Engineered reliability from design to delivery.

Virgo Metal Seated Ball Valves

EMERSON™
Process Management

TECHNOLOGY IN FULL FLOW

Inspired by the mission of offering world-class solutions in the area of Flow Control, a group of engineers with years of experience in design and manufacture of industrial valves, started Virgo Engineers.

Although valve automation system design and manufacture was its initial business, Virgo reverse integrated into manufacture of Ball Valves, Butterfly Valves and automation accessories. In a short period of 27 years, Virgo has gained a position of prominence in the field of process control valves and automation systems in varied applications in Chemical, Petrochemical, Oil & Gas, Fertilizer, Pharmaceutical and HVAC industries.

Metal Seated Ball Valves are used in a high temperature and pressure environment where solid and abrasive medium is handled. Both Ball and Seat are hardened or have an overlay of hard surface material.

High Velocity Oxygen Fuel (HVOF) is one of the most advanced coating processes. The coated components have an abrasion resistant surface which can be mate lapped for a smooth assembly.

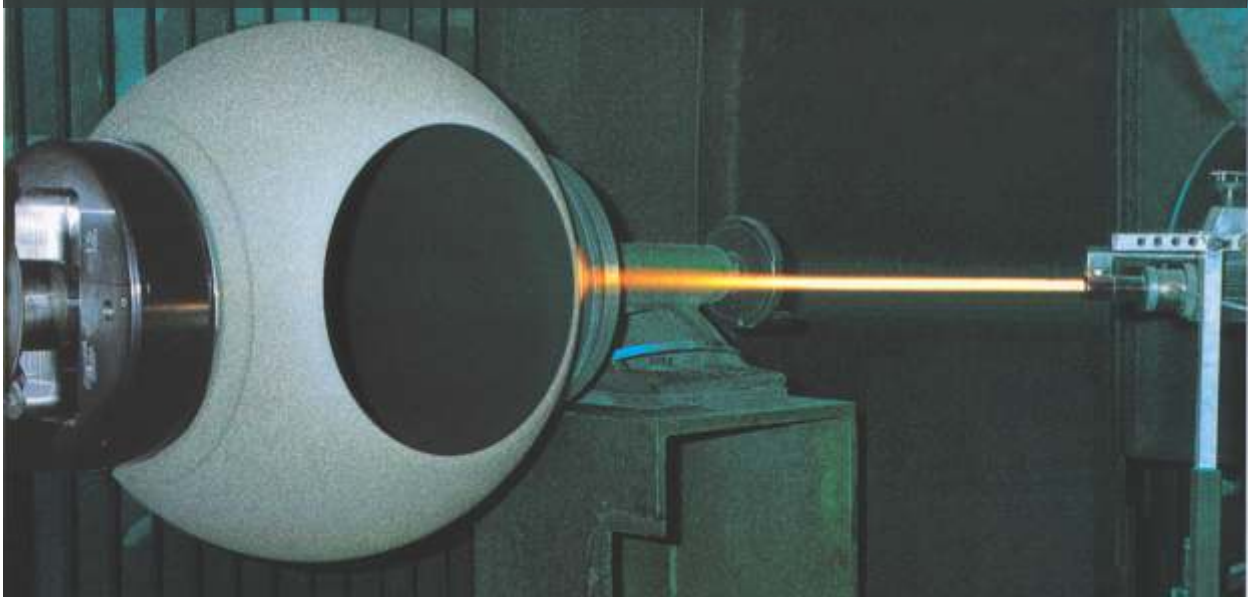
The hardness of the coated surface varies from 900 to 1300 HV.

HVOF HARD COATINGS

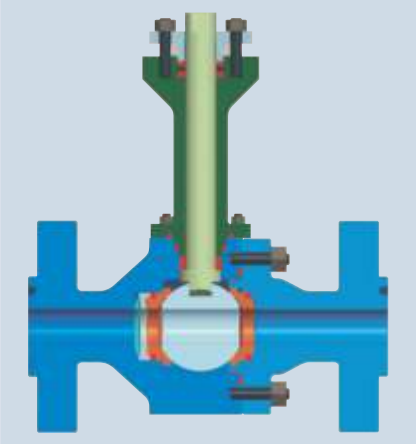
PROCESS	VIRGO CODE	TEMP LIMIT	TYPICAL HV# HARDNESS	CORROSION RESISTANCE	TYPICAL* APPLICATION
Chrome Carbide	c	-100° C To 800° C	900 - 1100	Excellent	Steam, Condensate Water, Catalyst, Refining
Tungsten Carbide	t	-196° C To 280° C	1100 - 1300	Excellent	Moderate Temp. Hydrocarbons, Abrasive Catalyst, Polymer Powder
Tungsten Carbide	t1	-29° C To 760° C	1100 - 1300	Excellent	Applications with wide temperature range requirements.

* These are general guidelines, please contact factory for specific applications.
#For actual temperature limits, consult Virgo.

High Velocity Oxygen Fuel (HVOF) coating being carried out on a ball. This advance coating process ensures uniform application, excellent finish and good bonding with the base metal. This results in an abrasion resistant surface that can be mate lapped with the hardened seat.



Virgo Metal Seated Ball Valves – Floating Design



Material of Construction

SR.NO.	NAME OF THE PART	MATERIAL		
		CARBON STEEL	**CHROME MOLY STEEL**	**STAINLESS STEEL**
1	BODY	ASTM A 216 WCB/WCC	ASTM A 217 WC6/WC9	ASTM A 351 CF8M
2	BODY ADAPTER	ASTM A 216 WCB/WCC	ASTM A 217 WC6/WC9	ASTM A 351 CF8M
3	BALL	SS 410 /SS 316 + HARD FACING		
4	SEAT	SS 410 /SS 316 + HARD FACING		
5	STEM	A 182 F 410 /17-4PH /INCONEL 718		
6	GLAND	ASTM A 216 WCB / WCC	ASTM A 217 WC6/WC9	ASTM A 351 CF8M
7	STEM PACKING	GRAPHITE		
8	BODY GASKET	GRAPHITE /REINFORCED SS 316 GRAPHITE		
9	SPRINGS	SPRING STEEL /INCONEL		
10	FASTENERS	ASTM A193 B7M / ASTM A194 2HM	ASTM A193 B16 / ASTM A194 Gr4	ASTM A193 B8M / ASTM A194 8M

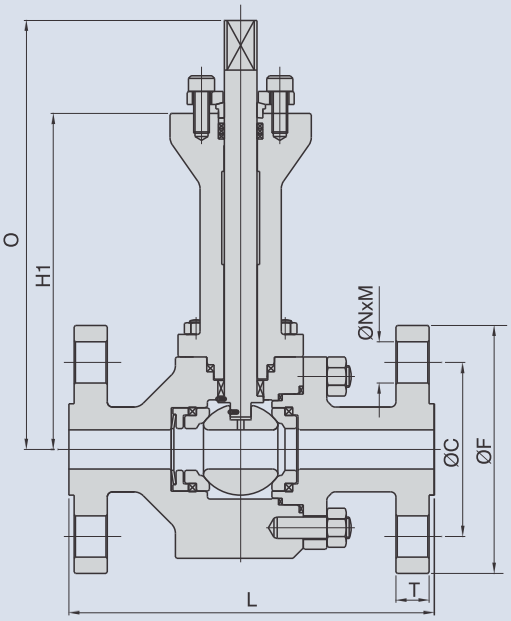
Dimensional Details

Dimensions are in mm

SIZE DN	15	20	25	40	50	80	100
CLASS	ASME 150						
L	108	117	127	165	178	203	229
ØF	90	100	110	125	150	190	230
ØC	60.3	69.9	79.4	98.4	120.7	152.4	190.5
ØN	15.9	15.9	15.87	15.87	19.05	19.05	19.05
M	4	4	4	4	4	4	8
T	8	8.9	9.6	12.7	14.3	17.5	22.3
O	217	220	235.5	248	*	*	*
H1	183	186	191	207	*	*	*

Dimensions are in mm

SIZE DN	15	20	25	40	50	80	100
CLASS	ASME 300						
L	140	152	165	190	216	283	305
ØF	95	115	125	155	165	210	255
ØC	66.7	82.6	88.9	114.3	127	168.3	200
ØN	15.9	19.1	19.05	22.22	19.05	22.22	22.22
M	4	4	4	4	8	8	8
T	12.7	14.3	15.9	19.1	20.7	27	30.2
O	217	233	235.5	248	*	*	*
H1	183	188	191	207	*	*	*



Dimensions are in mm

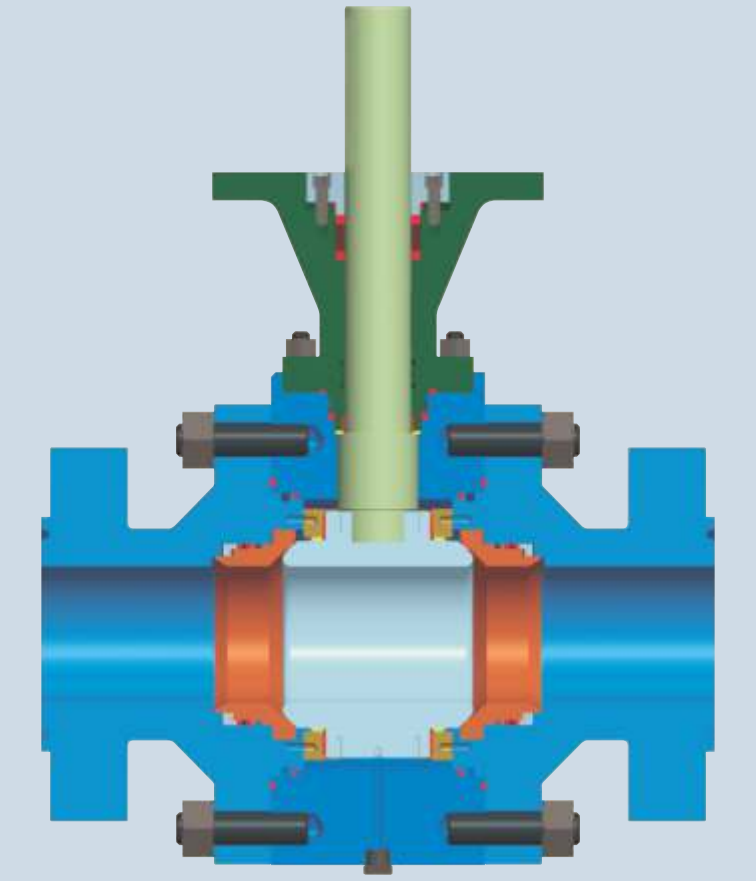
SIZE DN	15	20	25	40
CLASS	ASME 600			
L	165	190	216	241
ØF	95	115	125	155
ØC	66.7	82.6	88.9	114.3
ØN	15.9	19.1	19.05	22.2
M	4	4	4	4
T	14.3	15.9	17.5	22.3
O	202	233	248	224
H1	182	188	207	181

Dimensions are in mm

SIZE DN	15	20	25	40
CLASS	ASME 900/1500			
L	216	229	254	305
ØF	120	130	150	180
ØC	82.6	88.9	101.6	123.8
ØN	22.2	22.2	25.4	28.57
M	4	4	4	4
T	22.3	25.4	28.6	31.8
O	233.5	233.5	233.5	*
H1	189	190	190	*

For * marked dimensions consult Virgo

Virgo Metal Seated Ball Valves – Trunnion Supported



Material of Construction

		MATERIAL		
SR.NO	NAME OF THE PART	**CARBON STEEL**	**CHROME MOLY STEEL**	**STAINLESS STEEL**
1	BODY	ASTM A 216 WCB/WCC	ASTM A 217 WC6/WC9	ASTM A 351 CF8M
2	BODY ADAPTER	ASTM A 216 WCB/WCC	ASTM A 217 WC6/WC9	ASTM A 351 CF8M
3	BALL	SS 410/ SS 316 + HARD FACING		
4	SEAT	SS 410/ SS 316 + HARD FACING		
5	STEM	A 182 F 410 /17-4PH INCONEL 718		
6	STEM HOUSING	ASTM A 216 WCB/WCC	ASTM A 217 WC6/WC9	ASTM A 351 CF8M
7	TRUNNION	ASTM A 216 WCB/WCC	ASTM A 217 WC6/WC9	ASTM A 351 CF8M
8	BODY GASKET	GRAPHITE/REINFORCED SS 316 GRAPHITE		
9	GLAND	ASTM A 216 WCB/WCC	ASTM A 217 WC6/WC9	ASTM A 351 CF8M
10	STEM PACKING	GRAPHITE		
11	STEM HSG. GASKET	GRAPHITE		
12	TRUNNION GASKET	GRAPHITE		
13	SPRINGS	SPRING STEEL/INCONEL		
14	FASTENERS	ASTM A193 B7M / ASTM A194 2HM	ASTM A193 B16 / ASTM A194 Gr4	ASTM A193 B8M / ASTM A194 8M

Virgo Metal Seated Ball Valves – Trunnion Supported
Dimensional Details

Dimensions are in mm

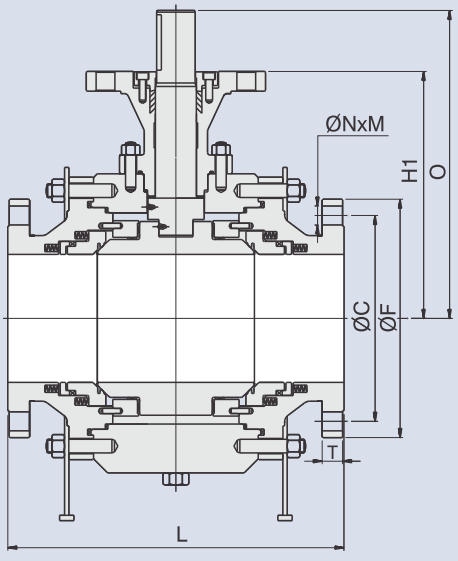
SIZE		50	80	100	150	200	250	300	350	400	450	500	600
CLASS		ASME 150											
L	RF	178	203	229	394	457	533	610	686	762	864	914	1067
	BWE	216	283	305	457	521	559	635	762	838	914	991	1143
	RTJ	191	216	241	406	470	546	622	699	775	876	927	1080
ØF		150	190	230	280	345	405	485	535	595	635	700	815
ØC		120.7	152.4	190.5	241.3	298.5	362	431.8	476.3	539.8	577.9	635	749.3
ØN		19.05	19.05	19.05	22.2	22.2	25.4	25.4	28.5	28.5	31.8	31.8	35
M		4	4	8	8	8	12	12	12	16	16	20	20
T		14.3	17.5	22.3	23.9	27	28.6	30.2	33.4	35	38.1	41.3	46.1
O		205	243	267	361	398.5	496.5	546.5	608	647	*	*	*
H1		166	199	217	289.5	327	402.5	433.5	493	525	*	*	*

SIZE		50	80	100	150	200	250	300	350	400	450	500	600
CLASS		ASME 300											
L	RF	216	283	305	403	502	569	648	762	838	914	991	1143
	BWE	216	283	305	403	521	559	635	762	838	914	991	1143
	RTJ	232	298	321	419	518	584	664	778	854	930	1010	1165
ØF		165	210	255	320	380	445	520	585	650	710	775	915
ØC		127	168.3	200	269.9	330.2	387.4	450.8	514.4	571.5	628.6	685.8	812.8
ØN		19.05	22.2	22.2	22.2	25.4	28.5	31.8	31.8	35	35	35	41.2
M		8	8	8	12	12	16	16	20	20	24	24	24
T		20.7	27	30.2	35	39.7	46.1	49.3	52.4	55.6	58.8	62	68.3
O		205	243	296	367	457	508	590	621	681	*	*	*
H1		166	199	228	289.5	367.5	400	466	493	536	*	*	*

SIZE		50	80	100	150	200	250	300	350	400	450	500	600
CLASS		ASME 600											
L	RF	292	356	432	559	660	787	838	889	991	1092	1194	1397
	BWE	292	356	432	559	660	787	838	889	991	1092	1194	1397
	RTJ	295	359	435	562	664	791	841	892	994	1095	1200	1407
ØF		165	210	275	355	420	510	560	605	685	745	815	940
ØC		127	168.3	215.9	292.1	349.2	431.8	489	527	603.2	654	723.9	838.2
ØN		19.05	22.2	25.4	28.5	31.8	35	35	38.1	41.2	44.45	44.45	50.8
M		8	8	8	12	12	16	20	20	20	20	24	24
T		25.4	31.8	38.1	47.7	55.6	63.5	66.7	69.9	76.2	82.6	88.9	101.6
O		227.5	291	330	427.5	482.5	581	617	696	733	873	915	1125
H1		183	227	253	329.5	359	444	472	501	537	645	685.5	870

SIZE		50	80	100	150	200	250	300	350
CLASS		ASME 900							
L	RF	368	381	457	610	737	838	965	1029
	BWE	368	381	457	610	737	838	965	1029
	RTJ	371	384	460	613	740	841	968	1038
ØF		215	240	290	380	470	545	610	640
ØC		165.1	190.5	235	317.5	393.7	469.9	533.4	558.8
ØN		25.4	25.4	31.75	31.75	38.1	38.1	38.1	41.27
M		8	8	8	12	12	16	20	20
T		38.1	38.1	44.5	55.6	63.5	69.9	79.4	85.8
O		235.5	367.5	355.5	663	594.5	684.5	658.5	762
H1		191	286.5	264	488	439.5	506	489.5	582

SIZE		50	80	100	150	200	250
CLASS		ASME 1500					
L	RF	368	470	546	705	832	991
	BWE	368	470	546	705	832	991
	RTJ	371	473	549	711	841	1000
ØF		215	265	310	395	485	585
ØC		165.1	203.2	241.3	317.5	393.7	482.6
ØN		25.4	31.75	34.92	38.1	44.45	50.8
M		8	8	8	12	12	12
T		38.1	47.7	54	83	92.1	108
O		235.5	388	472	663	*	*
H1		191	307.5	360	488	*	*



For * marked dimensions consult Virgo

Note : Construction & dimensions shown are typical, actual product may vary depending on size and class

PRODUCT SELECTION CODE

Design	Construction	End Connection	Ratings	Bore	Body	Ball+Coating	Seat+Coating	Fire Safety	Operation	Special Req.
N S M P W X C D T L E U B V	1 2 3	RF RS FF FS RT SW SN BS NP BW DN BT SG LG TG BN ST SB O	1 2 3 4 5 6 8 9 O	F R	C 1 7 L 8 2 4 6 3 5 A U W I M N P R O	C 1 7 L 8 2 4 6 3 5 A U W I M N P R O t1	1 2 4 6 3 5 7 U W I M T G N L D P E V O t1	F N	B G L A C O	SI PP SE BE DP SP LP JK LT XX

Design

N	-	Side Entry Soft SeatedTrunnion
S	-	Side Entry Soft Seated Floater
M	-	Side Entry Metal Seated Trunnion
P	-	Side Entry Metal Seated Floater
W	-	Side Entry Welded Body Trunnion
X	-	Side Entry Welded Body Floater
C	-	Side Entry Cryogenic Trunnion
D	-	Side Entry Cryogenic Floater
T	-	Side Entry Multi Port (T Port)
L	-	Side Entry Multi Port (L Port)
E	-	Top Entry Soft Seated Trunnion
U	-	Top Entry Metal Seated Trunnion
B	-	Top Entry Cryogenic Trunnion
V	-	Severe Service Ball Valve

Construction

1	-	One Piece
2	-	Two Piece
3	-	Three Piece

End Connection

RF	-	Flanged Raised Face Serrated
RS	-	Flanged Raised Face Smooth
FF	-	Flanged Flat Face Serrated
FS	-	Flanged Flat Face Smooth
RT	-	Flanged RTJ
SW	-	Socket Weld
SN	-	Socket Weld With Nipple Extension
BS	-	Screwed BSP
NP	-	Screwed NPT
BW	-	Butt Weld
DN	-	DIN
BT	-	Screwed BSPT
SG	-	Small Groove
LG	-	Large Groove
TG	-	Tongue & Groove
BN	-	Butt Weld + Nipple Ext.
ST	-	Socket Weld + NPT
SB	-	Socket Weld + Butt Weld
O	-	Other than above

Ratings

1	-	150# / PN16
2	-	1500#
3	-	300# / PN40
4	-	400# / PN64
5	-	2500#
6	-	600#
8	-	800#
9	-	900#
O	-	Other than above

Bore

F	-	Full
R	-	Reduced / Regular

Body & Ball

C	-	WCB
1	-	A105
7	-	WCC
L	-	LCB
8	-	LF2
2	-	LCC
4	-	CF8 / SS304 / F304
6	-	CF8M / SS316 / F316
3	-	CF3 / SS304L / F304L
5	-	CF3M / SS316L / F316L
A	-	CA 15 / SS 410 / F6A
U	-	Duplex SS
W	-	Super Duplex
I	-	Inconel
M	-	Monel
N	-	F11 Cl.2
P	-	F22 Cl.3
R	-	F91
O	-	Other than above

Ball/Seat Coating (If applicable)

e	-	ENP
w	-	Overlay
h	-	Hard Chrome
s	-	Stellited
c	-	Chrome Carbide
t	-	Tungsten Carbide
n	-	Chromium Nitride
o	-	Other than above
t1	-	Tungsten Carbide

Seat

1	-	A105
2	-	LF2
4	-	F304
6	-	F316
3	-	F304L
5	-	F316L
7	-	CA 15 / SS 410 / F6A
U	-	Duplex SS
W	-	Super Duplex
I	-	Inconel
M	-	Monel
T	-	PTFE
G	-	RPTFE
N	-	Nylon-PA 12
L	-	Nylon-Devlon
D	-	Delrin
P	-	PEEK
E	-	PCTFE
V	-	VITON
O	-	Other than above

Fire Safety

F	-	Fire Safe
N	-	Non-Fire Safe

Operator

B	-	Bare Stem
G	-	Gear
L	-	Hand Lever
A	-	Actuated
C	-	Chain Wheel
O	-	Other than above

Special Requirement

SI	-	Sealant Injection
PP	-	Pup Piece
SE	-	Stem Extension
BE	-	Bonnet Extension
DP	-	Double Piston Effect Non Relieving)
SP	-	Short Pattern
LP	-	Long Pattern
JK	-	Jacketed
LT	-	Low Temp. (-46°C/-50 F)
XX	-	Special Requirement To Be Specified

Examples

P	2	RF	1	F	C	6c	6c	F	L	LP

Above stands for - side entry metal Seated floater, Two piece body, RF ends 150#, Full Bore, WCB Body, SS316 Ball chrome carbide coating, F316 Seat chrome carbide coating, Fire Safe, Lever Operated, long pattern.

M	3	RT	9	F	1	6s	6s	F	G	BE

Above stands for - side entry metal seated trunnion, Three piece body, RTJ ends, 900#, Full Bore, A105 Body, SS316 Ball with stellite coating F316 Seat with stellite coating, Fire Safe, Gear Operated with Bonnet extension.

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