

TECHNICAL DESCRIPTION

Ball valves are designed and manufactured to ensure maximum durability and reliability. Valves meet requirements of API 608, API 6D and ASME B16.34 standards.

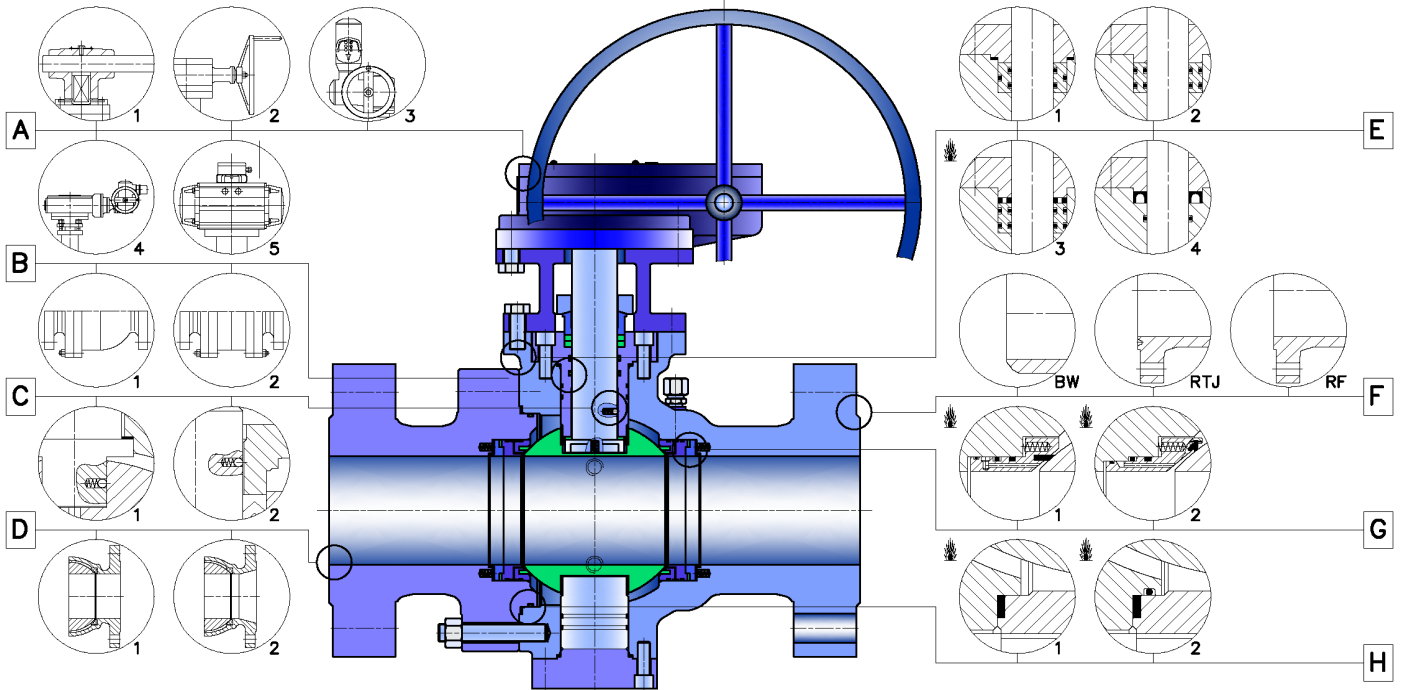
MATERIAL SPECIFICATION

Ball valves are made from carbon and stainless steel. Material execution of ball valves can be selected according to the customer's request so that it suits as much as possible valves service conditions.

APPLICATION

These shut-off valves are designed for complete closing or opening of the flow of the transported medium. The Ball valves are intended for gaseous and liquid media, e.g. air, propane-butane, city and natural gas, coke-oven and blast-furnace gas, hydrocarbons and crude oil products (diesel, petrol, oil), water and weak acids.

STRUCTURAL DESIGN OF BALL VALVE



A - Control

- hand lever
- gearbox
- electric actuator
- electric actuator with gearbox
- pneumatic actuator

B - Body execution

- Two pieces type
- Three pieces type

C - Antistatic execution

- Is solved by using springs and small balls. The ball, stem and body are electrically connected among themselves by electro-conductive method.

D - Flow through the valve

- ball valve with full flow
- ball valve with reduced flow

E - The stem packing and top bonnet sealing

- dynamically by two O-rings, statically by O-ring + graphite packing
- dynamically and statically by two O-rings
- dynamically and statically by two O-rings + graphite packing rings, meeting requirements of fire safe design
- by O-ring + V-shaped PTFE ring packing

F - Connection into piping

- Flanged
 - with rough or smooth raised face
 - with male / female facing
 - with tongue / groove facing
 - RTJ
- Welding-on
 - with welding ends according to customer's requirement

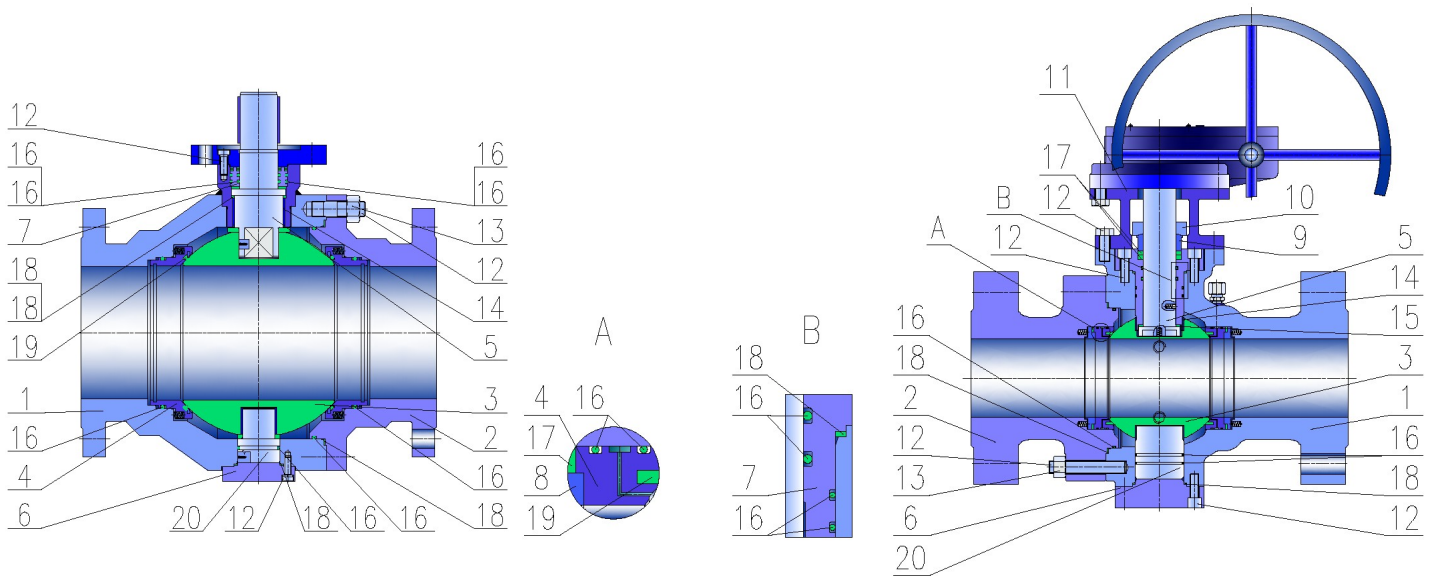
G - Execution of the seats

- The seats are made with single or double piston effect, with possibilities of greasing and in Fire safe design execution. Also the seats are supplied with „DBB“ (double block and bleed) execution. The seats with single piston effect have possibility to reduce the pressure in an intermediate space between the ball and body. The seats with double piston effect are pressed to the ball also by the fluid pressure in the intermediate space, what is ensuring hermetic closure at the inlet and the outlet side of the valve. For restriction of the pressure in the intermediate space of the body an overflow device is mounted.

H - Bonnet sealing

- executed by sealing ring or a combination of sealing ring and O-ring. To comply with Fire safe design the graphite seal ring is used, moreover body and bonnet are sealed by metal to metal.

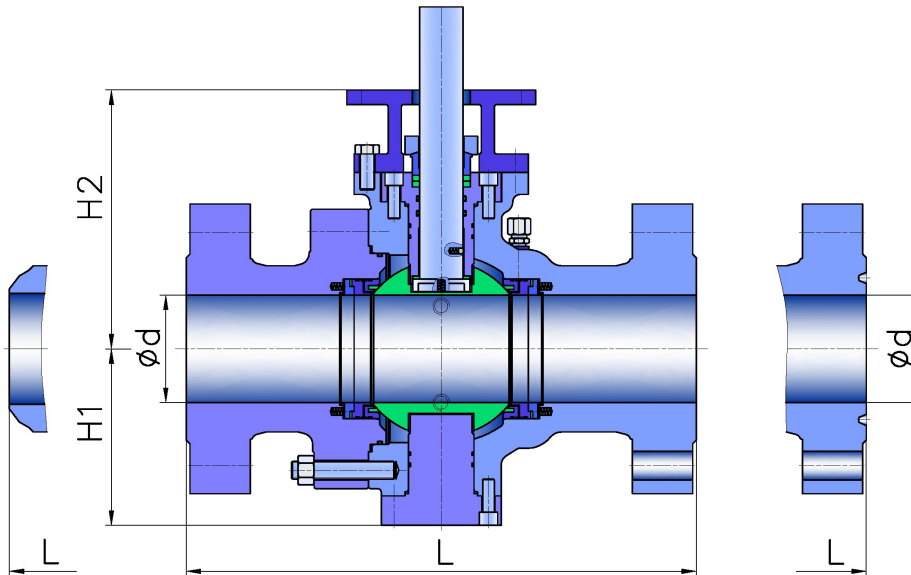
MATERIAL SPECIFICATION



Pos	Designation	Foundry execution						Forged execution					
		WCB	LCB, LCC	CF3	CF3M	CF8	CF8M	LF2	A105	1.4541	F316L	F304	F316
1	Body	A216 WCB	A352 LCB, LCC	A351 F3	A351 CF3M	A351 CF8	A351 CF8M	A350 LF2	A105	1.4541	A182 F316L	A182 F304	A182 F316
2	Bonnet	A216 WCB	A352 LCB, LCC	A351 CF3	A351 CF3M	A351 CF8	A351 CF8M	A350 LF2	A105	1.4541	A182 F316L	A182 F304	A182 F316
3	Ball	A105 + ENP (Cr), A350 LF2 + ENP (Cr)	A352 LCB, LCC + ENP (Cr)	A351 CF3, A182 F304L	A351 CF3M, A182 F316L	A351 CF8, A182 F304	A351CF8M, A182 F316	A350 LF2 + ENP (Cr)	A105 + ENP (Cr)	1.4541	A351 CF3M, A182 F316L	A351 CF8, A182 F304	A351 CF8M, A182 F316
4	Seat	A105 + ENP (Cr), A350 LF2 + ENP (Cr)	A182 F6a	A182 F304L	A182 F316L	A182 F304	A182 F316	A350 LF2 + ENP (Cr)	A105 + ENP (Cr)	1.4541	A182 F316L	A182 F304	A182 F316
5	Upper Stem	A182 F6a	A182 F6a	A182 F304L	A182 F316L	A182 F304	A182 F316	A182 F6a	A182 F6a	1.4541	A182 F316L	A182 F304	A182 F316
6	Bottom cover	A105, A350 LF2	A182 F6a	A182 F304L	A182 F316L	A182 F304	A182 F316	A350 LF2	A105	1.4541	A182 F316L	A182 F304	A182 F316
7	Top cover	A105, A350 LF2	A182 F6a	A182 F304L	A182 F316L	A182 F304	A182 F316	A350 LF2	A105	1.4541	A182 F316L	A182 F304	A182 F316
8	Thrust ring of the seat	A105 + ENP (Cr), A350 LF2 + ENP (Cr)	A182 F6a	A182 F304L	A182 F316L	A182 F304	A182 F316	A350 LF2 + ENP (Cr)	A105 + ENP (Cr)	1.4541	A182 F316L	A182 F304	A182 F316
9	Thrust ring	A182 F6a	A182 F6a	A182 F304L	A182 F316	A182 F304	A182 F316	A182 F6a	A182 F6a	1.4541	A182 F316L	A182 F304	A182 F316
10	Gland flange	A216 WCB	A352 LCB, LCC	A351 CF3	A351 CF3M	A351 CF8	A351 CF8M	A350 LF2	A105	1.4541	A182 F316L	A182 F304	A182 F316
11	Yoke	A216 WCB	A352 LCB, LCC	A351 CF3	A351 CF3M	A351 CF8	A381 CF8M	-	-	-	-	-	-
12	Bolt	A193 B7	A320 L7	A193 B8	A193 B8M	A193 B8	A193 B8M	25CrMo4	A193 B7	A2 - 70	A193 B8M	A193 B8	A193 B8M
13	Nut	A194 2H	A194 4	A194 8	A194 8M	A194 8	A194 8M	A2 - 70	A194 2H	A2 - 70	A194 8M	A194 8	A194 BM
14	Bushing	Stainless steel + PTFE, Bronze											
15	Washer	Stainless steel + PTFE, Bronze											
16	O-ring	NITRIL, VITON, NBR, HNBR, EPDM											
17	Sealing ring	Graphite											
18	Gasket	Graphite, Graphite+Stainless steel											
19	Seat ring	NYLON, DEVLON, PTFE, RPTFE, PEEK, NITRIL, VITON, NBR, HNBR, EPDM											
20	Bottom stem	A182 F6a	A182 F6a	A182 F304L	A182 F316L	A182 F304	A182 F316	A182 F6a	A182 F6a	1.1.4541	A182 F316L	A182 F304	A182 F316

Basic standards for design

- Basic design..... API 608, API 6D, ASME B16.34
- Building length..... ANSI B16.10, EN 558-2, EN 12982
- Flange dimension..... ASME B16.5, ANSI B16.47 A, EN 1759-1
- Dimension of the welding-on ends. ANSI B16.25, EN 12627
- Testing..... API 598, API 6D, EN 12266-1
- Pressure-temperature dependence.... ASME B16.34, EN 12516-1
- Top flange dimension..... EN ISO 5211
- Special NACE MR-0175



Diameter		CLASS 150									CLASS 300									CLASS 600								
		L		d	H1	H2	EN ISO 5211	weight (kg)		L		d	H1	H2	EN ISO 5211	weight (kg)		L			d	H1	H2	EN ISO 5211	weight (kg)			
NPS	DN	RF	BW					RF	BW	RF	BW					RF	BW	RF	BW	RF					BW	RF	BW	RF
1 1/2	40	165	190	38	107	119	F07	9	7,5	190	190	38	107	119	F07	9	13	241	241	241	38	119	107	F10	14	9		
2	50	178	216	49	110	170	F10	15	12	216	216	49	110	170	F10	15	20	292	292	295	51	94	110	F10	25	19		
2 1/2	65	191	241	62	118	215	F12	25	19	241	241	62	118	215	F12	25	31	330	330	333	64	115	118	F12	45	39		
3	80	203	283	74	153	218	F12	31	28	283	283	74	153	218	F12	31	42	356	356	359	76	136	153	F12	53	48		
4	100	229	305	100	135	229	F12	47	39	305	305	100	140	229	F12	52	66	432	432	435	102	180	170	F14	84	70		
6	150	394	457	152	193	245	F14	170	145	403	457	152	192	245	F14	145	178	559	559	562	152	209	237	F14	208	152		
8	200	457	521	203	240	288	F16	270	245	502	521	203	246	288	F14	245	293	660	660	664	203	263	277	F16	378	295		
10	250	533	559	254	293	331	F16	354	320	568	559	254	303	331	F16	320	392	787	787	791	254	312	314	F25	560	420		
12	300	610	635	305	340	368	F16	610	560	648	635	305	348	368	F16	560	660	838	838	841	305	354	355	F25	824	663		
14	350	686	762	337	372	393	F25	925	860	762	762	337	378	393	F25	860	990	889	889	892	334	389	381	F30	1080	923		
16	400	762	838	387	415	437	F25	1206	1036	838	838	387	429	437	F25	1036	1286	991	991	994	385	440	427	F30	1714	1434		
18	450	864	914	438	462	470	F25	1540	1320	914	914	438	518	470	F25	1320	1640	1092	1092	1095	436	530	460	F30	2120	1830		
20	500	914	991	489	511	515	F30	1832	1758	991	991	489	540	515	F30	1758	1928	1194	1194	1200	487	560	500	F35	2664	2250		
24	600	1067	1143	591	601	605	F30	2970	2860	1143	1143	591	650	605	F35	2860	3060	1397	1397	1407	538	670	615	F40	4092	3550		
26	650	1143	1245	633	700	622	F30	4140	3450	1245	1245	633	750	622	F35	4140	3450	-	-	-	-	-	-	-	-	-		
28	700	1245	1346	686	780	683	F35	4533	4250	1346	1346	686	800	683	F35	4250	4815	1549	1549	1562	636	658	675	F40	5800	5420		
30	750	1295	1397	737	830	721	F30	5307	5000	1397	1397	737	860	721	F30	5000	5595	1651	1651	1664	737	697	733	F35	7083	6450		
32	800	1372	1524	781	870	775	F35	6090	5640	1524	1524	781	900	775	F35	5640	6430	1778	1778	1794	781	736	783	F40	9137	8330		
36	900	1524	1727	876	970	849	F40	8565	8040	1727	1727	876	1020	849	F40	8040	8966	2083	2083	2099	876	821	905	F40	11549	10690		
40	1000	1900	1850	978	1028	943	F40	10872	10260	1900	1850	978	1099	943	F40	10260	10890	2180	2100	-	978	905	943	F40	14355	13210		

Diameter		CLASS 900									CLASS 1500									CLASS 2500								
		L			d	H1	H2	EN ISO 5211	weight (kg)		L			d	H1	H2	EN ISO 5211	weight (kg)		L			d	H1	H2	EN ISO 5211	weight (kg)	
NPS	DN	RF	BW	RTJ					RF	BW	RF	BW	RTJ					RF	BW	RTJ	RF	BW					RTJ	RF
2	50	368	368	371	49	98	118	F12	59	35	368	368	371	49	113	118	F12	59	35	451	451	454	49	120	170	F14	118	70
2 1/2	65	419	419	422	62	120	153	F14	67	50	419	419	422	62	125	153	F14	94	66	508	508	514	62	130	193	F16	135	85
3	80	381	381	384	74	140	170	F14	85	71	470	470	473	74	138	170	F14	109	81	578	578	584	74	150	210	F16	152	98
4	100	457	457	460	100	162	193	F14	177	160	546	546	549	100	171	193	F16	181	161	673	673	683	100	180	270	F25	362	322
6	150	610	610	613	152	213	255	F16	286	230	705	705	711	146	222	300	F16	400	300	914	914	927	146	230	300	F25	750	675
8	200	737	737	740	203	270	295	F25	440	345	832	832	841	194	280	350	F25	735	615	1022	1022	1038	194	290	350	F30	1970	1660
10	250	838	838	841	254	322	357	F25	720	560	991	991	1000	241	340	427	F25	1120	925	1270	1270	1292	241	350	427	F30	2990	2490
12	300	965	965	968	305	360	386	F30	990	770	1130	1130	1146	289	370	470	F30	1550	1300	1422	1422	1445	289	446	470	F35	4130	3450
14	350	1029	1029	1038	324	400	420	F60	1220	950	1257	1257	1276	318	499	522	F30	1915	1600	-	-	-	-	-	-	-	-	-
16	400	1130	1130	1140	375	460	471	F30	1610	1150	1384	1384	1407	362	558	598	F35	2350	1950	-	-	-	-	-	-	-	-	-
18	450	1219	1219	1232	425	486	509	F30	2600	2140	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	500	1321	1321	1334	473	530	547	F35	3480	2860	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Type designation

K84 XYZ RST - M PN / A

K84 - Valve type – Trunnion Ball Valve

X - Body design

- 2...Two pieces
- 3...Three pieces

Y - Seat execution

- 1...PTFE
- 2...PTFE + secondary sealing by paste
- 3...PTFE + Fire safe
- 4...PTFE + Fire safe + secondary sealing by paste
- 5...Metal + O - ring
- 6...Metal + O - ring + secondary sealing by paste
- 7...Metal + O - ring + Fire safe
- 8...Metal + O - ring + Fire safe + secondary sealing by paste
- 9...Metal to metal

Z - Control stem sealing method

- 1...Dynamic, Static - 2 x O - ring
- 2... Dynamic - 2xO-ring, Static-2xO-ring + Graphite
- 3...Fire safe: Dynamic - 2 x O - ring + Graphite packing,
Static - O - ring + Graphite
- 4...V-shaped PTFE O-rings
- 5...Graphite packing

R - Flow direction

- 1...Straight, full flow
- 2...Straight, reduced flow

S - Connection into piping

- 0... Wafer
- 1... Flanged
- 2... Welding-on
- 4... Outside thread G,R
- 5... Outside thread NPT
- 6... Inside thread M
- 7... Inside thread G,Rp
- 8... Combined

U - Control method

- 1...By hand lever
- 2...Hand wheel with gearbox
- 3...Electric actuator
- 4...Electric actuator with gearbox
- 5...Pneumatic actuator
- 9...Without control - bare shaft

M - Body material

- 1...Stainless steel
- 2...Alloy steel
- 3...Carbon steel

A - Special execution

DPE...Seats with double piston effect „Double Piston Effect”

As...Antistatic design

Lt...Low temperature design

