seat design configurations. when the ball is in the closed position the body cavity pressure may be drained down to 'zero' by opening the bleed valve and draining the fluid by removing the drain plug.each seat works independently assuring tight shut off seal agaist ball on the upstream and downstream side.



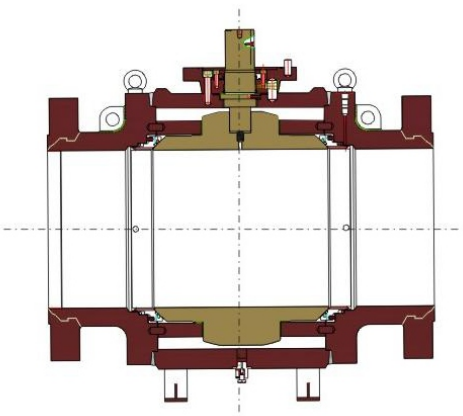
PB=body cavity pressure is zero
Cavity pressure is drained or vented to atmosphere

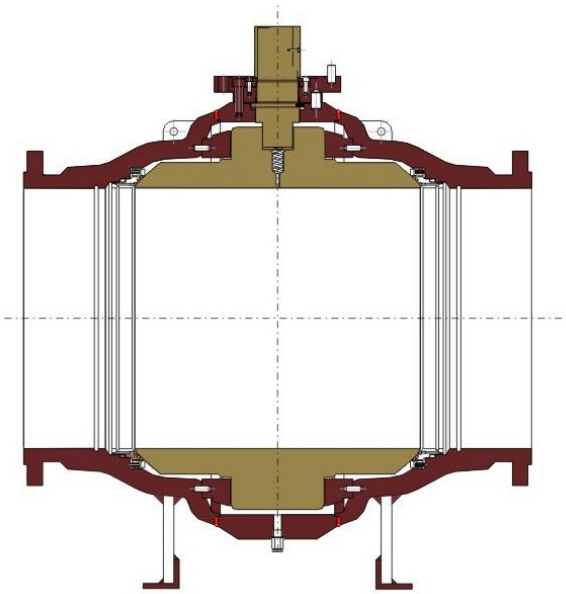
FULLY WELDED BODY BALL VALVE

- Nominal size(DN):6 inches(150mm) up to 48 inches(1200mm)
- Pressure class(PN):ANSI 150 up to ANSI 1500
- Bore:full & reduced(venturi type)
- ends:butt weld,flanged,ring joint,butt weld by flanged
- various configurations



FULLY WELDED BODY BALL VALVE

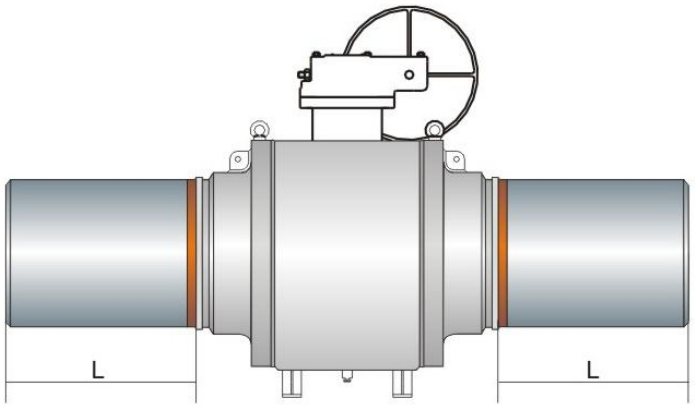




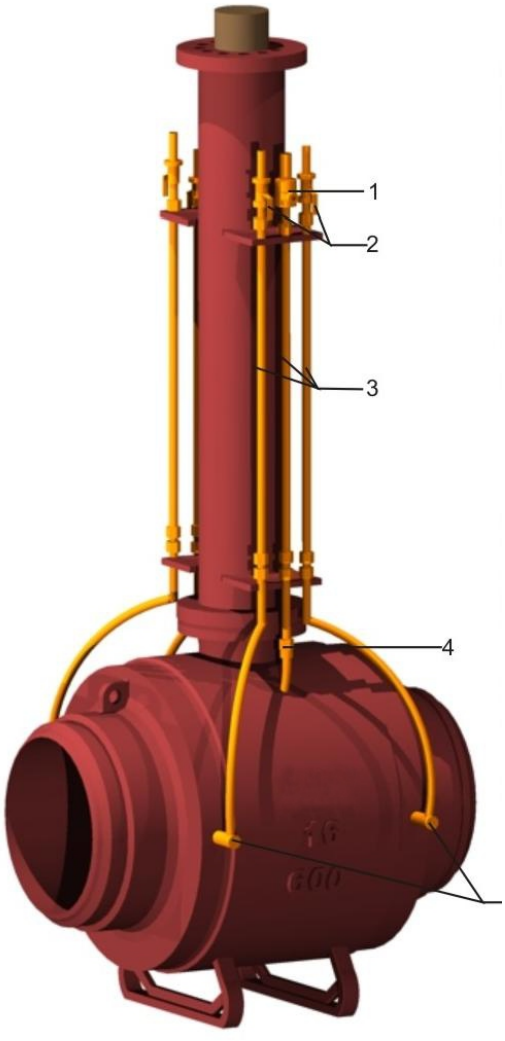
Assembly drawing

TRANSITION PUPS

The ball valves can be furnished with transition pups of different length to facilitate the installation of valve and piping on site in accordance with existing standard.
also the transition pups are required for welding between the valve and the pipeline.the transition piece length L is to be specified by the customer,including wall thickness and pipe specification.



EXTENSION DETAIL FOR AUXILIARY PIPES

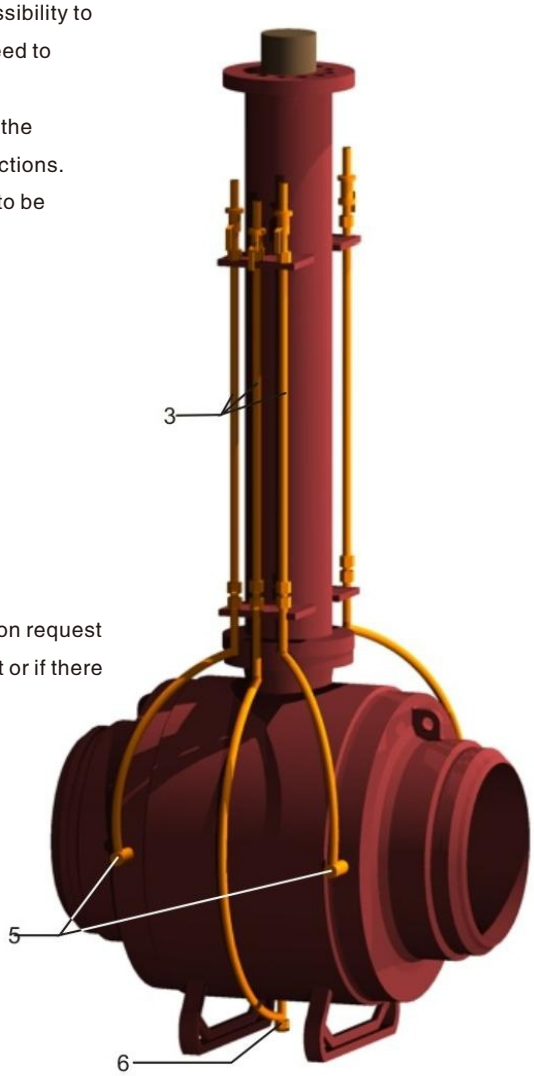


For valves buried,installed under groud or in areas that are inaccessible may be equipped with stem and auxiliary (drain,vent sealant) piping extensions.
Their operation and the accessibility to their auxiliary connections,need to be brought at ground level.
This requires an extension of the stem and all the piping connections.
The extension always needs to be specified by customer.

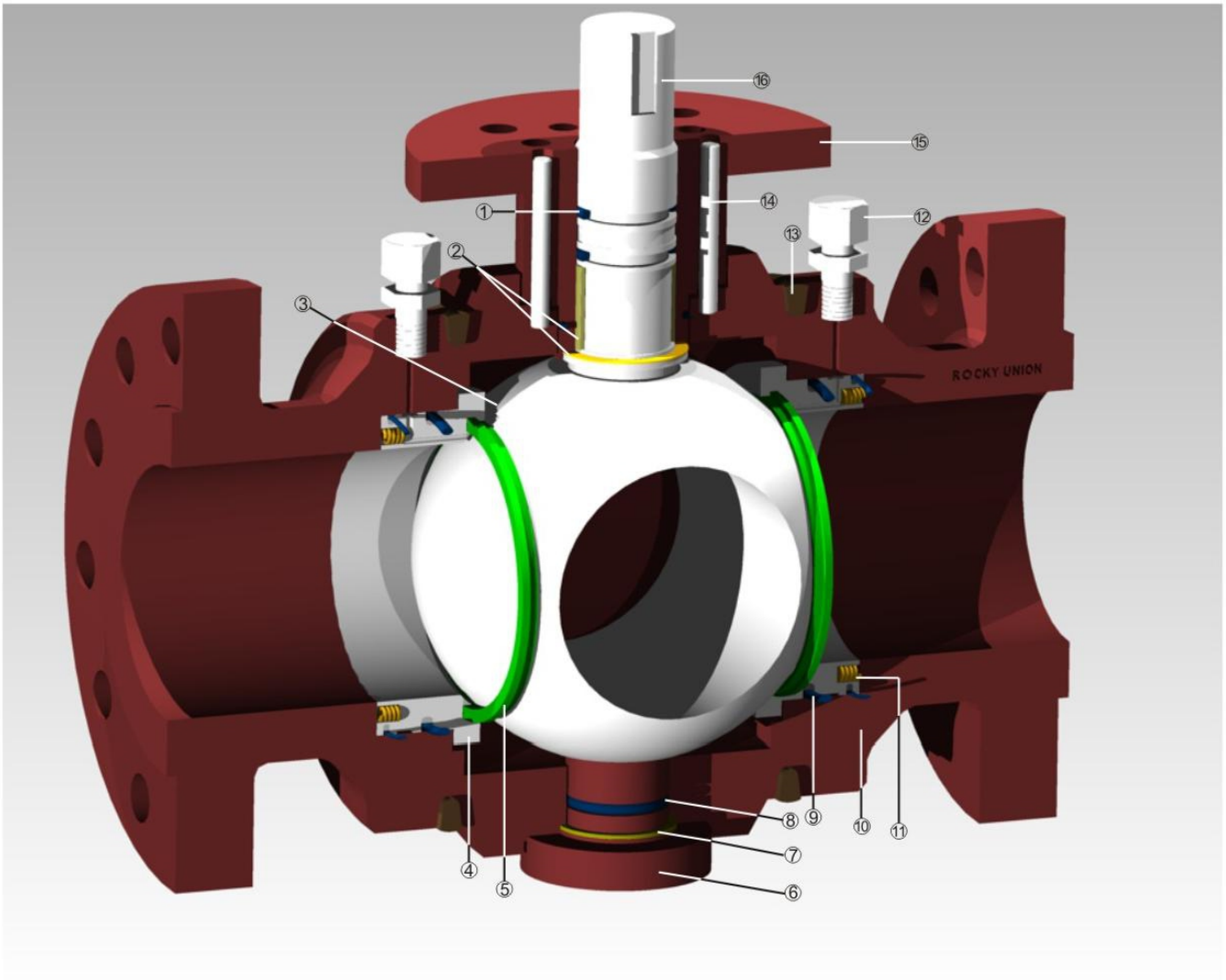
1–safety relief valve
2–needle valve
3–extension tube
4–body vent
5–seat sealant injection
6–body drain

NOTE:

1)Seat sealant injection only on request
2)Relief valve only on request or if there is a liquid medium



DYNAMIC DRAWING



Item	Part Name	Item	Part Name
1	Stem o–ring	9	seat ring o–ring
2	Stem bearing	10	body
3	Ball	11	seat ring spring
4	Seat ring	12	seat sealant injection
5	Seat insert	13	weld seam
6	Trunnion	14	pin
7	Trunnion bearing	15	monnting pad
8	Trunnion o–ring	16	stem

MATERIALS FOR MAIN PARTS

ITEM NO	SERVICE / PART NAME		NON SOUR		SOUR		CORROSION RESISTANT
			TEMPERATURE RANGE		TEMPERATURE RANGE		TEMPERATURE RANGE
			T=-45℃ up to +120℃	T=-29℃ up to +220℃	T=-45℃ up to +120℃	T=-2℃ up to +220℃	T=-200℃ up to +200℃
1	Body		ASTM A350 LF2	ASTM A105	ASTM A350 LF2	ASTM A105	ASTM A182 F316 OR 316L
2	End adapter		ASTM A350 LF2 OR A694(3)	ASTM A105 or A694(3)	ASTM A350 LF2 OR A694(3)	ASTM A105 OR A694(3)	ASTM A182 F316 OR 316L
3	Ball		ASTM A350 LF2 ENP(4)	ASTM A105 ENP(4)	ASTM A350 LF2 ENP(4)	ASTM A105 ENP(4)	ASTM A182 F316(5)
4	Seat ring		ASTM A350 LF2 ENP(4)	ASTM A105 ENP(4)	ASTM A350 LF2 ENP(4)	ASTM A105 ENP(4)	ASTM A182 F316 OR A564 TYPE 630 (17-PH)(5)
5	Seat insert(6)		Therban or viton GF (7) (8) (9)	PTFE OR Nylon OR Kel-F	PTFE OR Nylon OR kel-F		PTFE OR Nylon OR Kel-F
6	Sea(6)	STD	Therban or viton GF(9)	Nitrile or viton(9)	Therban viton GF(9)		PTFE+Inconelx750(10)
		Fire safe	viton GF(9)	viton(9)	viton GF(9)		
7	Spring(STD& FIRE SAFE)		ASTM A316 TYPE 302		Inconelx750		ASTM A316 TYPE 302
8	Stem		AISI14140 ENP(4) OR AISI 4340 ENP(4)		ASTM A564 Type 630(17-4PH)		ASTM A316 TYPE 302
9	adapter flange		ASTM A350 LF2	ASTM A105	ASTM A350 LF2	ASTM A105	ASTM A182 F304
10	bolt		ASTM A320 L7	ASTM B193 B7	ASTM A320 L7M	ASTM B192 B7M	ASTM A320 B8
11	nut		ASTM A194 Gr4	ASTM A194 2H	ASTM A194 Gr2M		ASTM A194 Gr8

For other trim material ,Ballvalve can make then at customer's request.

NOTES:

(1) Service covered by NACE MR-01-75 Code requirements(limited hardness).

(2) Elastomeric seals are not permitted.

(3) It is used for valves to be butt welded to high-strengh pipelines.

(4) ENP=Electroless nickel and/or chrome plating.

(5) Hard planting is needed when erosive phenomena are present.

(6) Selection of gasket material is according to the following temperature ranges: therban(HNBR) for T=-45℃ up to +175℃: Viton GF for T=-40℃ up to +220℃ Nitrile(NBR) for T=-29℃ up to +130℃; viton-(FPM) for T=-20℃ up to +220℃ PTFE for T=-200℃ up to +240℃;nylon 12G for T=-50℃ up to +120℃;kel-F for T=-250℃ up to +150℃

(7) Nylon 12G is used for valves pressure>ANSI600

(8) Seat insert made of PTFE reinforced with glass or graphite fiber is supplied on request.

(9) Special elastomers are supplied on request for "Crack on relief "proof.

(10) Spiral wound gasket (ANSI 316+Graphite) is used for body seals.

(11) Ballvalve reserves the right to change the materials complying with sepcifications without any notice.

APOLICABLE STANDARD

● BRITISH STANDRAD

BS 1503	Specification for steel forging for pressure purpose
BS 5404	Flanges and bolting for pipes valves and fittings
BS 1560	Steel pipe falnges and flanged fittings
BS 5351	Steel ball valves for the petroleum,petrochemicals and allied industrials
BS2080	Face to face center to center,end to end and center to end dimension of flanged butt–welding end steel valves for petroleum,petrochemical and allied industries
BS 6755Part2	Testing of valves :specification for fire type testing requirements
BS3239	Carbon steel pipe flanges for the petroleum industry

● ANSI/ASME AMERICAN STANDARDS

B 1.20.1	Pipe treads,general purpose
B 16.5	Pipe flanges and flanged fittings
B 16.10	Face to face and end to end dimessions of valves
B 16.25	Butt–welding end
B 16.34	Valves flanged,threaded and welding end
	ASME–Boiler and pressure vessel code section V,VIII & IX
B 31.3	Chemical plant and petroleum refinery piping
B 31.4	Liquid petroleum transportation piping system
B 31.8	Gas transmission and distribution piping system
B 46.1	Surface texture(surface roughness,waviness,and lay)

● API AMERICAN PETROLEUM INSTITUTE

Spec.6D	Specification for pipeline vavles
Spec.598	Valve inspection and test
Spec.5L	Sepecification for line pipe
Spec.6FA	Specification fo fire test for valves
Std.607	Fire test for soft seated ball valves
Std.5B	Threading gauging and ghread inspection of casting and line pipe thread

● DIN DEUTSCHE INSTITU FUR NORMUNG

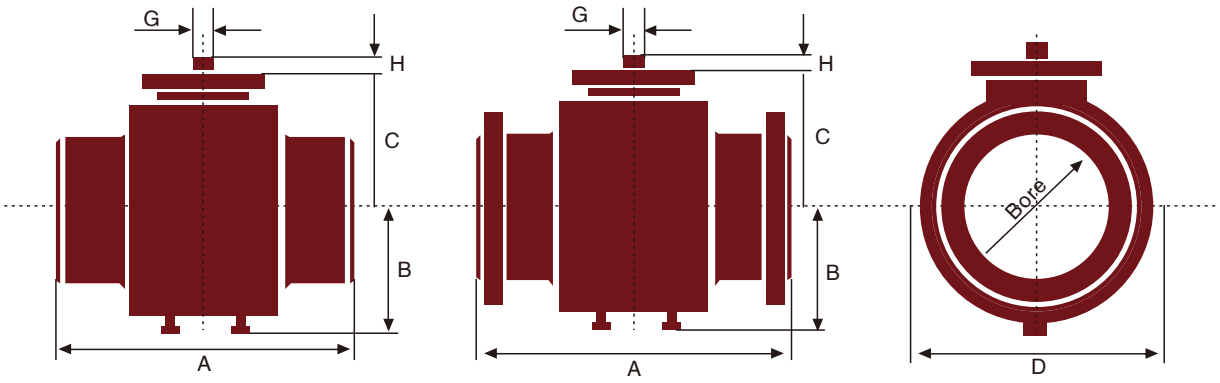
MSS	SP
SP–6	Standard finish for contract face of pipe flanges and connecting end flanges of valves and fittings
SP–25	Standard marketing system for valves,fittings, flanges and unions
SP–44	Ssteel pipe line flanges
SP–45	By pass and drain connection standard
SP–61	Hydrostatic testing of steel valves
SP–72	Ball valves with flanged or butt welding ends for general service
SP–82	Valve pressure testing methods
NACE	
MR–01–75	Sulfide stress cracking resistant material for oil field equipment
MT–01–77	Laboratory corrosion testing of metals for the process industry

● P–T Rating

The fllowing table indicates rated valves of temperature and pressusre for main materials of vlaves.
these valves are determined according to american standard ASME/ANSI B16.34

Temp.		Maximum working pressure																			
		150LB				300LB				400LB				600LB				900LB			
℃	OF	A105,LF2		ASTM A182 F316		A105,LF2		ASTM A182 F316		A105,LF2		ASTM A182 F316		A105,LF2		ASTM A182 F316		A105,LF2		ASTM A182 F316	
Up to	Up to	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi	bar	psi
38	100	19.7	285	19	275	51	740	49.6	720	68.3	990	66.2	960	102	1480	99.3	1440	153.1	2220	148.9	2160
93	200	17.9	260	16.5	240	46.5	675	42.7	620	62.1	900	56.9	825	93.1	1350	85.5	1240	139.6	2025	128.2	1860
149	300	15.9	230	14.8	215	45.2	655	38.6	560	60.3	875	51.4	745	90.7	1315	77.2	1120	135.8	1970	115.8	1680
204	400	13.8	200	13.4	195	43.8	635	35.5	515	58.3	845	47.2	685	87.6	1270	71.0	1030	131	1900	106.2	1540
264	500	11.7	70	11.7	170	41.4	600	33.1	480	55.2	800	43.8	635	82.7	1200	65.8	955	123.8	1795	98.9	1435

DIMENSIONS



ANSI 150

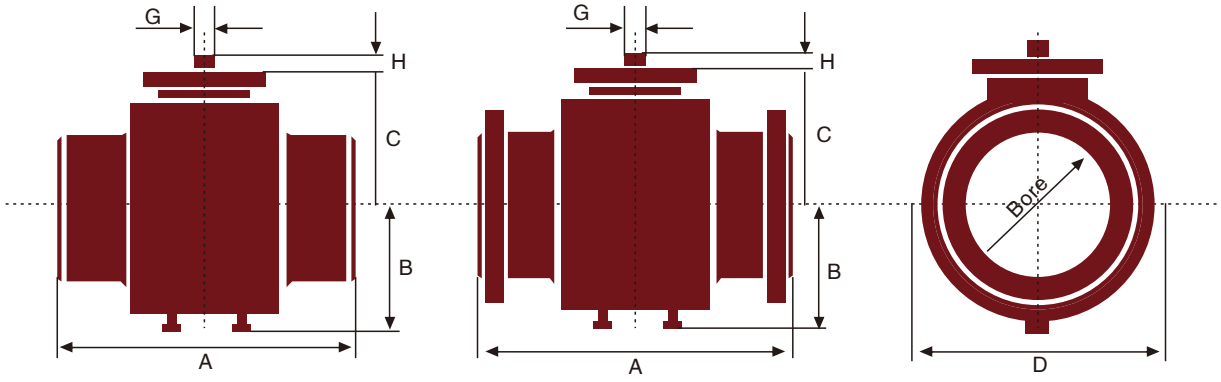
(Unit): mm

Nom.Dia	Bore	Face to face dimensions		Body			Stem		WT.(kg)	
DN(Inch)		A(WE)	A(RF)	B	C	D	G	H	WE	RF
6	152	457	394	270	225	345	55	70	185	220
8	203	521	457	325	265	425	55	70	250	290
10	254	559	533	362	299	485	55	70	400	430
12	305	635	610	405	340	560	55	70	550	620
14	337	762	686	440	371	695	75	85	820	900
16	387	838	762	430	410	792	75	85	1100	1220
18	438	914	864	490	457	870	90	115	1400	1550
20	489	991	914	535	500	950	90	115	17500	1950
22	540	1092	991	585	540	1040	90	115	2200	2350
24	591	1143	1067	635	585	1115	120	140	2800	3050
26	635	1245	1143	685	627	1190	120	140	2900	3250
28	686	1346	1245	730	667	1280	120	140	3400	3700
30	737	1397	1295	780	716	1345	120	140	4800	5300
32	781	1524	1372	820	750		120	140	5500	6000

ANSI 300

Nom.Dia	Bore	Face to face dimensions		Body			Stem		WT.(kg)	
DN(Inch)		A(WE)	A(RF)	B	C	D	G	H	WE	RF
6	152	457	403	270	225	345	55	70	185	230
8	203	521	502	325	265	425	55	70	250	300
10	254	559	568	362	299	485	55	70	400	460
12	305	635	648	405	340	560	55	70	550	670
14	337	762	762	440	371	620	75	85	820	1000
16	387	838	838	430	410	695	75	85	1100	1320
18	438	914	914	490	457	792	90	115	1400	1650
20	489	991	991	535	500	870	90	115	1750	2000
22	540	1092	1092	585	540	950	90	115	2200	2550
24	591	1143	1143	635	585	1040	120	140	2800	3100
26	635	1245	1245	685	627	1115	120	140	2900	3300
28	686	1346	1346	730	667	1190	120	140	3400	3750
30	737	1397	1397	780	716	1280	120	140	4800	5500
32	781	1524	1524	820	750	1345	120	140	5500	6500

DIMENSIONS



ANSI 600

(Unit): mm

Nom.Dia	Bore	Face to face dimensions			Body			Stem		WT.(kg)	
DN(Inch)		A(WE)	A(RF)	A(RJ)	B	C	D	G	H	WE	RF
6	152	559	559	562	270	225	345	55	70	250	330
8	203	660	660	664	325	265	425	55	70	340	450
10	254	787	787	791	362	299	485	55	70	570	710
12	305	838	838	841	405	340	560	55	70	850	1000
14	337	889	889	892	440	371	620	75	85	1100	1370
16	387	991	991	994	430	410	695	75	85	1350	1650
18	438	1092	1092	1095	490	457	792	90	115	2100	2400
20	489	1194	1194	1200	535	500	870	90	115	2600	3000
22	540	1295	1295	1305	585	540	950	90	115	3150	3550
24	591	1397	1397	1407	635	585	1040	120	140	3700	4300
26	635	1448	1448	1461	685	627	1115	120	140	3900	4500
28	686	1549	1549	1562	730	667	1190	120	140	4200	4900
30	737	1651	1651	1664	780	716	1280	120	140	6000	6900
32	781	1778	1778	1794	820	750	1345	120	140	6800	8000

ANSI 900

(Unit): mm

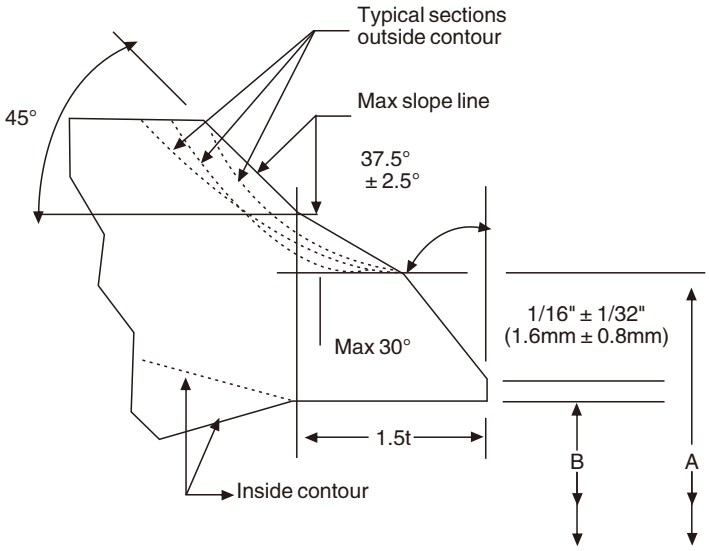
Nom.Dia	Bore	Face to face dimensions			Body			Stem		WT.(kg)	
DN(Inch)		A(WE)	A(RF)	A(RJ)	B	C	D	G	H	WE	RF
6	152	610	610	613	270	225	345	55	70	330	430
8	203	737	737	740	325	265	425	55	70	400	520
10	254	838	838	841	380	320	525	75	85	640	820
12	305	965	965	968	425	355	595	75	82	900	1050
14	324	1029	1029	1038	450	378	635	75	85	1020	1400
16	375	1130	1130	1140	455	426	735	90	115	1350	2050
18	425	1219	1219	1232	500	495	805	120	115	2600	3400
20	473	1321	1321	1334	560	520	910	120	140	3700	4200
22	524	1422	–	–	615	562	995	120	141	4000	4600
24	572	1549	1549	1568	635	585	1040	150	140	4400	5400
26	619	1729	1729	1751	715	655	1165	150	187	5800	7000
28	667	1700	1780	1802	770	694	1240	150	187	7600	8600
30	714	1700	1890	1912	815	737	1330	150	187	10000	11000
32	762	1884	2014	2036	855	781	1410	150	187	10600	12500

1)Reduced bore ball valves have the same fact–to face and end–to end dimensions as fulll bore ball valves of the same pipe size.
2)Valve size is as same as nominal pipe size.
3)Dimension(C)of a welding flanged end valves is one half the sum of dimensions (C)of a welding end and a flanged end valve of the same size and pressure rating.
4)Dimension and tolerances for flanges conform to ANSI B 16.5 or MSS SP–44
5)Welding ends conform to ANSI B31.8 and ANSI 16.25 it is up to the purchaser to specify welding end.

BUTT WELLDING DIMENSIONS----ANSI 16.25

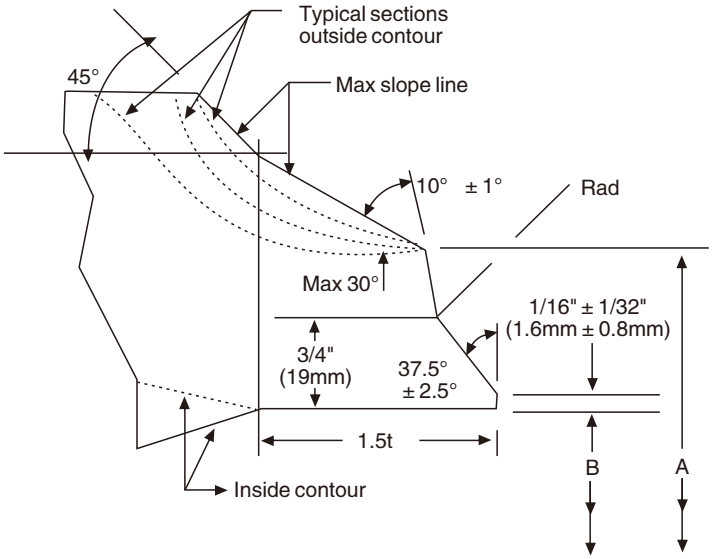
●Plain bevle butt-welding end for pipe wall thickness is 7/8"(22.23mm) or less.

Welding end details for cast components for use without backing ring or with split backing ring.



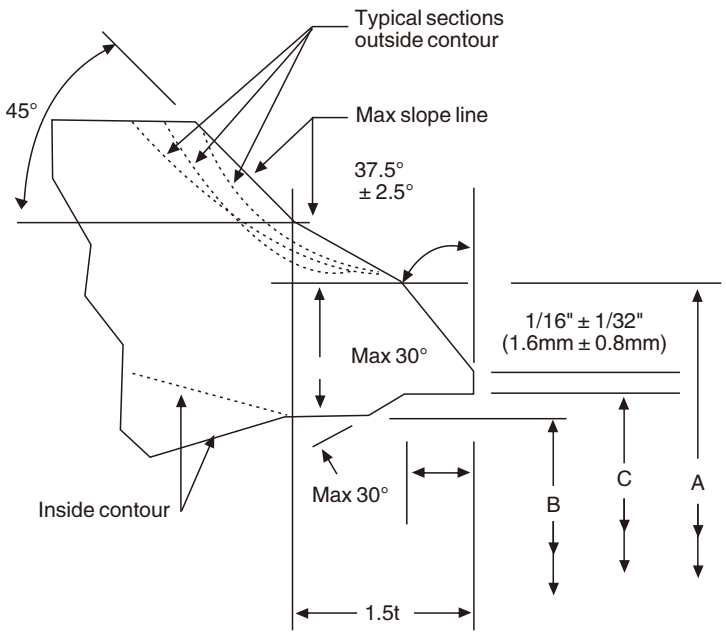
●Compound bevle butt-welding end for pipe wall thickness greater than 7/8" (22.23mm)

Welding end details for cast components for use without backing ring or with split backing ring.



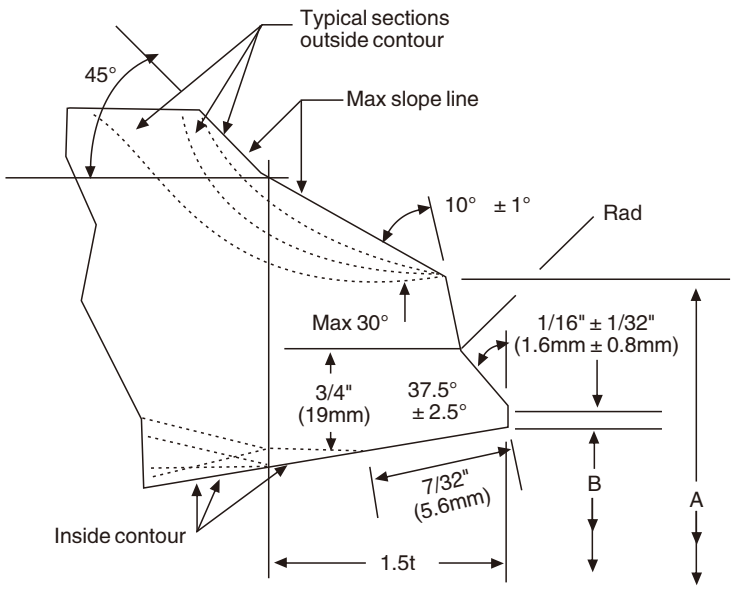
●Plain bevle butt-welding end for pipe wall thickness is 7/8"(22.23mm) or less.

Welding end details for cast components for use with continuous rectangular or tapered backing ring.



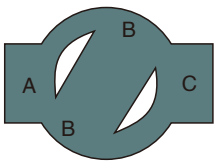
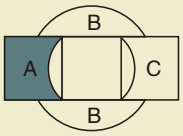
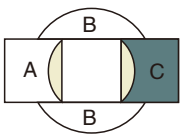
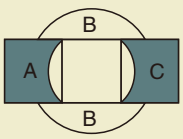
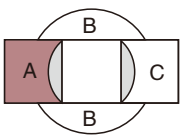
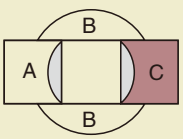
●Compound bevle butt-welding end for pipe wall thickness greater than 7/8" (22.23mm)

Welding end details for cast components for use with continuous rectangular or tapered backing ring.



FULLY WELDED BODY BALL VALVE TEST PROCEDURE

●HYDROSTATIC SEAL TEST API6D 10.3 and 10.4

Sequence		area pressure		durtion(min)		description
SHELL TEST		A	1.5XPN	6"–10"	5	1.Valve in partial open. 2.Set the pressure to 150% PN. 3.Reduce the pressure to 50% PN. 4.Reset the pressure to 50% PN. 5.Hold the pressure for the duration of testing.
		B	1.5XPN	12"–18"	15	
		C	1.5XPN	20"–60"	30	
		A	1.1XPN	5		Seat hydro seal test at A end toawrds body B
		B	Atmospheric			
		C	Atmospheric			
SHELL TEST		A	Atmospheric	5		Seat hydro seal test at C end toawrds body B
		B	Atmospheric			
		C	1.1xPN			
		A	1.1xPN	5		Seat hydro seal tes for both A and C DBB
		B	Atmospheric			
		C	1.1xPN			
●AIR SEAL TEST API6D 10.4						
SHELL TEST		A	Atmospheric	5		Seat air seal test at A end toawrds body B
		B	Atmospheric			
		C	80PSIG(5.5bar)			
		A	80PSIG(5.5bar)	5		Seat air seal test at C end toawrds body B
		B	80PSIG(5.5bar)			
		C	Atmospheric			

BallValve
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Fully welded body ball valve

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