

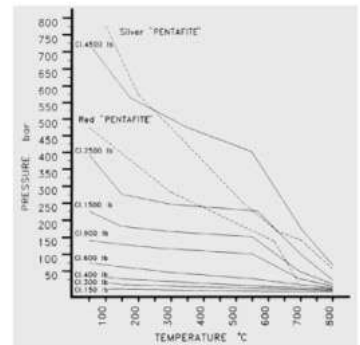
METAL SEATED
HIGH PERFORMANCE
BALL VALVES



THE PENTAFITE METAL-METAL SEAT | ESTRUCTURE
HIGH PERFORMANCE BALL VALVES

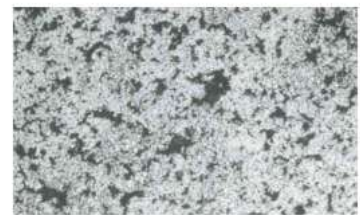


Pentafite is a metallic component with a **metallic matrix** that has a **solid lubricant dispersed inside**. It is the result that is obtained through a synthesizing process in which, from fine powders of this unique component, it is possible to produce the metal rings that form the seat insert for our ball valves with metal seat intended for services with high temperature, **high pressure** or with **pressure / temperature** combination higher than the tolerable limits for polymeric material.



Pressure / Temperature working range for seats manufactured in PENTAFITE

PENTAFITE SEAT TECHNOLOGY



100xmagnification of PENTAFITE cross-section

PENTAFITE seat insert



Seat holder



MOST IMPORTANT PROPERTIES OF PENTAFITE METAL SEATS

Perfect tightness

Elastic properties of PENTAFITE seat material allow the automatic adaptation of seats against ball shape, eliminating machining imperfections. This is the way to eliminate any possible leak-point and achieve the perfect tightness.

Low valve torque

The presence of the solid lubricant dispersion inside the metallic matrix, reduces the seat to ball friction factor and also the valve torque. For the same reason seizure or galling between seat and ball surfaces are eliminated even when the working temperature is high.

Easy maintenance

Because it is not necessary for additional machining to adapt seats against the ball (You do not have to lap the seat against the ball) valve assembly and maintenance are very easy when PENTAFITE metal seats are used.

Gas tightness

The presence of the solid lubricant inside allows the PENTAFITE material to reach very high working specific pressures resulting in perfect tightness when high pressure gases must be stopped.



AVAILABLE SEAT MATERIAL COMPOSITIONS

Material	Metallic matrix	Solid lubricant	Working temperature	Working pressure	Valve size
PENTAFITE serie SXX (Nickel base)	Nickel	Graphite or MoS2	-100°C / +780°C	ANSI 150-2500 API 10000 PN10 - 420	1/2" - 20"
PENTAFITE serie RXX (Copper base)	Copper	Graphite	-100°C / +500°C	ANSI 150-2500 PN10 - 420	1/2" - 20"
PENTAFITE serie BXX (Carbon base)	Carbon	Graphite	Amb. / +400°C	ANSI 150-300 PN10-40	1/2" - 4"

MECHANICAL AND PHYSICAL FEATURES

Friction factor against ground surface hardened to 1500 HV min. (SXX PENTAFITE Serie)	0.2
Maximum working specific pressure	30 Kg/mm ²
Maximum working temperature	780°C
Maximum working pressure	720 bar
Thermal expansion 0°-200°C	14 x10 ⁻⁵

WHAT THE AP SERIES OFFER

The AP series are our quality mass produced standard valves with excellent reliability and capability to solve the problem of high temperature fluid handling.

All valves of AP series are equipped with metallic seats in Pentafite to allow the manufacturing of metal seated ball valves with absolutely zero leakage and easy maintenance without necessity of additional lapping of the seats to the ball, typical of PENTAFITE elastic properties.

The same attention is put on the verification of tightness class toward the outside by RWTUV referred to the limits imposed from the German regulation TA-LUFT.

1 Stem tightness

The double spring system with loading nuts, allows the correct stem gasket pre-loading and the adjustment to recuperate wearing and clearance for different thermal dilation between stem and body.

2 Gasket

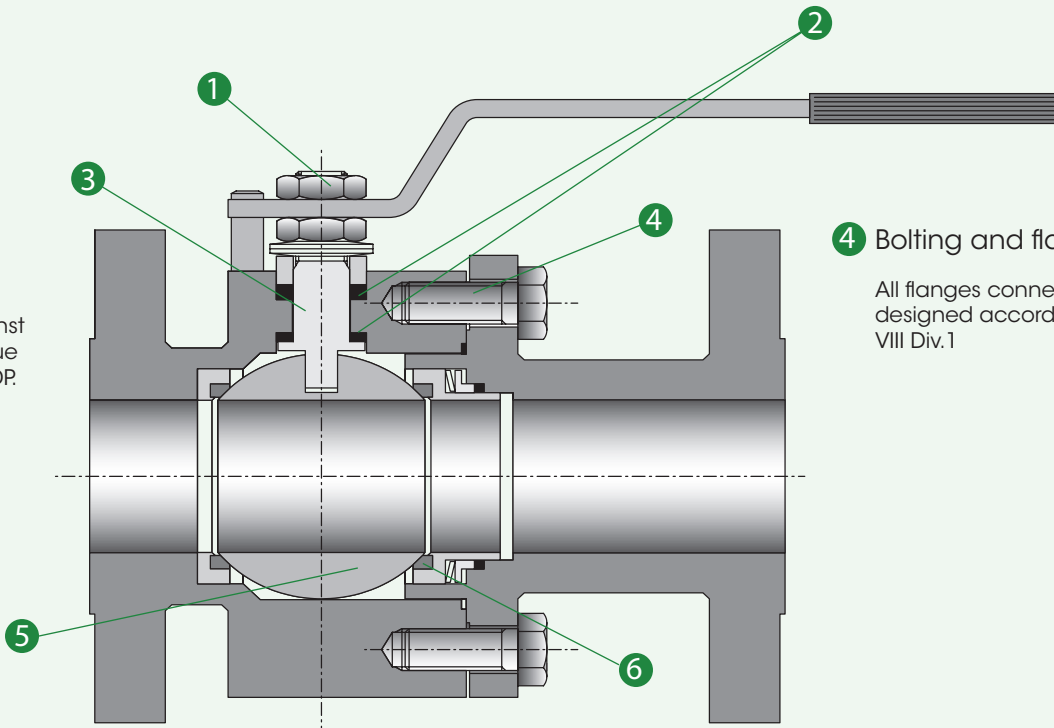
Only Grafoil® gaskets are used, inherently resistant to high temperatures; no polymers are used.

3 Stem

Stem are 100% oversized against expected torque at max. rated DP.

4 Bolting and flanges

All flanges connections are designed according to ASME VIII Div.1



5 Ball

Very high precision grounded balls are produced inside and then hard coated with most advanced system.

6 Seats

Metallic seats are pre-loading with springs for a perfect low-pressure bubble tightness and to recuperate life wearing and different thermal dilatation between internals.

METAL SEATED BALL VALVES | AP SERIES

WAFER BALL VALVE FLOATING BALL, FULLY REPLACEABLE SEATS

AVAILABLE SEAT MATERIAL				
Code	Material	Hardness	Working temperature	Service Limits
S01	SILVER PENTAFITE (Nickel + Graphite)	120 HB	-100°C / +780°C (-148°F / +1436°F)	Fear clean services both liquid or gas. For use with HTC, HTCN, HCR, WC, CRC, ST6 ball coated.
R01	RED PENTAFITE (Cu + Graphite)	100 HB	-100°C / +500°C (-148°F / +932°F)	For clean services both liquid or gas. Lower friction factors in dry gas or steam service. For use with HTC, HTCN, HCR, ST6 ball coated.
B01	BLACK PENTAFITE (Carbon + Graphite)	80 HB	Amb. / +400°C (Amb. / +662°F)	For low pressure specific services where S01 and R01 cannot be used due to corrosion problems. All bat coat is not structly necessary and should be evaluated time to time.
WC	TUNGSTEN CARBIDE COAT (Detonation Gun/HVOF)	1100 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with high presence of solids. Not suitable when small presence of caustic soda is expected. For use with WC ball coat.
ST6	STELLITE Gr.6 (Detonation Gun/HVOF)	1000 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Suitable when small presence of caustic soda is expected. Best on dry gas or steam services. For use with WC, CRC ball coat.
CRC	CHROME CARBIDE (Detonation Gun)	800 HV	Amb. / +750°C (Amb. / +1382°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
PK1	PEEK (Polietheretherketone)	800 HV	-100°C / +240°C (-148°F / +464°F)	For clean liquid or gas services with high frequency of valve operation.
RPTFE	PTFE REINFORCED WITH GRAPHITE (Glass/Graphite reinforces PTFE)	1000 HV	-100°C / +220°C (-148°F / +428°F)	For clean liquid or gas services with high frequency of valve operation.

AVAILABLE BALL COATING MATERIALS				
Code	Material	Hardness	Working temperature	Service Limits
HTC	TITANIUM NITRIDE (PVD)	2500 HV	-100°C / +600°C (-148°F / +1436°F)	For clean services both liquid or gas. For gas and steam up to 180°C.
HTCN	CARBO-TITANIUM NITRIDE (PVD)	3500 HV	-100°C / +400°C (-148°F / +752°F)	For liquid or gas services with small presence of solids. For gas and steam up to 180°C.
HCR	CHROME NITRIDE (PVD)	3000 HV	Amb. / +750°C (Amb. / +1382°F)	For clean services both liquid or gas. Best on oxidizing services.
WC	TUNGSTEN CARBIDE Tungsten Carbide (Detonation Gun/HVOF)	1100 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
CRC	CARBURO DI CROMO Chrome Carbide (Detonation Gun/HVOF)	800 HV	Amb. / +750°C (Amb. / +1382°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
ST6	STELLITE GR.6 (Detonation Gun/HVOF)	1000 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Suitable when small presence of caustic soda is expected. Best on dry or steam services.

TIGHTNESS

All KTN AP series valves are tested to verify their BUBBLE TIGHTNESS (no visible leakage during hydraulic seat test according to ANSI B16.34 and during low pressure air seats test at 100 psi)

METAL SEATED BALL VALVES | AP SERIES
 WAFER BALL VALVE FLOATING BALL, FULLY REPLACEABLE SEATS

PRODUCTION RANGE													
PRESSURE CLASSES													
ANSI B16.34		150		300		600		800		900		1500	
PN		16 - 25		40 - 50		64 - 100				160		250	
		F	T	F	T	F	T	F	T	F	T	F	T
DN	Fig	AP54 AP64 AP68 AP10N AP11N	APT2	AP50 AP60 AP10N AP11N	APT2	AP506 AP606 AP10HP	APT2	AP20P		AP609	APT2	AP615	APT2
1/2"													
3/4"													
1"													
1 1/4"													
1 1/2"													
2"													
2 1/2"													
3"													
4"													
6"													
8" RB													

F= Floating ball
 T= Trunnion mounted ball

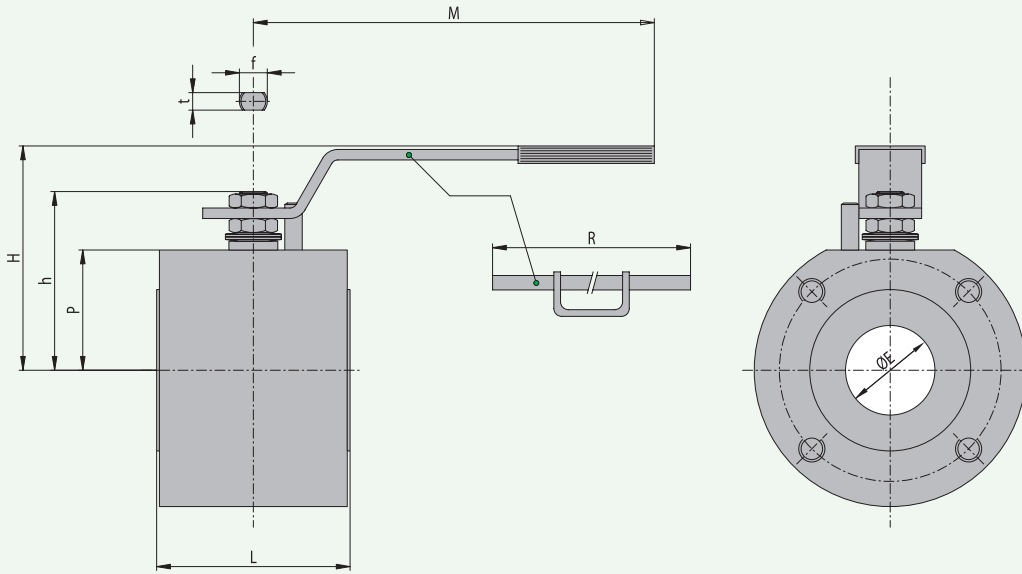
⁽¹⁾ solo AP50 e AP54 - AP50 and AP54 only

AVAILABLE VERSIONS	
AP10	Wafer ball valve floating ball, fully replaceable seats
AP10 HP	
AP11	Wafer ball valve fully detachable for maintenance with integral heating jacket
AP20P	Ball valve with two pieces screwed body and floating ball
AP50	Split Body valve, floating ball, with fully replaceable seats
AP54	
AP506	
AP60	
AP64	
AP68	
AP606	
AP609	
APT2	Split body valve, trunnion mounted ball, with fully replaceable seats
APT3	Split Body valve 3 pieces, trunnion mounted ball, with fully replaceable seats and gaskets

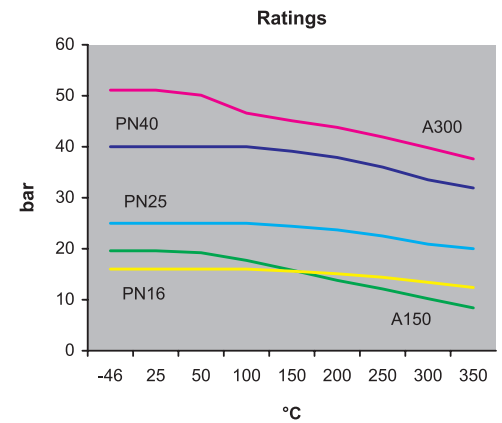
AP ACCESORIES
SIP lever elongation for insulated piping systems
Manual gear
Stem elongation
Single or double acting actuators, electric or hydraulic actuators

METAL SEATED BALL VALVES | AP SERIES - AP10NU (UNIDIRECTIONAL)

WAFER BALL VALVE FLOATING BALL, FULLY REPLACEABLE SEATS



STANDARD SPECIFICATION	
Design:	ASME B16.34, EN 12569, API 608, EN 17292
Rating:	CI 150/300, PN10/16/25/40
Flange:	ASME B16.5, EN 1092-1, DIN 2632 / 2633 / 2634 / 2635
Inspection:	ASME B16.104, API 598, EN 1266-1, ISO 5208, BS 6755-1



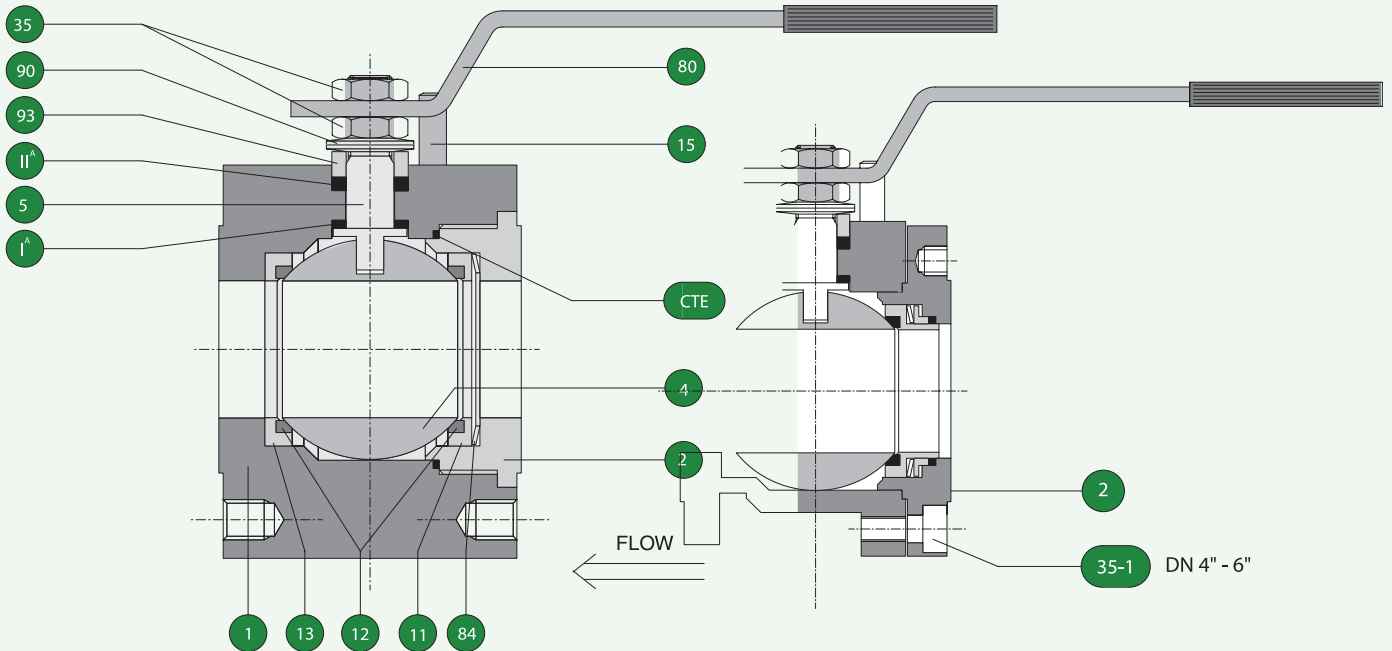
MEASURES											
DN	15	20	25	32	40	50	65	80	100	150	
Ø"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	
ØE	14	19	24	29	38	48	64	76	95	152	
L	45	50	56	60	75	91	120	127	152	243/255*	
M	145	145	180	180	275	275	380	380	-	-	[1]
R	-	-	-	-	-	-	-	-	500	800	
H	64	66	85	90	118	126	139	144	200	265	
h	52	55	70	73	96	101	122	128	157	220	
P	33	36	43	48	63	68.5	82	88.5	111	145	
F/t	10/6	10/6	12/8	12/8	16/10	16/10	22/14	22/14	30/18	45/30	
Kg	1.5	2	2.7	4	6.5	9	16	20.5	42	80	
ISO 5211	F03	F03	F03	F03	F05	F05	F07	F07	F10	F14	

*PN25-40/ASME 300RF

[1] Manual gear recommended

METAL SEATED BALL VALVES | AP SERIES - AP10NU (UNIDIRECTIONAL)

WAFER BALL VALVE FLOATING BALL, FULLY REPLACEABLE SEATS



-46°C +400°C

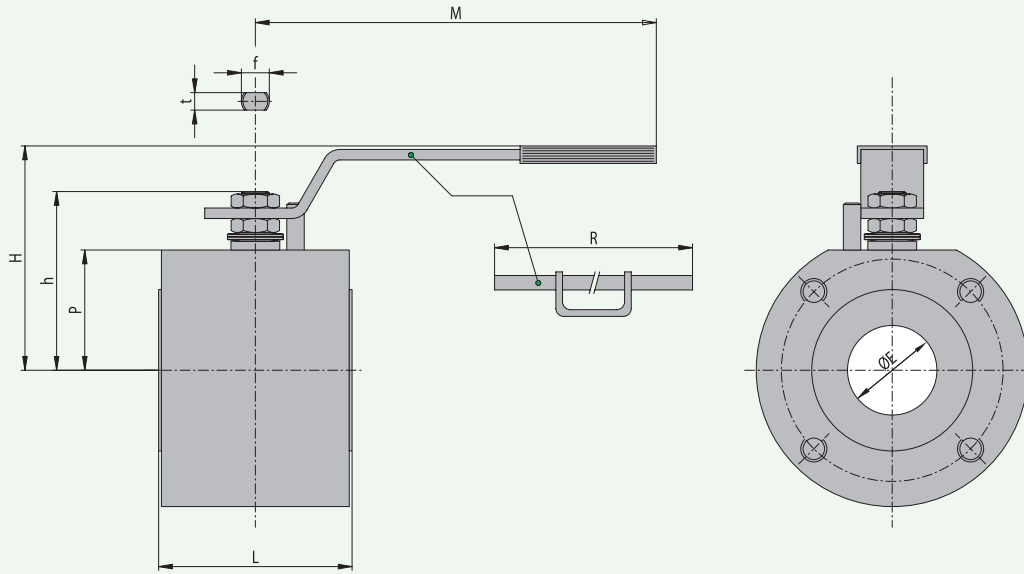
PART DRAWING

PART DRAWING				
CTE	Body connector gasket	Grafoil	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil	Grafoil
93	Gland	304SS	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070	Fe37 UNI 7070
35-1	Body / connector bolts	304SS	304SS	304SS
35	Nut	304SS	304SS	304SS
15	Lever stoper	UNI 3740 Gr.8.8	UNI 3740 Gr.8.8	UNI 3740 Gr.8.8
13	Body seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC
11	Connector seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
5	Stem	13% Cr. A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)
Coat	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	316SS	316SS	316SS
2	Connector	A105	A479 Tp.304	A479 Tp.316/A351 CF8M
1	Body	A105/A216 WCB	A479 Tp.304/A351CF8	A479 Tp.316/A351 CF8M

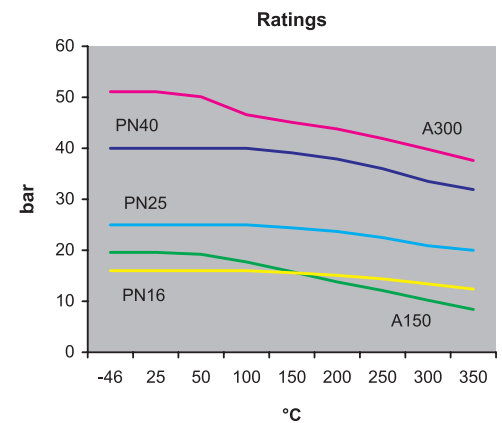
HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
 WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - AP10NB (BIDIRECTIONAL)

WAFER BALL VALVE FLOATING BALL, FULLY REPLACEABLE SEATS



STANDARD SPECIFICATION	
Design:	ASME B16.34, EN 12569, API 608, EN 17292
Rating:	CI 150/300, PN10/16/25/40
Flange:	ASME B16.5, EN 1092-1, DIN 2632 / 2633 / 2634 / 2635
Inspection:	ASME B16.104, API 598, EN 1266-1, ISO 5208, BS 6755-1



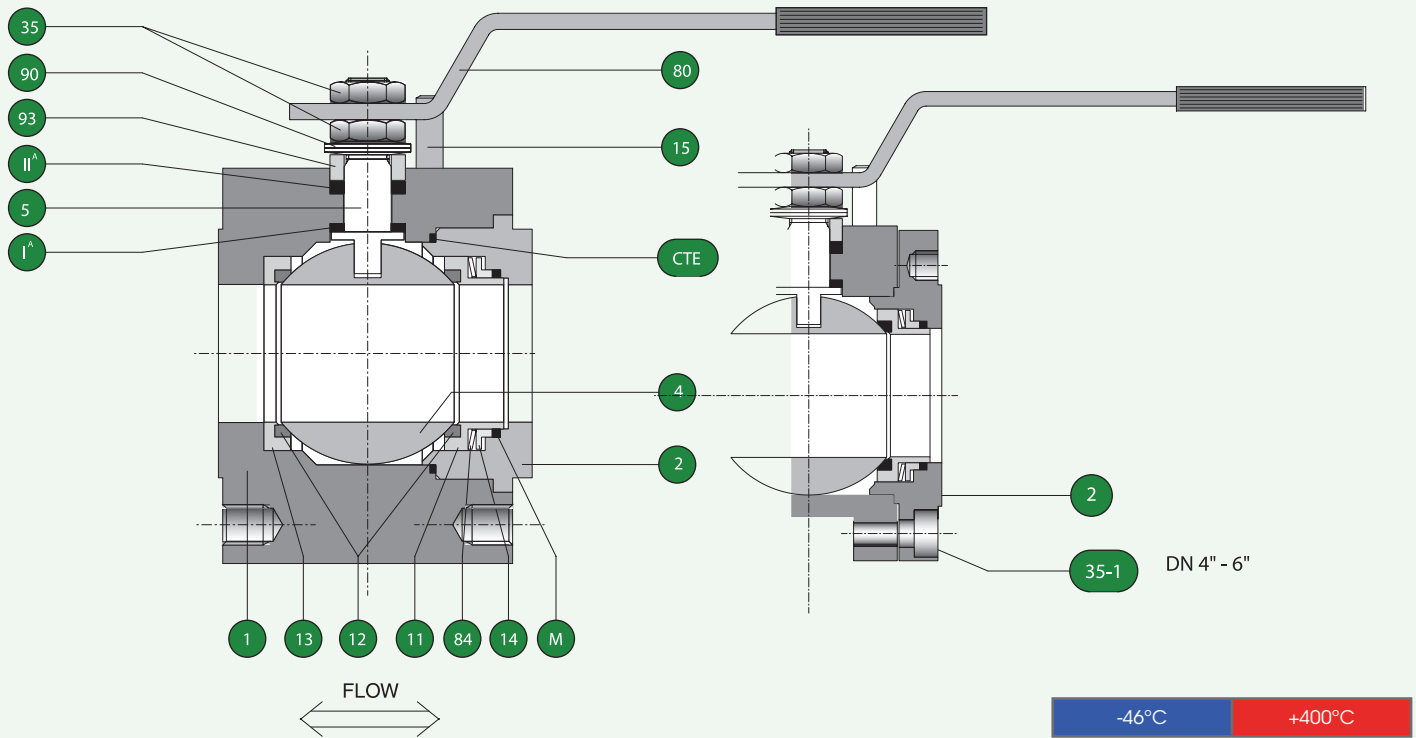
MEASURES											
DN	15	20	25	32	40	50	65	80	100	150	
Ø"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"	
ØE	14	19	24	29	38	48	64	76	95	152	
L	45	50	56	60	75	91	120	127	152	243/255*	
M	145	145	180	180	275	275	380	380	-	-	[1]
R	-	-	-	-	-	-	-	-	500	800	
H	64	66	85	90	118	126	139	144	200	265	
h	52	55	70	73	96	101	122	128	157	220	
P	33	36	43	48	63	68.5	82	88.5	111	145	
F/t	10/6	10/6	12/8	12/8	16/10	16/10	22/14	22/14	30/18	45/30	
Kg	1.5	2	2.7	4	6.5	9	16	20.5	42	80	
ISO 5211	F03	F03	F03	F03	F05	F05	F07	F07	F10	F14	

*PN25-40/ASME 300RF

[1] Manual gear recommended

METAL SEATED BALL VALVES | AP SERIES - AP10NB (IIDIRECTIONAL)

WAFER BALL VALVE FLOATING BALL, FULLY REPLACEABLE SEATS



-46°C +400°C

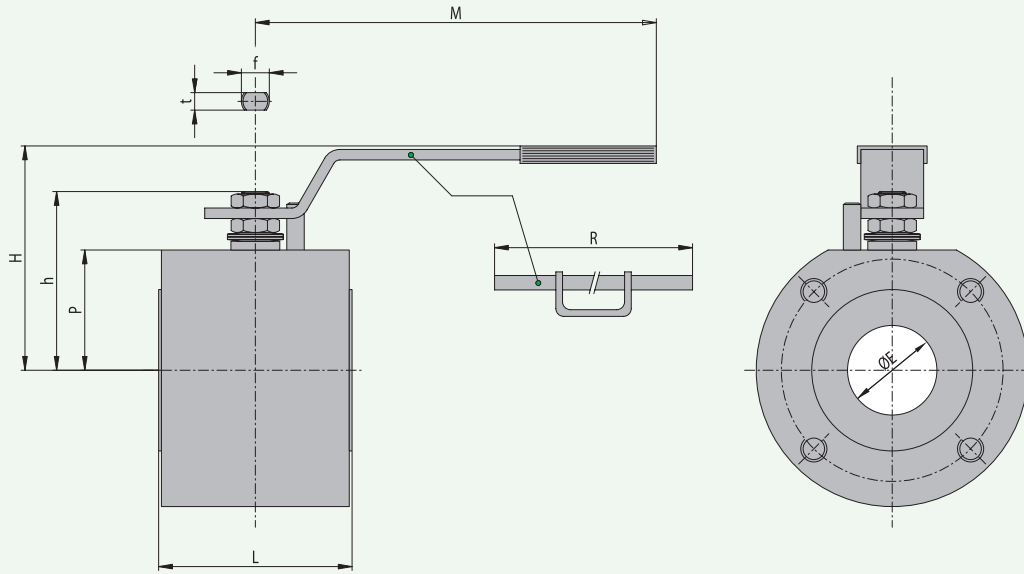
PART DRAWING

CTE	Body connector gasket	Grafoil	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil	Grafoil
93	Gland	304SS	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070	Fe37 UNI 7070
35-1	Body / connector bolts	304SS	304SS	304SS
35	Nut	304SS	304SS	304SS
15	Lever stoper	UNI 3740 Gr.8.8	UNI 3740 Gr.8.8	UNI 3740 Gr.8.8
14	Compression ring	A479 Tp.316	A479 Tp.316	A479 Tp.316
13	Body seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC
11	Connector seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
5	Stem	13% Cr. A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)
Coat	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	316SS	316SS	316SS
2	Connector	A105	A479 Tp.304	A479 Tp.316/A351 CF8M
1	Body	A105/A216 WCB	A479 Tp.304/A351 CF8	A479 Tp.316/A351 CF8M

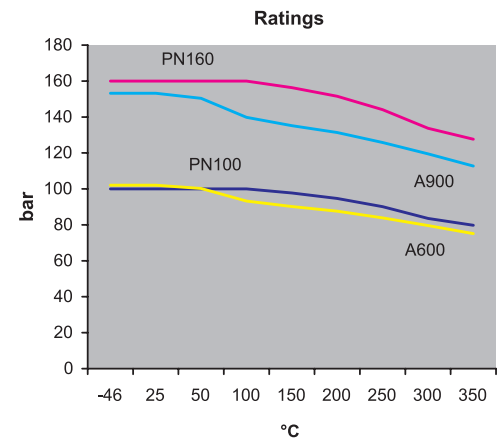
HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
 WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - AP10HP (BIDIRECTIONAL)

WAFER BALL VALVE FLOATING BALL, FULLY REPLACEABLE SEATS



STANDARD SPECIFICATION	
Design:	ASME B16.34, EN 12569, API 608, EN 17292, ASME VIII DIV.1, EN 12516-1
Rating:	CI 600/900, PN100
Flange:	ASME B16.5, EN 1092-1, DIN 2632 / 2633 / 2634 / 2635
Inspection:	ASME B16.104, API 598, EN 1266-I, ISO 5208, BS 6755-I

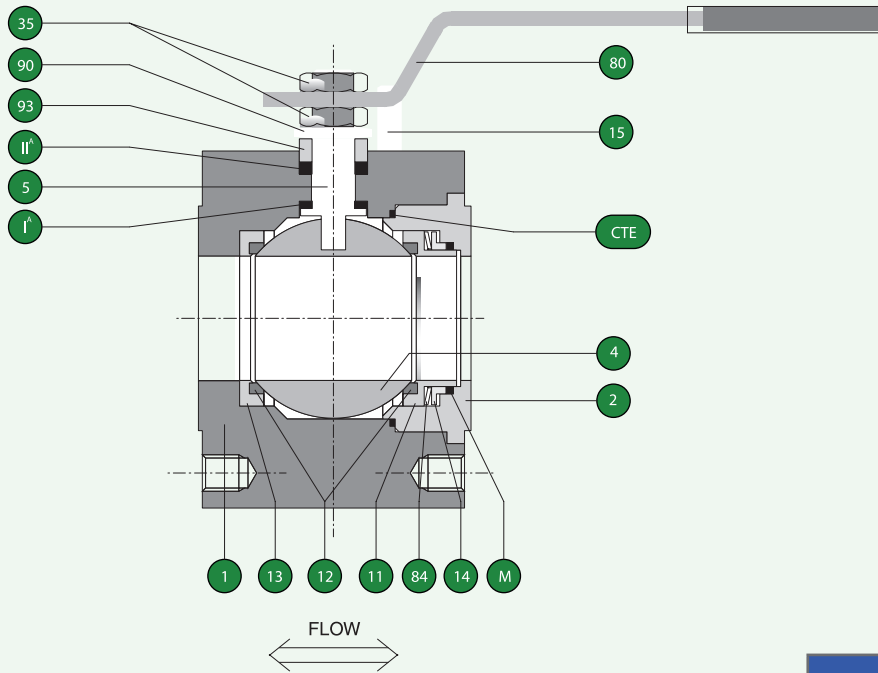


MEASURES								
DN	15	20	25	32	40	50	65	80
Ø"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"
ØE	14	19	24	29	38	48	64	76
L	55	60/75*	65/74*	75	85/100*	100	125	150
M	145	145	175	275	380	380	440	440
R	-	-	-	-	-	-	500	500
H	65	68	105	115	127	135	160	180
h	53	55/70*	15	73	105	110	122	142
P	33	36/46*	51	53	65	15	93	98
F/t	10/6	10/6	10/6	10/6	22/14	22/14	30/18	30/18
Kg	2.5	3.5	4.8	6.5	10	13.5	25	40
ISO 5211	F03	F03	F05	F05	F07	F07	F10	F10

*PN160/900RF

METAL SEATED BALL VALVES | AP SERIES - AP10HP (BIDIRECTIONAL)

WAFER BALL VALVE FLOATING BALL, FULLY REPLACEABLE SEATS

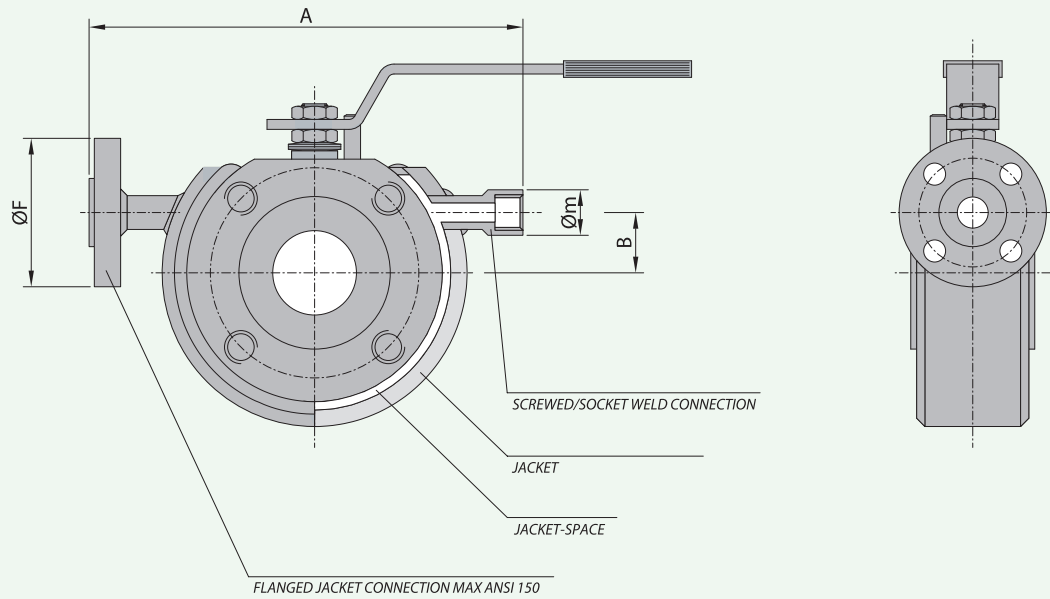


PART DRAWING

PART DRAWING				
CTE	Body connector gasket	Grafoil	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil	Grafoil
93	Gland	304SS	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070	Fe37 UNI 7070
35-1	Body / connector bolts	304SS	304SS	304SS
35	Nut	304SS	304SS	304SS
15	Lever stopper	UNI 3740 Gr.8.8	UNI 3740 Gr.8.8	UNI 3740 Gr.8.8
14	Compression ring	A479 Tp.316	A479 Tp.316	A479 Tp.316
13	Body seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC
11	Connector seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
5	Stem	13% Cr. A564 Tp.630	A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)
Coat	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	316SS	316SS	316SS
2	Connector	A105	A479 Tp.304	A479 Tp.316/A351 CF8M
1	Body	A105/A216 WCB	A479 Tp.304/A351CF8	A479 Tp.316/A351 CF8M

HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
 WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - AP11N (JACKET)
WAFER BALL VALVE FULLY DETACHABLE FOR MAINTENANCE WITH INTEGRAL HEATING JACKET

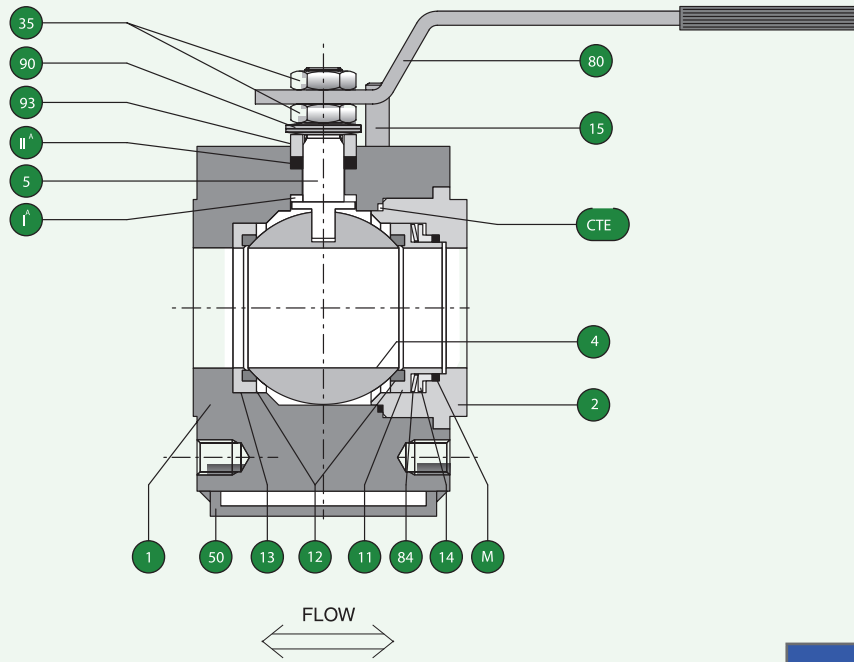


STANDARD SPECIFICATION	
Design:	ASME B16.34, EN 12569, API 608, EN 17292, ASME VIII DIV.1, EN 12516-1
Jacket:	ASME VII DIV.1
Rating:	CI 150/300/600, PN10/16/25/40/100
Flange:	ASME B16.5, EN 1092-1
Jacket connections:	SW / NPT, CI 150 RF, PN10/16
Inspection:	ASME B16.104, API 598, EN 1266-1, ISO 5208, BS 6755-1

MEASURES										
DN	15	20	25	40	50	65	80	100	150	
Ø"	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"	4"	6"	
A	160	160	190	230	250	270	300	340	420	
B	0	0	0	30	30	45	50	70	95	
ØF	DN15							DN25		
Øm	Ø1/2"							Ø1"		
Kg	3	3.5	4.5	9	11	20	25	40	80	

METAL SEATED BALL VALVES | AP SERIES - AP11N (JACKET)

WAFER BALL VALVE FULLY DETACHABLE FOR MAINTENANCE WITH INTEGRAL HEATING JACKET

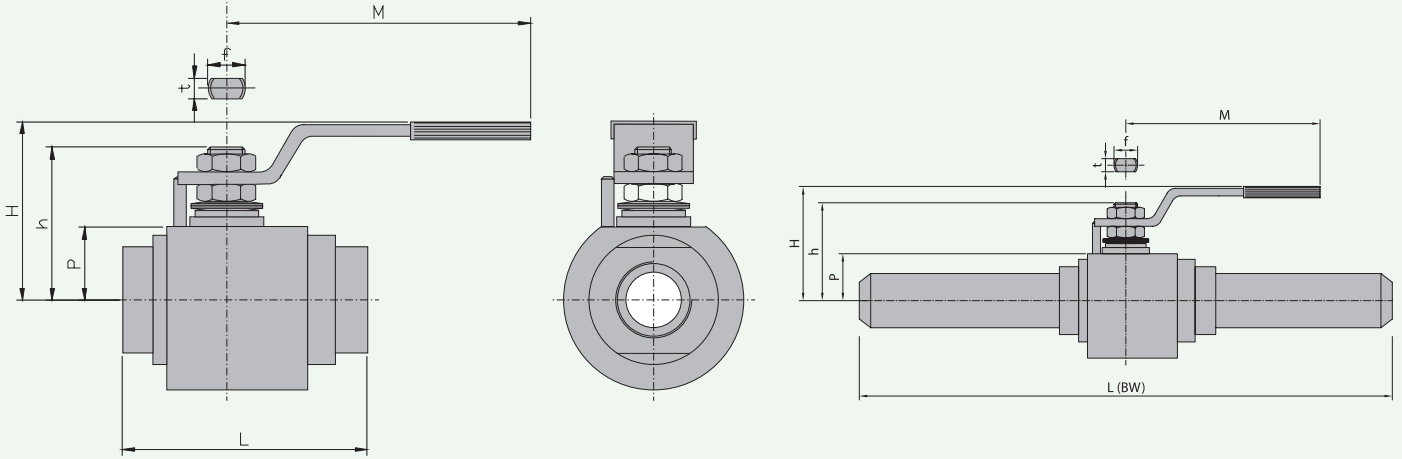


PART DRAWING				
CTE	Body connector gasket	Grafoil	Grafoil	Grafoil
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I ^A	Primary stem seal	Grafoil	Grafoil	Grafoil
93	Gland	304SS	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070	Fe37 UNI 7070
50	Heating hacket	A105	304SS	304SS
35	Nut	304SS	304SS	304SS
15	Lever stopper	UNI3740Gr.8.8	UNI3740Gr.8.8	UNI3740Gr.8.8
14	Compression ring	A479 Tp.316	A479 Tp.316	A479 Tp.316
13	Body seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC
11	Connector seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
5	Stem	13% Cr. A564 Tp. 630 (17/4PH)	A564 Tp. 630 (17/4PH)	A564 Tp. 630 (17/4PH)
-	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	A479 Tp.316	A479 Tp.316	A479 Tp.316
2	Connector	A105	A479 Tp.304	A479 Tp.316
1	Body	A105	A479 Tp.304	A479 Tp.316

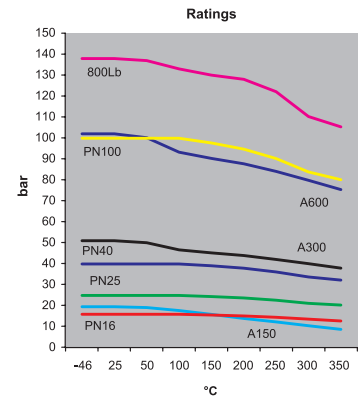
HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
 WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - AP20P

BALL VALVE WITH TWO PIECES SCREWED BODY AND FLOATING BALL



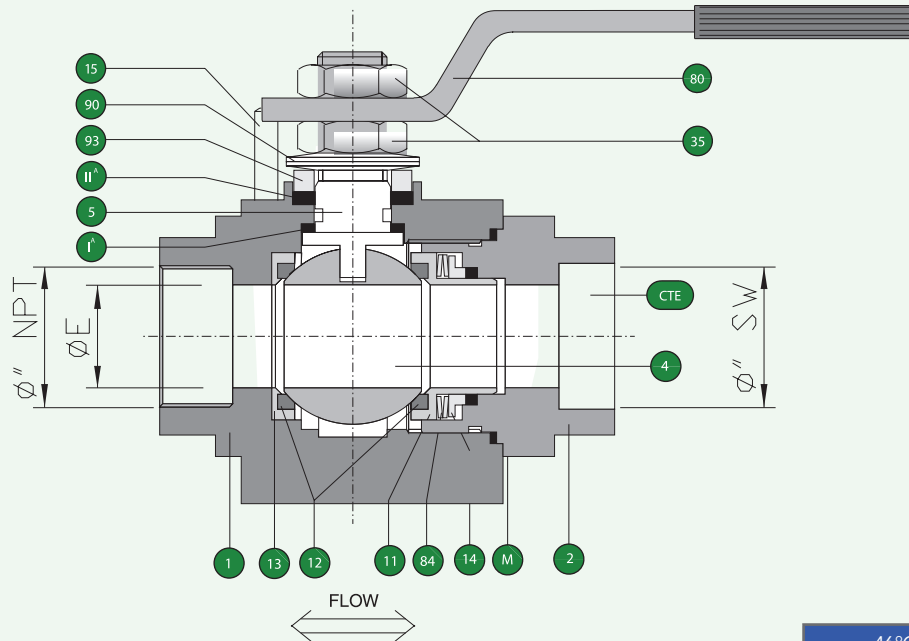
STANDARD SPECIFICATION	
Design:	ASME B16.34, EN 12569, API 608, EN 17292, ASME VIII DIV.1, EN 12516-1
Rating:	CI 150/300/600, PN10/16/25/40/100
Ends:	NPT ASME B1.20.1, SW ASME B16.11, BW ASME B16.25 (With integral nipples)
Inspection:	ASME B16.104, API 598, EN 1266-1, ISO 5208, BS 6755-1



MEASURES						
DN	15	20	25	40	50	
Ø"	1/2"	3/4"	1"	1 1/2"	2"	
ØE	12.5	19	24	38	51	
L (NPT)	80	90	110	130	155	
L (SW)	70	85	105	125	140	
L (BW)	270	285	305	325	350	
ØD	58	64	78	104	138	
M	145	145	275	380	380	
H	70	75	83	123	120	
h	50	53	63	91.5	102	
P	24	27	32	42	61	
F/t	10/6	10/6	16/10	22/14	22/14	
Kg	1.2	1.5	2.5	5.3	11.5	
ISO5211	F03	F03	F05	F07	F07	

METAL SEATED BALL VALVES | AP SERIES - AP20P

WAFER BALL VALVE FULLY DETACHABLE FOR MAINTENANCE WITH OPTIONAL ELONGATION

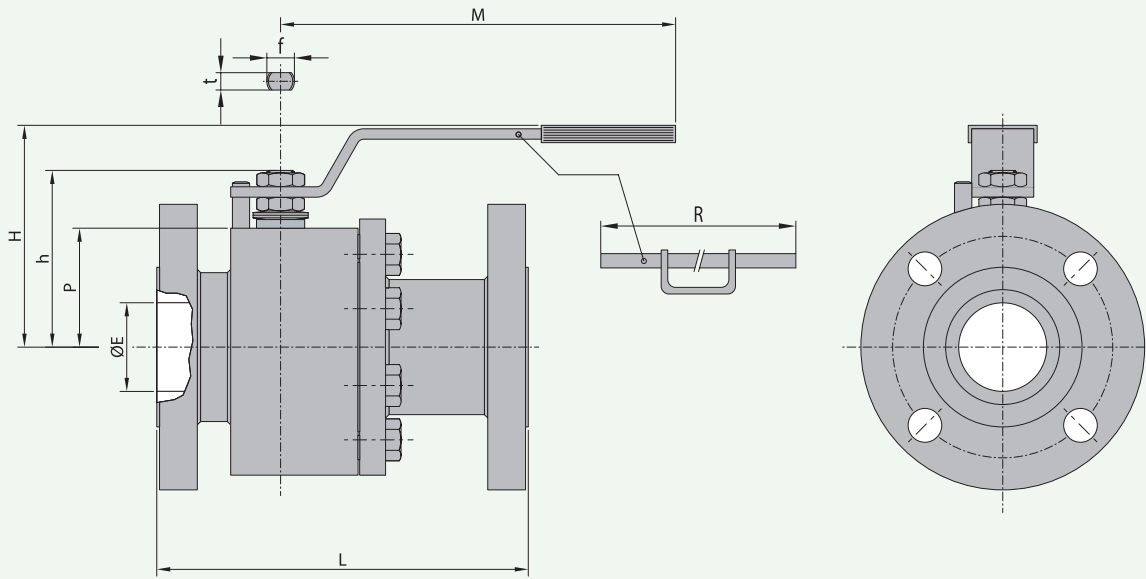


PART DRAWING			
CTE	Body connector gasket	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil
93	Gland	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070
35	Nut	304SS	304SS
15	Lever stopper	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740
14	Compression ring	A479 Tp.316	A479 Tp.316
13	Body seat holder	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC
11	Connector seat holder	A479 Tp.316	A479 Tp.316
5	Stem	A564 Tp. 630 (17/4PH)	A564 Tp. 630 (17/4PH)
-	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	A479 Tp.316	A479 Tp.316
2	Connector	A105	A479 Tp.304
1	Body	A105	A479 Tp.304

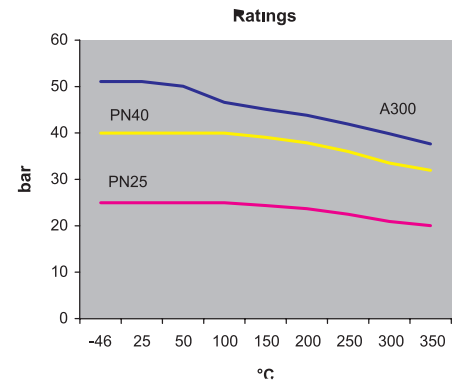
HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - AP60

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS



STANDARD SPECIFICATION	
Design:	ASME B16.34, EN 12569, API 608, EN 17292, ASME VIII DIV.1, EN 12516-1
Rating:	CI 150/300/600, PN10/16/25/40/100
Flanged ends:	ASME B16.5 CL.300, EN 1092-1 PN25/PN40, DIN 2634 (PN25) / 2635 (PN40)
BW ends:	ASME B16.25
Inspection:	ASME B16.104, API 598, EN 12664, ISO 5208, BS 6755-1

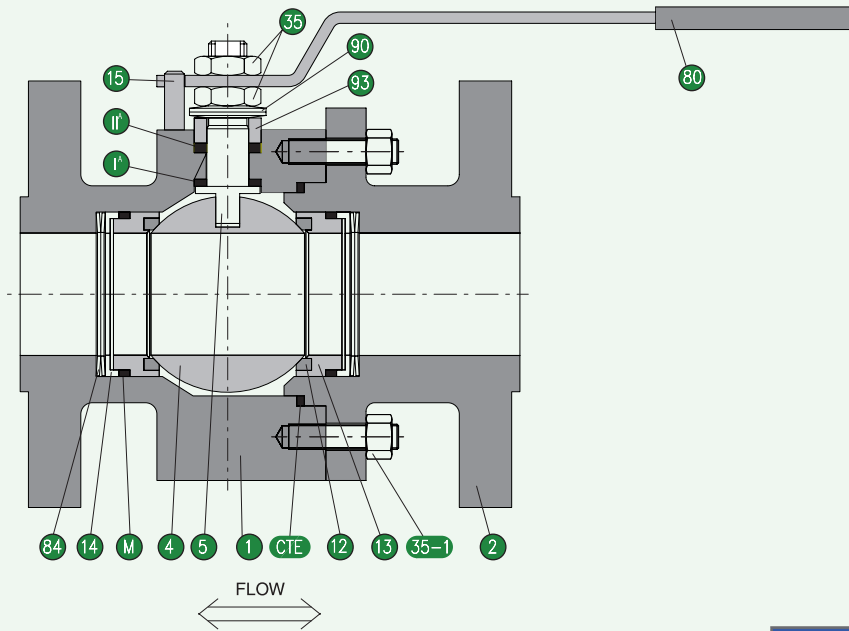


MEASURES										
DN	15	20	25	32	40	50	65	80	100	150
Ø"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"
ØE	14	19	24	29	38	51	65	76	102	152
L	140	152	165	178	191	216	241	283	305	403
M	145	145	180	180	275	275	380	380	440	- [1]
R	-	-	-	-	-	-	-	-	500	800
H	64	66	85	90	118	128	139	144	200	265
h	52	55	70	73	96	103	122	128	157	220
P	33	36	43	48	63	68.5	82	88.5	111	153
F/t	10/6	10/6	12/8	12/8	16/10	16/10	22/14	22/1	30/18	45/30
Kg	3	4	6	8	13.5	19	25	40	63	105
ISO5211	F03	F03	F03	F03	F05	F05	F07	F07	F10	F14

[1] Manual gear recommended

METAL SEATED BALL VALVES | AP SERIES - AP60

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS



-46°C +400°C

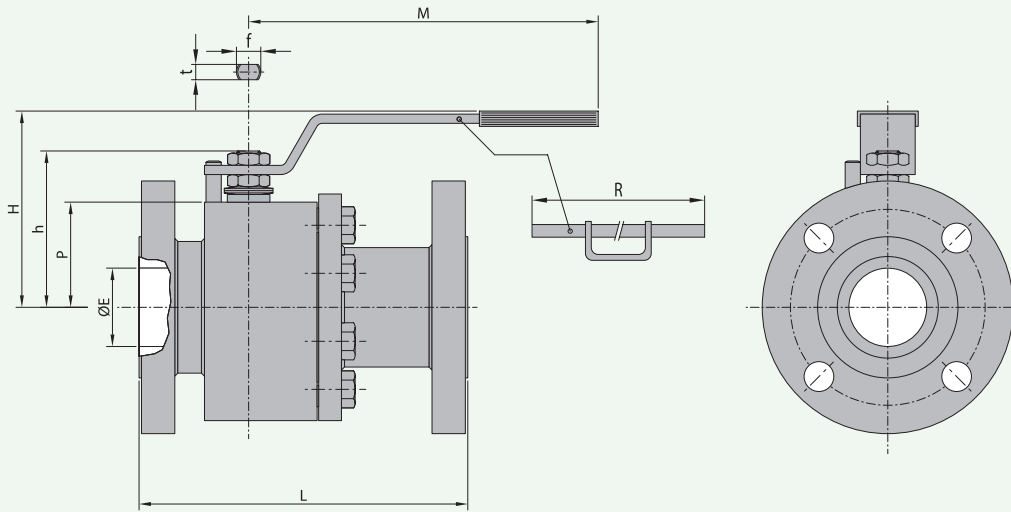
PART DRAWING

Part No.	Description	Material 1	Material 2	Material 3
CTE	Body connector gasket	Grafoil	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil	Grafoil
93	Gland	304SS	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070	Fe37 UNI 7070
35-1	Body / Connectors bolts	A193 B7 A194 Gr.2H	A193 B8 A194 Gr.8	A193 B8M A194 Gr.8M
35	Nut	304SS	304SS	304SS
15	Lever stopper	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740
14	Compression ring	A479 Tp.316	A479 Tp.316	A479 Tp.316
13	Seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC RPTFE/PEEK	PENTAFITE ST6 WC/CRC RPTFE/PEEK	PENTAFITE ST6 WC/CRC RPTFE/PEEK
5	Stem	13% Cr. A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)
-	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	316 SS A351 CF8M	316 SS A351 CF8M	316 SS A351 CF8M
2	Connector	A105 / A216 WCB	A479 Tp.304 / A351 CF8	A479 Tp.316 / A351 CF8M
1	Body	A105 / A216 WCB	A479 Tp.304 / A351 CF8	A479 Tp.316 / A351 CF8M

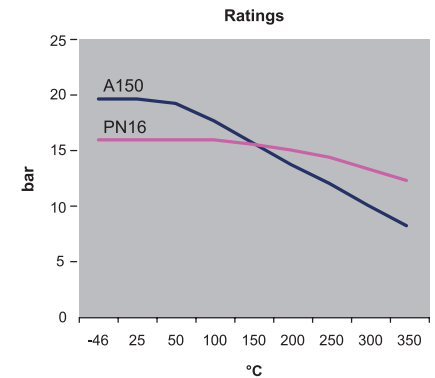
HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
 WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - AP64

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS



STANDARD SPECIFICATION	
Design:	ASME B16.34, EN 12569, API 608, EN 17292, ASME VIII DIV.1, EN 12516-1
Rating:	CI 150, PN16
Flanged ends:	ASME B16.5, EN 1092-1, DIN 2633
Inspection:	ASME B16.104, API 598, EN 1266-1, ISO 5208, BS 6755-1

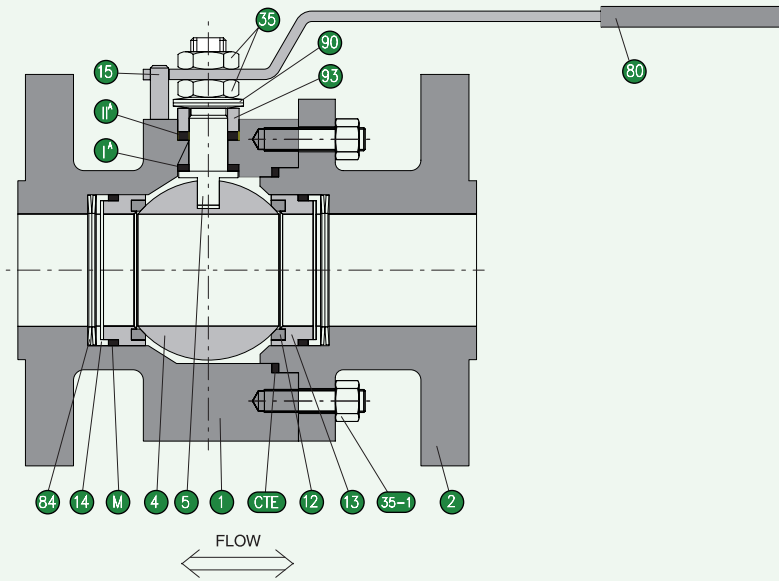


MEASURES										
DN	15	20	25	32	40	50	65	80	100	150
Ø"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"
ØE	14	19	24	29	38	51	64	76	102	152
L	108	117	127	140	165	178	190	203	229	394
M	145	145	180	180	275	275	380	380	440	- [1]
R	-	-	-	-	-	-	-	-	500	800
H	64	66	85	90	118	128	139	144	200	265
h	52	55	70	73	96	103	122	128	157	220
P	33	36	43	48	63	68.5	82	88.5	111	153
F/t	10/6	10/6	12/8	12/8	16/10	16/10	22/14	22/1	30/18	45/30
Kg	2.5	3	5.5	7	11	17	22	26	48	71
ISO5211	F03	F03	F03	F03	F05	F05	F07	F07	F10	F14

[1] Manual gear recommended

METAL SEATED BALL VALVES | AP SERIES - AP64

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS



-46°C +400°C

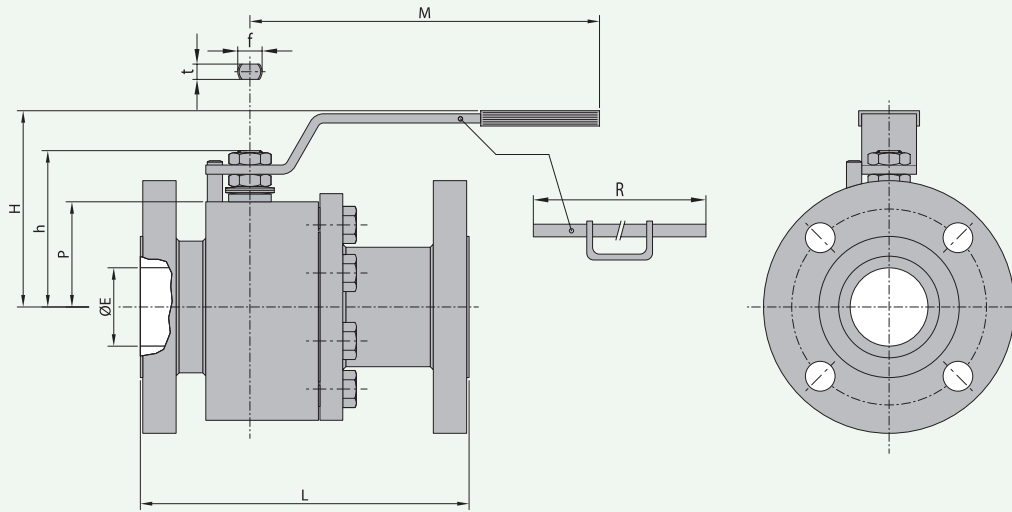
PART DRAWING

Part No.	Description	Material 1	Material 2	Material 3
CTE	Body connector gasket	Grafoil	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil	Grafoil
93	Gland	304SS	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070	Fe37 UNI 7070
35-1	Body / Connectors bolts	A193 B7 A194 Gr.2H	A193 B8 A194 Gr.8	A193 B8M A194 Gr.8M
35	Nut	304SS	304SS	304SS
15	Lever stopper	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740
14	Compression ring	A479 Tp.316	A479 Tp.316	A479 Tp.316
13	Seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC RPTFE/PEEK	PENTAFITE ST6 WC/CRC RPTFE/PEEK	PENTAFITE ST6 WC/CRC RPTFE/PEEK
5	Stem	13% Cr. A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)
-	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	316 SS A351 CF8M	316 SS A351 CF8M	316 SS A351 CF8M
2	Connector	A105 / A216 WCB	A479 Tp.304 / A351 CF8	A479 Tp.316 / A351 CF8M
1	Body	A105 / A216 WCB	A479 Tp.304 / A351 CF8	A479 Tp.316 / A351 CF8M

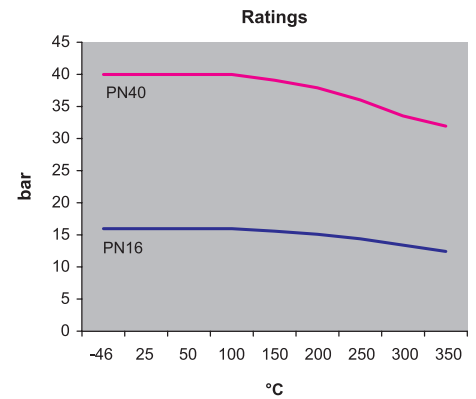
HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - AP68

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS



STANDARD SPECIFICATION	
Design:	ASME B16.34, EN 12569, API 608, EN 17292, ASME VIII DIV.1, EN 12516-1
Rating:	PN16/40
Flanged ends:	EN 1092-1, DIN2633, DIN2634
Inspection:	ASME B16.104, API 598, EN 1266-1, ISO 5208, BS 6755-1

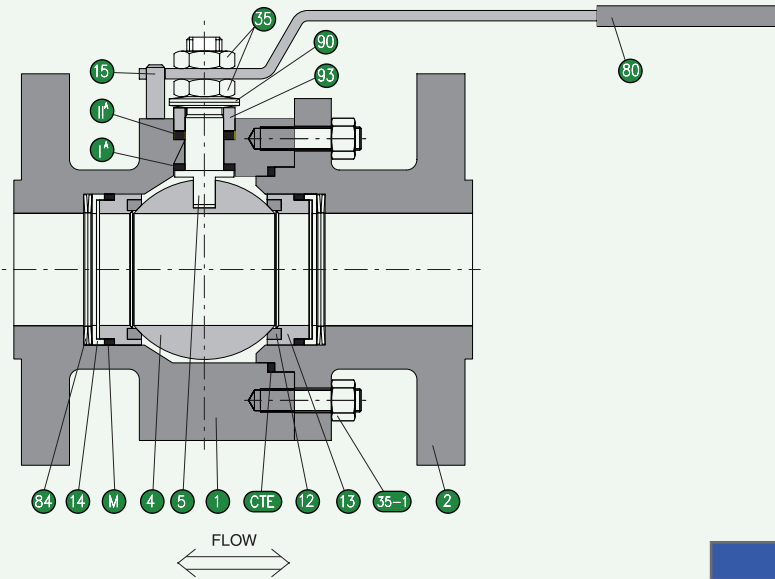


MEASURES										
DN	15	20	25	32	40	50	65	80	100	150
Ø"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"	2 1/2"	3"	4"	6"
PN	PN40									PN16
ØE	14	19	24	29	38	51	64	76	102	152
L	115	120	125	130	140	150	170	180	190	350
DIN3202	F4	F4	F4	F4	F4	F4	F4	F4	F4	F5
M	145	145	180	180	275	275	380	380	440	- ^[1]
R	-	-	-	-	-	-	-	-	500	800
H	64	66	85	90	118	128	139	144	200	265
h	52	55	70	73	96	103	122	128	157	220
P	33	36	43	48	63	68.5	82	88.5	111	153
F/t	10/6	10/6	12/8	12/8	16/10	16/10	22/14	22/14	30/18	45/30
Kg	2.7	3	5.5	6.8	10.5	15.5	21	25	38	70
ISO5211	F03	F03	F03	F03	F05	F05	F07	F07	F10	F14

^[1] Manual gear recommended

METAL SEATED BALL VALVES | AP SERIES - AP68

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS

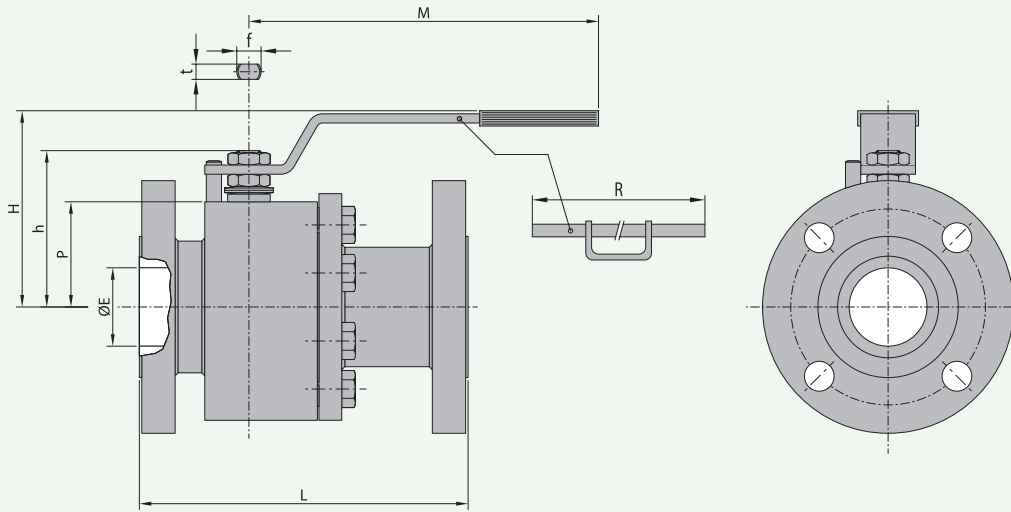


PART DRAWING				
CTE	Body connector gasket	Grafoil	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil	Grafoil
93	Gland	304SS	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070	Fe37 UNI 7070
35-1	Body / Connectors bolts	A193 B7 A194 Gr.2H	A193 B8 A194 Gr.8	A193 B8M A194 Gr.8M
35	Nut	304SS	304SS	304SS
15	Lever stopper	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740
14	Compression ring	A479 Tp.316	A479 Tp.316	A479 Tp.316
13	Seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC RPTFE/PEEK	PENTAFITE ST6 WC/CRC RPTFE/PEEK	PENTAFITE ST6 WC/CRC RPTFE/PEEK
5	Stem	13% Cr. A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)
-	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	316 SS A351 CF8M	316 SS A351 CF8M	316 SS A351 CF8M
2	Connector	A105 / A216 WCB	A479 Tp.304 / A351 CF8	A479 Tp.316 / A351 CF8M
1	Body	A105 / A216 WCB	A479 Tp.304 / A351 CF8	A479 Tp.316 / A351 CF8M

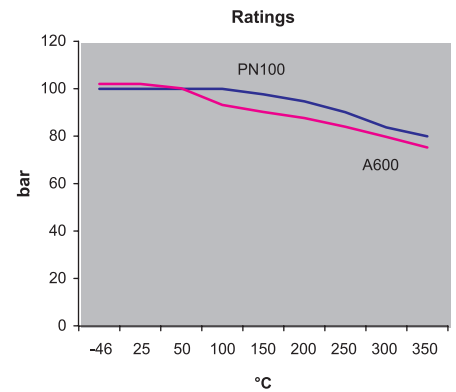
HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
 WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - AP606

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS



STANDARD SPECIFICATION	
Design:	ASME B16.34, EN 12569, API 608, EN 17292, ASME VIII DIV.1, EN 12516-1
Rating:	PN100/63, CI 600
Flanged ends:	EN 1092-1, DIN2637, DIN2636, ASME B16.5
Inspection:	ASME B16.104, API 598, EN 1266-I, ISO 5208, BS 6755-I

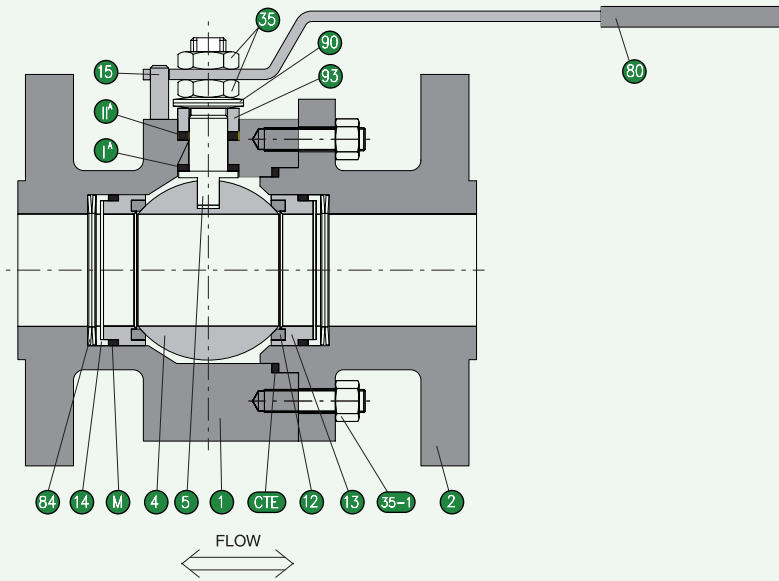


MEASURES							
DN	15	20	25	40	50	65	80
Ø"	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"	3"
ØE	14	19	24	38	51	64	76
L	165	191	216	241	292	330	356
M	145	145	275	380	380	440	440
M	145	145	275	380	380	440	440
R	-	-	-	-	-	500	500
H	70	75	101	135	146	180	185
h	52	55	76	105	113	136	141
P	33	36	51	65	75	90	95
F/t	10/6	10/6	16/10	22/14	22/14	30/18	30/18
Kg	7	8.5	10	18.5	25	38	50
ISO5211	F03	F03	F03	F07	F07	F10	F10

^[1] Manual gear recommended

METAL SEATED BALL VALVES | AP SERIES - AP606

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS



-46°C +400°C

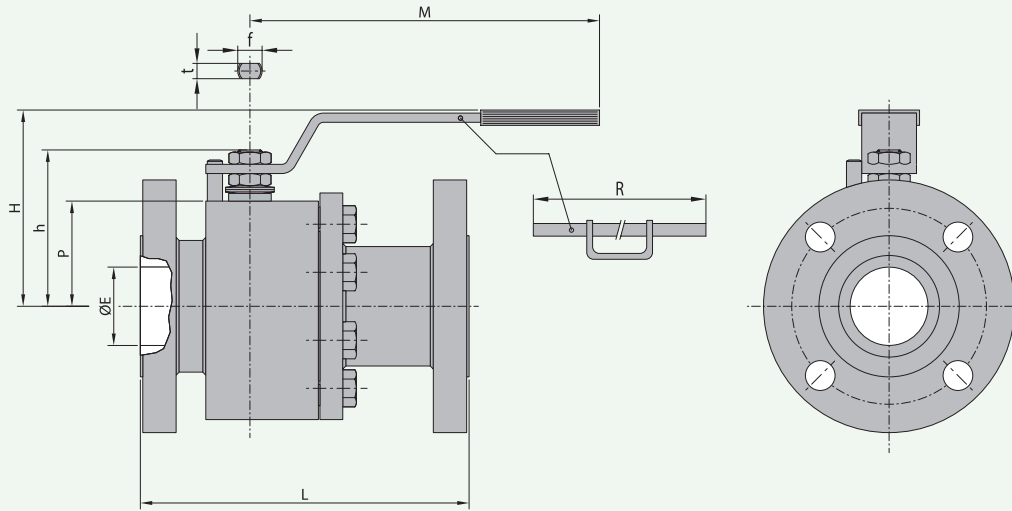
PART DRAWING

Part No.	Description	Material 1	Material 2	Material 3
CTE	Body connector gasket	Grafoil	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil	Grafoil
93	Gland	304SS	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070	Fe37 UNI 7070
35-1	Body / Connectors bolts	A193 B7 A194 Gr.2H	A193 B8 A194 Gr.8	A193 B8M A194 Gr.8M
35	Nut	304SS	304SS	304SS
15	Lever stopper	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740
14	Compression ring	A479 Tp.316	A479 Tp.316	A479 Tp.316
13	Seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC RPTFE/PEEK	PENTAFITE ST6 WC/CRC RPTFE/PEEK	PENTAFITE ST6 WC/CRC RPTFE/PEEK
5	Stem	13% Cr. A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)
-	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	316 SS A351 CF8M	316 SS A351 CF8M	316 SS A351 CF8M
2	Connector	A105 / A216 WCB	A479 Tp.304 / A351 CF8	A479 Tp.316 / A351 CF8M
1	Body	A105 / A216 WCB	A479 Tp.304 / A351 CF8	A479 Tp.316 / A351 CF8M

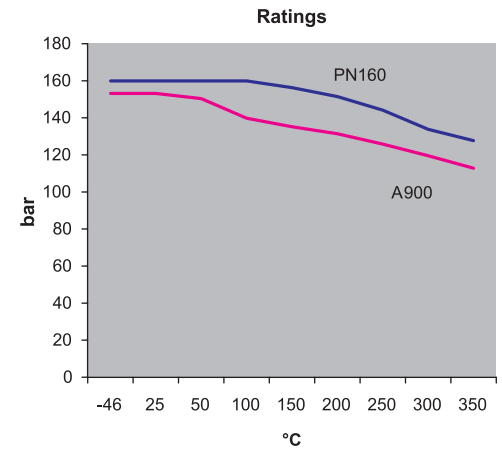
HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
 WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - AP609

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS



STANDARD SPECIFICATION	
Design:	ASME B16.34, API 608, ASME VIII DIV.1
Rating:	PN160, CI 900
Flanged ends:	DIN2638, ASME B16.5
Inspection:	ASME B16.104, API 598, EN 1266-I, ISO 5208, BS 6755-I

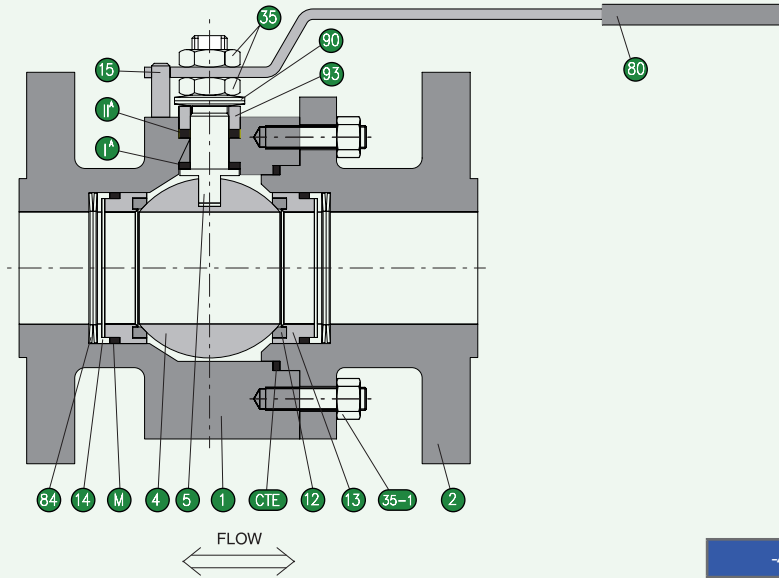


MEASURES					
DN	15	20	25	40	50
Ø"	1/2"	3/4"	1"	1 1/2"	2"
ØE	13	17	22	35	47
LRF	216	229	254	305	368
LTRJ	216	229	254	305	371
M	275	275	275	380	330
H	101	101	101	135	146
h	75	75	76	105	105
P	48	55	48	65	80
F/t	16/10	16/10	16/10	22/14	22/14
Kg	16/10	16/10	16/10	22/14	22/14
ISO5211	F05	F05	F05	F07	F07

[1] Manual gear recommended

METAL SEATED BALL VALVES | AP SERIES - AP609

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS



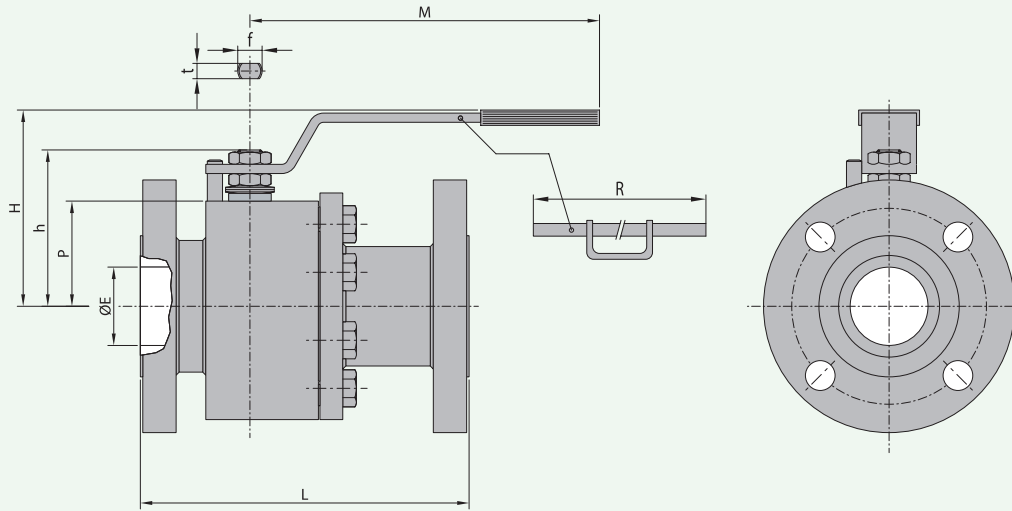
-46°C +400°C

PART DRAWING			
CTE	Body connector gasket	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil
93	Gland	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070
35-1	Body / Connectors bolts	A193 B7 A194 Gr.2H	A193 B8M A194 Gr.8M
35	Nut	304SS	304SS
15	Lever stopper	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740
14	Compression ring	A479 Tp.316	A479 Tp.316
13	Seat holder	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE	PENTAFITE
5	Stem	13% Cr. A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)
-	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	A182 F51	A182 F51
2	Connector	A105	A479 Tp.316
1	Body	A105	A479 Tp.316

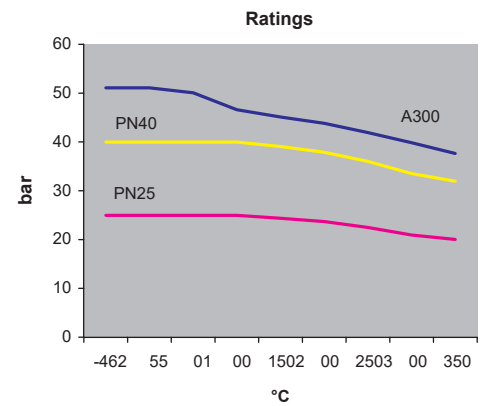
HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
 WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - AP50

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS



STANDARD SPECIFICATION	
Design:	ASME B16.34, EN 12569, API 608, EN 17292, ASME VIII DIV.1, EN 12516-1
Rating:	PN25/40, CI 300
Flanged ends:	ASME B16.5, EN1092-1, DIN 2634
BW ends:	ASME B16.25
Inspection:	ASME B16.104, API 598, EN 1266-I, ISO 5208, BS 6755-I

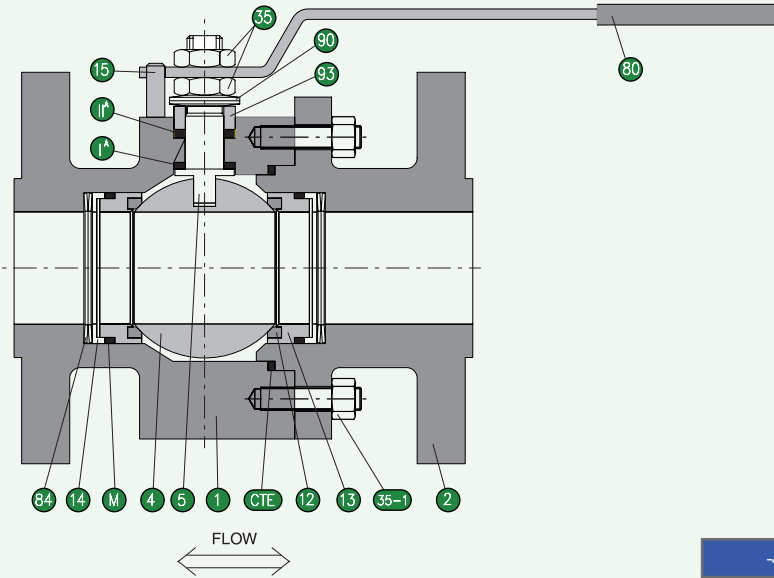


MEASURES						
DN	50	65	80	100	150	200
Ø"	2"	2 1/2"	3"	4"	6"	8"
ØE	35	51	64	76	102	152
L	216	241	283	305	403	419
M	275	275	380	380	440	-
R	-	-	-	500	800	800
H	118	126	139	144	212	-
h	96	103	122	128	158	220
P	63	68.5	82	88.5	111	153
F/t	16/10	16/10	22/14	22/14	30/18	45/30
Kg	18.5	22.5	32	45	70	105
ISO5211	F05	F05	F07	F07	F10	F14

^[1] Manual gear recommended

METAL SEATED BALL VALVES | AP SERIES - AP50

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS

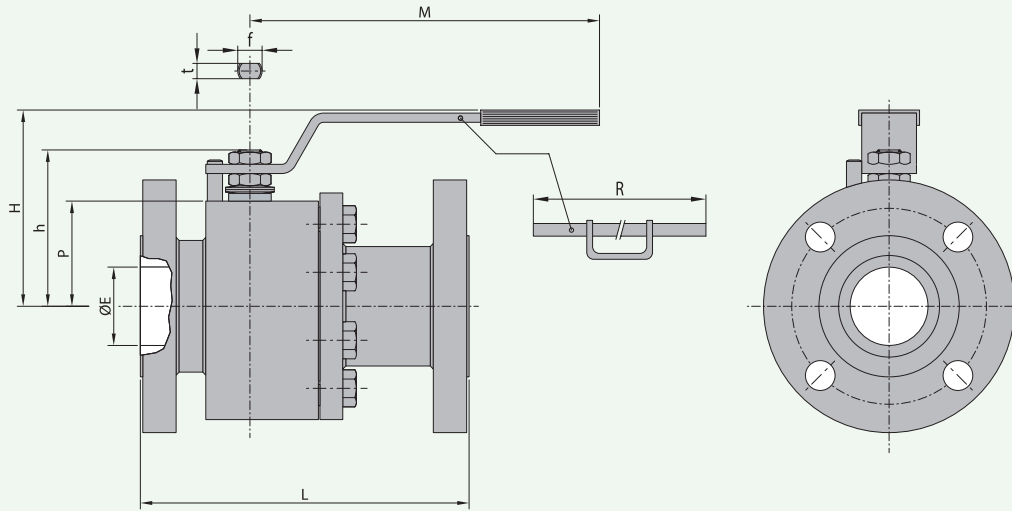


PART DRAWING				
CTE	Body connector gasket	Grafoil	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil	Grafoil
93	Gland	304SS	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070	Fe37 UNI 7070
35-1	Body / Connectors bolts	A193 B7 A194 Gr.2H	A193 B8M A194 Gr.8M	A193 B8M A194 Gr.8M
35	Nut	304SS	304SS	304SS
15	Lever stopper	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740
14	Compression ring	A479 Tp.316	A479 Tp.316	A479 Tp.316
13	Seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC
5	Stem	13% Cr. A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)
-	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	316SS	316SS	316SS
2	Connector	A105/A216 WCB	A479 Tp.304/A351 CF8	A479 Tp.304/A351 CF8M
1	Body	A105/A216 WCB	A479 Tp.304/A351 CF8	A479 Tp.304/A351 CF8M

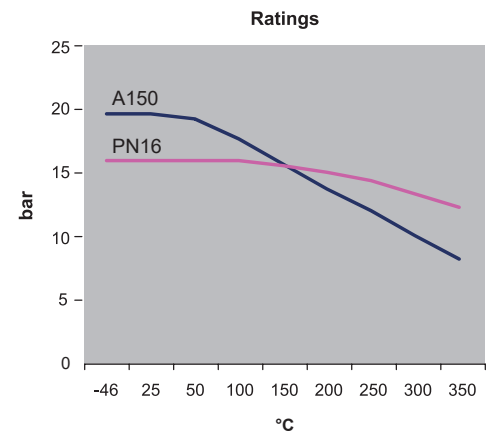
HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
 WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - AP54

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS



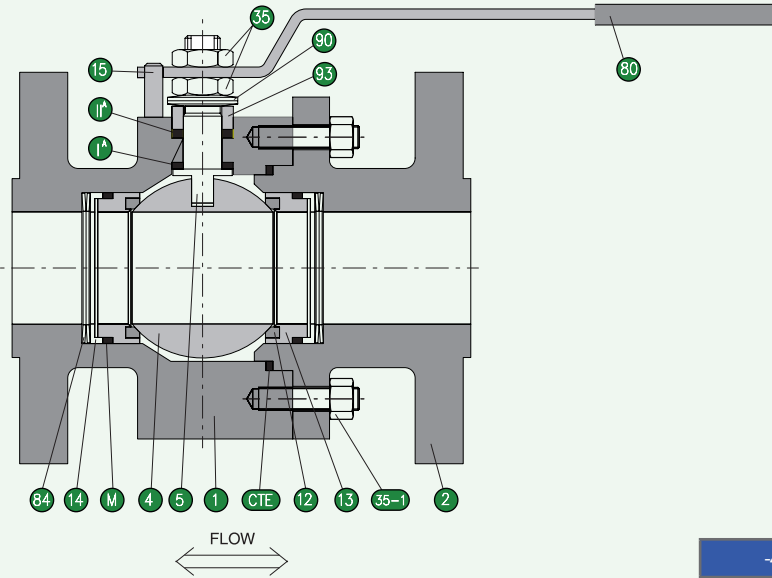
STANDARD SPECIFICATION	
Design:	ASME B16.34, EN 12569, API 608, EN 17292, ASME VIII DIV.1, EN 12516-1
Rating:	PN16, CI 150
Flanged ends:	ASME B16.5, EN1092-1, DIN 2633
Inspection:	ASME B16.104, API 598, EN 1266-I, ISO 5208, BS 6755-I



MEASURES							
DN	50	65	80	100	125	150	200
Ø"	2"	2 1/2"	3"	4"	5"	6"	8"
ØE	38	51	64	76	102	102	152
L	178	190	203	229	254	267	292
M	275	275	380	380	440	440	- [1]
R	-	-	-	-	500	500	800
H	118	126	139	144	212	212	-
h	96	103	122	128	158	128	220
P	63	68.5	82	88.5	111	111	153
F/t	16/10	16/10	22/14	22/14	30/18	30/18	45/30
Kg	13	17	26	34	38	43	68
ISO5211	F05	F05	F07	F07	F10	F10	F14

[1] Manual gear recommended

METAL SEATED BALL VALVES | AP SERIES - AP54
BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS

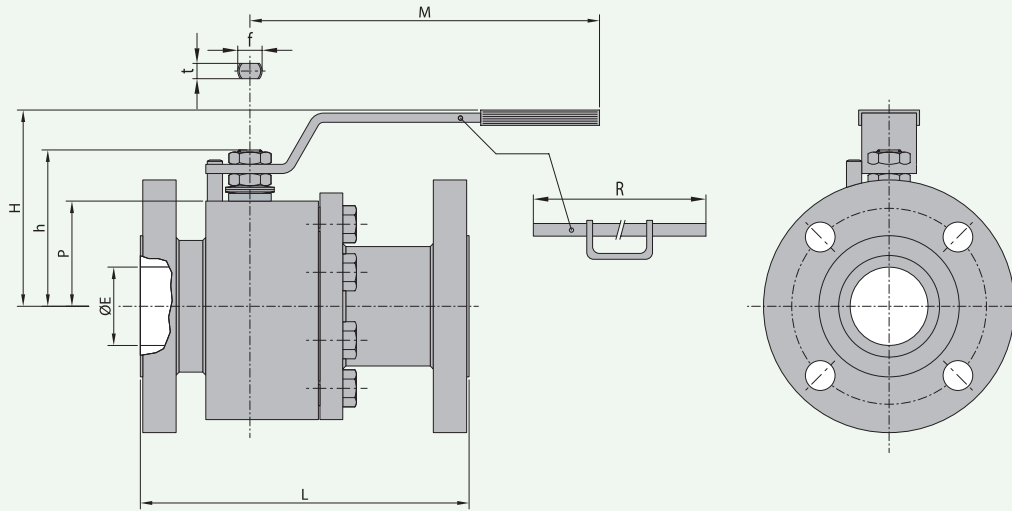


PART DRAWING				
CTE	Body connector gasket	Grafoil	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil	Grafoil
93	Gland	304SS	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070	Fe37 UNI 7070
35-1	Body / Connectors bolts	A193 B7 A194 Gr.2H	A193 B8 A194 Gr.8	A193 B8M A194 Gr.8M
35	Nut	304SS	304SS	304SS
15	Lever stopper	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740
14	Compression ring	A479 Tp.316	A479 Tp.316	A479 Tp.316
13	Seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC
5	Stem	13% Cr. A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)
-	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	A479 Tp. 316	A479 Tp. 316/A351 CF8	A479 Tp. 316/A351 CF8M
2	Connector	A105/A216 WCB	A479 Tp.304/A351 CF8	A479 Tp. 316/A351 CF8M
1	Body	A105/A216 WCB	A479 Tp.304/A351 CF8	A479 Tp. 316/A351 CF8M

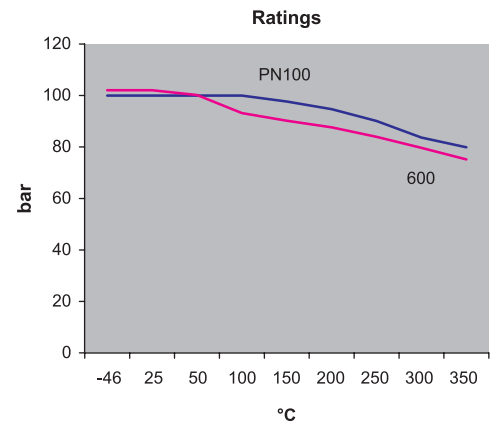
HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - AP506

BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS



STANDARD SPECIFICATION	
Design:	ASME B16.34, EN 12569, API 608, EN 17292, ASME VIII DIV.1, EN 12516-1
Rating:	PN63/100, CI 600
Flanged ends:	ASME B16.5, EN1092-1, DIN 2636, DIN 2637
Inspection:	ASME B16.104, API 598, EN 1266-I, ISO 5208, BS 6755-I

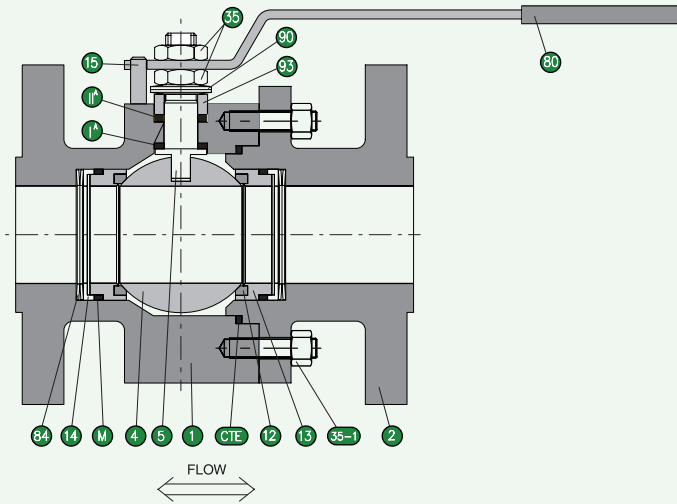


MEASURES				
DN	50	65	80	100
Ø"	2"	2 1/2"	3"	4"
ØE	38	51	51	76
L	292	330	356	432
M	380	380	380	440
R	-	-	-	500
H	135	146	146	185
h	104	115	115	141
P	65	75	75	95
F/t	22/14	22/14	22/14	30/18
Kg	22	33	38	65
ISO5211	F05	F05	F07	F07

^[1] Manual gear recommended

METAL SEATED BALL VALVES | AP SERIES - AP506

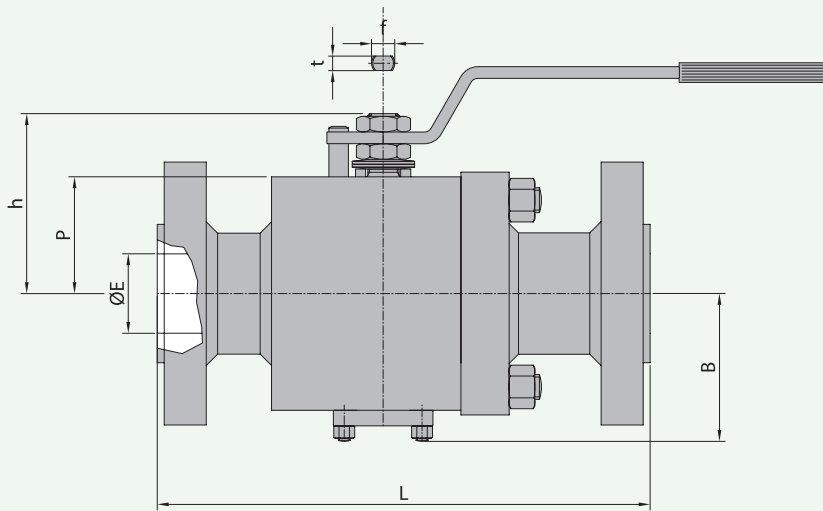
BALL VALVE WITH SPLIT BODY VALVE, FLOATING BALL, WITH FULLY REPLACEABLE SEATS



PART DRAWING				
CTE	Body connector gasket	Grafoil	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil	Grafoil
11 ^A	Secondary stem seal	Grafoil	Grafoil	Grafoil
11 ^A	Primary stem seal	Grafoil	Grafoil	Grafoil
93	Gland	304SS	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070	Fe37 UNI 7070
35-1	Body / Connectors bolts	A193 B7 A194 Gr.2H	A193 B8 A194 Gr.8	A193 B8M A194 Gr.8M
35	Nut	304SS	304SS	304SS
15	Lever stopper	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740	Gr. 8.8 UNI3740
14	Compression ring	A479 Tp.316	A479 Tp.316	A479 Tp.316
13	Seat holder	A479 Tp.316	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC
5	Stem	13% Cr. A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)
-	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	A479 Tp. 316	A479 Tp. 316/A351 CF8	A479 Tp. 316/A351 CF8M
2	Connector	A105	A479 Tp.304	A479 Tp. 316
1	Body	A105	A479 Tp.304	A479 Tp. 316

HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
 WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - APT2
 SPLIT BODY VALVE, TRUNNION MOUNTED BALL, WITH FULLY REPLACEABLE SEATS



STANDARD SPECIFICATION	
Design:	ASME B16.34, API 608, EN 12569, EN 17292, ASME VIII DIV.1, EN 12516-1
Rating:	PN10/16/25/40/63/100/160/250, CI 150/300/600/900/1500
Flanged ends:	ASME B16.5, EN1092-1, DIN 2632/2633/2634/2635/2636/2637/2638
Inspection:	ASME B16.104, API 598, EN 1266-1, ISO 5208, BS 6755-1

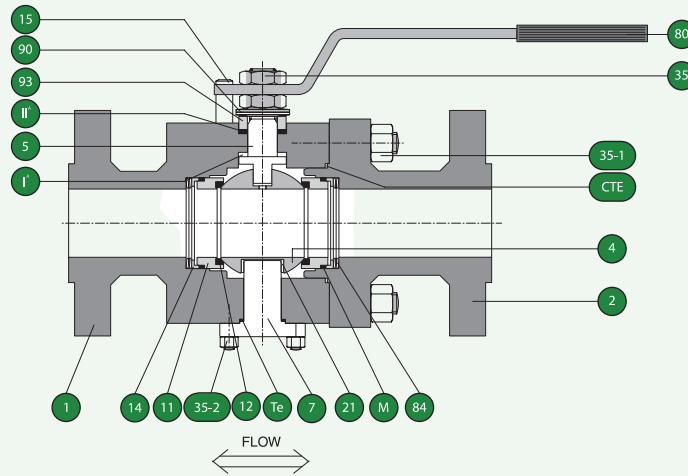
		MEASURES								
CLASS	DN	15	20	25	40	50	80	100	150	
CLASS	Ø"	1/2"	3/4"	1"	1 1/2"	2"	3"	4"	6"RB	PN
	ØE	14	19	24	38	51	76	102	152	
	L	140	152	165	191	178	203	229	394	
CI150	h	82	82	83	96	103	128	157	157	PN10-16
	P	48	48	50	63	69	89	111	111	
	B	732	73	68	81	87	114	125	125	
	F/t	16/10	16/10	16/10	16/10	16/10	22/14	30/18	30/18	
	ISO 5211	F05	F05	F05	F05	F05	F07	F10	F10	
	L	140	152	165	191	216	283	305	403	
h	82	82	83	96	103	128	180	180		
P	48	48	50	63	69	89	114	114		
B	73	73	68	81	87	114	125	125		
F/t	16/10	16/10	16/10	16/10	16/10	22/14	45/30	45/30		
ISO 5211	F05	F05	F05	F05	F05	F07	F14	F14		
CI600	L	165	191	216	241	291	356	432	559	PN64-100
	h	82	82	83	14	112	143	199	199	
	P	48	48	50	65	75	95	124	124	
	B	73	73	68	83	95	115	159	159	
	F/t	16/10	16/10	16/10	22/14	22/14	30/18	45/30	45/30	
	ISO 5211	F05	F05	F05	F07	F07	F10	F14 ^[1]	F14 ^[1]	
CI900	L	216	229	254	305	268	-	-	-	PN160
	h	79	79	79	104	116	-	-	-	
	P	55	55	55	65	75	-	-	-	
	B	73	73	73	98	100	-	-	-	
	F/t	16/10	16/10	16/10	22/14	22/14	-	-	-	
	ISO 5211	F05	F05	F05	F07	F07	-	-	-	
CI1500	L	216	229	254	-	-	-	-	-	PN250
	h	79	79	79	-	-	-	-	-	
	P	55	55	55	-	-	-	-	-	
	B	73	73	73	-	-	-	-	-	
	F/t	16/10	16/10	16/10	-	-	-	-	-	
	ISO 5211	F05	F05	F05	-	-	-	-	-	

^[1] Manual gear recommended

METAL SEATED BALL VALVES | AP SERIES - APT2

SPLIT BODY VALVE, TRUNNION MOUNTED BALL, WITH FULLY REPLACEABLE SEATS

SPECIAL FEATURES
BI-DIRECTIONAL
DOUBLE BLOCKED AND BLEED
AUTOMATIC BODY CAVITY RELIEF



-46°C +400°C

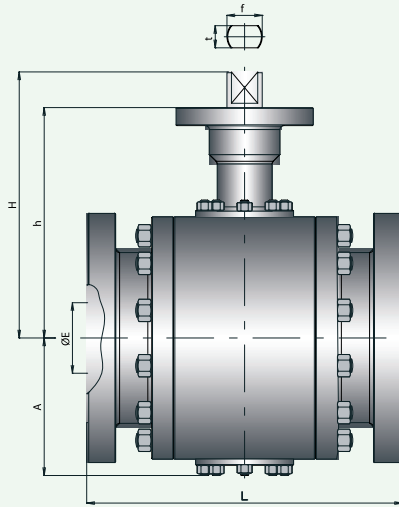
PART DRAWING

Part No.	Description	Material	Material
Te	Body cover gasket	Grafoil	Grafoil
CTe	Body connector gasket	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil
93	Gland	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070
35-2	Body / Cover bolts	A193 B7 A194 Gr.2H	A193 B8M A194 Gr.Gr.8M
35-1	Body / Connectors bolts	A193 B7 A194 Gr.2H	A193 B8M A194 Gr.Gr.8M
35	Nut	304SS	304SS
21	Trunnion bearing	DU/BM	DU/BM
15	Lever stopper	Gr.8.8 UNI 3740	Gr.8.8 UNI 3740
14	Compression ring	A479 Tp.316	A479 Tp.316
13	Body seat holder	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC
11	Connector seat holder	A479 Tp.316	A479 Tp.316
6	Lower cover	A105	A105
5	Stem	420 s.s. A564 Tp.630 (17/4PH)	420 s.s. A564 Tp.630 (17/4PH)
-	Ball coating	HTC/HCR ST6 WC/CRC	HTC/HCR ST6 WC/CRC
4	Ball	316SS	316SS
2	Connector	A105	A479 Tp.316
1	Body	A105	A479 Tp.316

HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | AP SERIES - APT3

SPLIT BODY VALVE 3 PIECES, TRUNNION MOUNTED BALL, WITH FULLY REPLACEABLE SEATS/GASKETS



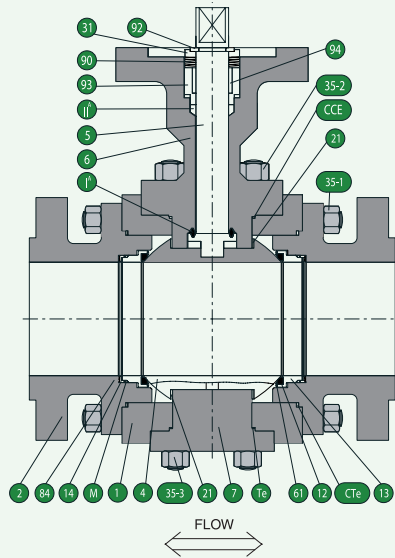
STANDARD SPECIFICATION	
Design:	ASME B16.34, API 608, EN 12569, EN 17292, ASME VIII DIV.1, EN 12516-1
Rating:	PN10/16/25/40/63/100, CI 150/300/600
Flanged ends:	ASME B16.5, EN1092-1, DIN 2632/2633/2634/2635/2636/2637/2638, GOST 54432/12815

CLASS	MEASURES				PN
	DN	150	200	250	
	Ø"	6"	8"	10"	PN10-16
CI150	ØE	152	203	254	
	L	394	457	533	
	A	175	210	255	
	h	239	266	329	
	H	290	317	408	
	F/t	45/30	45/30	55/40	
	ISO 5211	F14	F14	F14	
CI300	ØE	152	203	254	PN25-40
	L	403	502	568	
	A	175	210	255	
	h	244	266	329	
	H	290	320	408	
	F/t	45/30	45/30	55/40	
	ISO 5211	F14	F14	F14	
CI600	ØE	152	203	248	PN64-100
	L	559	660	787	
	A	185	235	275	
	h	244	298	329	
	H	290	377	408	
	F/t	45/30	55/40	55/40	
	ISO 5211	F14	F16	F16	

METAL SEATED BALL VALVES | AP SERIES - APT3

SPLIT BODY VALVE 3 PIECES, TRUNNION MOUNTED BALL, WITH FULLY REPLACEABLE SEATS/GASKETS

SPECIAL FEATURES
BI-DIRECTIONAL
DOUBLE BLOCKED AND BLEED
AUTOMATIC BODY CAVITY RELIEF



-46°C +400°C

PART DRAWING

PART DRAWING			
Te	Lower cover gasket		Grafoil
CCE	Upper cover gasket		Grafoil
CTE	Body / connector gasket		Grafoil
M	Seat gasket		Grafoil
II ^A	Secondary stem seal		Grafoil
I ^A	Primary stem seal		Grafoil
94	Stem plain bearing		DU
93	Gland		316SS
92	Stem retaining ring		316SS
90	Stem spring		301SS
84	Seat spring		X750
61	Seat support		316SS
35-3	Lower cover bolts	B7/2H	B8/Gr.8
35-2	Upper cover bolts	B7/2H	B8/Gr.8
35-1	Body / Connectors bolts	B7/2H	B8/Gr.8
31	Stem spring compression ring		316SS
21	Trunnion plain bearing	DU/BM	
14	Compression ring	316SS	
13	Seat holder	316SS	
12	Seat insert		PENTAFITE ST6 WC/CRC
7	Lower cover	A105	316SS
6	Upper cover	A105	316SS
5	Stem	410SS	316SS
-	Ball coating		HCR/HTC ST6 WC/CRC
4	Ball		316SS
2	Body connector	A105	316SS
1	Body	A105	316SS

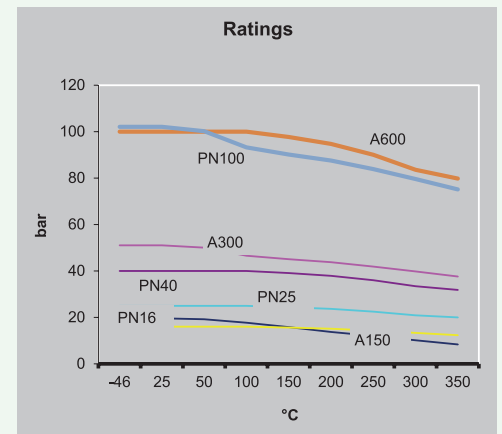
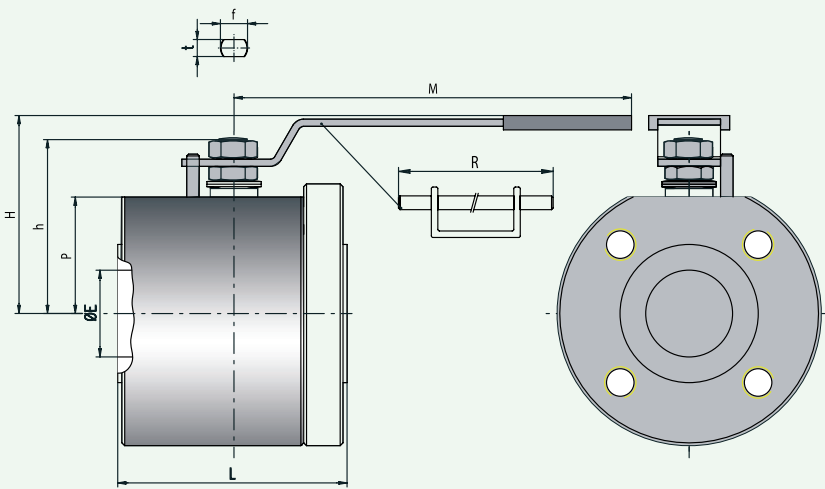
HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

WHAT THE WSS SERIES OFFER

The WSS series can be considered as an evolution of models AP10 and AP11, this is because they were made to offer an easier maintenance on dirty services.

The use of a split body wafer design eliminates the possibility of galling at the end of the ring nut like that could happen on standard AP10 or AP11. The automatic body cavity pressure relief and the bi-directionality makes this model a high technical level choice.

WSS series are also available with heating jacket and provided with ISO 5211 top drilling. Face to face according to EN 558 series 100 (3", 4", 6"), 101 (1/2", 3/4") and 107.



MEASURES										
CLASS	DN	15	20	25	40	50	80	100	150	PN
	Ø"	1/2"	3/4"	1"	1 1/2"	8"	3"	4"	6"	
CI150	ØE	14	19	24	38	48	75	95	152	PN10-16
	L	55	60	60	80	95	121	152	240	
	P	34	36	50	63	72	93	105	154	
	h	53	55	69	96	102	128	152	220	
	H	85	87	95	119	127	148	184	273	
	M	151	151	186	275	275	380	-	-	
	R	-	-	-	-	-	-	440	715	
	F/t	10/16	10/16	12/8	16/10	16/10	22/14	30/18	45/30	
ISO 5211	F03	F03	F03	F05	F05	F07	F10	F14		
CI300	ØE	14	19	24	38	48	75	95	152	PN25-40
	L	55	60	65	85	100	145	185	280	
	P	34	36	50	63	75	92	105	154	
	h	53	55	69	96	102	128	152	220	
	H	85	87	95	119	125	149	184	273	
	M	151	151	186	275	275	380	-	-	
	R	-	-	-	-	-	-	440	715	
	F/t	10/16	10/16	12/8	16/10	16/10	22/14	30/18	45/30	
ISO 5211	F03	F03	F03	F05	F05	F07	F10	F14		

METAL SEATED BALL VALVES | WSS SERIES

SPLIT BODY WAFER BALL VALVE (FOR EASIER MAINTENANCE)

AVAILABLE SEAT MATERIAL				
Code	Material	Hardness	Working temperature	Service Limits
S01	SILVER PENTAFITE (Nickel + Graphite)	120 HB	-100°C / +780°C (-148°F / +1436°F)	Fear clean services both liquid or gas. For use with HTC, HTCN, HCR, WC, CRC, ST6 ball coated.
R01	RED PENTAFITE (Cu + Graphite)	100 HB	-100°C / +500°C (-148°F / +932°F)	For clean services both liquid or gas. Lower friction factors in dry gas or steam service. For use with HTC, HTCN, HCR, ST6 ball coated.
B01	BLACK PENTAFITE (Carbon + Graphite)	80 HB	Amb. / +400°C (Amb. / +662°F)	For low pressure specific services where S01 and R01 cannot be used due to corrosion problems. All bat coat is not structly necessary and should be evaluated time to time.
WC	TUNGSTEN CARBIDE (Detonation Gun/HVOF)	1100 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with high presence of solids. Not suitable when small presence of caustic soda is expected. For use with WC ball coat.
ST6	STELLITE Gr.6 (Detonation Gun/HVOF)	1000 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Suitable when small presence of caustic soda is expected. Best on dry gas or steam services. For use with WC, CRC ball coat.
CRC	CHROME CARBIDE (Detonation Gun)	800 HV	Amb. / +750°C (Amb. / +1382°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
PK1	PEEK (Polyetheretherketone)		-100°C / +240°C (-148°F / +464°F)	For clean liquid or gas services with high frequency of valve operation.
RPTFE	PTFE REINFORCED WITH GRAPHITE (Glass/Graphite reinforces PTFE)		-100°C / +220°C (-148°F / +428°F)	For clean liquid or gas services with high frequency of valve operation.

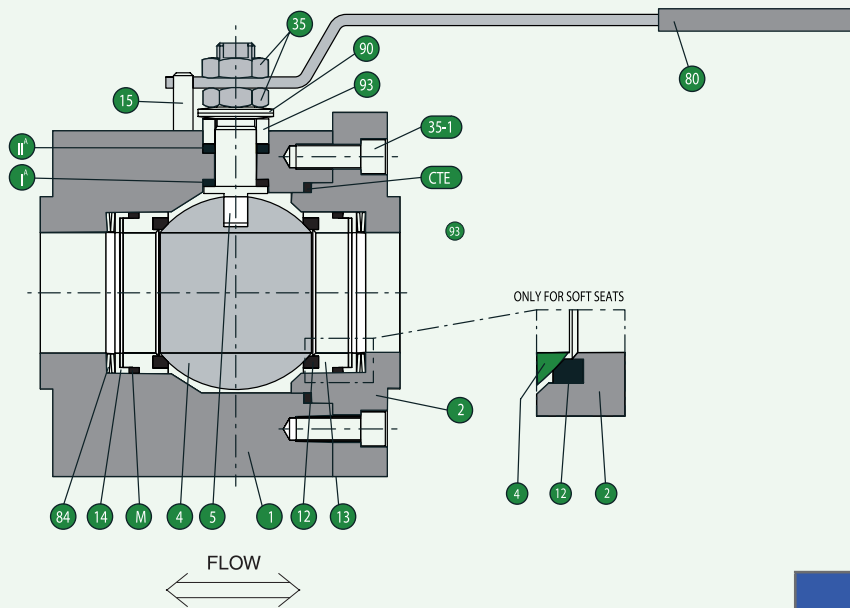
AVAILABLE BALL COATING MATERIALS				
Code	Material	Hardness	Working temperature	Service Limits
HTC	TITANIUM NITRIDE (PVD)	2500 HV	-100°C / +600°C (-148°F / +1436°F)	For clean services both liquid or gas. For gas and steam up to 180°C.
HTCN	CARBOTITANIUM NITRIDE (PVD)	3500 HV	-100°C / +400°C (-148°F / +752°F)	For liquid or gas services with small presence of solids. For gas and steam up to 180°C.
HCR	CHROME NITRIDE (PVD)	3000HV	Amb. / +750°C (Amb. / +1382°F)	For clean services both liquid or gas. Best on oxidizing services.
WC	TUNGSTEN CARBIDE (Detonation Gun/HVOF)	1100 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
CRC	CHROME CARBIDE (Detonation Gun/HVOF)	800 HV	Amb. / +750°C (Amb. / +1382°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
ST6	STELLITE GR.6 (Detonation Gun/HVOF)	1000 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Suitable when small presence of caustic soda is expected. Best on dry or steam services.

TIGHTNESS

All KTN WSS series valves are tested to verify their BUBBLE TIGHTNESS (no visible leakage during hydraulic seat test according to ANSI B16.34 and during low pressure air seats test at 100 psi)

METAL SEATED BALL VALVES | WSS SERIES

SPLIT BODY WAFER BALL VALVE (FOR EASIER MAINTENANCE)



PART DRAWING			
CTE	Body / connector gasket		Grafoil
M	Seat gasket		Grafoil
II ^A	Secondary stem seal		Grafoil
I ^A	Primary stem seal		Grafoil
93	Gland		316SS
90	Stem spring		301SS
84	Seat spring		301SS/X750
80	Seat support		Fe 37 UNI7070
35-1	Body / Connectors bolts		304SS
31	Stem spring compression ring		304SS
15	Trunnion plain bearing		UNI 3740 Gr.8.8
14	Compression ring		316SS
13	Seat holder		316SS
12	Seat insert		PENTAFITE ST6 CRC- WC RTFE
5	Stem		A564 Tp.630 (17/4PH)
-	Ball coating		HCR/HTC ST WC/CRC
4	Ball		316SS
2	Body connector		A105 316SS
1	Body		A105 316SS

HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
 WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

WHAT THE P40 SERIES OFFER

The P40 series uses the SAT serie unique seat design to guarantee the best reliability and long-term tightness against high pressures.

Stem seal simplified design is made for easier maintenance activities. As every KTN high performance ball valves all of our seats are available on P40 with also hard coated ones.

All valves are provided with ISO 5211 top drilling.

1 Stem tightness

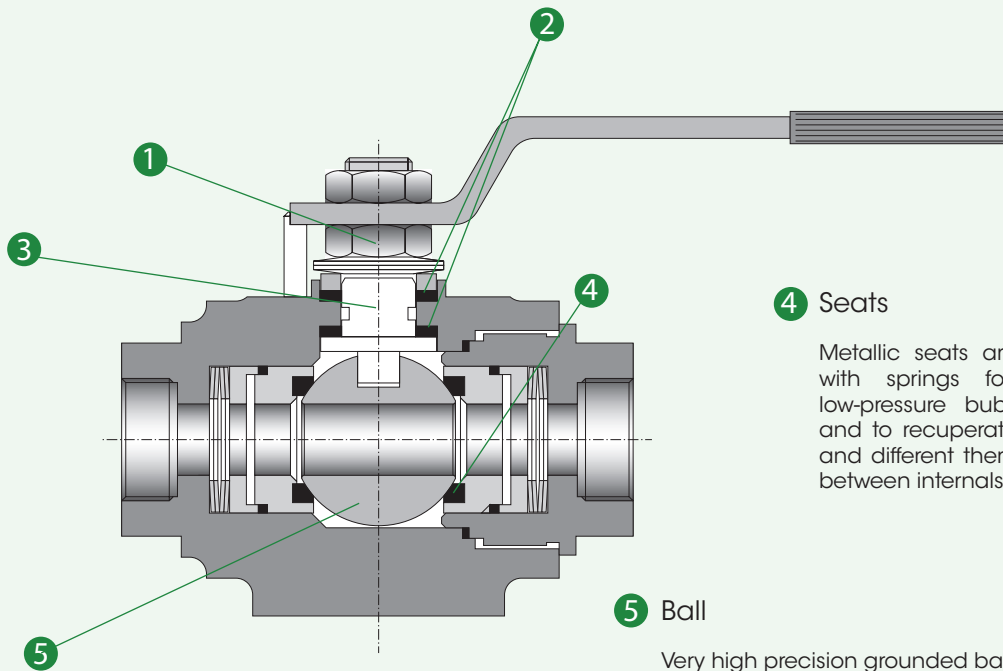
The double spring system with loading nuts, allows the correct stem gasket pre-loading and the adjustment to recuperate wearing and clearance for different thermal dilation between stem and body.

2 Gasket

Only Grafoil® gaskets are used, inherently resistant to high temperatures; no polymers are used.

3 Stem

Stem are 100% oversized against expected torque at max. rated DP.



4 Seats

Metallic seats are pre-loading with springs for a perfect low-pressure bubble tightness and to recuperate life wearing and different thermal dilatation between internals.

5 Ball

Very high precision grounded balls are produced inside and then hard coated with most advanced system.

PRODUCTION RANGE

PRESSURE CLASSES

ANSI B16.34		900		1500	
PN		160		250	
		F	T	F	T
DN	Fig	P40		P40	
1/2"					
3/4"					
1"					

F= Floating ball

T= Trunnion mounted ball

METAL SEATED BALL VALVES | P40 SERIES

2 PIECES FLOATING BALL VALVE #1500 PN250

AVAILABLE SEAT MATERIAL

Code	Material	Hardness	Working temperature	Service Limits
S01	SILVER PENTAFITE (Nickel + Graphite)	120 HB	-100°C / +780°C (-148°F / +1436°F)	Fear clean services both liquid or gas. For use with HTC, HTCEN, HCR, WC, CRC, ST6 ball coated.
R01	RED PENTAFITE (Cu + Graphite)	100 HB	-100°C / +500°C (-148°F / +932°F)	For clean services both liquid or gas. Lower friction factors in dry gas or steam service. For use with HTC, HTCEN, HCR, ST6 ball coated.
WC	TUNGSTEN CARBIDE (Detonation Gun/HVOF)	1100 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with high presence of solids. Not suitable when small presence of caustic soda is expected. For use with WC ball coat.
ST6	STELLITE Gr.6 (Detonation Gun/HVOF)	1000 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Suitable when small presence of caustic soda is expected. Best on dry gas or steam services. For use with WC, CRC ball coat.

AVAILABLE BALL COATING MATERIALS

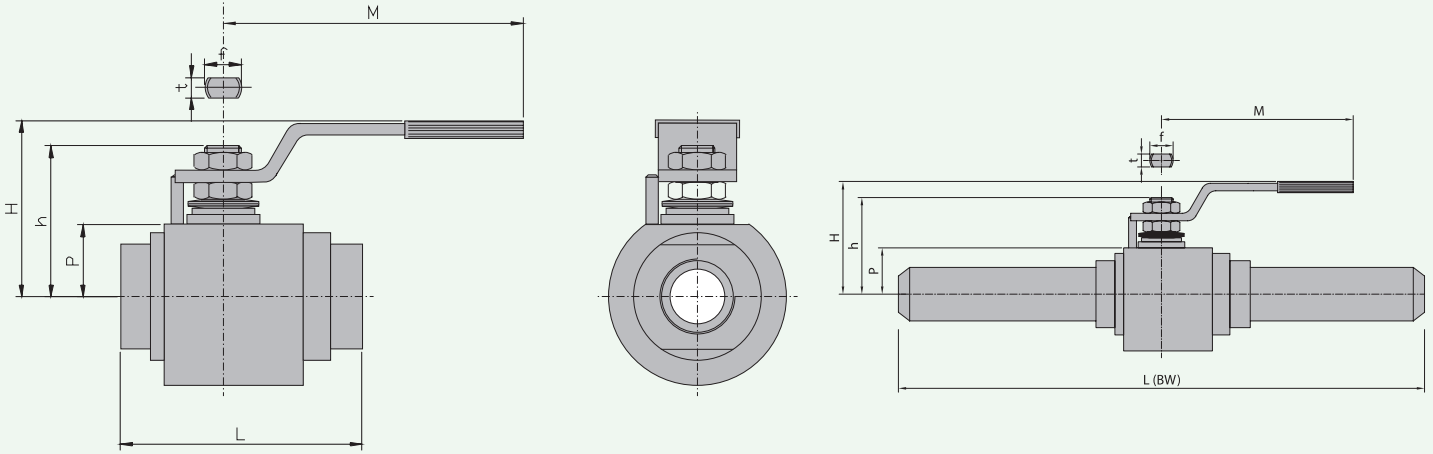
Code	Material	Hardness	Working temperature	Service Limits
HTC	TITANIUM NITRIDE (PVD)	2500 HV	-100°C / +600°C (-148°F / +1132°F)	For clean services both liquid or gas. For gas and steam up to 180°C.
HTCEN	CARBO TITANIUM NITRIDE (PVD)	3500 HV	-100°C / +400°C (-148°F / +752°F)	For liquid or gas services with small presence of solids. For gas and steam up to 180°C.
HCR	CHROME NITRIDE (PVD)	3000 HV	Amb. / +750°C (Amb. / +1382°F)	For clean services both liquid or gas. Best on oxidizing services.
WC	TUNGSTEN CARBIDE (Detonation Gun/HVOF)	1100 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
CRC	CHROME CARBIDE (Detonation Gun/HVOF)	800 HV	Amb. / +750°C (Amb. / +1382°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
ST6	STELLITE GR.6 (Detonation Gun/HVOF)	1000 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Suitable when small presence of caustic soda is expected. Best on dry or steam services.

TIGHTNESS

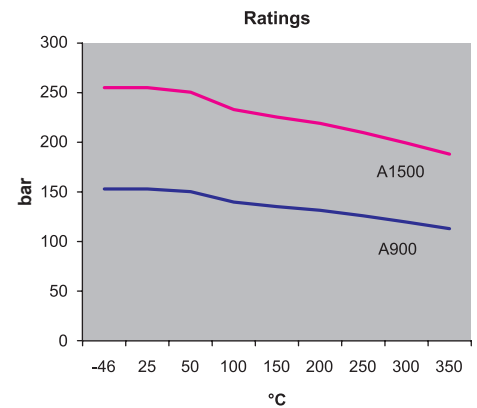
All KTN P40 series valves are tested to verify their BUBBLE TIGHTNESS (no visible leakage during hydraulic seat test according to ANSI B16.34 and during low pressure air seats test at 100 psi)

METAL SEATED BALL VALVES | P40 SERIES

2 PIECES FLOATING BALL VALVE #1500.PN250



STANDARD SPECIFICATION	
Design:	ASME B16.34, API 608, EN 12516-1
Rating:	900/1500
Ends:	NPT ASME B1.20.1,
Inspection:	ASME B16.104, API 598, EN 1266-I, ISO 5208, BS 6755-I

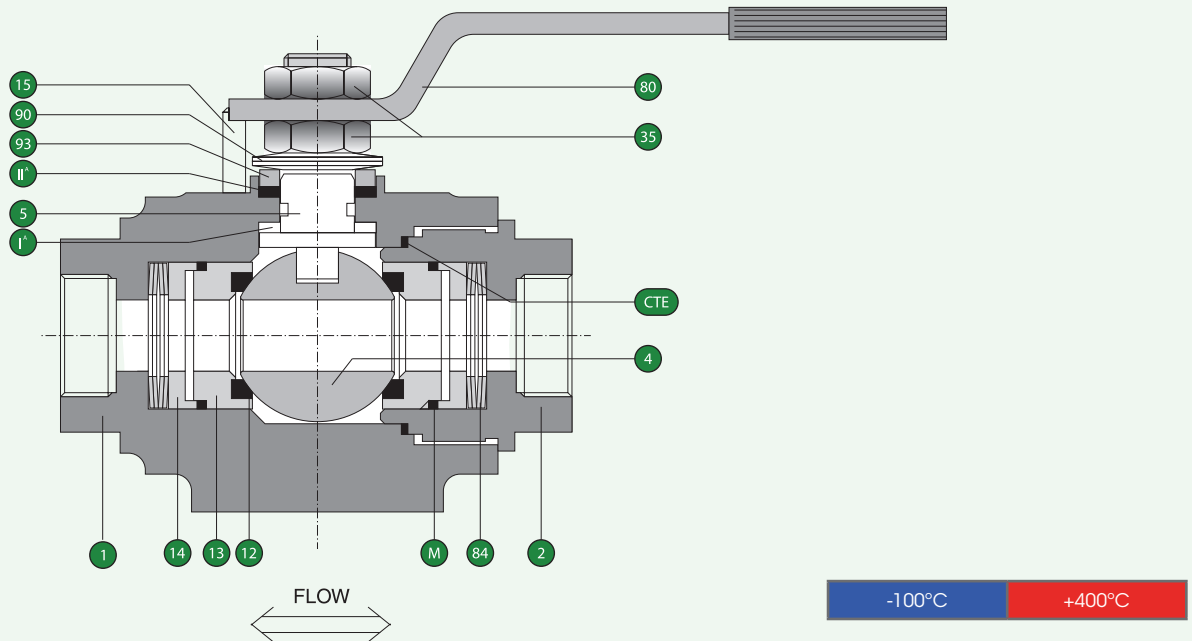


MEASURES			
DN	15	20	25
Ø"	1/2"	3/4"	1"
ØE	13	17	22
L	130	130	160
LBW	270	270	305
h	64	68	86
P	34	34	41
H	92	96	102
F/t	16/10	16/10	22/14
ISO211	F05	F05	F07

P40 ACCESSORIES
SIP lever elongation for insulated piping systems
Manual gear
Stem elongation
Single or double acting actuators, electric or hydraulic actuators

METAL SEATED BALL VALVES | P40 SERIES

2 PIECES FLOATING BALL VALVE #1500 PN250



PART DRAWING			
CTE	Body / connector gasket	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil
93	Gland	304SS	304SS
90	Stem spring	UNS30100	UNS30100
84	Seat spring	UNS30100	UNS30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070
35	Nut	304SS	304SS
15	Lever stopper	Gr.8.8 UNI 3740	Gr.8.8 UNI 3740
14	Compression ring	A479 Tp.316	A479 Tp.316
13	Body seat holder	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE ST6 WC/CRC	PENTAFITE ST6 WC/CRC
5	Stem	13%Cr. A564 Tp.630 (17/4PH)	A564 Tp.630 (17/4PH)
-	Ball coating	HCR/HTC ST6 WC/CRC	HCR/HTC ST6 WC/CRC
4	Ball	A479 Tp.316	A479 Tp.316
2	Body connector	A105	A479 Tp.304
1	Body	A105	A479 Tp.304

HTC = Titanium Nitrides; HCR = Chrome Nitrides; ST6 = Stellite 6 Detonation Gun/HVOF
 WC = Tungsten Carbides Detonation Gun/HVOF; CRC = Chrome Carbides Detonation Gun/HVOF

METAL SEATED BALL VALVES | SAT SERIES

SPLIT BODY VALVE 3 PIECES, FLOATING/TRUNNION MOUNTED BALL #2500 PN420 +780°C

Fire-Safe
Certificate
API 607 VED.
ISO 10497

CRN
Certificate

Ta-Luft
Approved
(c/w 100 mm stem elongation)

EAC
Eurasian Conformity

CE
Directive 2014/68/UE
"PED"

II2G c IIC TX
II2D c IIC TX
Directive 2014/34/UE
"ATEX"

WHAT THE SAT SERIES OFFER

The SAT series is the best design of KTN to solve the widest range of uses. The main aim in its design philosophy is to achieve the highest reliability using advanced solutions that still has no equal on the market.

Like all KTN production, SAT valves are equipped with metallic seats in Pentafite to allow the manufacturing of metal seated ball valves with absolutely zero leakage suitable for a wide range of services with working temperatures up to 780°C (1436°F) in continuous operation or 720 bar pressure.

The typical elastic properties of Pentafite seats and the fully bolted construction allow an easy maintenance without necessity of additional lapping of the seats against the ball.

Hard coated seats are also available.

SAT valves are available with floating or Trunnion mounted ball, with reduced bore or full bore and all valves are provided with automatic body cavity pressure relief arrangement. Finally, the stem seal has been simplified for easier maintenance activities.

STANDARD SPECIFICATION	
Design:	ANSI B16.34 / API 608 / API 6D / ISO 14313 / EN12569 / EN17292 / ASME VIII Div.1 / EN 12516-1
Rating:	CLASS150/300/600/900/1500/2500, PN16-25/40-50/64-100/150/250/420
Flanged ends:	ANSI B16.5 / EN 1092-1 / DIN
Butt weld ends:	ANSI B16.5
Inspection:	ASME B16.104, API 598, EN 1266-1, ISO 5208, BS 6755-1

Other end connections are available on request

1 Stem tightness

Unique stem seal design (patented). The spring placed at stem top gives the contact load for low pressure tightness and the adjustment for wearing and clearance for different dilatation between stem and cover.

3 Upper cover

All SAT valves are provided with bolted upper cover for quick and easy stem assembly maintenance.

6 Ball

Very high precision grounded balls are produced inside and then hard coated with most advanced system.

2 Stem

Stem are 100% oversized against expected torque at max. rated DP.

4 Backseat gasket

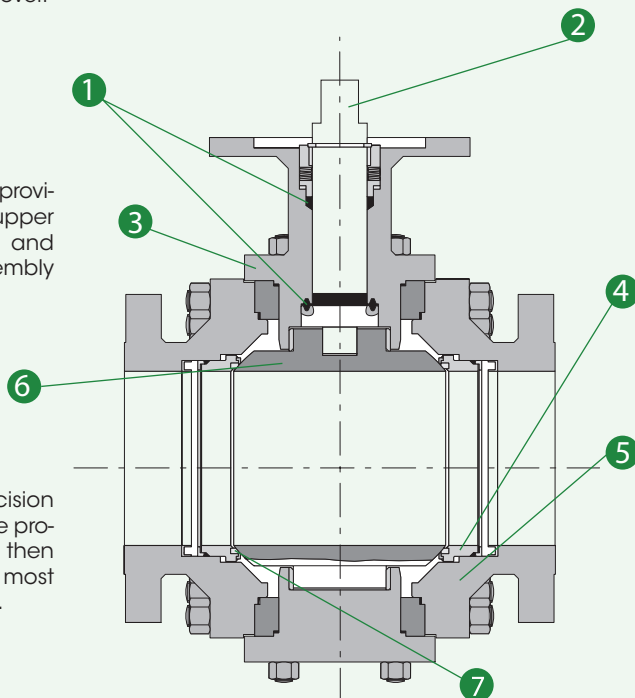
The patented cross-section of the backseat Grafoil gasket allows the automatic body cavity relief.

5 Bolting and flanges

All flanges connections are designed according to ASME VIII Div.1.

7 Seats

Metallic seats are loaded with springs on both valve side, also for floating ball construction, for a full bidirectionality.



METAL SEATED BALL VALVES | SAT SERIES

SPLIT BODY VALVE, 3 PIECES, FLOATING/TRUNNION MOUNTED BALL #2500 PN420 +780°C

AVAILABLE SEAT MATERIAL				
Code	Material	Hardness	Working temperature	Service Limits
S01	SILVER PENTAFITE (Nickel + Graphite)	120 HB	-100°C / +780°C (-148°F / +1436°F)	Fear clean services both liquid or gas. For use with HTC, HTCEN, HCR, WC, CRC, ST6 ball coated.
R01	RED PENTAFITE (Cu + Graphite)	100 HB	-100°C / +500°C (-148°F / +932°F)	For clean services both liquid or gas. Lower friction factors in dry gas or steam service. For use with HTC, HTCEN, HCR, ST6 ball coated.
B01	BLACK PENTAFITE (Carbon + Graphite)	80 HB	Amb. / +400°C (Amb. / +662°F)	For low pressure specific services where S01 and R01 cannot be used due to corrosion problems. All ball coat is not strictly necessary and should be evaluated time to time.
WC	TUNGSTEN CARBIDE (Detonation Gun/HVOF)	1100 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with high presence of solids. Not suitable when small presence of caustic soda is expected. For use with WC ball coat.
ST6	STELLITE Gr.6 (Detonation Gun/HVOF)	1000 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Suitable when small presence of caustic soda is expected. Best on dry gas or steam services. For use with WC, CRC ball coat.
CRC	CHROME CARBIDE (Detonation Gun)	800 HV	Amb. / +750°C (Amb. / +1382°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
PK1	PEEK (Polyetheretherketone)	800 HV	-100°C / +240°C (-148°F / +464°F)	For clean liquid or gas services with high frequency of valve operation.
RPTFE	PTFE REINFORCED WITH GRAPHITE (Glass/Graphite reinforces PTFE)	1000 HV	-100°C / +220°C (-148°F / +428°F)	For clean liquid or gas services with high frequency of valve operation.

AVAILABLE BALL COATING MATERIALS				
Code	Material	Hardness	Working temperature	Service Limits
HTC	TITANIUM NITRIDE (PVD)	2500 HV	-100°C / +600°C (-148°F / +1132°F)	For clean services both liquid or gas. For gas and steam up to 180°C.
HTCEN	CARBO TITANIUM NITRIDE (PVD)	3500 HV	-100°C / +400°C (-148°F / +752°F)	For liquid or gas services with small presence of solids. For gas and steam up to 180°C.
HCR	CHROME NITRIDE (PVD)	3000 HV	Amb. / +750°C (Amb. / +1382°F)	For clean services both liquid or gas. Best on oxidizing services.
WC	CARBURO DI TUNGSTENO Tungsten Carbide (Detonation Gun/HVOF)	1100 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
CRC	TUNGSTEN CARBIDE (Detonation Gun/HVOF)	800 HV	Amb. / +750°C (Amb. / +1382°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
ST6	STELLITE GR.6 (Detonation Gun/HVOF)	1000 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Suitable when small presence of caustic soda is expected. Best on dry or steam services.

TIGHTNESS

All KTN SAT series valves are tested to verify their BUBBLE TIGHTNESS (no visible leakage during hydraulic seat test according to ANSI B16.34 and during low pressure air seats test at 100 psi)

METAL SEATED BALL VALVES | SAT SERIES

SPLIT BODY VALVE 3 PIECES, FLOATING/TRUNNION MOUNTED BALL #2500 PN420 +780°C

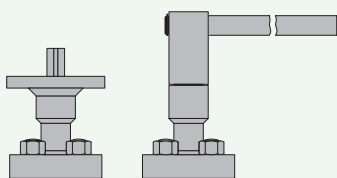
PRODUCTION RANGE													
PRESSURE CLASSES													
ANSI B16.34		150		300		600		900		1500		2500	
PN		16-25		40-50		64-100		150		250		420	
DN	Fig	F	T	F	T	F	T	F	T	F	T	F	T
1/2"													
3/4"													
1"													
1 1/2"													
2"													
3"													
4"													
6"													
8"													
10"													
12"													
14"													
16"													
18"													
20"													
22"													
24"													
26"													
28"													
30"													
32"													

F= Floating ball

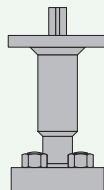
T= Trunnion mounted ball

SAT ACCESORIES
SIP lever elongation for insulated piping systems
Manual gear
Stem elongation
Single or double acting actuators, electric or hydraulic actuators

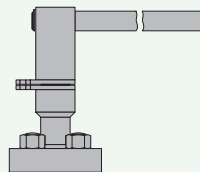
Many accessories are available on request



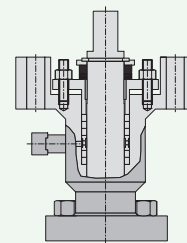
Cover with flange or lever



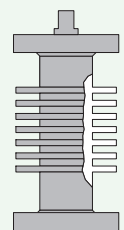
Longated cover for high temperatures



locking device



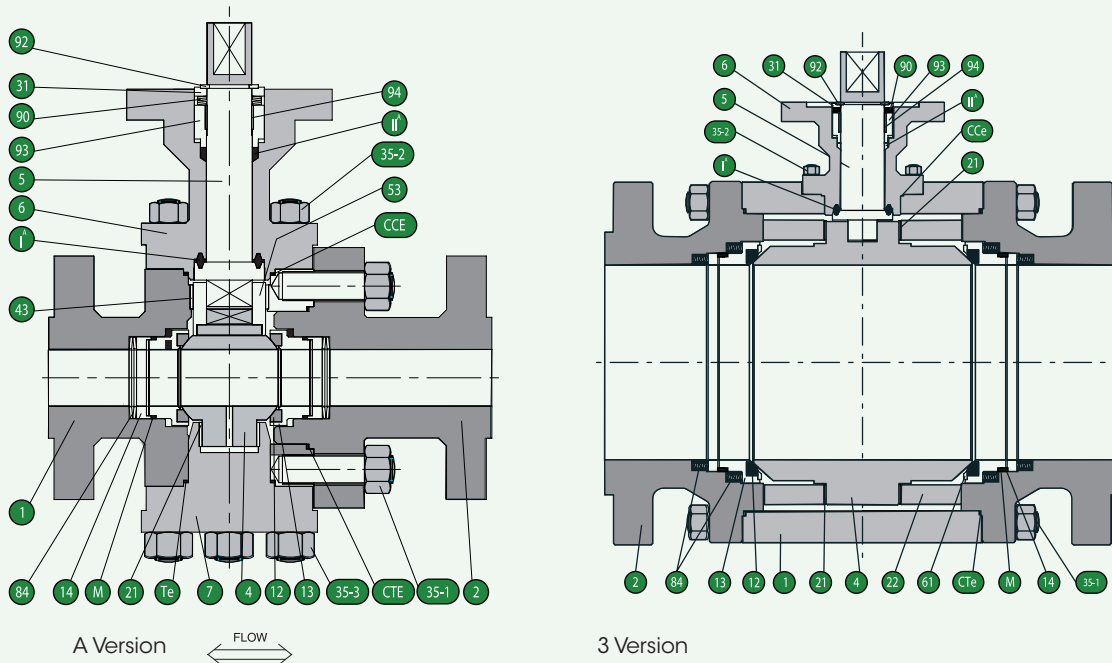
Cover with packing



Finned cover

METAL SEATED BALL VALVES | SAT SERIES

SPLIT BODY VALVE 3 PIECES, TRUNNION MOUNTED BALL #2500 PN420 +780°C

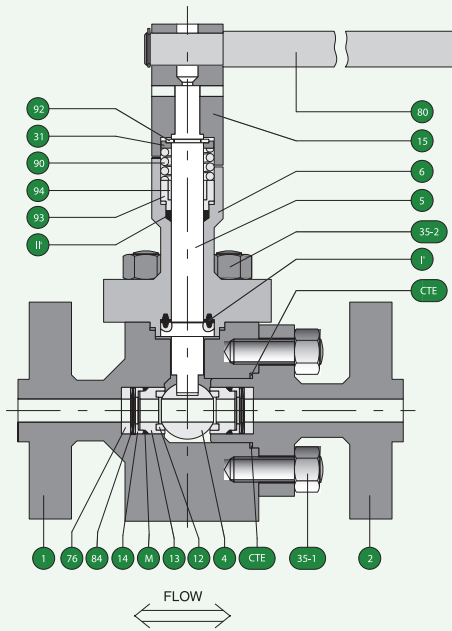


PART DRAWING				
TE	Lower cover gasket		Grafoil	
CCE	Upper cover gasket		Grafoil	
CTE	Body / Connector gasket		Grafoil	
M	Seat gasket		Grafoil	
II ^A	Secondary stem seal		Grafoil	
I ^A	Primary stem seal		Grafoil	
94	Stem plain bearing		DU	
93	Gland		316SS	
92	Stem retaining ring		316SS	
90	Stem spring		301SS	
84	Seat spring		301SS/X750	
61	Seat support		316SS	
53	Couping		316SS	
43	Stem gland		DU/BM	
35-3	Lower cover bolts		B72H	BU/Gr.8
35-2	Upper cover bolts		B72H	BU/Gr.8
35-1	Body / Connector bolts		B72H	BU/Gr.8
31	Stem spring compression ring		316SS	
22	Saddle		A105	316SS
21	Trunnion plain bearing		DU/BM	
14	Compression ring		316SS	
13	Seat holder		316SS	
12	Seat insert	PENTAFITE	ST6	CRC/WC
7	Lower cover		A105	316SS
6	Upper cover		A105	316SS
5	Stem		410SS	316SS
-	Ball coating	HCR/HTC	ST6	WC/CRC
4	Ball		316SS	
2	Body connector		A105	316SS
1	Body		A105	316SS

Valves can be manufactured in all materials according Customer requirements when available in form of bars, forged bars or rings.

METAL SEATED BALL VALVES | SAT SERIES

SPLIT BODY VALVE 3 PIECES, FLOATING BALL #2500 PN420 +780°C



+720°C

-100°C

PART DRAWING

PART DRAWING			
CCE	Upper cover gasket	Grafoil	Grafoil
CTE	Body / Connector gasket	Grafoil	Grafoil
M	Seat gasket	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil
94	Stem plain bearing	DU	DU
93	Gland	316SS	316SS
92	Stem retaining ring	316SS	316SS
90	Stem spring	AISI 301	AISI 301
84	Seat spring	AISI 301	X750
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070
76	Distance	316SS	316SS
35-2	Upper cover bolts	B72H	BU/Gr.8
35-1	Body/Connector bolts	B72H	BU/Gr.8
31	Stem spring compression ring	316SS	316SS
15	Wrench head	A105	316SS
14	Compression ring	316SS	316SS
13	Seat holder	316SS	316SS
12	Seat insert	PENTAFITE ST6 CRC/WC	PENTAFITE ST6 CRC/WC
6	Upper cover	A105	316SS
5	Stem	410SS	316SS
-	Ball coating	HCR/HTC ST6 WC/CRC	HCR/HTC ST6 WC/CRC
4	Ball	316SS	316SS
2	Body connector	A105	316SS
1	Body	A105	316SS

Valves can be manufactured in all materials according Customer requirements when available in form of bars, forged bars or rings.

WHAT THE SAT CRIO SERIES OFFER

The SAT crio series is the extension of the SAT model down to the low temperature.

The design philosophy involve unique technical solutions to meet the bet reliability as many field applications have demonstrated.

Like all KTN high performance ball valves production, SAT crio valves are equipped with metallic seats in Pentafite(-down to -100°C max.) or with polymeric seats for lower working temperature, resulting ball valves with absolutely zero leakage. SAT crio valves are available with floating or Trunnion mounted ball, with reduced bore or full bore and all valves are provided with automatic body cavity pressure relief arrangement as like as cryogenic stem elongation.

STANDARD SPECIFICATION	
Design:	B16.34 / API 608 / BS 6364 / EN1626 / ASME VIII Div.1 / EN 12516-1
Rating:	CLASS150/300/600/900/1500/2500, PN16-25/40-50/64-100/150/250/420
Flanged ends:	ANSI B16.5 / EN 1092-1 / DIN
Butt weld ends:	ANSI B16.25
Inspection:	ASME B16.104, API 598, EN 1266-I, ISO 5208, BS 6755-I

Other end connections are available on request

1 Stem tightness

Unique stem seal design (patented). The spring placed at stem top gives the contact load for low pressure tightness and the adjustment for wearing and clearance for different dilatation between stem and cover.

2 Stem

Stem are 100% oversized against expected torque at max. rated DP.

3 Cryogenic Vapour Space

All valves are provided with stem cryogenic elongation communicating with valve body cavities with lenght in accordance with SHELL SPE 77/100.

4 Ball

Very high precision grounded balls are produced inside and then hard coated with most advanced system.

6 Seats

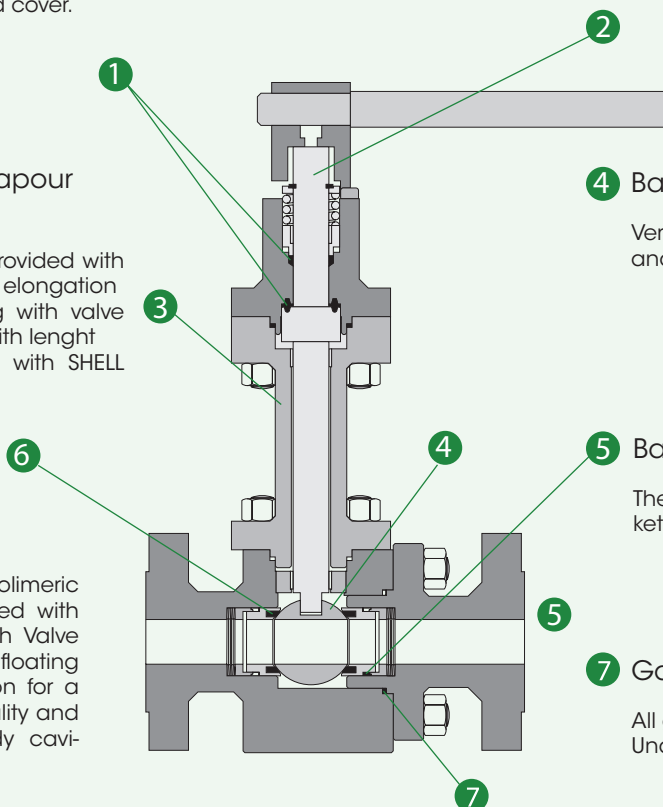
Metallic or polimeric seats are loaded with springs on both Valve sides, also in floating ball construction for a full Bi-directionality and automatic body cavities relief.

5 Backseat gasket

The patented cross-section of the backseat Grafoil gasket allows the automatic body cavity relief.

7 Gaskets

All gaskets are made in Expanded Graphite for their. Unalterability against any temperature conditions



METAL SEATED BALL VALVES | SAT CRIO SERIES

SAT CRIO METAL OR POLYMERIC SEAT FOR CRIO #1500 PN250 -200°C

AVAILABLE SEAT MATERIAL					
Code	Material	Hardness	Working temperature	Working pressure	Service Limits
KEL+F	KEL-F (PCTFE)		-200°C / +150°C (-148°F / +1436°F)		For cryogenic services, all temperatures.
PTFE	PTFE		-200°C / +200°C (-328°F / +392°F)	ANSI 150 - 1500 PN 10 - 250	For cryogenic services, all temperatures.
PEEK	PoliEter EterKetone		-100°C / +240°C (-148°F / 1436°F)	ANSI 150 - 1500 PN 10 - 250	For cryogenic services, down to -100°C only, with high pressure.
S01	SILVER PENTAFITE (Nickel+Graphite)	120 HB	-100°C/+780°C (-148°F / 1436°F)	ANSI 150 - 600 PN 10 - 100	For cryogenic services, down to -100°C only.

AVAILABLE BALL COATING MATERIALS					
Code	Material	Hardness	Working temperature	Working pressure	Service Limits
HTC	TITANIUM NITRIDE (PVD)	2500 HV	-200°C / +600°C (-148°F / +1112°F)	ANSI 150 - 600 PN 10 - 100	For clean services both liquid or gas. For gas and steam up to 180°C.
HCR	CHROME NITRIDE (PVD)	3000 HV	-100°C / +780°C (-148°F / +1112°F)	ANSI 150 - 300 PN 10 - 100	For clean services both liquid or gas. Great on oxidizing services.

TIGHTNESS

All KTN AP series valves are tested to verify their BUBBLE TIGHTNESS (no visible leakage during hydraulic seat test according to ANSI B16.34 and during low pressure air seats test at 100 psi)

STEM CRYOGENIC ELONGATION				
DN	15-25	40-50	80-100	150
Stem steam length	200	250	300	350

PRODUCTION RANGE											
PRESSURE CLASSES											
ANSI B16.34		150		300		600		900		1500	
PN		16-25		40-50		64-100		150		250	
DN	Fig	F	T	F	T	F	T	F	T	F	T
1/2"											
3/4"											
1"											
1 1/2"											
2"											
3"											
4"											
6"											
8"											
10"											

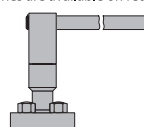
F= Floating ball T= Trunnion mounted ball

SAT ACCESORIES
SIP lever elongation for insulated piping systems
Manual gear
Stem elongation
Single or double acting actuators, electric or hydraulic actuators

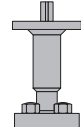
Many accessories are available on request



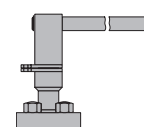
Cover with flange or lever



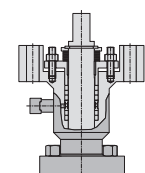
Longated cover for high temperatures



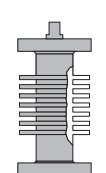
locking device



Cover with packing

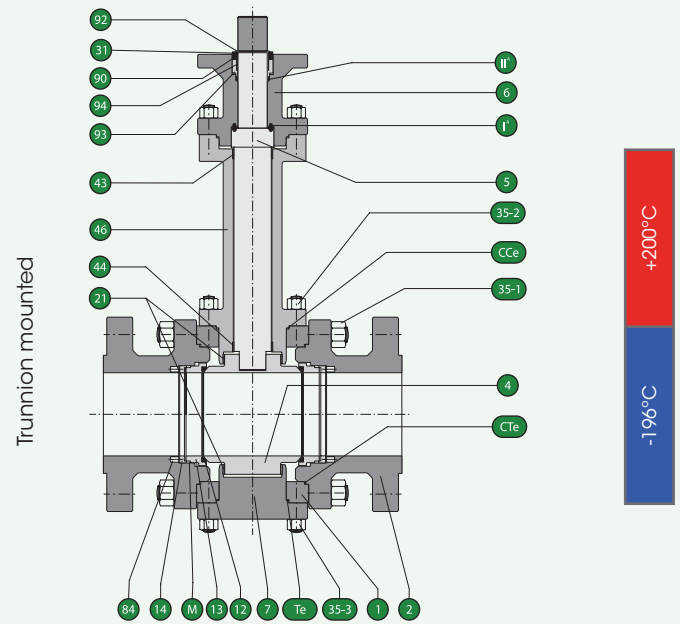
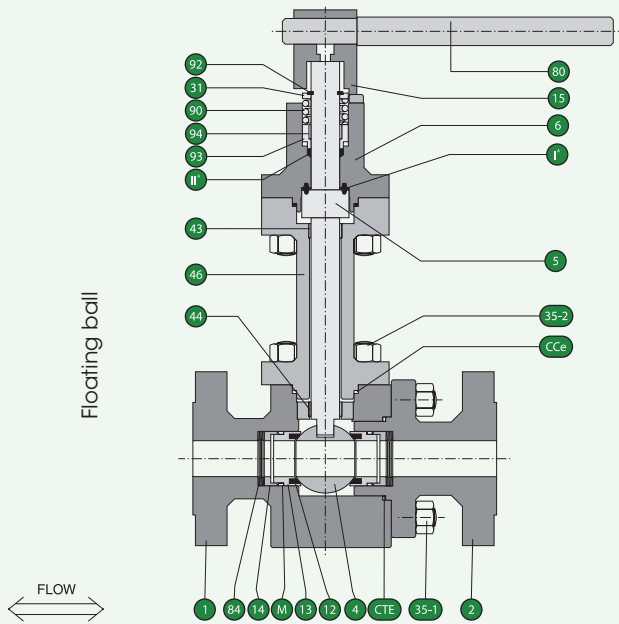


Finned cover



METAL SEATED BALL VALVES | SAT CRIO SERIES

SAT CRIO METAL OR POLYMERIC SEAT FOR CRIO #1500 PN250 -200°C



+200°C
-196°C

PART DRAWING			
CCE	Body cover gasket	Grafoil	Grafoil
CTE	Body connector gasket	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil
93	Gland	304SS	304SS
92	Stop ring	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070
46	Cryogenic elongation	A479 Tp.304	A479 Tp.316
44	Lower stem bearing	DU	DU
43	Upper stem bearing	DU	DU
35-2	Cover boltings	B8/Gr.8	B8M/Gr.8M
35-1	Body boltings	B8/Gr.8	B8M/Gr.8M
31	Stem spring ring	304SS	304SS
15	Wrench	A479 Tp.304	A479 Tp.316
14	Compression ring	A479 Tp.316	A479 Tp.316
13	Seat holder	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE PTFE PEEK KEL - F	PENTAFITE PTFE PEEK KEL - F
5	Stem	A479 Tp.316 Duplex SS UNS S31803	A479 Tp.316 Duplex SS UNS S31803
-	Ball coating	- / HTC / HCR	- / HTC / HCR
4	Ball	A479 Tp.316 Duplex SS UNS S31803	A479 Tp.316 Duplex SS UNS S31803
2	Connector	A479 Tp.304	A479 Tp.316
1	Body	A479 Tp.304	A479 Tp.316

PART DRAWING			
Te	Body cover gasket	Grafoil	Grafoil
CCE	Body cover gasket	Grafoil	Grafoil
CTE	Body connector gasket	Grafoil	Grafoil
M	Backseat gasket	Grafoil	Grafoil
II ^A	Secondary stem seal	Grafoil	Grafoil
I ^A	Primary stem seal	Grafoil	Grafoil
93	Gland	304SS	304SS
92	Stop ring	304SS	304SS
90	Stem spring	UNS S30100	UNS S30100
84	Seat spring	UNS S30100	UNS S30100
80	Handle	Fe37 UNI 7070	Fe37 UNI 7070
46	Cryogenic elongation	A479 Tp.304	A479 Tp.316
44	Lower stem bearing	DU	DU
43	Upper stem bearing	DU	DU
35-3	Cover boltings	B8/Gr.8	B8M/Gr.8M
35-2	Cover boltings	B8/Gr.8	B8M/Gr.8M
35-1	Body boltings	B8/Gr.8	B8M/Gr.8M
31	Stem spring ring	304SS	304SS
21	Ball bearings	DU	DU
15	Wrench	A479 Tp.304	A479 Tp.316
14	Compression ring	A479 Tp.316	A479 Tp.316
13	Seat holder	A479 Tp.316	A479 Tp.316
12	Seat	PENTAFITE PTFE PEEK KEL - F	PENTAFITE PTFE PEEK KEL - F
7	Lower cover	A479 Tp.304	A479 Tp.316
5	Stem	A479 Tp.316 Duplex SS UNS S31803	A479 Tp.316 Duplex SS UNS S31803
-	Ball coating	- / HTC / HCR	- / HTC / HCR
4	Ball	A479 Tp.316 Duplex SS UNS S31803	A479 Tp.316 Duplex SS UNS S31803
2	Connector	A479 Tp.304	A479 Tp.316
1	Body	A479 Tp.304	A479 Tp.316

Valves can be manufactured in all materials according Customer requirements when available in form of bars, forged bars or rings.

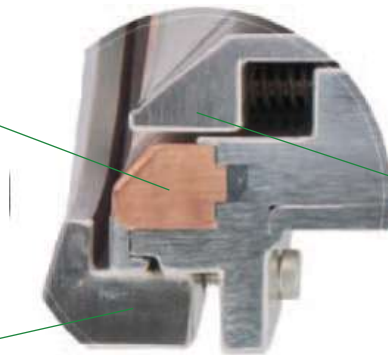
WHAT THE SAT3 SERIES OFFER

The SAT3 series is an evolution of the SAT with the insertion of two rings (called Scraper Rings) inside and outside the seats.

The Scraper Rings have to:

- Clean ball surface during valve operation
- Protect the seats from abrasion by fluid solid content
- Avoid wedging in of solids between seat and ball surface cause of valve blocking
- Reduce dirt can fill body cavity

1 Pentafite Seat holder



3 Internal scraper

2 External scraper

+400°C

-100°C

Like all KTN production, valves of SAT3 series are equipped with metallic seats in pentafite that allow the manufacturing of metal seated ball valves with Bubble tight (no leakage) suitable for a wide range of services with working temperatures up to 700°C.

The typical elastic properties of pentafite seats and the fully bolted construction, allow an easy maintenance without necessity of additional lapping of the spare seats against the ball, The SAT3 model is available in two version:

- Bi-directional, both with floating ball or trunnion mounted
- Uni-directional, trunnion mounted ball for applications where pipe axis is vertical.

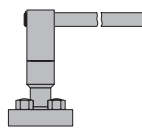
In this case body cavity is machined to obtain a complete body cavity draining avoiding fluid deposit inside the valve (best for bottom tank valves).

SAT ACCESORIES
SIP lever elongation for insulated piping systems
Manual gear
Stem elongation
Single or double acting actuators, electric or hydraulic actuators

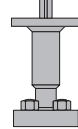
Many accessories are available on request



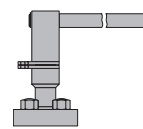
Cover with flange or lever



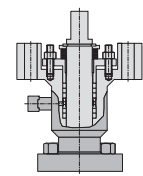
Longated cover for high temperatures



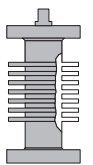
Locking device



Cover with packing



Finned cover



METAL SEATED BALL VALVES | SAT3 SERIES
SAT CONFIG + 2 SCRAPER RINGS (EXTRA ENDURANCE) #600 PN100 +700°C

AVAILABLE SEAT MATERIAL				
Code	Material	Hardness	Working temperature	Service Limits
S01	SILVER PENTAFITE (Nickel + Graphite)	120 HB	-100°C / +780°C (-148°F / +1436°F)	Fear clean services both liquid or gas. For use with HTC, HTCN, HCR, WC, CRC, ST6 ball coated.
R01	RED PENTAFITE (Cu + Graphite)	100 HB	-100°C / +500°C (-148°F / +932°F)	For clean services both liquid or gas. Lower friction factors in dry gas or steam service. For use with HTC, HTCN, HCR, ST6 ball coated.
B01	BLACK PENTAFITE (Carbon + Graphite)	80 HB	Amb. / +400°C (Amb. / +662°F)	For low pressure specific services where S01 and R01 cannot be used due to corrosion problems. All ball coat is not strictly necessary and should be evaluated time to time.
WC	TUNGSTEN CARBIDE (Detonation Gun/HVOF)	1100 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with high presence of solids. Not suitable when small presence of caustic soda is expected. For use with WC ball coat.
ST6	STELLITE Gr.6 (Detonation Gun/HVOF)	1000 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Suitable when small presence of caustic soda is expected. Best on dry gas or steam services. For use with WC, CRC ball coat.
CRC	CHROME CARBIDE (Detonation Gun)	800 HV	Amb. / +750°C (Amb. / +1382°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
PK1	PEEK (Polyetheretherketone)	800 HV	-100°C / +240°C (-148°F / +464°F)	For clean liquid or gas services with high frequency of valve operation.

AVAILABLE BALL COATING MATERIALS				
Code	Material	Hardness	Working temperature	Service Limits
WC	CARBURO DI TUNGSTENO Tungsten Carbide (Detonation Gun/HVOF)	1100 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
CRC	TUNGSTEN CARBIDE (Detonation Gun/HVOF)	800 HV	Amb. / +750°C (Amb. / +1382°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
ST6	STELLITE GR.6 (Detonation Gun/HVOF)	1000 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Suitable when small presence of caustic soda is expected. Best on dry or steam services.

TIGHTNESS

All KTN SAT3 series valves are tested to verify their BUBBLE TIGHTNESS (no visible leakage during hydraulic seat test according to ANSI B16.34 and during low pressure air seats test at 100 psi)

PRODUCTION RANGE							
PRESSURE CLASSES							
ANSI B16.34		150		300		600	
PN		16-25		40-50		64-100	
DN	Fig	F	T	F	T	F	T
1/2"							
3/4"							
1"							
1 1/2"							
2"							
3"							
4"							
6"							

F= Floating ball T= Trunnion mounted ball

WHAT THE SAT3 SERIES OFFER

Basing on a trunnion mounted ball construction, KTN can manufacture a range of 3-way metal seated ball valves, with "L" port or "T" port. The advanced solutions typical for SAT model are used on these valves that still has no equal on the market at present.

Like all KTN production, MULTI-PORT valves are equipped with metallic seats in pentafite to allow the manufacturing of metal seated ball valves with absolutely zero leakage suitable for a wide range of services with working temperatures from -100°C a -400°C.

STANDARD SPECIFICATION	
Design:	B16.34 / API 608 / EN12569 / EN17292 / ASME VIII Div.1 / EN 12516-1
Rating:	CLASS150/300/600/900/1500/2500, PN16-25/40-50/64-100/150/250/420
Flanged ends:	ANSI B16.5 / EN 1092-1 / DIN
Butt weld ends:	ANSI B16.25
Inspection:	ASME B16.104, API 598, EN 1266-I, ISO 5208, BS 6755-I

1 Stem

Stem are 100% oversized against expected torque at max. rated DP.

2 Upper cover

All 3 WAY valves are provided with bolted upper cover for quick and easy stem assembly maintenance.

3 Gasket

Only Grafoil® gasket are used, inherently resistant to high temperatures; no polymers are used.

4 Ball

Very high precision grounded balls are produced inside and then hard coated with most advanced system. All balls are "trunnion mounted" in order to avoid lateral load against the seats.

6 Stem tightness

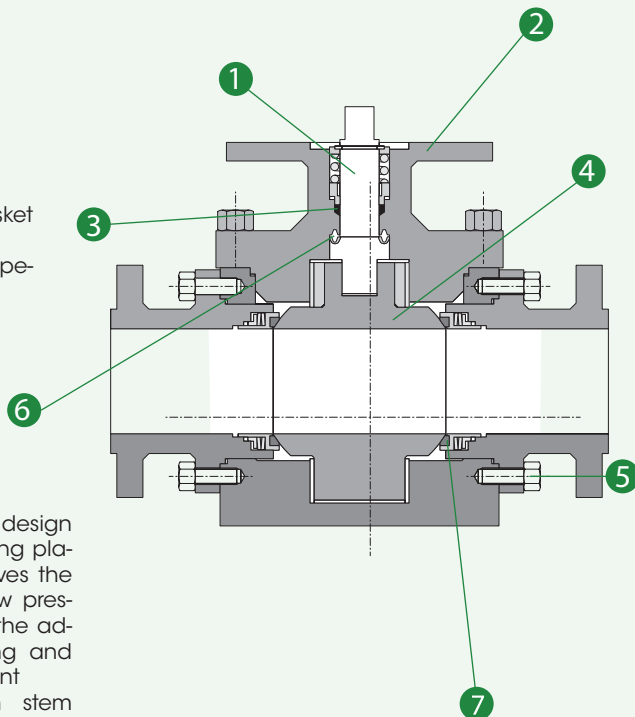
Unique stem seal design (patented). The spring placed at stem top gives the contact load for low pressure tightness and the adjustment for wearing and clearance for different dilatation between stem and cover.

5 Bolting and flanges

All flanges connections are designed according to ASME VIII Div.1.

7 Seats

Every way is predisposed with independent seat. Metallic seats are loaded with springs on both valve side, also for floating ball construction, for a full bi-directionality.



METAL SEATED BALL VALVES | MULTIPOINT SERIES

SAT CONFIG +3 WAY #600 PN100 -100°C to +400°C

AVAILABLE SEAT MATERIAL				
Code	Material	Hardness	Working temperature	Service Limits
S01	SILVER PENTAFITE (Nickel + Graphite)	120 HB	-100°C / +780°C (-148°F / +1436°F)	Fear clean services both liquid or gas. For use with HTC, HTCN, HCR, WC, CRC, ST6 ball coated.
R01	RED PENTAFITE (Cu + Graphite)	100 HB	-100°C / +500°C (-148°F / +932°F)	For clean services both liquid or gas. Lower friction factors in dry gas or steam service. For use with HTC, HTCN, HCR, ST6 ball coated.
B01	BLACK PENTAFITE (Carbon + Graphite)	80 HB	Amb. / +400°C (Amb. / +662°F)	For low pressure specific services where S01 and R01 cannot be used due to corrosion problems. All ball coat is not strictly necessary and should be evaluated time to time.
WC	TUNGSTEN CARBIDE COAT (Detonation Gun/HVOF)	1100 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with high presence of solids. Not suitable when small presence of caustic soda is expected. For use with WC ball coat.
ST6	STELLITE Gr.6 (Detonation Gun/HVOF)	1000 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Suitable when small presence of caustic soda is expected. Best on dry gas or steam services. For use with WC, CRC ball coat.
PK1	PEEK (Polyetheretherketone)	800 HV	-100°C / +240°C (-148°F / +464°F)	For clean liquid or gas services with high frequency of valve operation.

AVAILABLE BALL COATING MATERIALS				
Code	Material	Hardness	Working temperature	Service Limits
HTC	TITANIUM NITRIDE (PVD)	2500 HV	-100°C / +600°C (-148°F / +1436°F)	For clean services both liquid or gas. For gas and steam up to 180°C.
HTCN	CARBO-TITANIUM NITRIDE (PVD)	3500 HV	-100°C / +400°C (-148°F / +752°F)	For liquid or gas services with small presence of solids. For gas and steam up to 180°C.
HCR	CHROME NITRIDE (PVD)	3000 HV	Amb. / +750°C (Amb. / +1382°F)	For clean services both liquid or gas. Best on oxidizing services.
WC	TUNGSTEN CARBIDE Tungsten Carbide (Detonation Gun/HVOF)	1100 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
CRC	CARBURO DI CROMO Chrome Carbide (Detonation Gun/HVOF)	800 HV	Amb. / +750°C (Amb. / +1382°F)	For liquid or gas services with small presence of solids. Not suitable when small presence of caustic soda is expected.
ST6	STELLITE GR.6 (Detonation Gun/HVOF)	1000 HV	Amb. / +350°C (Amb. / +662°F)	For liquid or gas services with small presence of solids. Suitable when small presence of caustic soda is expected. Best on dry or steam services.

TIGHTNESS

All KTN MULTIPOINT series valves are tested to verify their BUBBLE TIGHTNESS (no visible leakage during hydraulic seat test according to ANSI B16.34 and during low pressure air seats test at 100 psi)

METAL SEATED BALL VALVES | MULTI-PORT SERIES

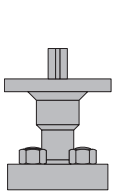
SAT CONFIG +3 WAY #600 PN100 -100°C to +400°C

PRODUCTION RANGE					
PRESSURE CLASSES					
ANSI B16.34		150	300	600	
PN		16-25	40-50	64-100	
DN	Fig	T	T	T	
1/2"					
3/4"					
1"					
1 1/2"					
2"					
3"					
4"					
6"					
8"					
10"					

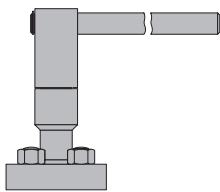
T= Trunnion mounted ball

SAT ACCESORIES
SIP lever elongation for insulated piping systems
Manual gear
Stem elongation
Single or double acting actuators, electric or hydraulic actuators

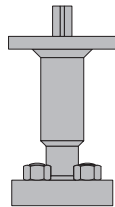
Many accessories are available on request



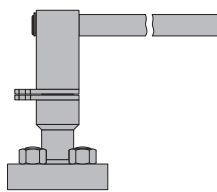
Cover with flange or lever



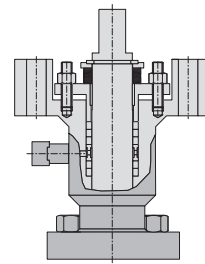
Longated cover for high temperatures



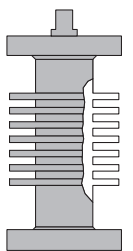
locking device



Cover with packing

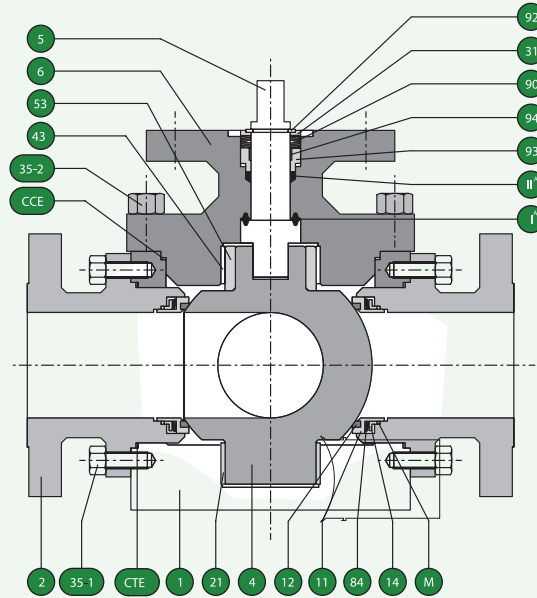


Finned cover



METAL SEATED BALL VALVES | MULTI-PORT SERIES

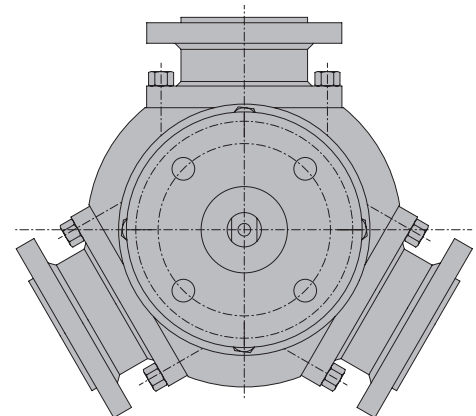
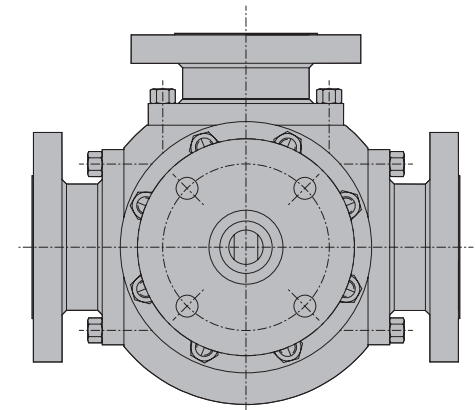
SAT CONFIG +3 WAY #600 PN100 -100°C to +400°C



+400°C

-100°C

PART DRAWING		
CCE	Body cover gasket	Upper cover gasket
CTE	Body connector gasket	Body-Connector gasket
M	Backseat gasket	Seat gasket
II ^A	Secondary stem seal	Secondary stem seal
I ^A	Primary stem seal	Primary stem seal
94	Gland	Stem plain bearing
93	Stop ring	Gland
92	Stem spring	Stem retaining ring
90	Seat spring	Stem spring
84	Handle	Seat spring
53	Cryogenic elongation	Coupling
43	Lower stem bearing	Coupling plain bearing
35-2	Upper stem bearing	Upper cover bolts
35-1	Cover boltings	Body/Connector bolts
31	Body boltings	Stem spring compression rings
21	Stem spring ring	Trunnion plain bearing
14	Wrench	Compression ring
13	Compression ring	Seat holder
12	Seat holder	Seat
6	Seat	Upper cover
5	Stem	Stem
4	Ball coating	Ball
2	Ball	Body connector
1	Connector	Body



Valves can be manufactured in all materials according Customer requirements when available in form of bars, forged bars or rings



Directive 2014/68/UE
"PED"



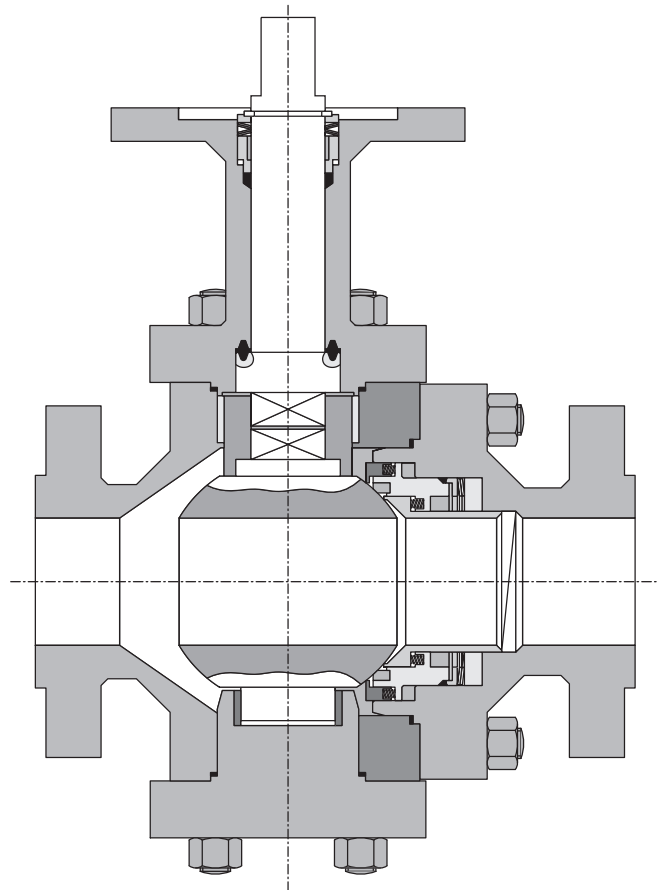
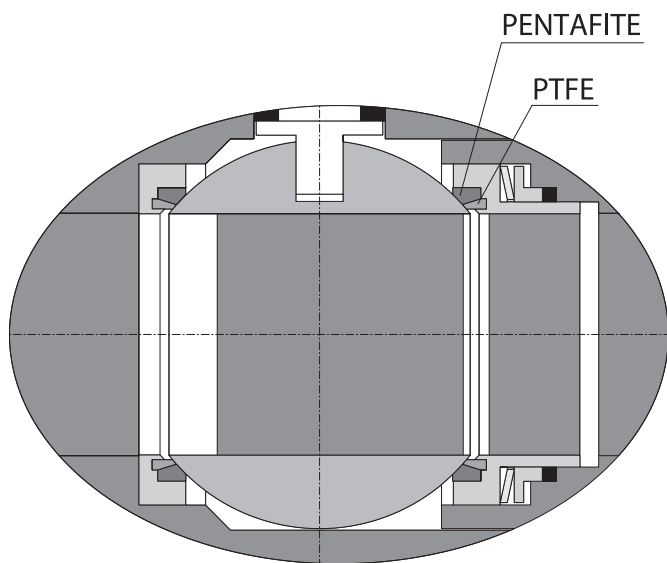
II2G c IIC TX
II2D c IIC TX
Directive 2014/34/UE
"ATEX"

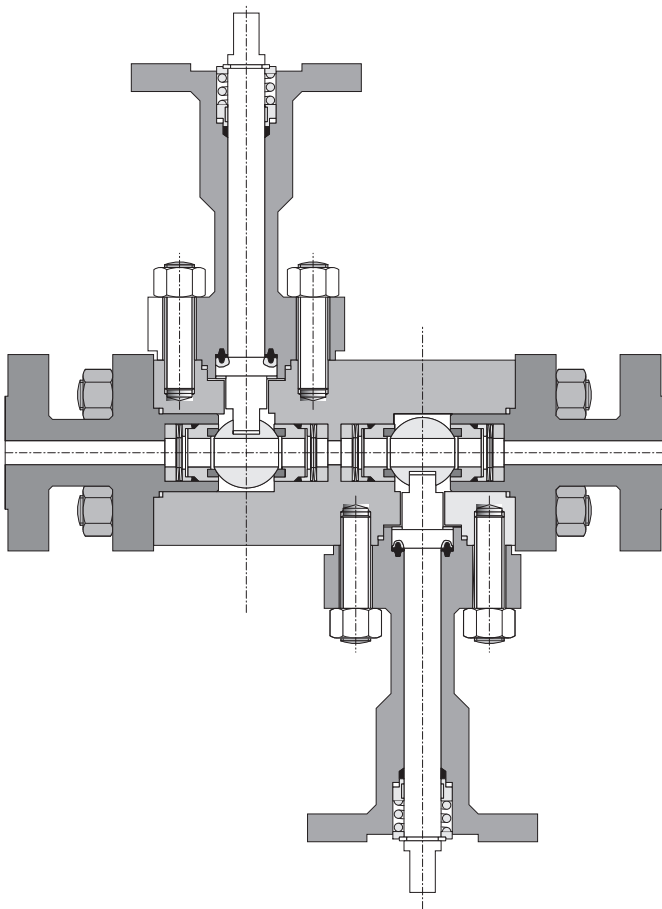
SPECIAL PROTECTION

Basing on property technologies developed in years of activity in the fluid handling, KTN is able to design special ball valves for a wide range of working conditions: from -200°C up to 780°C.

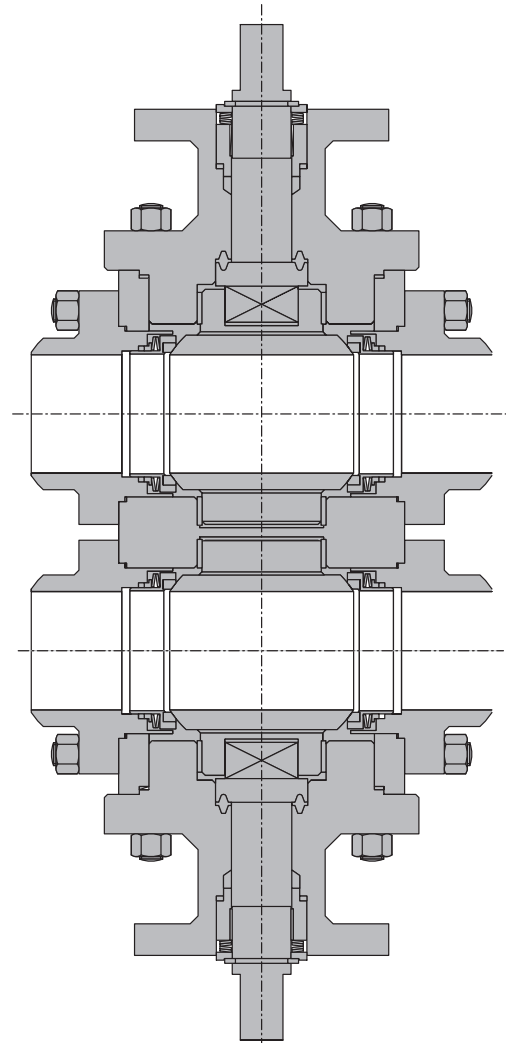
Like all KTN production range, also special valves are equipped with metallic seats in Pentafite allowing to obtain bubble tight metal seated ball valves with absolutely zero leakage with no additional lapping of seats against ball.

The typical elastic properties of Pentafite seats allow an easy maintenance without necessity of additional lapping of the seats against the ball.



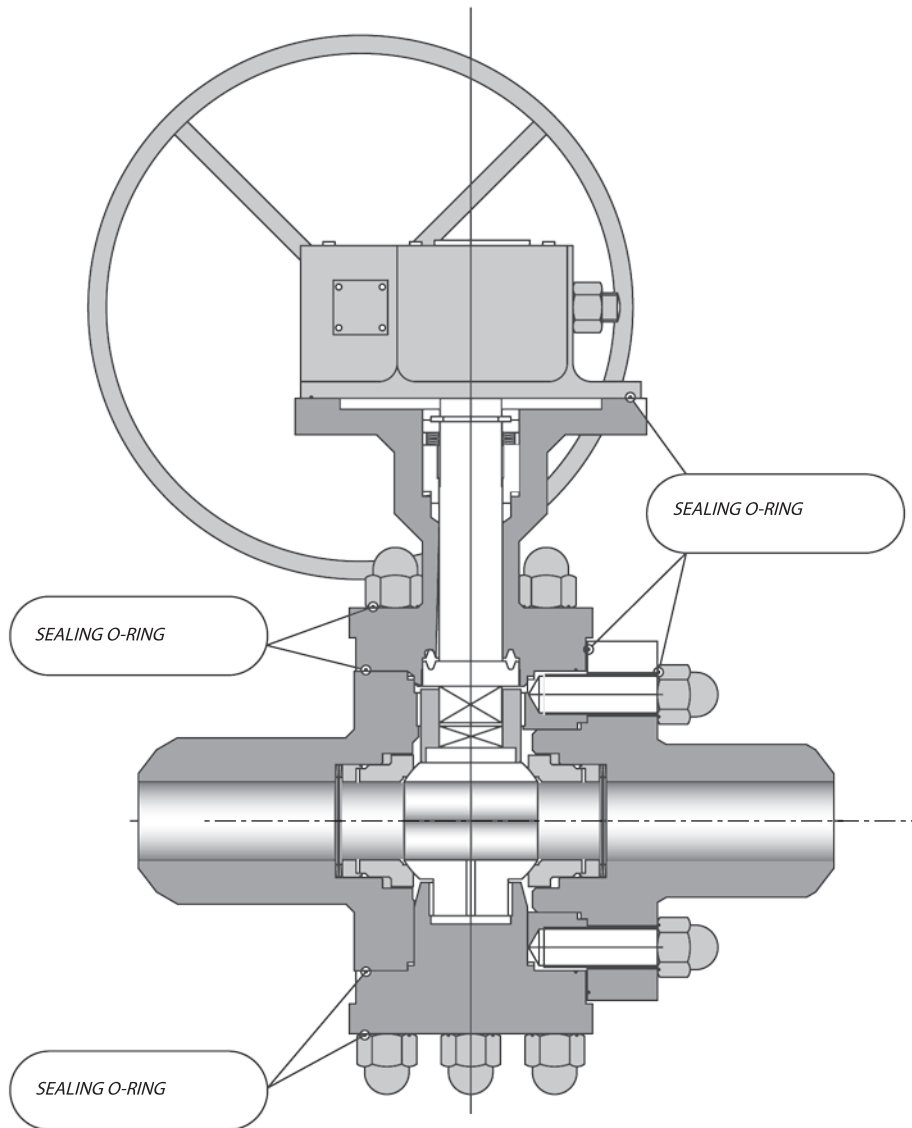


Double block and bleed system with two balls



Double block construction with or without unique operator





Subsea valves (not for deep sea applications)