



A-T Controls, Inc.

## M Series (FMX)

3-PC High Performance Metal Seat  
Floating Ball Valve



# M Series

## 3-PC High Performance Metal Seat Ball Valve

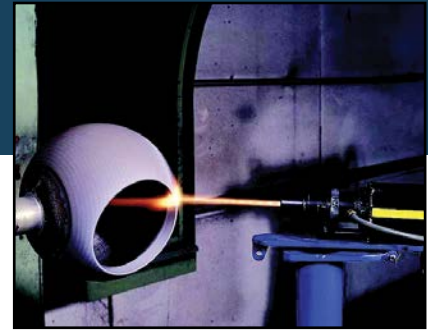
### Full Bore TH/SW/BW Ends ANSI Class 600



The A-T Controls *M Series* metal seat ball valve is designed for use in severe services such as high temperature, high pressure, and abrasive fluids found in Oil & Gas, Petroleum, Petrochemical, Chemical, Power Generation, Pulp & Paper, and Mining industries.

### Product Features

- Oversized stem design prevents deformation at higher pressures and temperatures.
- Larger ball design provides better sealing to prevent leakage.
- ANSI Class 600 wall thickness design
- Bidirectional design for backflow application
- Inconel® spring design to maintain good contact between ball and seats during operation
- Live-loaded packing design and dual anti-static devices eliminate stem leakage while providing longer life cycle.
- Blowout proof stem
- ISO 5211 mounting pad
- Fire safe design conforms to ISO 10497 3rd edition
- Optional Tungsten Carbide (TC) coating for heavy slurry & high temperatures

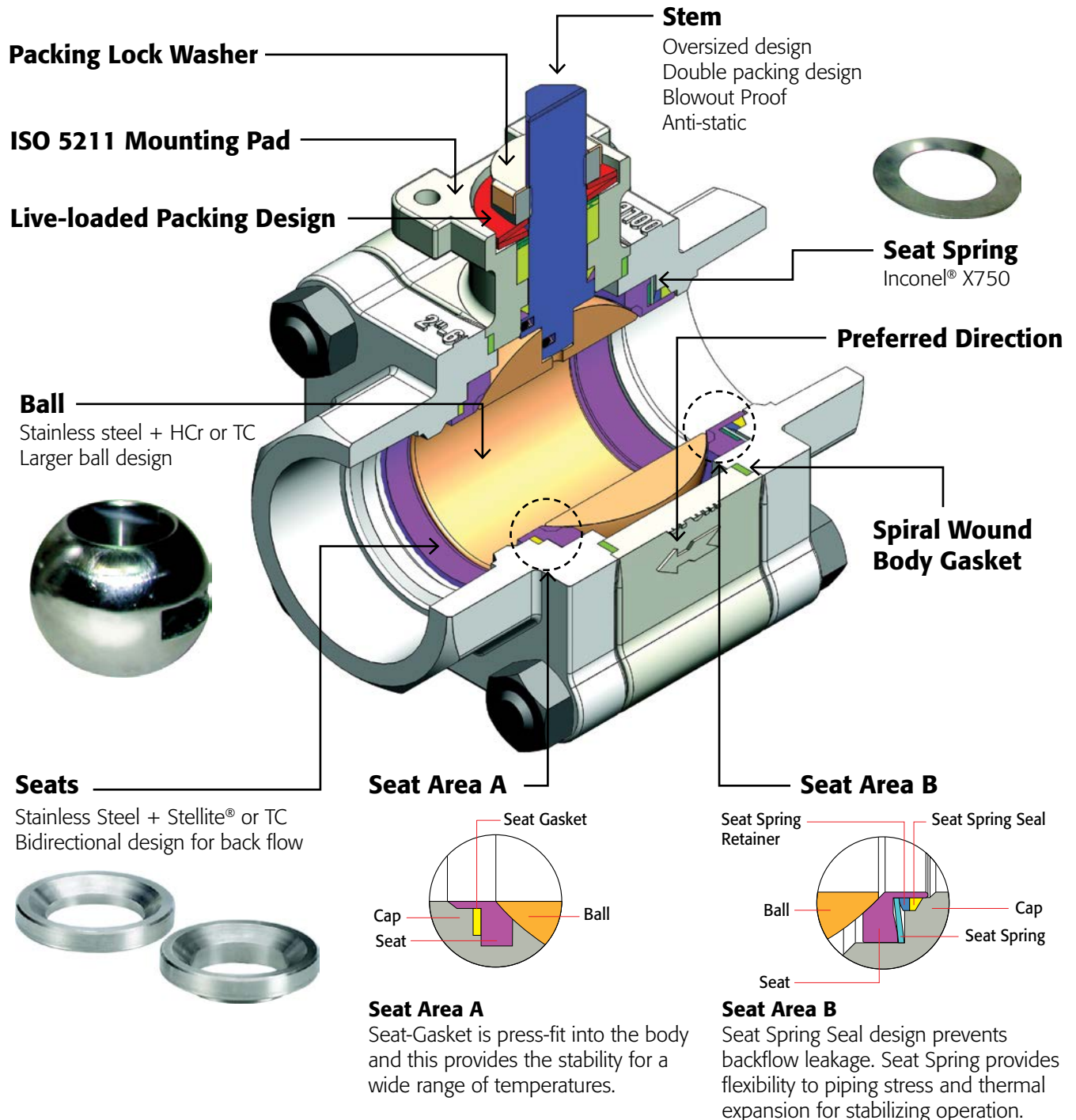


HVOF Thermal Spray

## Applications

- Abrasive Fluids
- High Temperatures
- High Pressure
- Steam, gas & liquid

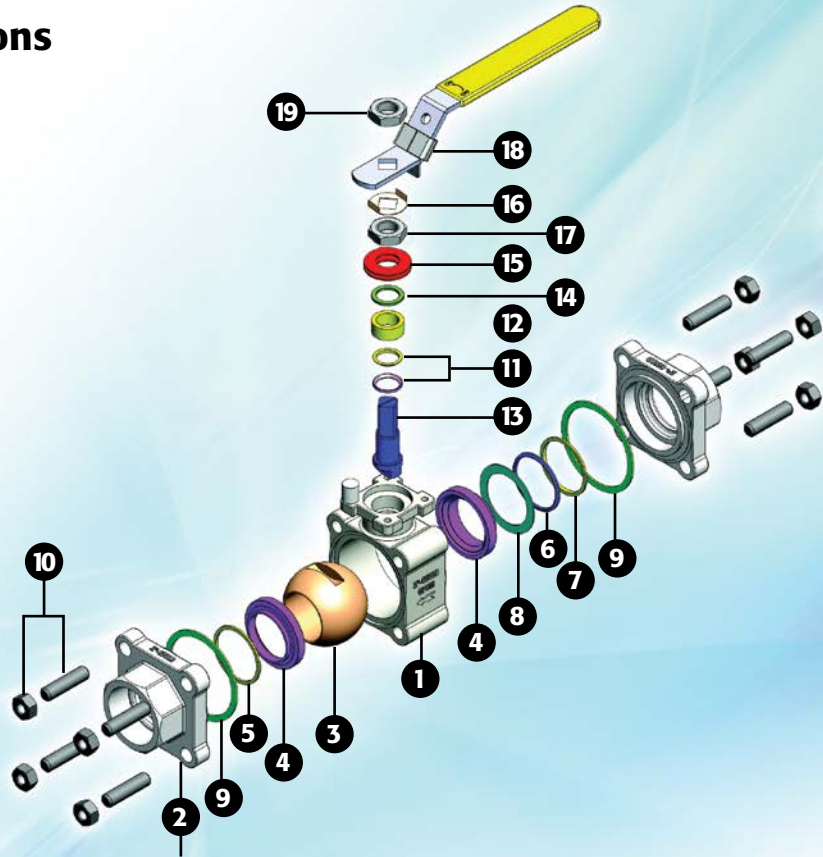
## Design and Structures



# M Series

## 3-PC High Performance Metal Seat Ball Valve

### Technical Specifications



### MATERIALS LIST

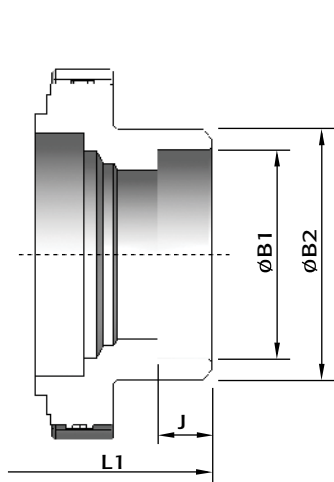
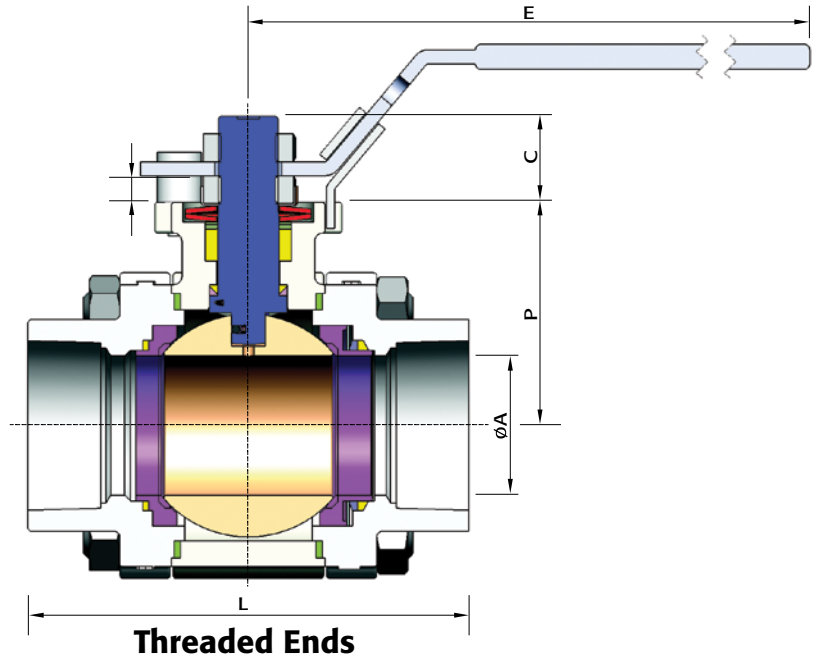
VALVE OPTIONS	CARBON STEEL			STAINLESS STEEL			
	STELLITE® SEAT	TUNGSTEN CARBIDE	CHROME CARBIDE	STELLITE® SEAT	TUNGSTEN CARBIDE	CHROME CARBIDE	
NO.	PART NAME	-20°F - 661°F	-20°F - 800°F	-20°F - 800°F	-50°F - 661°F	-50°F - 842°F	-50°F - 932°F
1	BODY	ASTM A216 GRADE WCB			ASTM A351 GRADE CF8M		
2	CAP	ASTM A216 GRADE WCB			ASTM A351 GRADE CF8M		
3	BALL	ASTM A351 GRADE CF8M + HCr	ASTM A351 GRADE CF8M + TC	ASTM A351 GRADE CF8M + CrC	ASTM A351 GRADE CF8M + HCr	ASTM A351 GRADE CF8M + TC	ASTM A351 GRADE CF8M + CrC
4	SEAT	AISI 316 + STELLITE®	AISI 316 + TC	AISI 316 + CrC	AISI 316 + STELLITE®	AISI 316 + TC	AISI 316 + CrC
5	SEAT GASKET	GRAPHITE					
6	SEAT SPRING RETAINER	AISI 316			INCONEL® X750		
7	SEAT SPRING SEAL	GRAPHITE			GRAPHITE		
8	SEAT SPRING	INCONEL® X750			INCONEL® X750		
9	GASKET	AISI 316 + GRAPHITE			AISI 316 + GRAPHITE		
10	BOLT	ASTM A193 GRADE B7			ASTM A193 GRADE B8		
	NUT	ASTM A194 GRADE 2H			ASTM A194 GRADE 8		
11	THRUST WASHER	AISI 316 + GRAPHITE					
12	GLAND PACKING	GRAPHITE					
13	STEM	17-4 PH			XM-19		
14	RING	AISI 316					
15	BELLEVILLE WASHER	AISI 301					
16	LOCK SADDLE	AISI 304					
17	NUT	AISI 304					
18	HANDLE	AISI 304					
19	HANDLE NUT	AISI 304					
18	HANDLE	AISI 304					
19	HANDLE NUT	AISI 304					

TRIM ABBREVIATIONS:  
HCr = Hard Chrome Plated; TC = Tungsten Carbide; CrC = Chrome Carbide

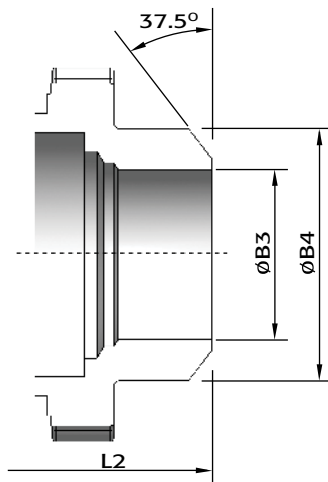
\*Various usage conditions shall determine stem material  
17-4 PH SST: use below 750°F  
XM-19: use up to 1100°F

## Applicable Standards

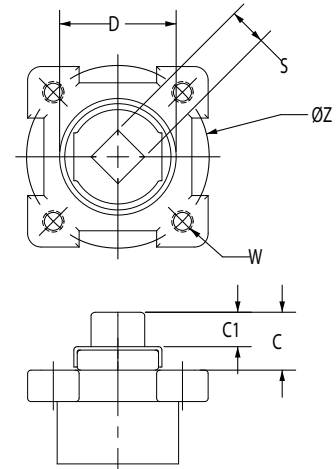
- **Standard Body material:**  
WCB or CF8M (other Alloys available)
- **Nominal size:**  
1/2" to 2"
- **Pressure rating:**  
ANSI Class 600
- **End connections:**  
Threaded/Socket Weld/Butt Weld
- **Temperature Range:**  
-20°F to 932°F
- **Body Pressure Testing:**  
ANSI B16.34/API 598
- **Seat Leakage Testing:**  
ANSI B16.104/FCI 70-2, Class V or VI
- **Fire Safety:**  
Design conforms to ISO 10497 3rd Edition
- **Casting:**  
MSS-SP-25 / MSS-SP-55
- **Fugitive Emissions:**  
Designed to ISO 15848-1



Socket Weld Ends



Butt Weld Ends



D=minimum bracket clearance

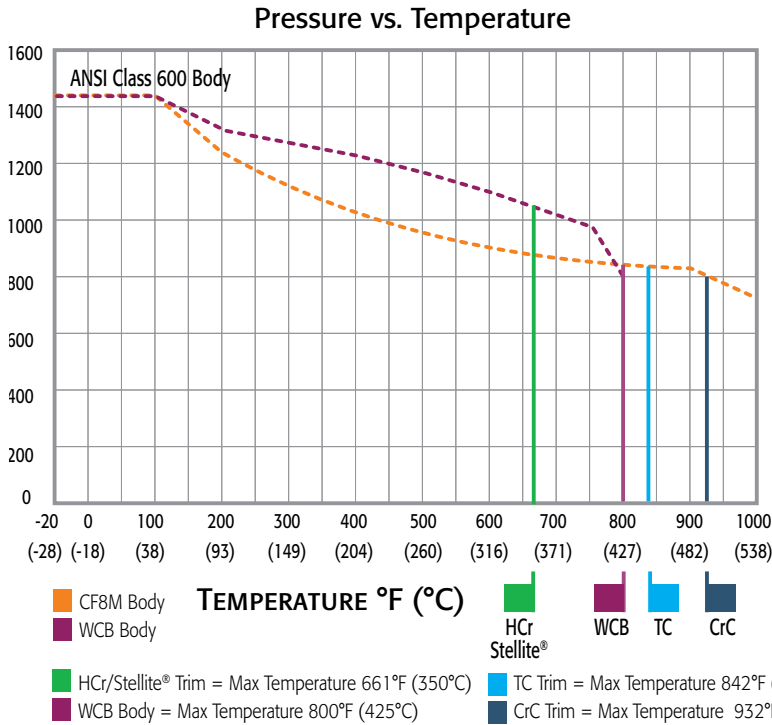
## Dimensions (IN) FMX Series TH/SW/BW Ends

SIZE	A	B1	B2	B3	B4	C	C1	D	E	J	L	L1	L2	P	S	W	Z	ISO 5211	LBS
1/2"	0.59	0.87	1.18	0.59	1.18	0.55	0.35	1.08	5.12	0.37	3.17	2.95	2.95	1.75	0.354	M5	1.654	F04	3
3/4"	0.79	1.09	1.50	0.79	1.50	0.55	0.35	1.08	5.12	0.49	3.80	3.54	3.54	1.85	0.354	M5	1.654	F04	3.5
1"	0.98	1.35	1.81	0.98	1.81	0.79	0.59	1.23	6.69	0.49	4.25	3.94	3.94	2.36	0.433	M6	1.969	F05	6
1-1/4"	1.26	1.70	2.20	1.26	2.20	0.79	0.59	1.23	6.69	0.49	5.00	4.33	4.33	2.52	0.433	M6	1.969	F05	9
1-1/2"	1.57	1.94	2.44	1.57	2.44	1.22	0.83	1.88	8.82	0.49	5.59	4.92	4.92	2.87	0.669	M8	2.756	F07	13
2"	1.97	2.43	2.91	1.97	2.91	1.22	0.83	1.88	8.82	0.63	6.22	5.91	5.91	3.15	0.669	M8	2.756	F07	18

# M Series

## 3-PC High Performance Metal Seat Ball Valve

### Temperature & Pressure Curves



NOTE: At temperature, the maximum pressure for the valve is limited by either the valve body/end cap material, or trim; whichever is lower.

NOTE: If larger differentials are needed for trim, please see our Trunnion product line.

### Full Bore Cv

Size	Cv
1/2"	25
3/4"	50
1"	90
1-1/4"	160
1-1/2"	245
2"	460

### FMX Series Metal Seat Torque Tables

HCr/Stellite® Trim	Torques (in*lbs) @ PSIG															
	75	150	225	290	350	435	500	575	650	725	800	870	1015	1160	1300	1450
1/2"	95	95	95	95	110	110	110	110	115	130	130	150	170	185	210	230
3/4"	165	185	185	200	215	215	235	245	260	290	300	325	335	380	425	475
1"	200	235	255	290	310	325	350	400	435	460	500	530	585	650	700	760
1-1/4"	370	480	585	660	690	760	830	900	980	1060	CF	CF	CF	CF	CF	CF
1-1/2"	460	555	830	1035	1140	1275	1475	1660	1850	2025	CF	CF	CF	CF	CF	CF
2"	600	890	1330	1785	2225	2675	3100	3400	3625	3800	CF	CF	CF	CF	CF	CF

TC Trim	Torques (in*lbs) @ PSIG															
	75	150	225	290	350	435	500	575	650	725	800	870	1015	1160	1300	1450
1/2"	119	119	119	119	140	140	140	140	147	166	169	195	221	241	273	299
3/4"	206	231	231	250	273	273	298	311	333	371	390	423	436	494	553	618
1"	250	294	319	363	394	413	445	508	557	589	650	689	761	845	910	988
1-1/4"	463	600	731	825	876	965	1054	1143	1254	1357	CF	CF	CF	CF	CF	CF
1-1/2"	575	694	1038	1294	1448	1619	1873	2108	2368	2592	CF	CF	CF	CF	CF	CF
2"	750	1113	1663	2231	2826	3397	3937	4318	4640	4864	CF	CF	CF	CF	CF	CF

Notes:

- 1) Torques include 30% safety factor tested by warm, clean water.
- 2) Additional safety factors should be added for high temperature, viscous fluid, powders, steam and slurries.

## Manual Ball Valve Part Number Matrix

<b>1</b>	<b>Fire Safe Designation</b>	<b>6</b>	<b>Seat, Lining &amp; Trim Materials</b>
F	Fire Safe design	2	Tungsten Carbide Coated 316SST Seats & Ball
<b>2</b>	<b>Valve Series</b>	3	HCr Coated Ball with Stellite® Inlay Seats
MX	Metal Seat 3-pc Bidirectional, Floating Ball	4	Chrome Carbide Coated 316SST Seats & Ball
<b>3</b>	<b>Body Material</b>	8	Chrome Carbide Coated Inconel® 718 Seats & Ball
Blank	No Designation = Stainless Steel Body and Trim CF8M-316 SST (-450° F to 1100° F)	<b>7</b>	<b>Special Designations</b>
C	Carbon Steel Body, A216 Gr WCB (-20° F to 800° F)	X	No Specials
L	Low Carbon 316 SST, CF3M-316L ( to 800° F)	G	Gear Operator
D	CD3MN Duplex SST	<b>8</b>	<b>Additional Specials</b>
G	CE3MN Super Duplex SST	X	No Specials
4	F316H Forged	O	Oxygen Cleaned
5	LCB, A352 (-50° F to 800° F)	Z	Special End Configuration
8	LCC, A352 (-50° F to 650° F)	V	Vented Ball
6	WC6, A217 (-20° F to 1100° F)	<b>9</b>	<b>Special Stem Designation</b>
9	WC9, A217 (-20° to 1100° F)	Blank	No Designation = Standard Stem
<b>4</b>	<b>End Connection</b>	A	17-4PH Stem
TH	Threaded (NPT)	B	XM-19 (Nitronic 50) Stem
SW	Socket Weld	C	Duplex 2205 Stem
BW	Butt Weld	D	Inconel® 718 Stem
<b>5</b>	<b>Valve Size</b>		
0050	1/2"		
0075	3/4"		
0100	1"		
0125	1-1/4"		
0150	1-1/2"		
0200	2"		



## How To Order

**1 - 2 - 3 - 4 - 5 - 678 - 9**  
 ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓ ↓  
**F MX C - TH - 0150 - 4XX - A**



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