WALWORTH®
Since 1842

CATALOG
BALL VALVE
TRUNNION MOUNTED

Note: The drawings and information shown here are illustrative of the different Walworth® designs. Valve physical configurations may change in accordance with Walworth® standards.

WALWORTH GROUP

TRUNNION-MOUNTED BALL VALVE
STANDARDS AND SPECIFICATIONS

Although their primary use is to convey crude oil, gas mixtures, or petroleum products, trunnion ball valves (trunnion mounted) can handle any type of fluid, liquid, gas, and steam (including water steam); whether or not containing suspended solid particles. The most common application for trunnion ball valves is port shut-off; due to its design, it has a smooth and uninterrupted port passage that offers little (or almost no) resistance to flow when open; this enables to significantly reduction flow turbulence due to section changes and minimizes pressure drop.

The WALWORTH® trunnion ball valve is designed and manufactured under API-6D and ISO-14313 international standards. They also meet the criteria referenced in ASME B16.34 and ASME PVC Section VIII Division I; they also comply with the criteria of the Technical Specification PEMEX-EST-0211/02-2017. Its main features are:

- Three-piece design (Side Entry), Bolted Body (Bolted body) or Welded Body (Fully welded)
- Full constant port to minimize pressure drop and allow inspection or cleaning tools (pigs) through. Reduced port option upon customer request.
- Ball (or sphere) type plug mounted on trunnions rotating on its axis perpendicular to the flow direction.
- Ejection-proof stem.
- Dynamic Seat Rings, Spring-loaded.
- Seats for soft seals (inserts); manufactured from elastomers chosen according to service conditions (pressure, temperature).
- Anti-static device to avoid electrostatic charges (sparks) that may cause a fire.
- Metal to metal seats or Dual Seats (PMSS) option.
- Perform Double Block and Bleed (DBB) function.
- Suitable to fit through tooling, or inspection equipment (piggable).
- Unidirectional (SPE), Bidirectional (DPE), or Mixed seat option.
- •DIB-1 or DIB-2 type Double Block and Bleed options.
- Face-to-face dimension (RF) or end-to-end dimension (RTJ or WE) under API-6D (Table C3). For dimensions not listed in API-6D, the dimensions published in ASME B16.10 are used.

- RF or RTJ flange dimensions under ASME B16.5 from NPS 1 to NPS 24; for NPS 26 and larger valves, ASME B16.47 Series A flanges. WE end dimensions under ASME B16.25.
- Suitable for sour service under NACE MR-01-75, or NACE MR-01-03 (ISO15156, or ISO 17945).
- Fireproof design in accordance with API-6FA (“Standard for Fire Test for Valves”) and API-607 (”Fire Test for Quarter Turn Valves and Valves Equipped with Nonmetallic Seals”).
- Low leakage certification under ISO-15848-1.
- Hydrostatic and Performance tests under API-6D, and ISO-5208.
- Handle operated on small diameters and gear operated on large diameters.

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TRUNNION-MOUNTED BALL VALVE
BODY AND INTERIOR MATERIALS (TRIM)

STANDARD MATERIALS: BODY and ENDS.

International standard materials of construction for body and ends are shown below:

FORGED BODY MATERIAL ASTM STANDARD.	ASME GROUP B16.34	STANDARD DESIGNATION	CAST BODY MATERIAL SPECIFICATION	BAR BODY MATERIAL SPECIFICATION
ASTM A105	1.1	CARBON STEEL C-Mn-Si	ASTM A216 WCB	ASTM A105
ASTM A105N	1.1	CARBON STEEL C-Mn-Si	ASTM A216 WCC	ASTM A105N
ASTM A350 LF1	1.4	LOW-TEMPERATURE CARBON STEEL C-Mn-Si	ASTM A352 LCB	ASTM A350 LF1
ASTM A350 LF2	1.1	LOW-TEMPERATURE CARBON STEEL C-Mn-Si	ASTM A352 LCC	ASTM A350 LF2
ASTM A182 316	2.2	STAINLESS STEEL 18 Cr-12NI-2Mo-0.08C.	ASTM A351 CF8M	ASTM A479 316
ASTM A182 F51	2.8	DUPLEX STAINLESS STEEL GRADE 4A 22Cr-5Ni-3Mo-N-0.030C	ASTM A995 CD3MN	ASTM A479 31803
ASTM A182 F53	2.8	DUPLEX STAINLESS STEEL GRADE 5A 25Cr-7Ni-4.5Mo-N-0.030C	ASTM A995 CE3MN	ASTM A479 32750

Note: The above list of consumer industries and corrosive materials are useful as examples of typical applications where these materials may be used; however, all responsibility for the selection of the proper alloy rests with the engineering firm or end-user.
If other types of end-body materials are required, consult your nearest sales representative.

STANDARD MATERIALS FOR INTERIOR ARRANGEMENT WITH SOFT SEALS:

WALWORTH® stocks soft-seal interior arrangements that cover most services. The most common internal arrangements for soft seals are as follows:

INTERNAL ARRANGEMENTS (TRIM) COMMONLY USED IN TRUNNION BALL VALVES SOFT SEALS							
WALWORTH® DESIGNATION	NPS	CLASS	PLUG	STEM	TRUNNION	SEAT RINGS	INSERT
T1	2" A 36"	150, 300, 600, 900 $ 1500	ASTM A105 +0.003" ENP	AISI 4140 +0.003"" ENP	AISI 4140 + 0.003"" ENP	A105 + 0.003" ENP	Temperature dependent
T2	2" A 36"	150, 300, 600, 900 & 1500	ASTM A182 F6A +0.003"	A182 F6A	A182 F6A	A182 F6A	Temperature dependent
T3	2" A 36"	150 & 300	ASTM A182 316	ASTM A182 316	ASTM A182 316	ASTM A182 316	Temperature dependent
	2" A 6"	600					
	8" A 24"	600	ASTM A182 316	ASTM A693 630 H1150 (17-4Ph)	ASTM A693 630 H1150 (17-4Ph)	ASTM A182 F6 (SS-410)	Temperature dependent
	30" A 36"	600	ASTM A693 630 H1150 (17-4Ph)				
T3	2"	900	ASTM A182 316	ASTM A182 316	ASTM A182 316	ASTM A182 316	Temperature dependent
	3" A 8"		ASTM A693 630 H1150 (17-4Ph)	ASTM A693 630 H1150 (17-4Ph)	ASTM A693 630 H1150 (17-4Ph)	ASTM A182 316	
	10" A 24"					ASTM A182 F6 (SS-410)	
T3	2"	1500	ASTM A693 630 H1150 (17-4Ph)	ASTM A693 630 H1150 (17-4Ph)	ASTM A693 630 H1150 (17Ph)	ASTM A182 316	Temperature dependent
	3" A 24"					ASTM A182 F6 (SS410)	
T5	2" A 36"	150, 300, 600, 900 & 1500	ASTM A350 LF2 +0.003" ENP	AISI 4140 +0.003" ENP	AISI 4140 + 0.003" ENP	ASTM A350 LF2 + 0.003" ENP	Temperature dependent
T35	2" A 36"	150, 300, 600, 900 & 1500	AISI-4130 + 0.003" ENP	AISI 4130 +0.003" ENP	AISI 4350 LF2 + 0.003" ENP	ASTM A182 F6 (SS-410)	Temperature dependent
T40	2" A 36"	150, 300, 600, 900 & 1500	ASTM A694 F60 +0.003" ENP	AISI 4140 +0.003" ENP	AISI 4140 + 0.003" ENP	ASTM A182 F6 (SS-410)	Temperature dependent

Note 1. ENP: 0.003" (75μm) Electrolytic nickel coating. For Class 2500 consult your nearest WALWORTH® sales representative. All interior materials in compliance with NACE MR-01-75 and/or NACE MR-01-73. Other internal arrangements are available upon request.

TRUNNION-MOUNTED BALL VALVE
BODY AND INTERIOR MATERIALS (TRIM)

Manufacturing range. WALWORTH® offers a wide range of side entry style trunnion ball valves in both body-screwed ends (bolted body) and body-welded ends (fully welded); and through Conduit reduced port styles in accordance with the following table:

BODY-JOINT ENDS	STYLE	CLASS 150 NPS (DN)	CLASS 300 NPS (DN)	CLASS 600 NPS (DN)	CLASS 900 NPS (DN)	CLASS 1500 NPS (DN)	CLASS 2500 NPS (DN)
BODY-SCREWED ENDS	FULL PORT	2-48 (50-1200)	2-48 (50-1200)	2-48 (50-1200)	2-42 (50-1050)	2-36 (50-900)	2-24 (50-600)
BODY-SCREWED ENDS	REDUCED PORT	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	UPON REQUEST	UPON REQUEST
BODY-WELDED ENDS	FULL PORT	2-48 (50-1200)	2-48 (50-1200)	2-48 (50-1200)	2-42 (50-1050)	2-36 (50-900)	2-24 (50-600)
BODY-WELDED ENDS	REDUCED PORT	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	2 X 1 1/2 - 36 X 32 (50X40 - 900X800)	UPON REQUEST	UPON REQUEST

STANDARD MATERIALS FOR INTERIOR ARRANGEMENT WITH METAL TO METAL SEALS:

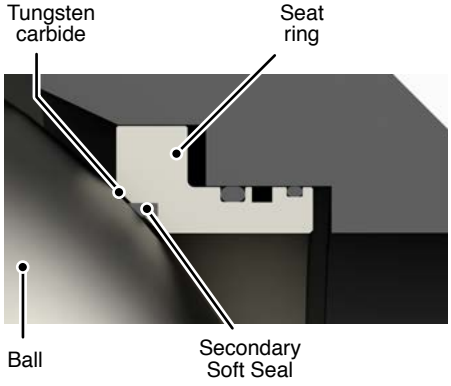
In services where abrasive solids are in suspension, critical services, or where the operating temperature compromises the proper functioning of the soft seals, WALWORTH® offers the option of metal-to-metal seals. The most common arrangements are:

WALWORTH® DESIGNATION	NPS	CLASS	PLUG	STEM	TRUNNION	SEAT RINGS	INSERT
T6	2" a 36"	150, 300,600,900 & 1500	ASTM A105 + TC	ASTM 4140 + TC	ASTM 4140 + TC	ASTM 4140 + TC	N/A
T7	2" a 36"	150, 300,600,900 & 1500	ASTM A320 LF2 + TC	ASTM A350 LF2 + TC	ASTM A350 LF2 + TC	ASTM A350 LF2 + TC	N/A
T8	2" a 24"	150, 300,600,900 & 1500	ASTM A182 F6A + TC	ASTM A182 F6A + TC	ASTM A182 F6A + TC	ASTM A182 F6A + TC	N/A
T9	2" a 12"	150, 300,600,900 & 1500	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	N/A
T10	2" a 12"	150, 300,600,900 & 1500	AISI 4140 + ST-6	AISI 4140 + ST-6	AISI 4140 + ST-6	AISI 4140 + ST-6	N/A
T11	2" a 12"	150, 300,600,900 & 1500	ASTM A350 LF2 + ST6	ASTM A350 LF2 + ST6	ASTM A350 LF2 + ST6	ASTM A350 LF2 + ST6	N/A
T12	2" a 12"	150, 300,600,900 & 1500	ASTM A182 F6A + ST6	ASTM A182 F6A + ST6	ASTM A182 F6A + ST6	ASTM A182 F6A + ST6	N/A
T13	2" a 12"	150, 300,600,900 & 1500	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	N/A

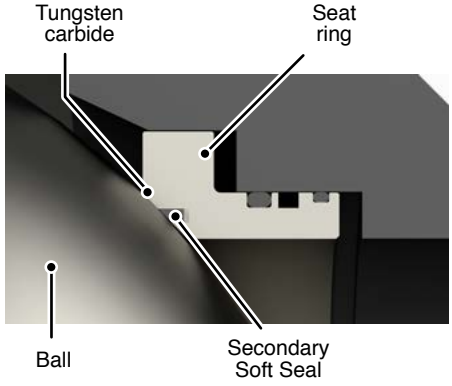
TC: Tungsten carbide coating applied by HVOF process with a minimum thickness of 0.006".
ST-6: Stellite 6 coating applied by HVOF process with a minimum thickness of 0.006".
N/A: Not Applicable
NOTE: Hard chromium carbide coating is available upon request.

STANDARD MATERIALS FOR INTERIOR ARRANGEMENT WITH DUAL SEALS (PMSS).

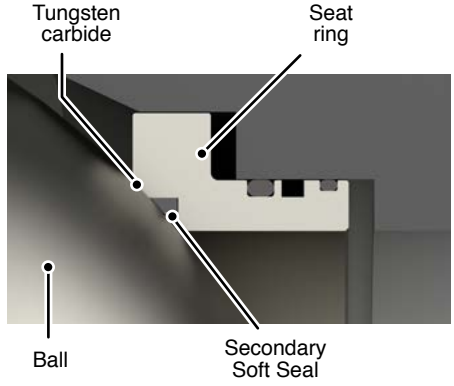
The dual seal arrangement (primary metal-to-metal seal and secondary soft seal) combines the advantages of both of the above options.



The secondary seal is the soft seal that allows the valve to seal when there is low pressure in the system; it also provides a seal that prevents sludge or foreign material from being trapped between the annulus and plug.



When the pressure increases, the soft seals collapse in their elastic zone; then the metal coating (primary seal) of the ball comes in contact with the metal seal of the seat rings achieving the metal-to-metal seal.



When the pressure decreases again, the soft (secondary) seals return to their position due to the phenomenon of resilience. This dual-action provides a tighter seal for longer and fewer in-service problems.

TRUNNION-MOUNTED BALL VALVE
BODY AND INTERIOR MATERIALS (TRIM)

The most common arrangements for dual seals are shown below:

WALWORTH® DESIGNATION	NPS	CLASS	PLUG	STEM	TRUNNION	SEAT RINGS	INSERT
T6-D	2” a 36”	150, 300,600,900 & 1500	ASTM A105 + TC	ASTM 4140 + TC	ASTM 4140 + TC	ASTM 4140 + TC	Temperature dependent
T7-D	2” a 36”	150, 300,600,900 & 1500	ASTM A320 LF2 + TC	ASTM A350 LF2 + TC	ASTM A350 LF2 + TC	ASTM A350 LF2 + TC	Temperature dependent
T8-D	2” a 24”	150, 300,600,900 & 1500	ASTM A182 F6A + TC	ASTM A182 F6A + TC	ASTM A182 F6A + TC	ASTM A182 F6A + TC	Temperature dependent
T9-D	2” a 12”	150, 300,600,900 & 1500	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	Temperature dependent
T10-D	2” a 12”	150, 300,600,900 & 1500	AISI 4140 + ST-6	AISI 4140 + ST-6	AISI 4140 + ST-6	AISI 4140 + ST-6	Temperature dependent
T11-D	2” a 12”	150, 300,600,900 & 1500	ASTM A350 LF2 + ST6	ASTM A350 LF2 + ST6	ASTM A350 LF2 + ST6	ASTM A350 LF2 + ST6	Temperature dependent
T12-D	2” a 12”	150, 300,600,900 & 1500	ASTM A182 F6A + ST6	ASTM A182 F6A + ST6	ASTM A182 F6A + ST6	ASTM A182 F6A + ST6	Temperature dependent
T13-D	2” a 12”	150, 300,600,900 & 1500	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	ASTM A182 F51 + TC	Temperature dependent

TC: Tungsten carbide coating applied by HVOF process with a minimum thickness of 0.006”.
ST-6: Stellite 6 coating applied by HVOF process with a minimum thickness of 0.006”.
Note: Hard chromium carbide coating is available upon request.