



A-T Controls, Inc.

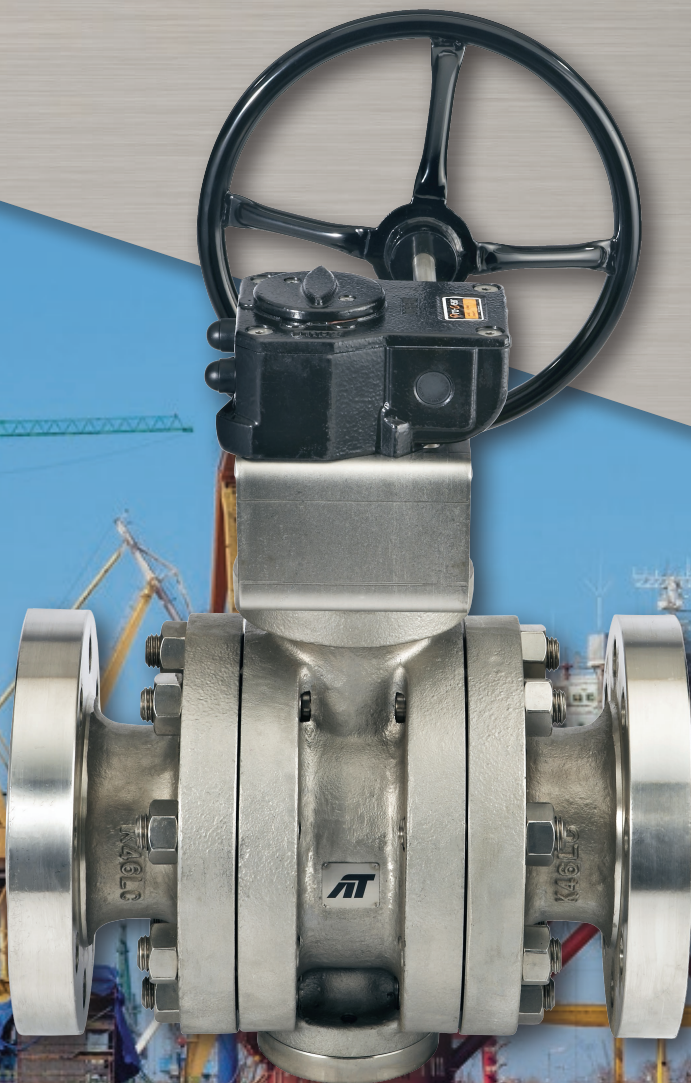
ACUTROL

CE
0035



Trunnion Mounted Ball Valves

3 pc. Metal Seat



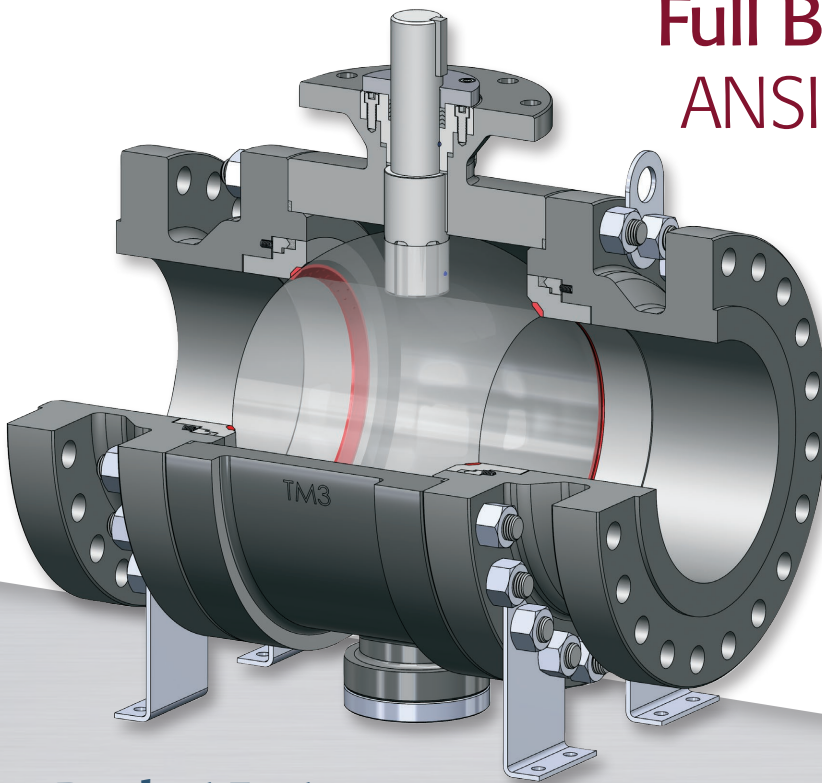
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TRUNNION Mounted Metal Seat Ball Valve

Full Bore 3-piece Flanged ANSI Class 150/300/600



Series TM3 metal seated valves are designed in accordance with the leading industry standards such as API 6D, API 598 and ASME B16.34.

To ensure product reliability, the valve designs are validated by actual prototype testing that includes a high cycle testing.

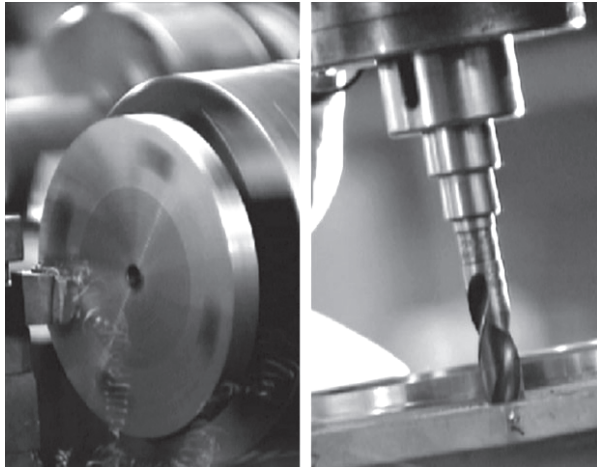
The valves are produced by employing state-of-the-art manufacturing technology and under strict quality control standards.

Product Features

- Bi-directional metal seat design
- Standard SPE (Single Piston Effect) metal seat design with self-relieving features
- DPE (Double Piston Effect) metal seat design is available*
- Metal seat hard face coatings are available in Stellite®, Tungsten Carbide or Chrome Carbide options.
- Standard metal seat leakage rating is in compliance with ANSI/FCI-70-2 Class V for Stellite® seats. Class VI is standard for Tungsten Carbide and Chrome Carbide coated seats.
- Splined stem connection 6" and larger. Square drive 2" to 4"
- Standard graphite stem packing design
- Trunnion mounted ball valve design for high pressure applications
- Anti-blowout stem design
- Anti-static design
- Fire-safe design in accordance with API 6FA
- ISO 5211 mounting design
- Optional drain plug and body purge device available

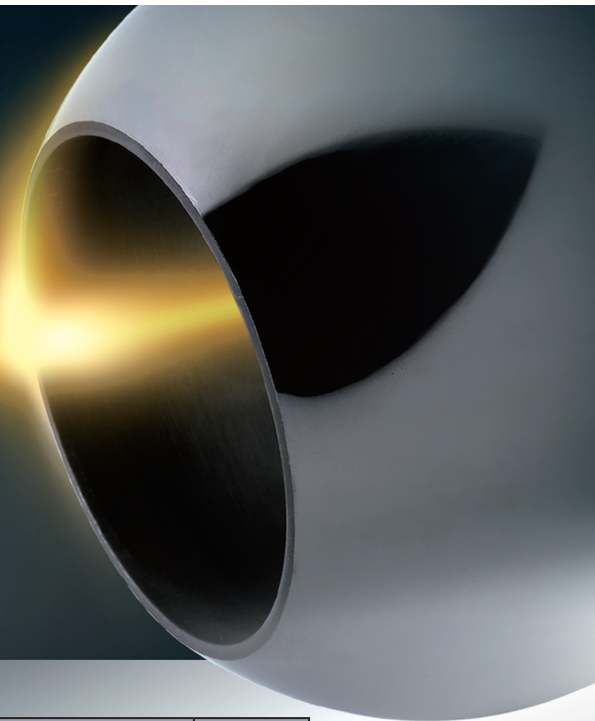
**Consult factory for details*

Valve Standards



DESIGN	API 6D, ASME B16.34
END CONNECTIONS	Raised Face (RF), Ring Type Joint (RTJ)
TEMPERATURE RANGE	-50°F to 932°F (<i>higher on application</i>)
FACE-TO-FACE DIMENSION	ANSI/ASME B16.10
FLANGED DIMENSION	ANSI/ASME B16.5
BODY PRESSURE TESTING	ANSI/ASME B16.34, API 598, API 6D
SEAT LEAKAGE TESTING	ANSI/FCI 70-2
FIRE TESTING	API 6FA and ISO 10497
MOUNTING	ISO 5211
MARKING SYSTEM	MSS SP-25, MSS SP-55
SAFETY INTEGRITY	SIL 3
FUGITIVE EMISSIONS	Certified to ISO 15848-1 (<i>up to 14"</i>)
MATERIAL CERTIFICATION	EN 10204-3.1
QUALITY ASSURANCE	ISO 9001:2015

A-T Series TM3 trunnion mounted ball valves are designed for severe service applications such as high temperature and corrosive environments. The ball and the metal seat contact surfaces are coated with wear resistant materials by HVOF (High Velocity Oxygen Fuel) thermal spraying process. The HVOF coating method is a high-velocity, low-temperature coating process which can provide a strong metal bonding and with minimal impact to the metal deformation.

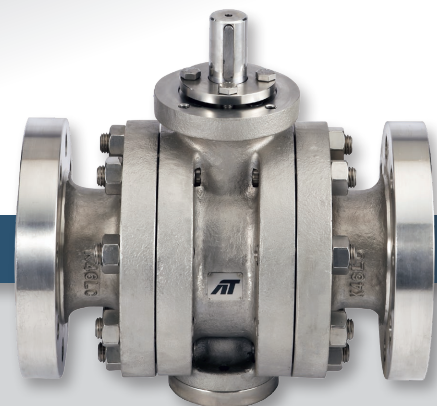


Ball	Seat	Max Temperature	Typical Applications	Shutoff Class
Tungsten Carbide Coated 316SS	Tungsten Carbide Coated 316SS	842°F (450°C)	High temperature environment. Corrosive, high wearing, and abrasive applications.	VI
Chrome Carbide Coated 316SS	Chrome Carbide Coated 316SS	932°F (500°C)	Excellent for high temperature or hot gas environments. Cavitation and high wearing applications.	VI
316/HCr	316/Stellite®	661°F (350°C)	High-pressure and high-temperature conditions.	V

TM3 SERIES

METAL SEAT

Design



Standard Design

Anti-Blowout Stem Design

Stem is retained by the body cover when the valve is under pressure.

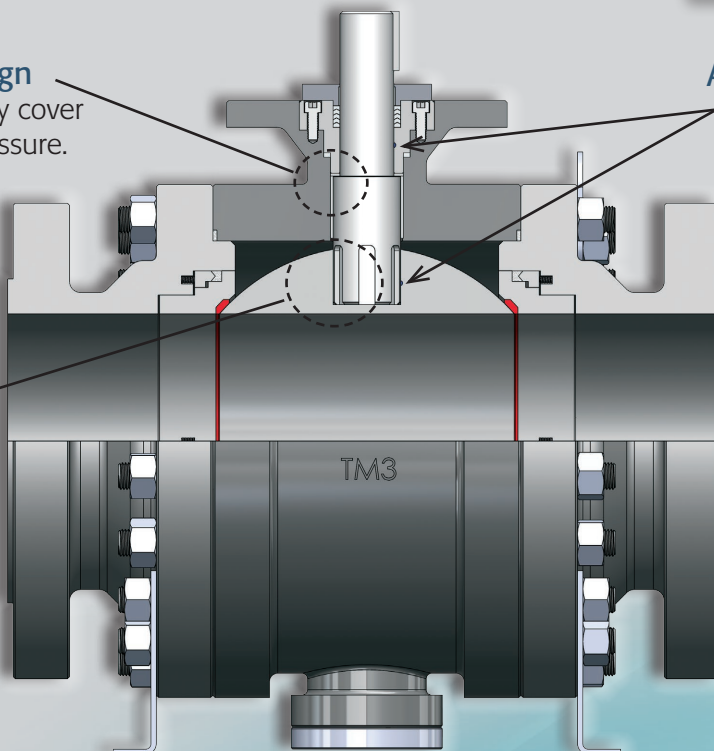
Anti-Static Device

Anti-static devices between

- Body and Stem
- Stem and Ball

Splined Stem/Ball Connection

Splined connection for a greater torque transmitting capacity. (Square drive 2" to 4")

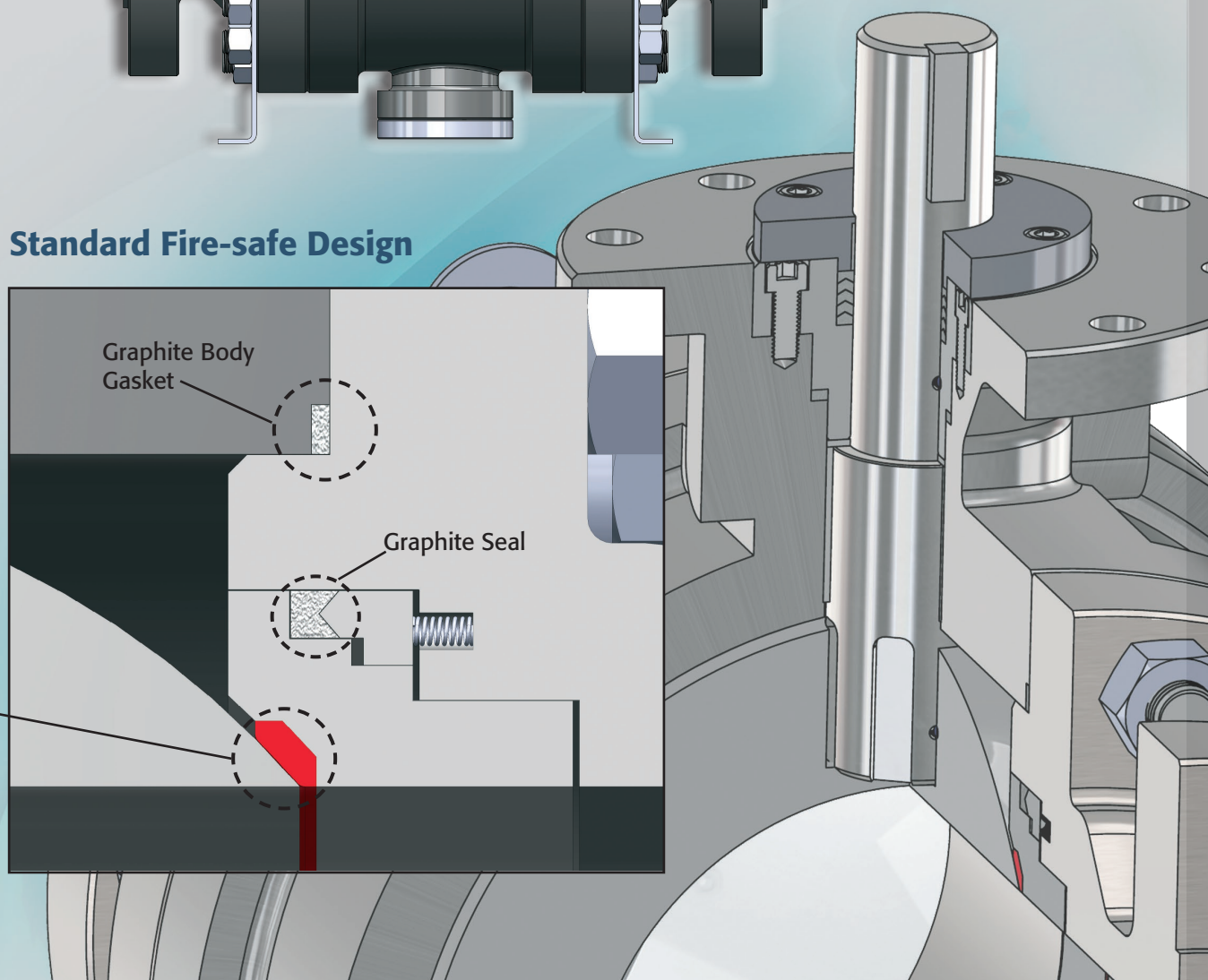


Standard Fire-safe Design

Graphite Body Gasket

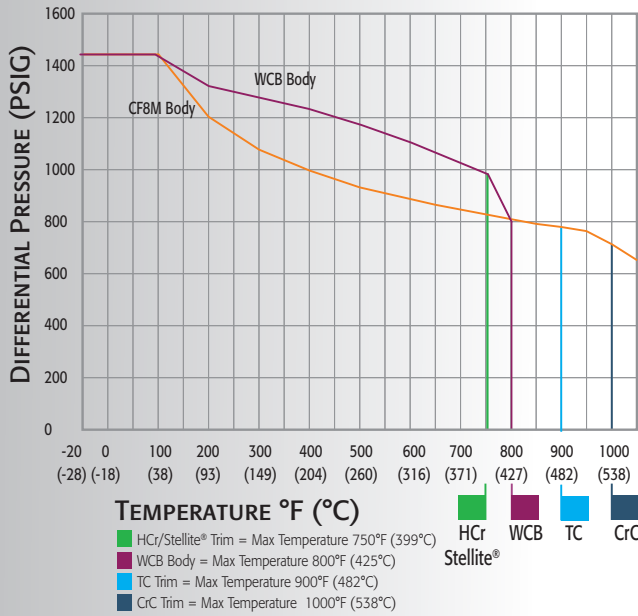
Graphite Seal

Bi-directional metal seat design with various hard face coating options.

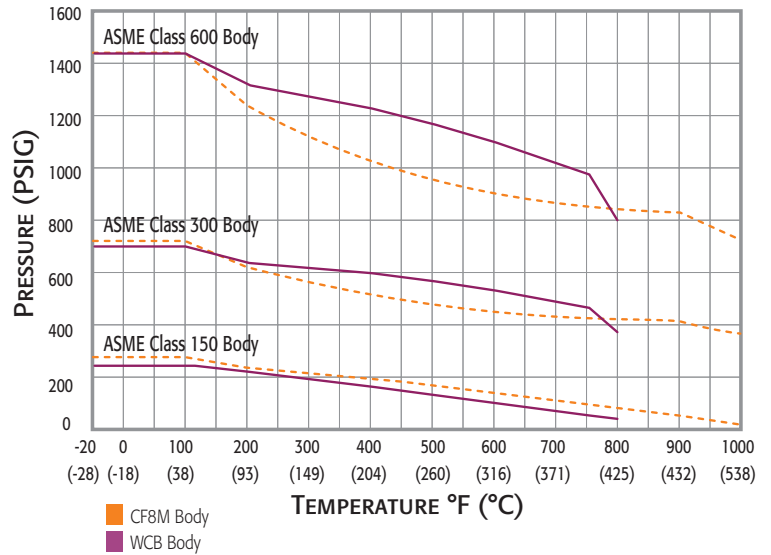


Temperature & Pressure Curves

Pressure vs. Temperature
TRIM OPTIONS - P/T @ Max. Shutoff ΔP



Pressure vs. Temperature
BODY MATERIAL



Cv VALUES

Size	Cv Value
2"	501
3"	1,158
4"	2,118
6"	5,074
8"	9,337
10"	14,590
12"	21,802
14"	29,675
16"	38,760
18"	51,058
20"	63,035
24"	90,770



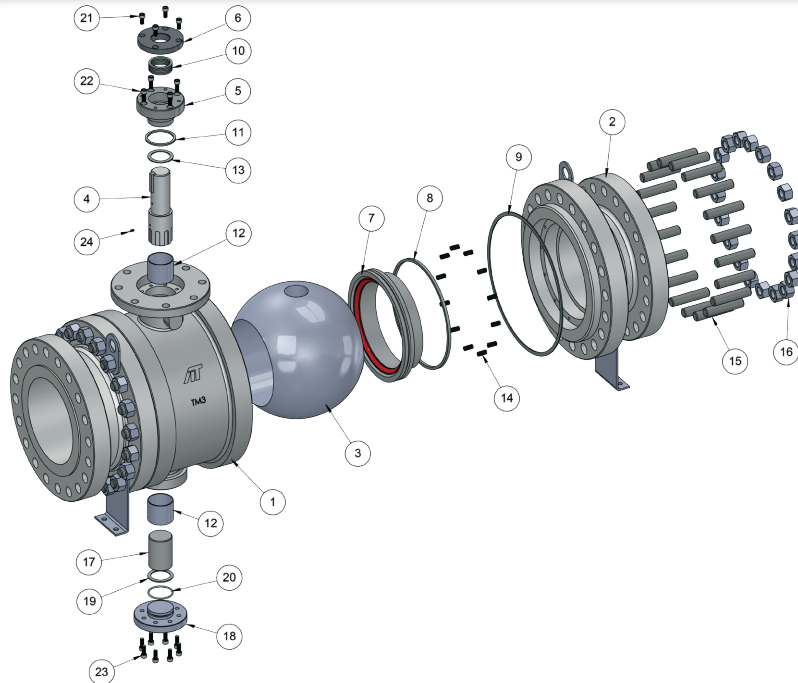
TM3 SERIES

METAL SEAT

Metal

Bill Of Materials | 2"-14"

TM3 Series
2"-14"



MATERIALS LIST		CARBON STEEL			STAINLESS STEEL		
		STELLITE® SEAT	TUNGSTEN CARBIDE	CHROME CARBIDE	STELLITE® SEAT	TUNGSTEN CARBIDE	CHROME CARBIDE
SEAT HARD FACE OPTION		STELLITE® SEAT	TUNGSTEN CARBIDE	CHROME CARBIDE	STELLITE® SEAT	TUNGSTEN CARBIDE	CHROME CARBIDE
OPERATING TEMP. RANGE		-20°F - 661°F	-20°F - 800°F	-20°F - 800°F	-50°F - 661°F	-50°F - 842°F	-50°F - 932°F
NO.	PART NAME						
1	BODY	A216 WCB			A351 CF8M		
2	CLOSURE	A216 WCB			A351 CF8M		
3	BALL	A351 CF8M + HCr	A351 CF8M + TC	A351 CF8M + CrC	A351 CF8M + HCr	A351 CF8M + TC	A351 CF8M + CrC
4	STEM	A564 17-4 PH	XM-19	XM-19	XM-19	XM-19	XM-19
5	BODY COVER	A216 WCB			A351 CF8M		
6	GLAND PLATE	A216 WCB			A351 CF8M		
7	SEAT ASSEMBLY	A351 CF8M + Stellite®	A351 CF8M + TC	A351 CF8M + CrC	A351 CF8M + Stellite®	A351 CF8M + TC	A351 CF8M + CrC
8	SEAT RING SEAL	GRAPHITE					
9	BODY GASKET	STAINLESS STEEL + GRAPHITE					
10	GLAND PACKING	GRAPHITE					
11	GLAND SEAL	GRAPHITE					
12	STEM BEARING	STAINLESS STEEL					
13	STEM THRUST WASHER	STAINLESS STEEL					
14	SEAT SPRING	INCONEL® X750					
15	STUD	A193 Gr B7			A193 Gr B8		
16	NUT	A194 Gr 2H			A194 Gr 8		
17	TRUNNION STEM	A564 17-4 PH	XM-19	XM-19	XM-19	XM-19	XM-19
18	LOWER COVER	A216 WCB			A351 CF8M		
19	TRUNNION STEM WASHER	STAINLESS STEEL					
20	TRUNNION STEM GASKET	GRAPHITE					
21	CAP SCREW	STAINLESS STEEL					
22	CAP SCREW	STAINLESS STEEL					
23	CAP SCREW	STAINLESS STEEL					

HCr = Hard Chrome Plated; TC = Tungsten Carbide; CrC = Chrome Carbide

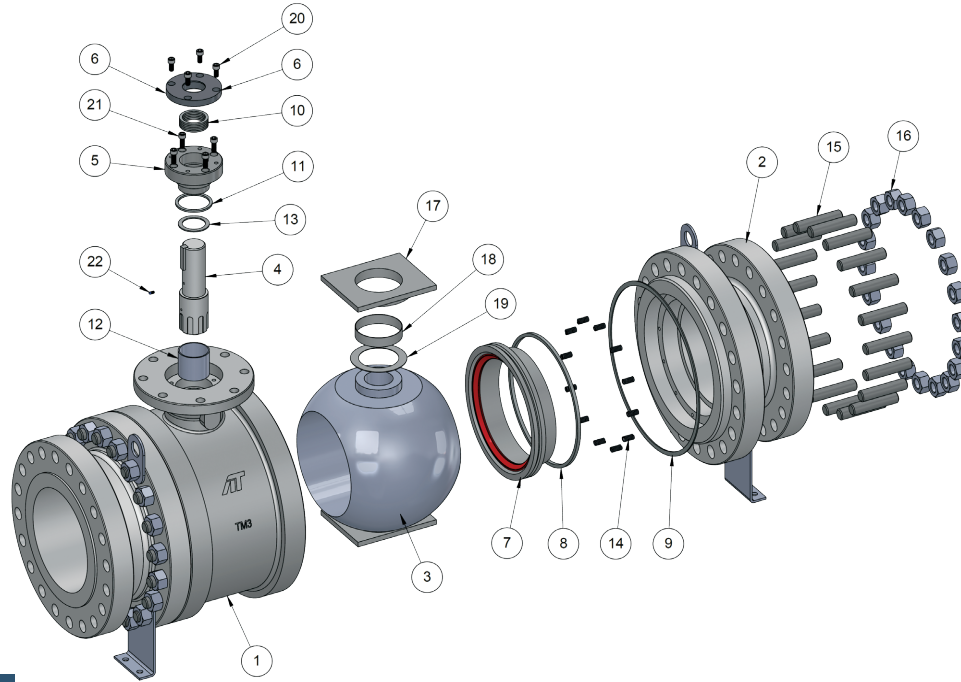
Seated

TM3 SERIES

METAL SEAT

Bill of Materials | 16"-24"

TM3 Series
16"-24"



MATERIALS LIST		CARBON STEEL			STAINLESS STEEL		
		STELLITE® SEAT	TUNGSTEN CARBIDE	CHROME CARBIDE	STELLITE® SEAT	TUNGSTEN CARBIDE	CHROME CARBIDE
SEAT HARD FACE OPTION		STELLITE® SEAT	TUNGSTEN CARBIDE	CHROME CARBIDE	STELLITE® SEAT	TUNGSTEN CARBIDE	CHROME CARBIDE
OPERATING TEMP. RANGE		-20°F - 661°F	-20°F - 800°F	-20°F - 800°F	-50°F - 661°F	-50°F - 842°F	-50°F - 932°F
NO.	PART NAME						
1	BODY	A216 WCB			A351 CF8M		
2	CLOSURE	A216 WCB			A351 CF8M		
3	BALL	A351 CF8M + HCr	A351 CF8M + TC	A351 CF8M + CrC	A351 CF8M + HCr	A351 CF8M + TC	A351 CF8M + CrC
4	STEM	A564 17-4 PH	XM-19	XM-19	XM-19	XM-19	XM-19
5	BODY COVER	A216 WCB			A351 CF8M		
6	GLAND PLATE	A216 WCB			A351 CF8M		
7	SEAT ASSEMBLY	A351 CF8M + Stellite®	A351 CF8M + TC	A351 CF8M + CrC	A351 CF8M + Stellite®	A351 CF8M + TC	A351 CF8M + CrC
8	SEAT RING SEAL	GRAPHITE					
9	BODY GASKET	STAINLESS STEEL + GRAPHITE					
10	GLAND PACKING	GRAPHITE					
11	GLAND SEAL	GRAPHITE					
12	STEM BEARING	STAINLESS STEEL					
13	STEM THRUST WASHER	STAINLESS STEEL					
14	SEAT SPRING	INCONEL® X750					
15	STUD	A193 Gr B7			A193 Gr B8		
16	NUT	A194 Gr 2H			A194 Gr 8		
17	BEARING RETAINER	A216 WCB			A351 CF8M		
18	BEARING	STAINLESS STEEL					
19	THRUST WASHER	STAINLESS STEEL					
20	CAP SCREW	STAINLESS STEEL					
21	CAP SCREW	STAINLESS STEEL					

HCr = Hard Chrome Plated; TC = Tungsten Carbide; CrC = Chrome Carbide

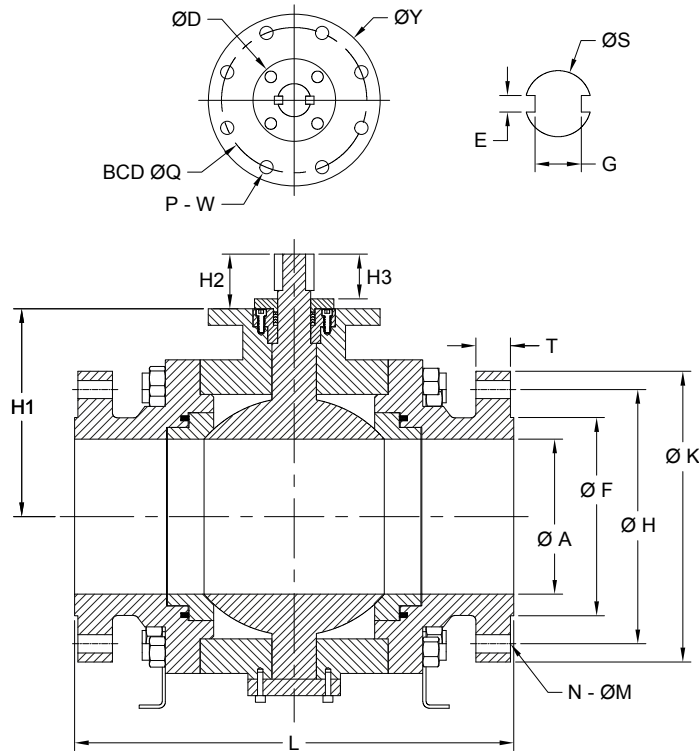
TM3 SERIES

METAL SEAT

Metal

Dimensions | 2"-14"

TM3 Series (2"-14")
ANSI Class 150/300/600



DIMENSIONS (IN)

150	SIZE	A	F	H	K	M	N	L	T	H1	H2	H3	S	E	G	Q	W	P	Y	D	
	2"	2.00	3.62	4.74	5.98	0.75	4	7.01	0.63	4.59	2.36	1.57	1.063	0.315	0.669	4.02	M10	4	5.12	2.87	38
	3"	3.00	5.00	6.00	7.48	0.75	4	7.99	0.75	6.12	2.40	1.57	1.429	0.394	1.035	4.02	M10	4	5.12	3.35	68
	4"	4.00	6.18	7.50	9.02	0.75	8	9.02	0.94	7.13	3.31	2.36	1.575	0.394	1.181	4.92	M12	4	6.02	3.94	112
	6"	5.91	8.50	9.51	10.98	0.88	8	15.51	1.00	9.25	3.58	2.76	1.890	0.551	1.457	6.50	M20	4	8.27	4.92	262
	8"	7.91	10.63	11.75	13.50	0.88	8	17.99	1.13	11.81	3.94	2.95	2.362	0.709	1.811	6.50	M20	4	8.27	5.04	462
	10"	9.92	12.76	14.25	15.98	1.00	12	20.98	1.19	13.39	3.94	2.95	2.362	0.709	1.811	6.50	M20	4	8.27	5.04	700
	14"	13.15	16.26	18.76	20.98	1.13	12	27.01	1.38	17.26	5.75	4.33	2.953	0.787	2.323	10.00	M16	8	11.42	6.14	1,078

300	SIZE	A	F	H	K	M	N	L	T	H1	H2	H3	S	E	G	Q	W	P	Y	D	
	2"	2.00	3.62	5.00	6.50	0.75	8	8.50	0.88	4.59	2.36	1.57	1.063	0.315	0.669	4.02	M10	4	5.12	2.87	47
	3"	3.00	5.00	6.61	8.27	0.88	8	11.10	1.13	6.12	2.40	1.57	1.429	0.394	1.035	4.02	M10	4	5.12	3.35	103
	4"	4.00	6.18	7.87	10.00	0.88	8	12.01	1.25	7.13	3.31	2.36	1.575	0.394	1.181	4.92	M12	4	6.02	3.94	165
	6"	5.91	8.50	10.63	12.52	0.88	12	15.87	1.44	9.25	3.58	2.76	1.890	0.551	1.457	6.50	M20	4	8.27	4.92	330
	8"	7.91	10.63	12.99	15.00	1.00	12	19.76	1.63	11.81	3.94	2.95	2.362	0.709	1.811	6.50	M20	4	8.27	5.04	591
	10"	9.92	12.76	15.26	17.48	1.13	16	22.36	1.88	13.39	3.94	2.95	2.362	0.709	1.811	10.00	M16	8	11.42	5.04	950
	14"	13.15	16.26	20.26	22.99	1.25	20	30.00	2.13	17.26	5.75	4.33	2.953	0.787	2.323	10.00	M16	8	11.42	6.69	1,881

600	SIZE	A	F	H	K	M	N	L	T	H1	H2	H3	S	E	G	Q	W	P	Y	D	
	2"	2.00	3.62	5.00	6.50	0.75	8	11.50	1.25	4.59	2.36	1.57	1.063	0.315	0.669	4.02	M10	4	5.12	2.87	62
	3"	3.00	5.00	6.61	8.27	0.88	8	14.02	1.50	6.12	2.40	1.57	1.429	0.394	1.035	4.02	M10	4	5.12	3.35	136
	4"	4.00	6.18	8.50	10.75	1.00	8	17.01	1.75	7.13	3.31	2.36	1.575	0.394	1.181	4.92	M12	4	6.02	3.94	239
	6"	5.91	8.50	11.50	14.02	1.13	12	22.01	2.13	9.25	3.58	2.76	1.890	0.551	1.457	6.50	M20	4	8.27	4.92	482
	8"	7.91	10.63	13.74	16.50	1.25	12	25.98	2.44	11.81	3.94	2.95	2.362	0.709	1.811	6.50	M20	4	8.27	5.04	961
	10"	9.92	12.76	17.01	20.00	1.38	16	30.98	2.75	13.39	3.94	2.95	2.362	0.709	1.811	10.00	M16	8	11.42	5.04	1,419
	14"	13.15	16.26	20.75	23.74	1.50	20	35.00	3.00	17.26	5.75	4.33	2.953	0.787	2.323	10.00	M16	8	11.42	6.69	2,519

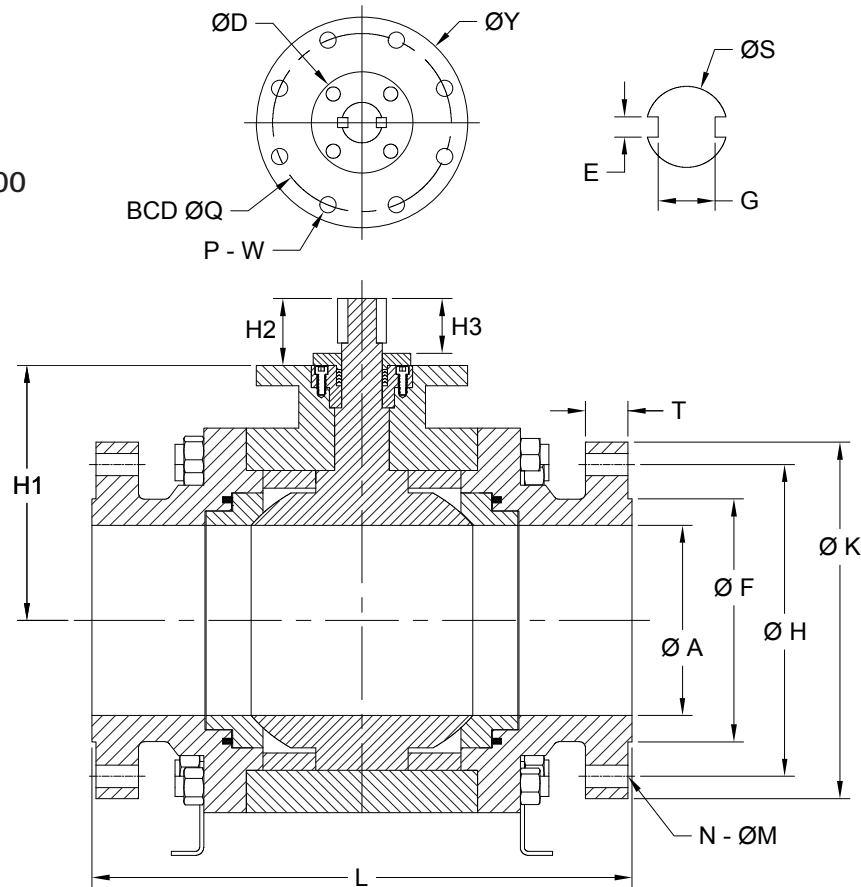
Seated

TM3 SERIES

METAL SEAT

Dimensions | 16"-24"

TM3 Series (16"-24")
ANSI Class 150/300/600



DIMENSIONS (IN)

150	SIZE	A	F	H	K	M	N	L	T	H1	H2	H3	S	E	G	Q	W	P	Y	D	WEIGHT (Lb)
	16"	15.25	18.50	21.25	23.50	1.13	16	30.00	1.44	19.17	5.71	4.25	3.346	0.945	2.583	10.00	M16	8	11.42	7.05	1,947
	18"	17.25	20.98	22.76	25.00	1.25	16	34.02	1.56	20.91	6.69	5.31	3.937	1.102	3.150	10.00	M16	8	11.42	7.48	2,548
	20"	19.25	22.99	25.00	27.48	1.25	20	35.98	1.68	22.13	7.09	5.71	4.331	1.260	3.307	11.73	M20	8	13.78	8.27	3,190
	24"	23.19	27.24	29.51	32.01	1.38	20	42.01	1.87	25.59	7.87	6.30	4.724	1.260	4.291	14.02	M30	8	16.34	9.06	4,466

300	SIZE	A	F	H	K	M	N	L	T	H1	H2	H3	S	E	G	Q	W	P	Y	D	WEIGHT (Lb)
	16"	15.25	18.50	22.50	25.51	1.38	20	32.99	2.25	19.17	5.71	4.25	3.346	0.945	2.583	10.00	M16	8	11.42	7.05	2,640
	18"	17.25	20.98	24.75	27.99	1.38	24	35.98	2.37	20.91	6.69	5.31	3.937	1.102	3.150	10.00	M16	8	11.42	7.48	3,463
	20"	19.25	22.99	27.01	30.51	1.38	24	39.02	2.50	22.13	7.09	5.71	4.331	1.260	3.307	11.73	M20	8	13.78	8.27	4,325
	24"	23.19	27.24	32.01	35.98	1.63	24	45.00	2.75	25.59	7.87	6.30	4.724	1.260	4.291	14.02	M30	8	16.34	9.06	5,914

600	SIZE	A	F	H	K	M	N	L	T	H1	H2	H3	S	E	G	Q	W	P	Y	D	WEIGHT (Lb)
	16"	15.25	18.50	23.74	27.01	1.63	20	39.02	3.25	19.17	5.71	4.25	3.346	0.945	2.583	14.02	M30	8	16.34	7.05	3,659
	18"	17.25	20.98	25.75	29.25	1.75	20	42.99	3.50	20.91	6.69	5.31	3.937	1.102	3.150	14.02	M30	8	16.34	8.27	4,708
	20"	19.25	22.99	28.50	32.01	1.75	24	47.01	3.75	22.13	7.09	5.71	4.331	1.260	3.307	14.02	M30	8	16.34	8.27	5,731
	24"	23.19	27.24	32.99	37.01	2.00	24	55.00	4.25	25.59	7.87	6.30	4.724	1.260	4.291	14.02	M30	8	16.34	9.06	7,830

TM3 SERIES

METAL SEAT

3-PC Metal Seated Valve Torques



TORQUES: 3-Piece Metal Seat Ball Valve for TC Ball & Seat

SIZE (NPS)	Break to OPEN Torques (In-Lbs)		
	Class 150	Class 300	Class 600
2"	1,681	2,810	5,841
3"	2,158	4,259	11,151
4"	4,758	7,335	15,554
6"	10,510	22,889	41,994
8"	21,028	43,169	85,486
10"	25,165	52,826	106,186
12"	32,190	69,840	143,381
14"	50,021	113,684	240,000
16"	62,274	143,258	304,544
18"	94,370	213,594	449,840
20"	124,100	283,179	599,209
24"	200,516	461,685	981,960

Note: Torques include a 15% safety factor based on water at full differential pressure.

TORQUES: 3-Piece Metal Seat Ball Valve for HCr Ball & Stellite® Seat

SIZE (NPS)	Break to OPEN Torques (In-Lbs)		
	Class 150	Class 300	Class 600
2"	1,529	2,555	5,310
3"	1,961	3,873	10,138
4"	4,325	6,668	14,140
6"	9,554	20,808	38,176
8"	19,410	39,848	78,910
10"	23,229	48,763	98,019
12"	29,714	64,468	132,353
14"	46,173	104,939	221,539
16"	57,483	132,238	281,118
18"	87,111	197,164	415,238
20"	114,554	261,396	553,116
24"	185,091	426,170	906,424

Note: Torques include a 15% safety factor based on water at full differential pressure.



HOW TO ORDER

TRUNNION MOUNTED BALL VALVES PART NUMBER MATRIX

Fire Safe Designation (must be included)

F Firesafe (standard)

Port

F Full Port

Valve Series

TM3 Metal seat Trunnion, 3 pc design (cast)

Body Material

C A216 WCB (-20°F to 800°F)
 5 A352 LCB (-50°F to 800°F)
 8 A352 LCC (-50°F to 650°F)
 X CF8M 316 SST (-450°F to 1200°F)
 L CF3M 316L SST (-450°F to 800°F)
 7 A105N Forged Steel (-20°F to 800°F)
 D CD3MN Duplex SST (-50°F to 550°F)
 G CE3MN Super Duplex SST (-50°F to 550°F)
 6 WC6, A217 (-20° F to 1100° F)
 9 WC9, A217 (-20° F to 1100° F)
 F A350 LF2 (-50° F to 800° F)
 4 A182 F316 (-450°F to 1200°F)
 (other options: consult factory)

End Connection

F1 150 RF
 F3 300 RF
 F6 600 RF

Configurable End Connection

XX not applicable

Valve Size

0200	2"	1200	12"
0300	3"	1400	14"
0400	4"	1600	16"
0600	6"	1800	18"
0800	8"	2000	20"
1000	10"	2400	24"

Ball

2 Tungsten Carbide Coated 316SST
 3 316SST / HCr
 4 Chrome Carbide Coated 316SST

Stem

H 4140 / ENP
 A 17-4 PH
 B XM-19
 S 316SST
 D Inconel® 718
 C A182 F51 Duplex SST
 9 A350 LF2 / ENP
 7 A105N / ENP

Seat

2 Tungsten Carbide Coated 316SS
 3 316/Stellite®
 4 Chrome Carbide Coated 316SS

Packing

G Graphite packing (standard)

Seals

X Standard

Paint

X Standard
 S Special (Customer Specified Coating)

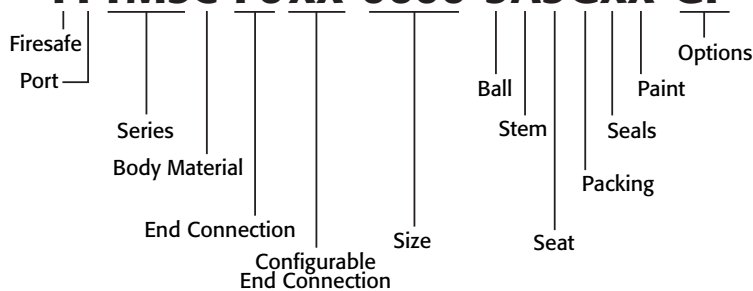
Options

G Gear Operator
 L Gear Operator w/ Locking Plate
 X Bare Stem
 E Extended Bonnet (specify extension length required)
 B Bypass Piping w/ 2-way valve
 F Factory Acceptance Test
 C Customer to specify custom testing
 S Spool Piece Mounting Kit for Automation
 M Channel Design Mounting Kit for Automation
 P Purge Ports per Drawing
 (other options: consult factory)

HOW TO ORDER

A-T Trunnion Mounted Ball Valves:

FFTM3C-F6XX-0600-3A3GXX-GF



FFTM3C-F6XX-0600-3A3GXX-GF

6", 3-Piece, Full Port Trunnion Ball Valve, ANSI Class 600 RFF, API-6FA & ISO 10497 Firesafe, A216 WCB Body, 316SST/HCr Ball, 17-4 PH Stem, 316/Stellite® Seat, Graphite Packing/Seals, Gear Operator with Factory Acceptance Test

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 Stellite® is a registered trademark of the Deloro Stellite Company, Inc.
 Inconel® is a registered trademark of Inco Alloys/Special Metals Corporation.



TRUNNION MOUNTED BALL VALVES

TRUN-TM-20220615
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