



TI-P182-05
ST Issue 6

M70i ISO

Forged Stainless Steel Ball Valve for Sanitary Applications

Description

The M70i forged 316L stainless steel, three-piece body ball valve has ISO mounting as standard. It has been designed in accordance with ASME BPE for use as an isolating valve, not a control valve on clean steam and other high purity and aseptic processes where bacteria and media deposits can put product quality at risk. The low maintenance, clean design is suitable for steam, liquid and gas services ranging from vacuum to the higher temperatures and pressures. Applications include the pharmaceutical, biotech, food and beverage and cosmetics industries.

Principal features:

- **True port design** - The internal diameter of the end connections and ball precisely match that of the connecting tubing to guarantee drainability.
- **Forged material** - The M70i is manufactured from high integrity ASTM A182 F316L.
- **Low ferrite** - Body and end connections have 3% to 5% ferrite content to help prevent rouge.
- **Designed with orbital welding in mind** - Extended tube weld end connections means that automatic orbital welding can be performed without valve disassembly.
- **Designed for automation** - ISO 5211 mounting pad as standard enabling simple actuator mounting.
- **Lockable handle** - A spring loaded lockable handle allows the valve to be locked in the chosen position – ensuring system integrity.

Surface finish

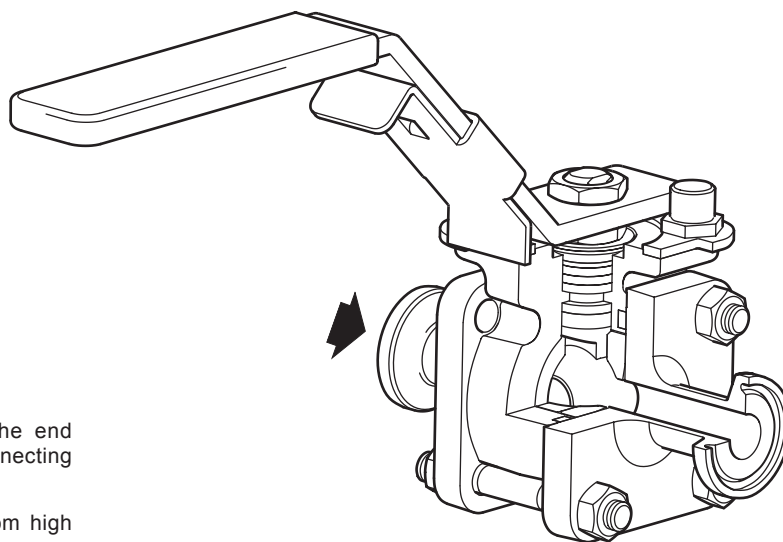
Standard internal surface finish is 0.5 micron Ra (20 micro inch). Electropolishing to 0.375 micron Ra (15 micro inch) is available to special order. External surface finishes are as forged / machined.

Available types

M70iV ISO	Virgin PTFE TFM 1600
M70iVEP ISO	Virgin PTFE TFM 1600 electropolished to 0.375 micron Ra
M70iG ISO	Mineral filled PTFE
M70iGEP ISO	Mineral filled PTFE electropolished to 0.375 micron Ra

Optional extras:

- Extended stem 100 mm (4") to allow for insulation.
- Cavity fillers are provided as standard. If cavity fillers are not required please specify when placing an order.
- Low ferrite < 1% under special request.



Standards

This product fully complies with the requirements of the European Pressure Equipment Directive 97/23/EC.

Certification:

- Material Certification to EN 10204 3.1
- Elastomer FDA / USP compliance certificate.
- Surface finish certification.

Note: All certification / inspection requirements must be stated at the time of order placement.

Packaging

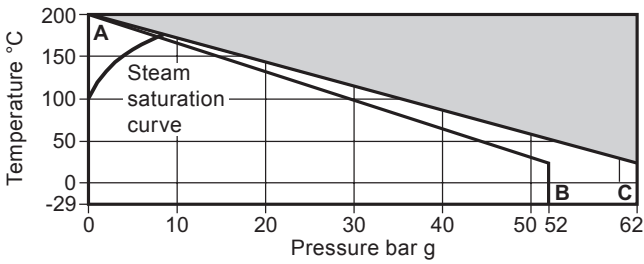
Each valve is end capped and sealed in a plastic bag, in accordance with ASME BPE, to avoid the ingress of dirt.

Sizes and pipe connections

½", ¾", 1", 1½", 2" sanitary clamp (ASME BPE).
½", ¾", 1", 1½", 2" extended O/D tube weld ends (ETO) (ASME BPE).
Sanitary clamp / ETO combinations are also available.
Alternatively: 2½", 3" and 4" investment cast sanitary ball valves are available through our M80i range - see TI-P182-06.

Note: Other connection options are available on request. Please consult Spirax Sarco.

Pressure / temperature limits



The product **must not** be used in this region.

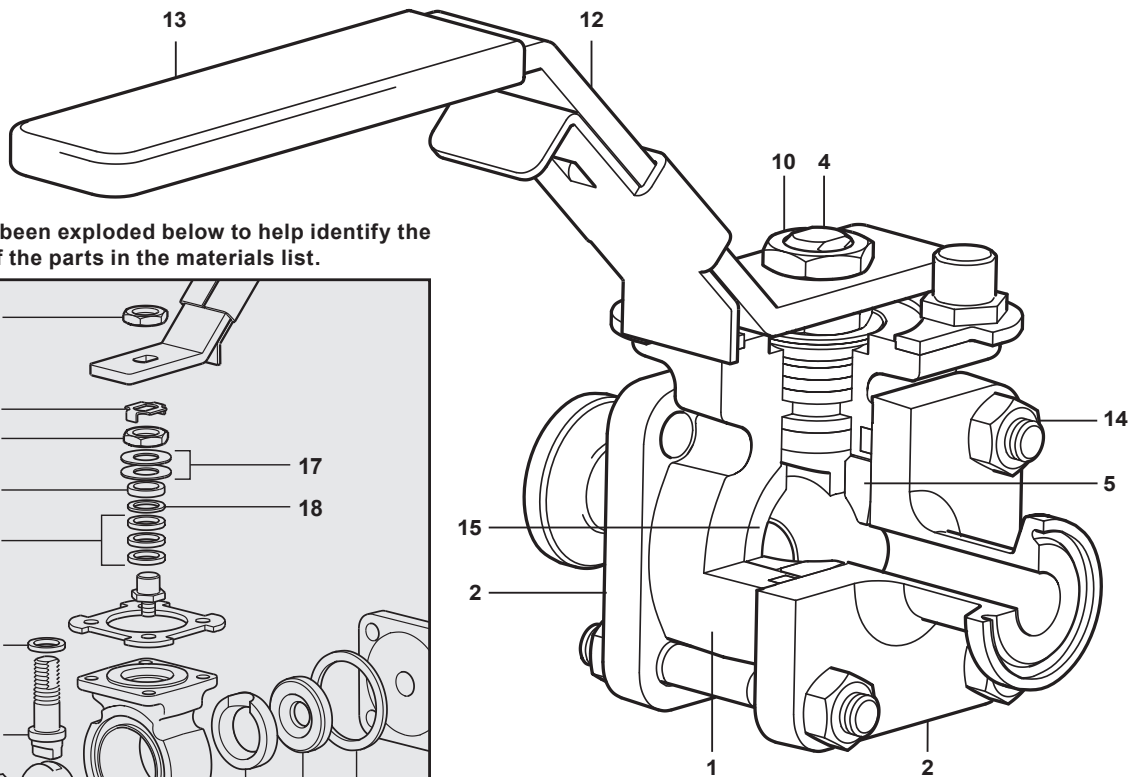
A - B Virgin PTFE TFM 1600.

A - C Mineral filled PTFE.

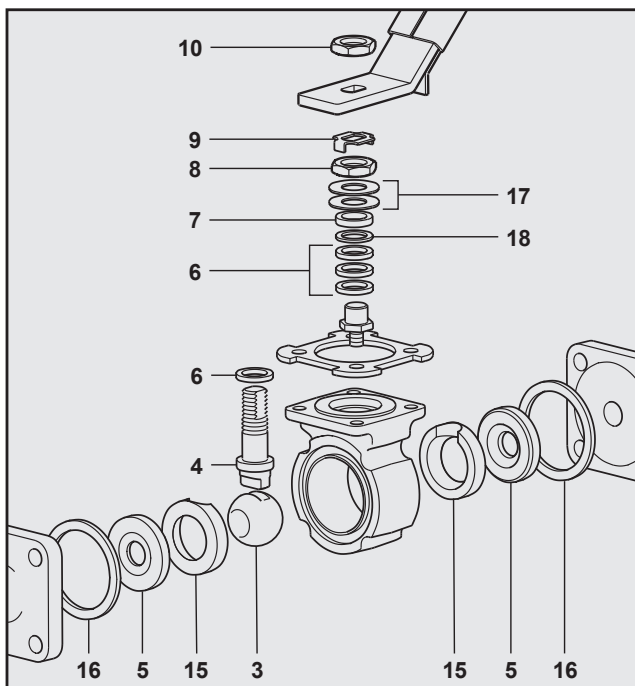
Body design conditions	PN63		
PMA	Maximum allowable pressure	62 bar g @ 20 °C	
TMA	Maximum allowable temperature	200 °C @ 0 bar g	
	Minimum allowable temperature	-29 °C	
PMO	Maximum operating pressure for saturated steam service	Virgin PTFE	7.0 bar g
		Mineral filled PTFE	8.5 bar g
TMO	Maximum operating temperature	200 °C @ 0 bar g	
	Minimum operating temperature	-29 °C	
Note: For lower operating temperatures consult Spirax Sarco			
ΔPMX	Maximum differential pressure is limited to the PMO		
Designed for a maximum cold hydraulic test pressure of 93 bar g			

Materials

No. Part	Material	
1	Body	Stainless steel ASTM A 182 F 316L
2	End connection	Stainless steel ASTM A 182 F 316L
3	Ball	Stainless steel AISI 316L
4	Stem	Stainless steel AISI 316L
5	Seat	M70iG Mineral filled PTFE
		M70iV Virgin PTFE TFM 1600
6	Stem seal	Virgin PTFE TFM 1600
7	Spacer	Stainless steel AISI 316
8	Compression nut	Stainless steel AISI 316
9	Lock washer	Stainless steel AISI 316
10	Stem nut	Stainless steel AISI 316
11	Nameplate (not shown)	Stainless steel AISI 430
12	Handle	Stainless steel AISI 316
13	Cover	Vinyl
14	Stud and nut	Stainless steel AISI 316
15	Cavity filler	Virgin PTFE TFM 1600
16	Body cap gasket	Virgin PTFE TFM 1600
17	Belleville washer	Stainless steel AISI 316
18	Stem seal	Stainless steel



The internals have been exploded below to help identify the position of some of the parts in the materials list.



Technical data

Leakage test procedure to ISO 5208 (Rate A) / EN 12266-1 (Rate A)

	Materials comply with;
Stem seal and seat	- FDA CFR title 21 part 177, section 1550. - USP23 Class VI
Flow characteristic	Modified linear
Port	True port design

K_V values

Size	½"	¾"	1"	1½"	2"
K _V	7	25	56	164	360

For conversion

$$C_V \text{ (UK)} = K_V \times 0.963$$

$$C_V \text{ (US)} = K_V \times 1.156$$

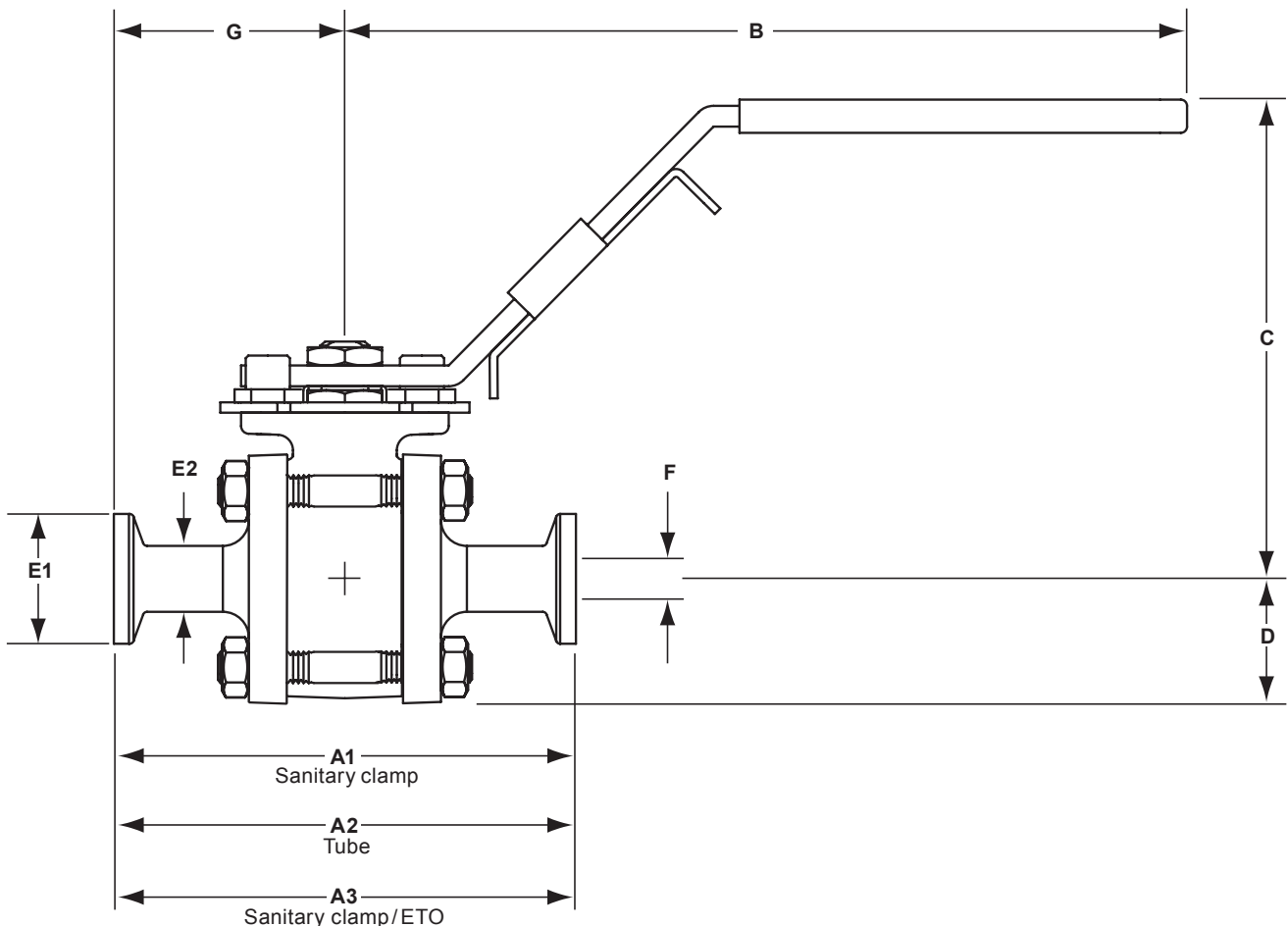
Torque value

Size	½"	¾"	1"	1½"	2"
N m	13	15	19	70	100

The torque figures shown are for a valve at maximum operating pressure that is operated frequently. Valves that are subject to long static periods, may require greater break-out torque.

Dimensions / weights (approximate) in mm and kg

Size	A1	A2	A3	B	C	D	E1	E2	F	G (Clamp)	G (ETO)	Weight
½"	89.0	140.0	114.5	161	92	24	25.0	12.70	9.4	44.5	70.0	0.80
¾"	101.6	152.4	127.0	161	94	26	25.0	19.05	15.8	50.8	76.2	1.00
1"	114.2	165.0	139.6	161	101	31	50.5	25.40	22.2	57.1	82.5	1.55
1½"	139.6	190.4	165.0	185	126	48	50.5	38.10	34.8	69.8	95.2	4.50
2"	158.7	203.1	180.9	250	141	57	64.0	50.80	47.5	79.4	101.6	7.70



Safety information, installation and maintenance

For full details see the Installation and Maintenance Instructions supplied with the product.

Welding

Only the models that have connections designed for welding (ETO) should be welded. Valves with clamp connections must not be welded to avoid damages to soft parts.

How to order

The M70i has a number of features that must be specified at the time of order placement; they are size, end connection, seat material, internal surface finish, and any certification that is required.

Note: Cavity fillers are provided as standard. If cavity fillers are not required please specify so when placing an order.

Example: 1 off Spirax Sarco ½" M70iV ISO forged sanitary ball valve complete with sanitary clamp connections (ASME BPE) and an internal surface finish of 0.5 micron Ra (20 micro inch).

The unit is to be supplied complete with EN 10204 3.1 material certification.

Spare parts

The spare parts available are shown in solid outline. Parts drawn in a grey line are not supplied as spares.

Available spares

Seat and seal set with cavity filler

5, 6, 15, 16, 18

How to order spares

Always order spares by using the description given in the column headed 'Available spares' and state the size and type of ball valve.

Example: 1 - Virgin PTFE TFM 1600 seat and seal set with cavity filler for a Spirax Sarco ½" M70iV ISO forged stainless steel ball valve.

