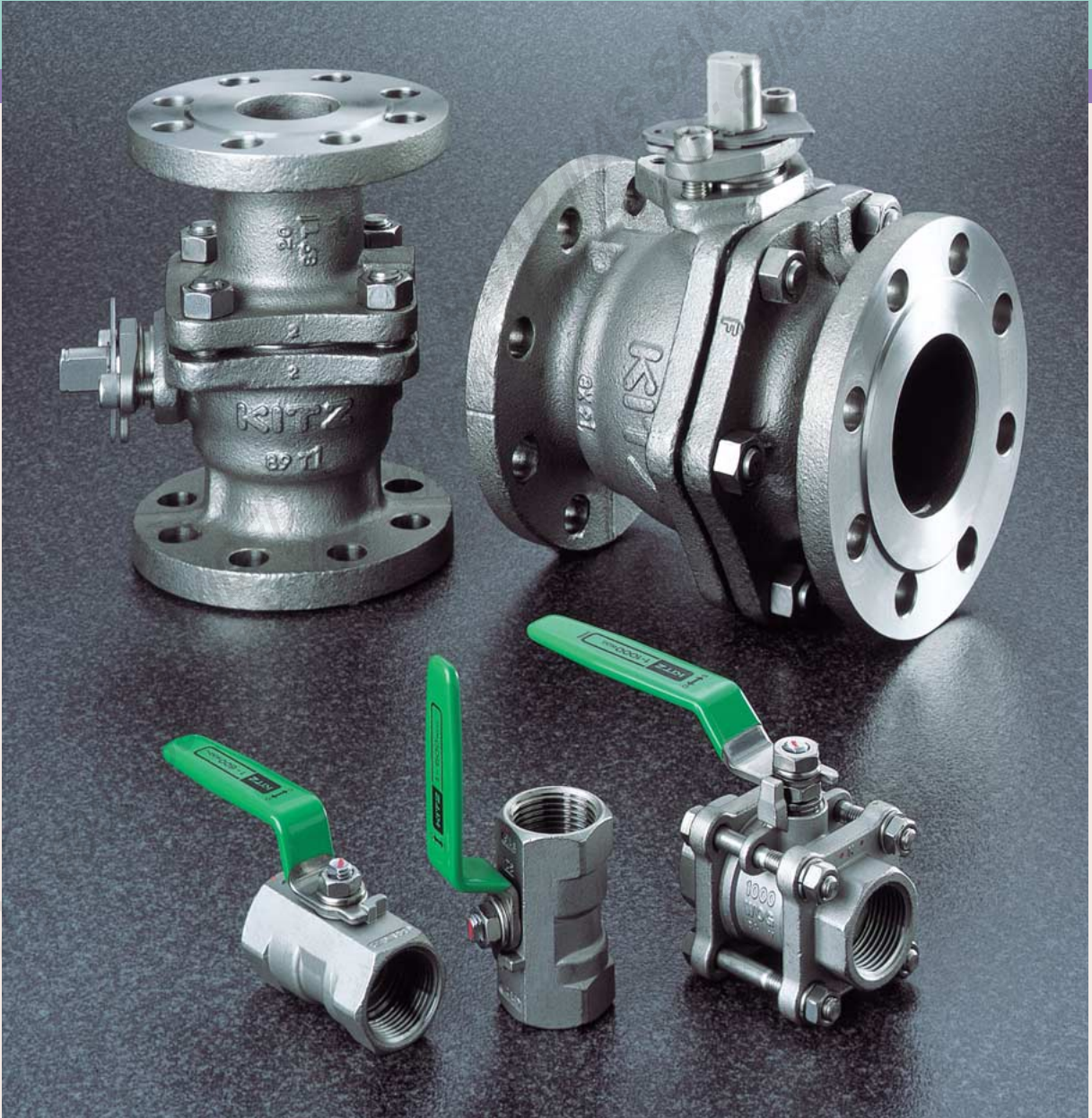


# KITZ

# Steel Ball Valves

## Floating Ball Design



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# KITZ Steel Ball Valves

## Floating Ball Design

The products introduced in this catalog are all covered by ISO 9001 and 9002 certification awarded KITZ Corporation, KITZ Corporation of Europe, S.A. and KITZ Corporation of Taiwan.



KITZ Corporation of Taiwan, Kaohsiung Plant, Taiwan (ISO 9002)



KITZ Corporation of Europe, S.A., Barcelona Plant, Spain (ISO 9001)



KITZ Corporation, Ina Plant, Japan (ISO 9001)



KITZ Corporation, Nagasaka Plant, Japan (ISO 9001)

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# KITZ Steel Ball Valves

## Floating Ball Design

### Design and Inspection Standards of KITZ Flanged Ball Valves

Item	American Standards	British Standards
Pressure-temperature ratings	ASME B16.34	BS 5351
	KITZ Standard	
Shell wall thickness	ASME B16.34	BS 5351
Face-to-face dimensions	ASME B16.10	BS 2080* <sup>1</sup>
End flange dimensions and flange gasket facing	ASME B16.5	BS 1560
Pressure test	API 598 or API 6D* <sup>2</sup>	BS 6755 Part 1* <sup>2</sup>
Fire test	API 607 and API 6FA	BS 6755 Part 2

\*1 Option for 2" to 4" Class 150 full port design.  
\*2 Option.

### Product Coding for KITZ Flanged Ball Valves

#### Example:

**150 U T A M** (Uni-body, end entry design)  
**G- 150 SC T B M -FS** (Split body, side entry design)

1 2 3 4 5 9 6 3A 7 8

#### 1 Valve operational measure

None ..... Lever handle  
 G ..... Worm gear  
 E ..... Electric actuator  
 B ..... KITZ Type B actuator  
 BS ..... KITZ Type BS actuator  
 BSW ..... KITZ Type BSW actuator  
 FA ..... KITZ Type FA actuator  
 FAS ..... KITZ Type FAS actuator

#### 2 ASME pressure class

150, 300, 600 or 1500

#### 3 Shell material

SC ..... Carbon or low alloy steel  
 U ..... Stainless or high alloy steel

#### 3A Shell material

An additional symbol is suffixed here, if other than WCB or CF8 is employed for shell material, such as:

M ..... CF8M    BL ..... LCB  
 V ..... CF3    CL ..... LCC  
 O ..... CF3M    1L ..... LC1  
 CB ..... CF8C    2L ..... LC2  
 CG ..... CG8M    3L ..... LC3  
 CK ..... CK20  
 SD ..... CD3MWCuN  
 CN ..... CN7M  
 HB ..... N-12MV  
 HC ..... CW-12MW

#### 4 Symbol for ball valves

#### 5 Valve design

B ..... Full port, split body with KITZ actuator mounting pad  
 A ..... Regular port, uni-body with ISO actuator mounting pad

#### 6 Valve type

P ..... Pocketless  
 2L ..... 3-way 2-seat, L-port  
 2T ..... 3-way 2-seat, T-port  
 4LA ..... 3-way 4-seat, L-port  
 4TA ..... 3-way 4-seat, T-port  
 J ..... Jacketed  
 X ..... Extended stem  
 LN ..... PFA lined

#### 7 Trim material for carbon steel valves

No symbol suffixed for 304 s/s trim.  
 "M" suffixed for 316 s/s trim.

#### 8 No symbol suffixed for PTFE packing and gasket.

"-FS" or "S" suffixed for flexible graphite packing and gasket for super-firesafe provision.

#### 9 Seat Material

None ..... HYPATITE® PTFE  
 1H ..... FILLTITE®

This catalog uses **MPa**, a SI unit, for indication of pressures. **psi** and **kgf/cm<sup>2</sup>** are also added for readers' convenience.

## Product Range

### Flanged Floating Ball Valves

Shell Material	Class	KITZ Product Code	Bore *1	Body Design	Size																	Page
					in.	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12			
					mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300			
Carbon Steel	150	150SCTB	F	Split		●	●	●		●	●	●	●	●	●	●	●	●	●	▲*2	15	
	150	150SCTA	R	Uni		●	●	●		●	●		●	●		●	●	●	●		16	
	300	300SCTB	F	Split		●	●	●		●	●	●	●	●	●	●	●	●	●		15	
	300	300SCTA	R	Uni		●	●	●		●	●		●	●		●	●	●	●		16	
	600	600SCTB	F	Split		●	●	●		●											17	
	1500	1500SCTB	F	Split		●	●	●		●											17	
	150	150SCTR	R	Split											●	●	●	●	●	▲	*3	
	300	300SCTR	R	Split												●	●	●	●		*3	
	JIS 10K	10SCTB	F	Split		●	●	●		●	●	●	●	●	●	●	●	●	●	▲	*3	
	JIS 20K	20SCTB	F	Split		●	●	●		●	●	●	●	●	●	●	●	●	●		*3	
Stainless Steel	150	150UTBM	F	Split		●	●	●		●	●	●	●	●	●	●	●	●	●	▲	18	
	150	150UTAM	R	Uni		●	●	●		●	●		●	●		●	●	●	●		19	
	300	300UTBM	F	Split		●	●	●		●	●		●	●		●	●	●	●		18	
	300	300UTAM	R	Uni		●	●	●		●	●		●	●		●	●	●	●		19	
	600	600UTBM	F	Split		●	●	●		●											20	
	1500	1500UTBM	F	Split		●	●	●		●											20	
	150	150UTBX	F	Split/Extended stem		●	●	●		●	●	●	●	●	●	●	●	●	●	▲		21
	300	300UTBX	F	Split/Extended stem		●	●	●		●	●		●	●		●	●	●	●			22
	150	150UTRM	R	Split							●	●	●	●	●	●	●	●	●	▲	*3	
	300	300UTRM	R	Split							●	●	●	●	●	●	●	●	●		*3	
	JIS 10K	10UTBM	F	Split		●	●	●	●	●	●	●	●	●	●	●	●	●	●	▲	*3	
	JIS 20K	20UTBM	F	Split		●	●	●		●	●	●	●	●	●		●	●			*3	
	150	150UTB2LM/2TM	F	Split/3-way·2-seat				●		●	●	●	●	●	●	●	●	●				23
	150	150UTB4LAM/4TAM	F	Split/3-way·4-seat		●	●	●		●	●	●	●	●	●	●	●	●	●			23
	JIS 10K	10UTB2LM/2TM	F	Split/3-way·2-seat				●		●	●	●	●	●	●	●	●	●			*3	
	JIS 10K	10UTB4LAM/4TAM	F	Split/3-way·4-seat		●	●	●		●	●	●	●	●	●	●	●	●	●		*3	
	150	150UTBPM	F	Split/Pocketless		●	●	●		●	●	●	●	●	●	●	●	●	●			24
	150	150UTBJM	F	Jacketed		●	●	●		●	●	●	●	●	●		●	●				24
	JIS 10K	10UTBJM	F	Jacketed		●	●	●		●	●		●	●		●	●				*3	
	150	150UTBTM	F	Split/Tank ball				●		●	●	●	●	●	●	●	●	●	●			25
JIS 10K	10UTBTM	F	Split/Tank ball				●		●	●	●	●	●	●	●	●	●	●			*3	
JIS 10K	10UTBLN	F	Split/PFA lined		●	●	●		●	●	●	●	●	●							*3	
Ductile Iron	JIS 10K	10STBF	F	Split		●	●	●	●	●	●	●	●	●	●	●	●	●			*4	
	JIS 10K	10STLBF	F	Split/Gas service		●	●	●	●	●	●	●	●	●	●	●	●	●	●			*4
	JIS 20K	20STLB	F	Split/Gas service		●	●	●	●	●	●	●	●	●		●	●				*4	
	JIS 10K	10STB4LAF/4TAF	F	Split/3-way·4-seat						●	●	●	●	●	●	●	●	●			*4	
Cast Iron	125	125FCTB	F	Split							●	●	●	●		●	●				*5	
	JIS 10K	10FCTB	F	Split		●	●	●	●	●	●	●	●	●	●	●	●	●	▲		*5	
	JIS 10K	10FCTB2L	F	Split/3-way·2-seat						●	●	●	●	●	●	●	●	●			*5	

\*1 Bore design: F=Full port, R=Reduced port  
 \*2 Worm gear operation is standardised for the sizes marked ▲ with the prefix "G-" on each KITZ product code.  
 \*3 Please contact KITZ Corporation for details.  
 \*4 Refer to KITZ Ductile Iron Valves catalog (No. E-140) for details.  
 \*5 Refer to KITZ Cast Iron Valves catalog (No. E-120) for details.

## Product Range

### Flanged High Performance Ball Valves

Shell Material	Class	KITZ Product Code	Bore *1	Body Design	Size																Page	
					in.	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14		
					mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300	350		
Λ-port Stainless Steel	150	L-150UVC(T)M*2	F	Split/For control				●		●	●	●	●	●	●	●	●					*4
	150	G-150UVC(T)M*2	F	Split/For control													●	●	●	●		*4
	300	L-300UVC(T)M*2	F	Split/For control				●		●	●	●	●	●	●	●	●					*4
	300	G-300UVC(T)M*2	F	Split/For control													●	●	●			*4
	JIS 10K	L-10UVC(T)M*2	F	Split/For control				●		●	●	●	●	●	●	●	●					*4
	JIS 10K	G-10UVC(T)M*2	F	Split/For control													●	●	●	●		*4
	JIS 20K	L-20UVC(T)M*2	F	Split/For control				●		●	●	●	●	●	●	●	●					*4
	JIS 20K	G-20UVC(T)M*2	F	Split/For control							●	●	●	●	●	●	●	●				*4
Graphite Seated Carbon and Stainless Steel	150	150SCTB3H	F	Split/Max. 500°C	●	●	●			●	●	●	●	●	●		▲ <sup>*3</sup>	▲ <sup>*3</sup>				*5
	150	150UTB3HM	F	Split/Max. 500°C	●	●	●			●	●	●	●	●	●	▲	▲	▲				*5
	300	300SCTB3H	F	Split/Max. 500°C	●	●	●			●	●	●	●	●	▲		▲	▲				*5
	300	300UTB3HM	F	Split/Max. 500°C	●	●	●			●	●	●	●	●	▲		▲	▲				*5
	JIS 10K	10SCTB3H	F	Split/Max. 300°C	●	●	●			●	●	●	●	●	●	▲	▲	▲				*5
	JIS 10K	10UTB3HM	F	Split/Max. 300°C	●	●	●	●		●	●	●	●	●	●	▲	▲	▲				*5
	JIS 20K	20SCTB3H	F	Split/Max. 425°C	●	●	●			●	●	●	●	●	▲	▲	▲	▲				*5
	JIS 20K	20UTB3HM	F	Split/Max. 425°C	●	●	●			●	●	●	●	●	▲		▲	▲				*5
Metal Seated Carbon and Stainless Steel	150	150SCTB5H	F	Split/Max. 300°C	●	●	●			●	●	●	●	●	●		▲	▲				*5
	150	150UTB5H	F	Split/Max. 300°C	●	●	●			●	●	●	●	●	●		▲	▲				*5
	150	150UTB5HM	F	Split/Max. 300°C	●	●	●			●	●	●	●	●	●		▲	▲				*5
	300	300SCTB5H	F	Split/Max. 300°C	●	●	●			●	●	●	●	●	▲		▲	▲				*5
	300	300UTB5H	F	Split/Max. 300°C	●	●	●			●	●	●	●	●	▲		▲	▲				*5
	300	300UTB5HM	F	Split/Max. 300°C	●	●	●			●	●	●	●	●	▲		▲	▲				*5
	JIS 10K	10SCTB5H	F	Split/Max. 300°C	●	●	●	●		●	●	●	●	●	●		▲	▲				*5
	JIS 10K	10UTB5H	F	Split/Max. 300°C	●	●	●	●		●	●	●	●	●	●		▲	▲				*5
	JIS 10K	10UTB5HM	F	Split/Max. 300°C	●	●	●			●	●	●	●	●	●		▲	▲				*5
	JIS 20K	20SCTB5H	F	Split/Max. 300°C	●	●	●			●	●	●	●	●	▲		▲	▲				*5
	JIS 20K	20UTB5H	F	Split/Max. 300°C	●	●	●			●	●	●	●	●	▲		▲	▲				*5
	JIS 20K	20UTB5HM	F	Split/Max. 300°C	●	●	●			●	●	●	●	●	▲		▲	▲				*5
Metal Seated Carbon and Stainless Steel	150	150SCTB6H	F	Split/Max. 500°C	●	●	●			●	●	●	●	●		▲	▲					*5
	150	150UTB6HM	F	Split/Max. 500°C	●	●	●			●	●	●	●	●	▲		▲	▲				*5
	300	300SCTB6H	F	Split/Max. 500°C	●	●	●			●	●	●	●	●	▲		▲	▲				*5
	300	300UTB6HM	F	Split/Max. 500°C	●	●	●			●	●	●	●	●	▲		▲	▲				*5
	600	600SCTB6H	F	Split/Max. 500°C	●	●	●			●												*5
	600	600UTB6HM	F	Split/Max. 500°C	●	●	●			●												*5
	JIS 10K	10SCTB6H	F	Split/Max. 300°C	●	●	●			●	●	●	●	●	●		▲	▲	▲			*5
	JIS 10K	10UTB6HM	F	Split/Max. 300°C	●	●	●	●		●	●	●	●	●	●		▲	▲	▲			*5
	JIS 20K	20SCTB6H	F	Split/Max. 425°C	●	●	●			●	●	●	●	●	▲		▲	▲	▲			*5
	JIS 20K	20UTB6HM	F	Split/Max. 425°C	●	●	●			●	●	●	●	●	▲		▲	▲	▲			*5
Titanium	150	150TTB	F	Split	●	●	●			●	●	●	●	●	●	●	●					*6
	300	300TTB	F	Split	●	●	●			●	●	●	●	●	●		●	●				*6
	JIS 10K	10TTB	F	Split	●	●	●			●	●	●	●	●	●	●	●	●				*6
	JIS 20K	20TTB	F	Split	●	●	●			●	●	●	●	●	●		●	●				*6

\*1 Bore design: F=Full port

\*2 Operation: L=Lever, G=Gear

\*3 Worm gear operation is standardised for the sizes marked ▲ with the prefix "G-" on each KITZ product code.

\*4 Refer to KITZ Graphite and Metal Seated Ball Valves catalog (No. E-204) for details.

\*5 Refer to KITZ Λ-port Quarter-Turn Control Valves catalog (No. E-203) for details.

\*6 Please contact KITZ Corporation for details.



## Product Range

### Threaded or Welded Ball Valves

Shell Material	Class	KITZ Product Code	Bore *1	Body Design	Size		1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	Page
					in.	mm	8	10	15	20	25	32	40	50	65	80	
Carbon Steel	600/1000 WOG	SCTK *2	D	Uni/Threaded ends	●	●	●	●	●	●	●	●	●				26
	800	800SCTK *3	R	Seal welded/Threaded or welded ends	●	●	●	●	●	●	●	●	●				28
	1000WOG	SC3TZF *3	F	3-piece/Threaded or welded ends	●	●	●	●	●	●	●	●					29
	1000WOG	SC3TZ *3	R	3-piece/Threaded or welded ends			●	●	●	●	●	●					29
	1500/2000 WOG	SCTKZM-FS *2	D	Uni/Threaded ends	●	●	●	●	●	●	●	●	●				26
	1500/2000 WOG	AKSCTHZM *4	R	Split/Threaded ends	●	●	●	●	●	●	●	●	●				27
	1500/2000 WOG	AKSCTWZM *4	R	Seal welded/Threaded ends	●	●	●	●	●	●	●	●	●				27
	3000WOG	3000SCTK *3	R	Seal welded/Threaded or welded ends	●	●	●	●	●	●	●	●	●				28
Stainless Steel	600/1000 WOG	UTKM *2	D	Uni/Threaded ends	●	●	●	●	●	●	●	●	●				30
	800WOG	UTHM *2	R	Split/Threaded ends			●	●	●	●	●	●	●				30
	1000WOG	UTFM *2	F	Split/Threaded ends			●	●	●	●	●	●	●				31
	800WOG	UTH4LM/4TM	R	Split/3-way·4-seat/Threaded ends			●	●	●	●	●	●	●				34
	1000WOG	U3TZFM *3	F	3-piece/Threaded or welded ends	●	●	●	●	●	●	●	●					33
	1000WOG	U3TZM *3	R	3-piece/Threaded or welded ends			●	●	●	●	●	●	●				33
	1500/2000 WOG	UTKZM-FS *2	D	Uni/Threaded ends	●	●	●	●	●	●	●	●	●				31
	1500/2000 WOG	AKUTHZM *4	R	Split/Threaded ends	●	●	●	●	●	●	●	●	●				32
	1500/2000 WOG	AKUTWZM *4	R	Seal welded/Threaded ends	●	●	●	●	●	●	●	●	●				32
	150	AK150UTM *4	F	Split/Threaded ends		●	●	●	●	●	●	●	●	●	●	●	34
	JIS 10K	10UTM	F	Split/Threaded ends		●	●	●	●	●	●	●	●	●	●	●	*5
Ductile Iron	JIS 20K	20ST	R	Split/Threaded ends			●	●	●	●	●	●	●				*6
	400WOG	ST	R	Split//Threaded ends	●	●	●	●	●	●	●	●	●				*6
Cast Iron	JIS 10K	10FCT	R	Split/Seal welded/Threaded ends		●	●	●	●	●	●	●	●	●	●		*7

\*1 Bore design: F=Full port, R=Regular port, D=Reduced port

\*2 Rc threaded ends are standard. Prefix "AK" means NPT threaded end.

\*3 Rc threaded ends are standard. Prefix "AK" means NPT threaded ends and "AW" means socket welded ends.

\*4 NPT threaded ends are only available.

\*5 Please contact KITZ Corporation for details.

\*6 Refer to KITZ Ductile Iron Valves catalog (No. E-140) for details.

\*7 Refer to KITZ Cast Iron Valves catalog (No. E-120) for details.



● A-port Ball Valves

## Pressure-Temperature Ratings

The pressure-temperature ratings of ball valves are determined, not only by valve shell materials, but more essentially by sealing materials, used for ball seats, gland packing and gaskets. Sealing materials may be high molecule, or rubber, but the choice is limited by the characteristics of the service fluid, working temperatures, working pressures, velocity of fluid, and operational frequency of valves.

As it is very difficult to predetermine the exact pressure-temperature rating for all kinds of fluid under all imaginable conditions, we have prepared general rating charts for non-

shock fluid service here, based on our past experiences both in the field and in our laboratory.

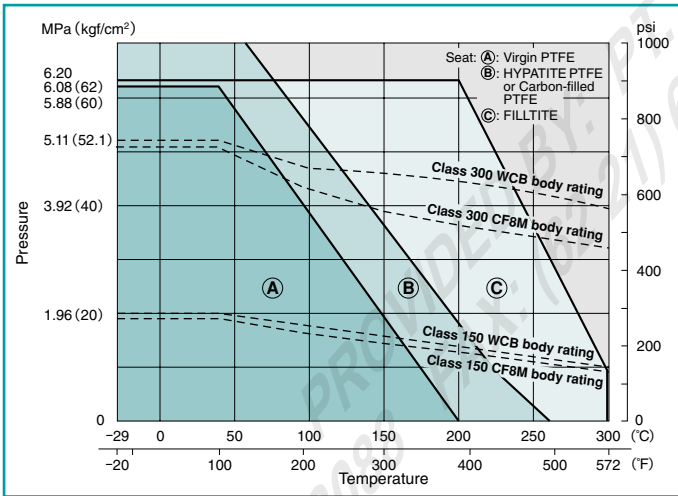
In case of extraordinary service conditions as mentioned below, contact KITZ Corporation or its distributors for technical advice:

1. Valves shall be left fully closed for a long period of time under high temperature or high differential pressure.
2. Valves shall be frequently operated under high temperature or high differential pressure.
3. Frequent change of line pressure or temperature.

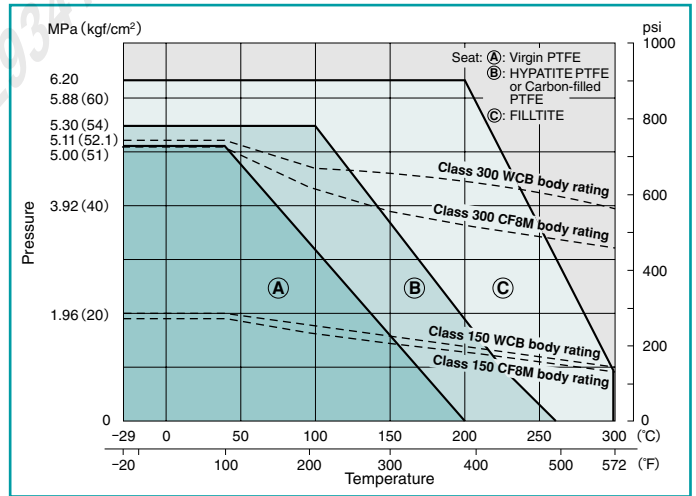
HYPATITE® PTFE is the standard seat material for KITZ ball valves. Specify virgin PTFE or carbon-filled PTFE when required. The body ratings shown here are for ASTM A216 Gr. WCB and A351 Gr. CF8M. For the pressure ratings of other valve shell materials, refer to the latest edition of ASME B16.34.

FILLTITE® is a specially reinforced ball seat, made by using carbon based fillers into PTFE at higher rate than conventional carbon filled PTFE, which greatly improves heat and abrasion resistance. The material shows excellent operability, durability, chemical resistance and sealing performance at a high temperature of 300°C. In addition, the ball seat is replaceable with the most of our conventional ball seats, so it also has the cost advantage.

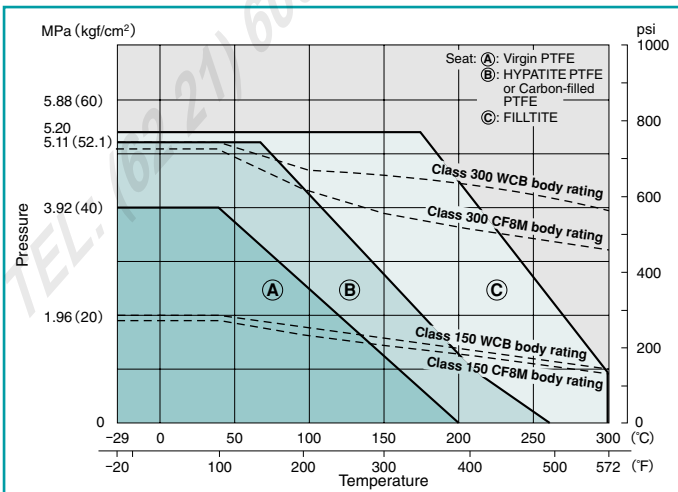
**150/300 SCTB/UTBM: 1/2" & 3/4"**  
**150/300 SCTA/UTAM: 1/2" to 1"**



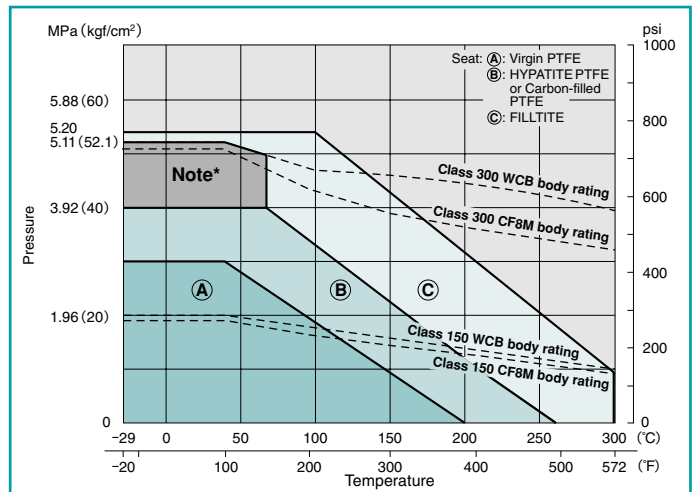
**150/300 SCTB/UTBM: 1" to 2 1/2"**  
**150/300 SCTA/UTAM: 1 1/4" to 3"**



**150/300 SCTB/UTBM: 3" & 4"**  
**150/300 SCTA/UTAM: 4" & 6"**



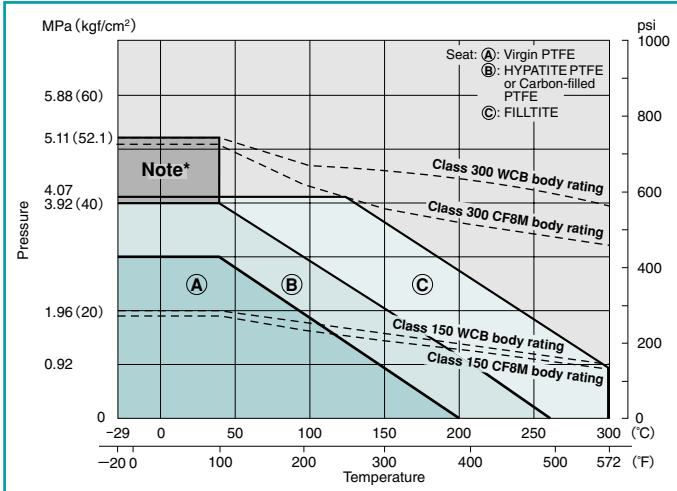
**150/300 SCTB/UTBM: 5" & 6"**  
**150/300 SCTA/UTAM: 8" & 10"**



**Note\*:** Continuous pressurization is not recommended in this P-T range.

## Pressure-Temperature Ratings

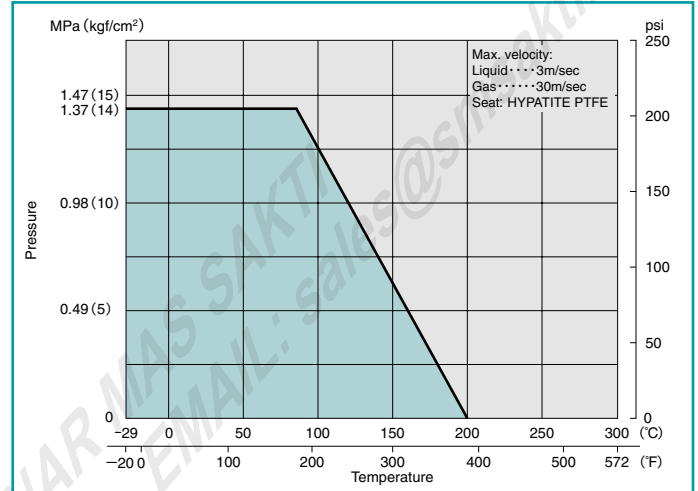
### 150/300 SCTB/UTBM : 8" & 10"



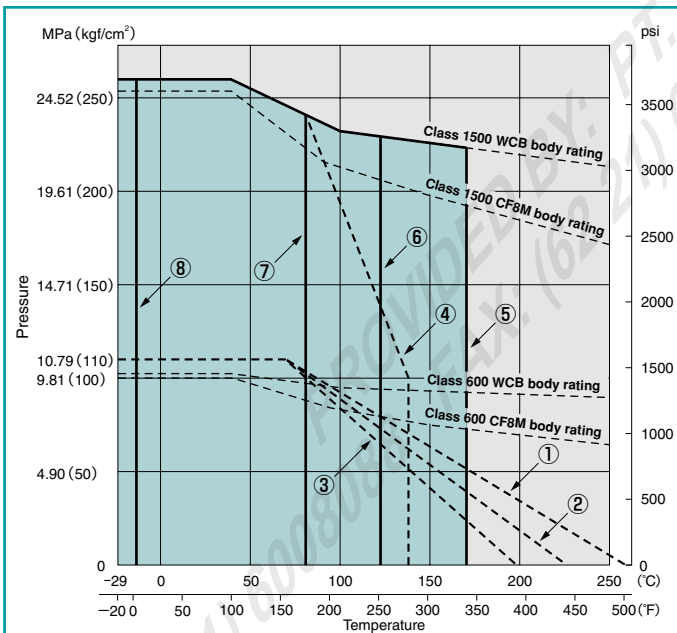
**Note\*:** Continuous pressurization is not recommended in this P-T range.

### 3-way : 150UTB4LAM/4TAM

\* Refer to 150UTBM ratings for 150UTB2LM/2TM



### 600/1500 SCTB/UTBM



#### Ball Seat Materials

- ①: KITZ HYPATITE or Carbon-filled PTFE
- ②: Glass-filled PTFE with MoS<sub>2</sub>
- ③: Virgin PTFE
- ④: Nylon with MoS<sub>2</sub>

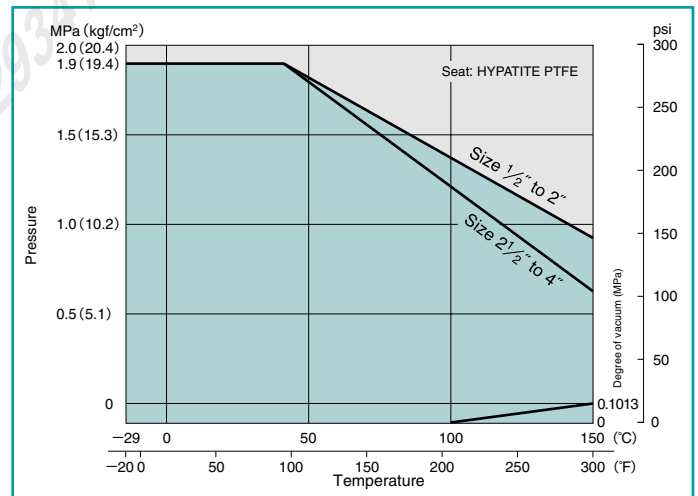
#### O-ring Upper Limit

- ⑤: (1) FPM (2) Low-temperature FPM
- ⑥: (1) EPDM (2) ECO (Epichlorohydrin Copolymer)
- ⑦: (1) NBR (2) Low-temperature NBR

#### O-ring Lower Limit

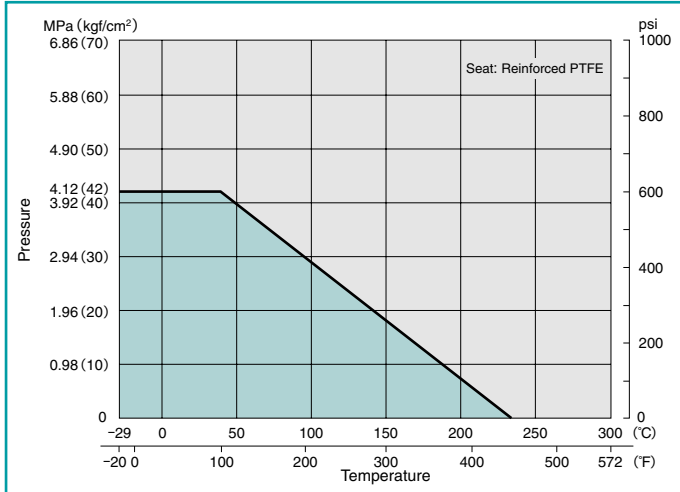
- ⑧: FPM

### PFA Lined : 10UTBLN

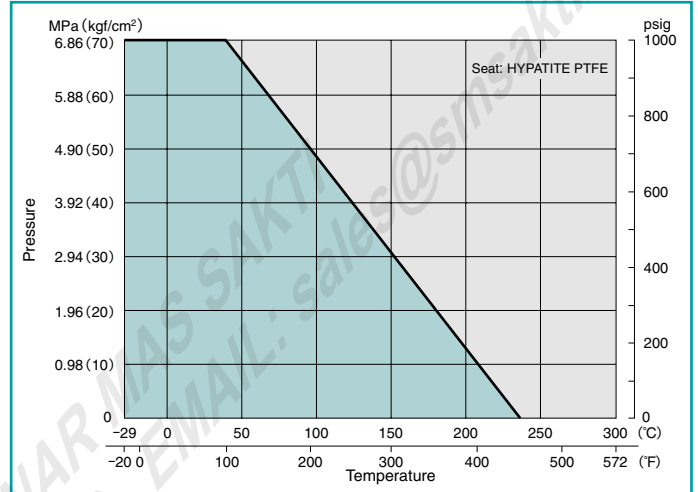


## Pressure-Temperature Ratings

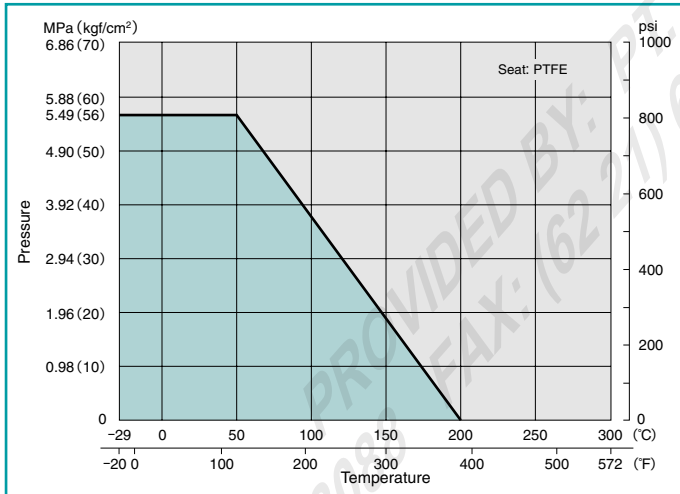
**Type 600 : SCKT/UTKM**



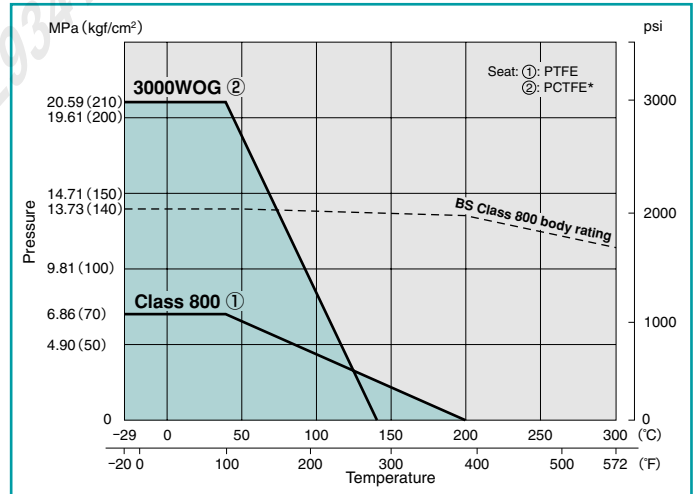
**Type 1000 : SCKT/UTKM/UTFM**



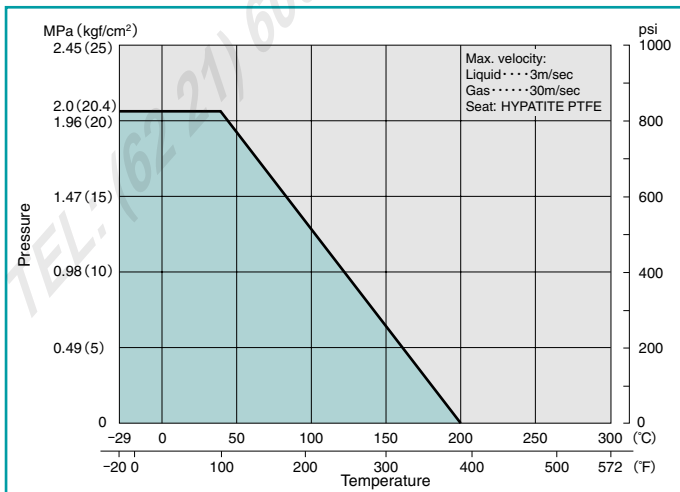
**Type 800 : UTHM**



**Class 800 and Type 3000 : SCKT**

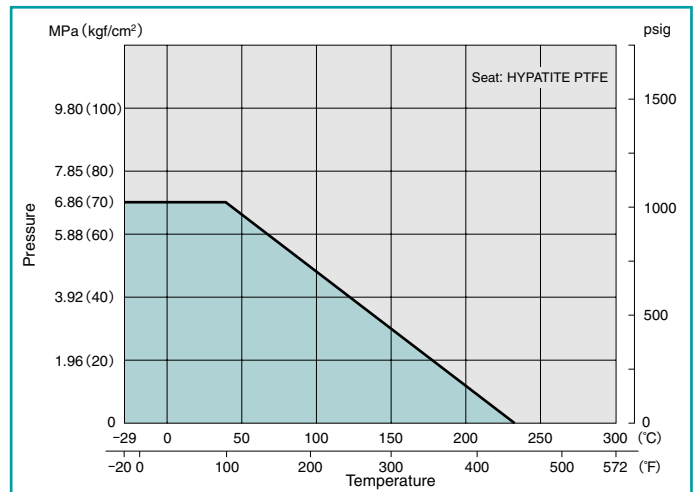


**Type 800 : UTH4LM/4TM**



\* Polychloro-Trifluoro-Ethylene

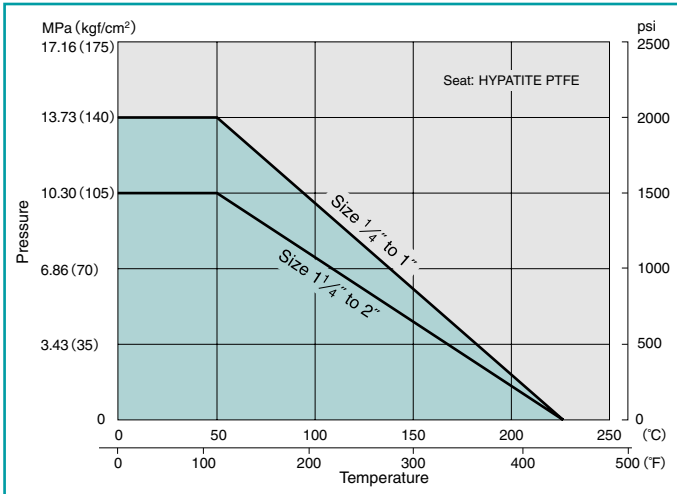
**Type 1000 : SC3TZ/ U3TZ Series**



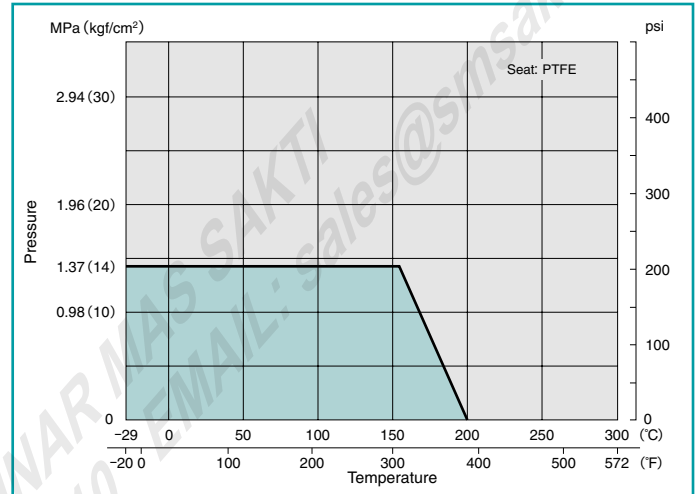
Note: Type 1500 is optionally available

## Pressure-Temperature Ratings

**Type 1500/2000:**  
**SCTKZM-FS/UTKZM-FS**  
**AKSCTHZM/AKSCTWZM/AKUTHZM/AKUTWZM**



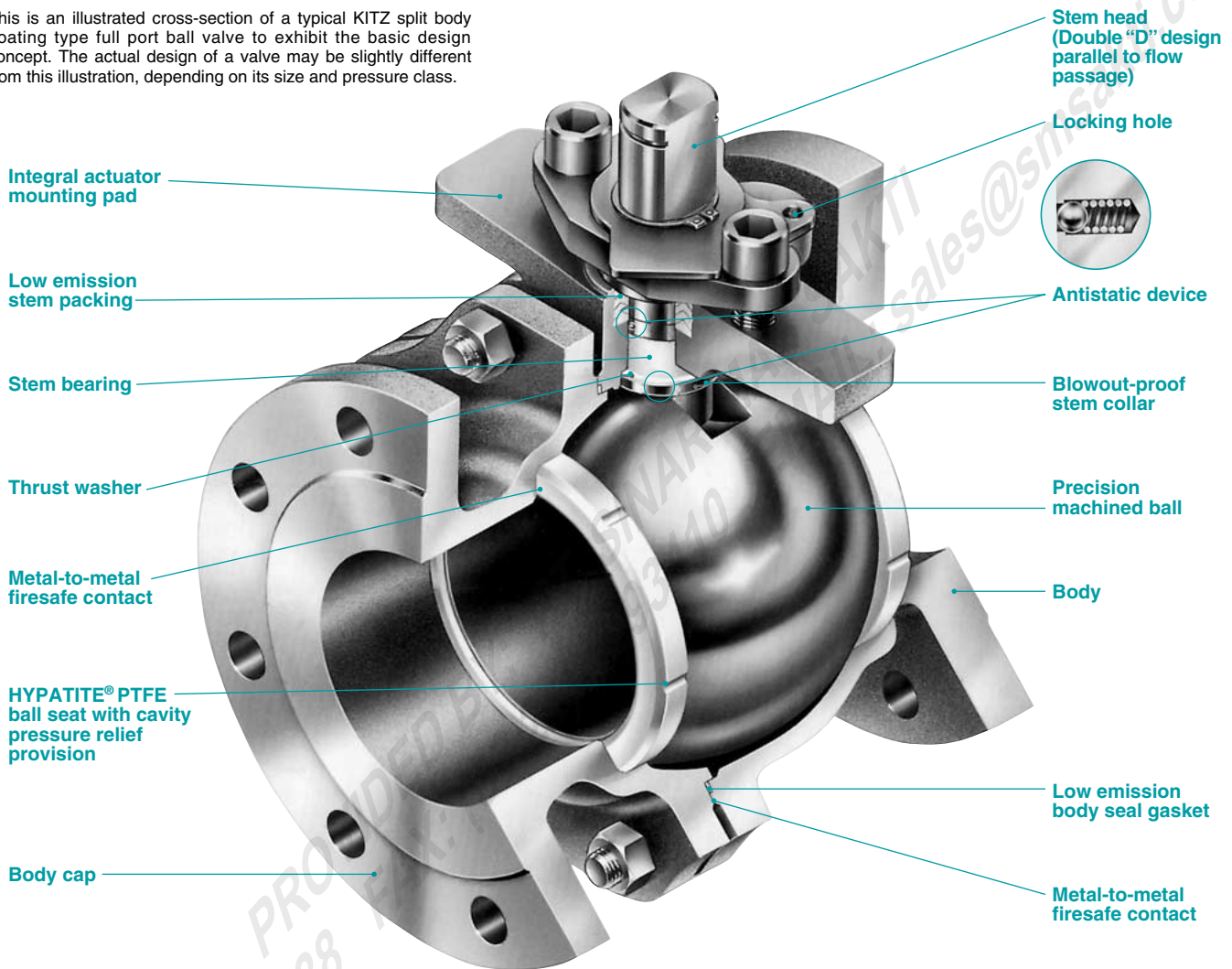
**Class 150: AK150UTM**



PROVIDED BY: PT. SINAR MAS SAKTI  
 TEL: (62 21) 6008088 FAX: (62 21) 6293410 EMAIL: sales@sinsakti.com

## KITZ 150/300 SCTB/UTBM Series Full Port, Split Body, Side Entry Ball Valves

This is an illustrated cross-section of a typical KITZ split body floating type full port ball valve to exhibit the basic design concept. The actual design of a valve may be slightly different from this illustration, depending on its size and pressure class.



4" KITZ 150SCTB

### Bubble-tight sealing performance with HYPATITE® PTFE ball seats

HYPATITE® PTFE ball seats, standard stem seals of KITZ ball valves, are made of denatured PTFE, a molecularly reinforced PTFE/PFA copolymer, and specifically engineered for high **bi-directional** sealing performance and prolonged service life of valves. Its resistance to high or low temperature, creep or compression, abrasion and corrosion is all outstanding. As an option, KITZ **SWELLESS®** ball seats principally made of PFA are recommended specifically for monomer service. This epoch-making new seat maximizes resistance to the permeation of monomer into its molecular structure (generally known as a "swelling" problem) which causes seat deformation and seriously affects shut-off function of valves in styrene and butadiene monomer service.

### Simplified actuator mounting

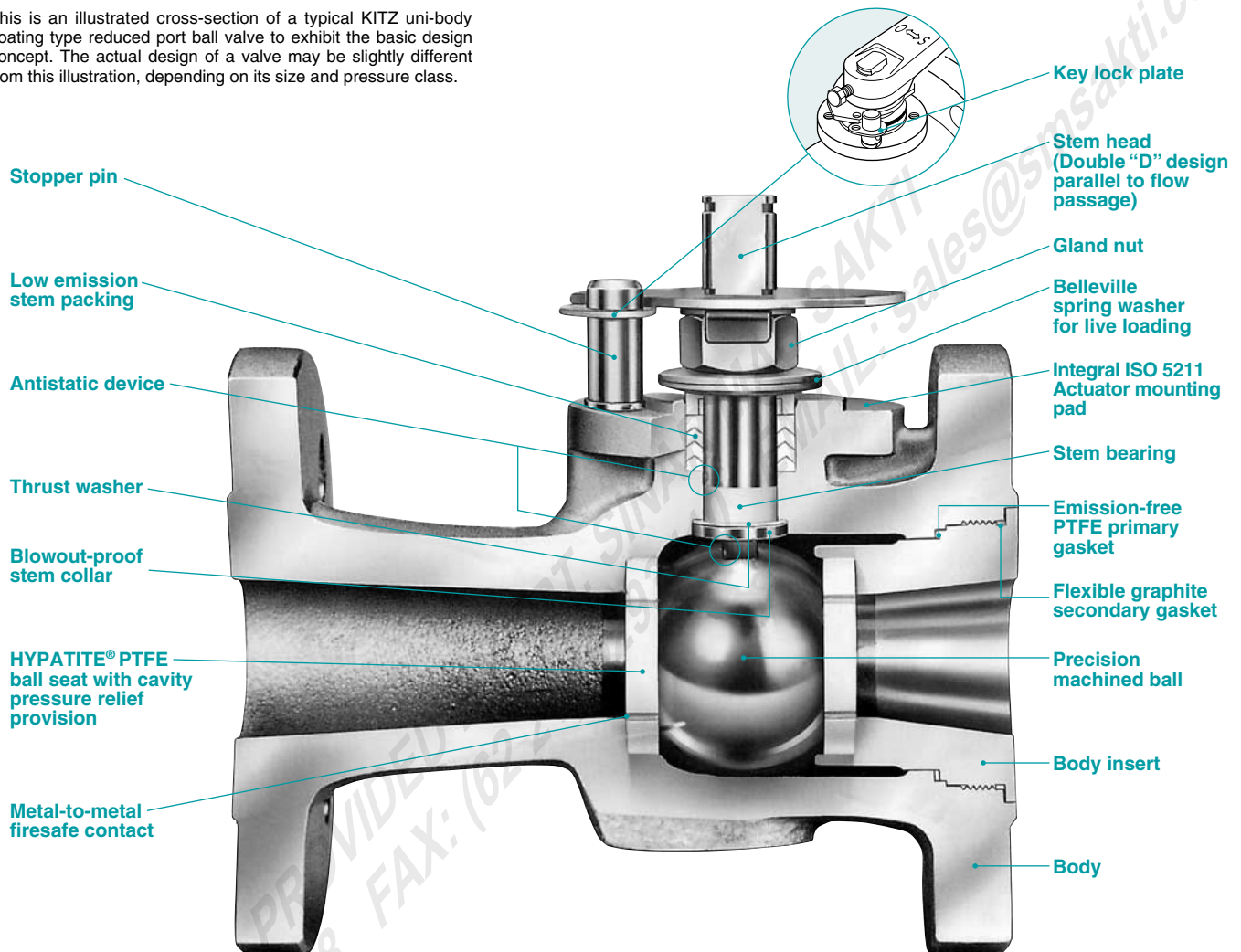
For 150/300 SCTA/UTAM Series ball valves, **ISO 5211** actuator mounting pad is integrally provided for uniformly simplified mounting of any actuators provided with valve mounting flanges designed to ISO 5211 dimensional requirement. 150/300 SCTB/UTBM Series ball valves are provided with KITZ standard integral actuator mounting pad.

### Easy maintenance

Split body design for KITZ 150/300 SCTB/UTBM Series provides the convenience of very easy maintenance critically required for process plants. Body inserts of uni-body, end entry design for KITZ 150/300 SCTA/UTAM Series are threaded into the valve body with provision of unthreading for valve disassembly in case of maintenance operation.

## KITZ 150/300 SCTA/UTAM Series Reduced Port, Uni-body, End Entry Ball Valves

This is an illustrated cross-section of a typical KITZ uni-body floating type reduced port ball valve to exhibit the basic design concept. The actual design of a valve may be slightly different from this illustration, depending on its size and pressure class.



4" KITZ 150SCTA

### Extensive safety considerations

KITZ ball valves are designed with extensive safety considerations for users. Blow-out proof stems, provision of locking devices and prevention of misalignment of lever handles provide safe handling in the field and trouble-free operation in the plant. Antistatic devices, firesafe seal design and cavity pressure relief features all assure the economic benefits of smooth, steady plant operation. KITZ advancements in low emission design features contribute to the global battle against fugitive emissions while greatly reducing costs caused by product loss.

### Standard material configuration for sour service

KITZ Class 150/300 steel ball valves are all made of component materials specially heat-treated and hardness-controlled to conform with NACE MR0103 requirements, and proved suitable for servicing sour gases or other hydrogen sulfide bearing hydrocarbons. KITZ Class 600 and higher **stainless steel** ball valves are also suitable for sour service. However, NACE materials are optional for KITZ Class 600 and higher **carbon steel** ball valves.

## Seven Safety Considerations for KITZ 150/300 SCTB/UTBM and 150/300 SCTA/UTAM Series Ball Valves

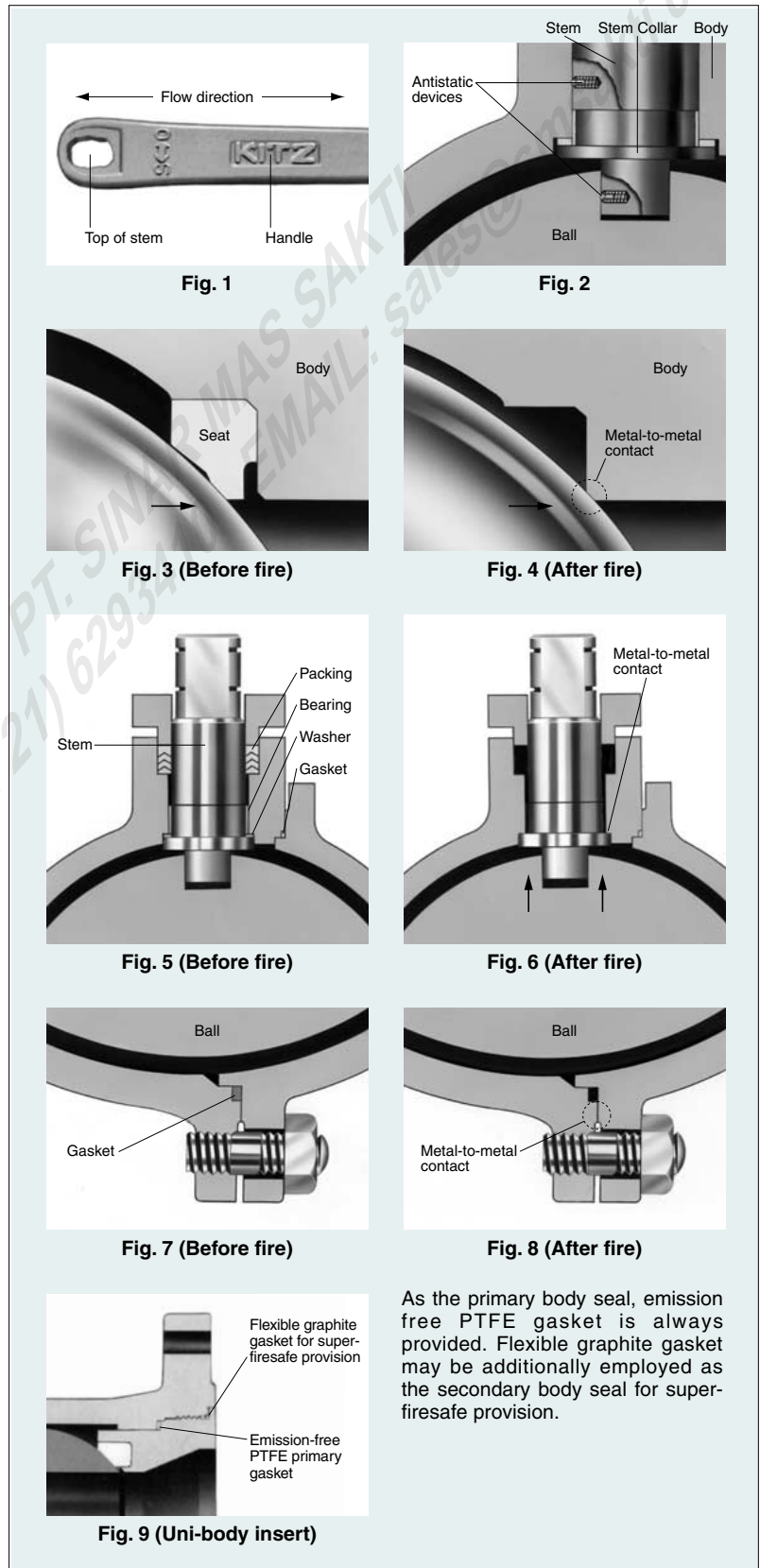
1. **Double "D"** stem head design provides mounting of the lever handle always in parallel to the flow passage. Misalignment of the handle is thus prevented. (Fig. 1)
2. The lower end of the stem is designed with an integral collar to be **blowout-proof**. It also functions as the backseat for assured stem sealing. (Fig. 2)
3. An **antistatic feature** is provided to ensure electrical continuity between ball, stem, and body. (Fig. 2)
4. Facility for mounting a **locking device** for prevention of accidental valve operation is provided.
5. **Plant fires** are a serious concern for soft-seated ball valves because of possible fluid leakage and consequent increase of the fire magnitude caused by deterioration of resilient sealing materials.

KITZ ball valves are engineered for firesafety and successfully **fire tested** to minimize both external and internal fluid leakage after plant fires. They have **post-fire metal-to-metal contact** of all sealing areas such as:

- Contact between ball and valve shell (Fig. 3 & 4)
- Contact between stem and valve shell (Fig. 5 & 6)
- Valve shell coupling flanges of split body design (Fig. 7 & 8)
- Contact between valve body and insert of uni-body design (Fig. 9)

The problem of external fluid leakage is more serious than internal leakage through the valve bore because of the fear of fueling the fire. To prevent this, KITZ ball valves may be ordered with **flexible graphite packing** and **gaskets**, which are extremely heat resistant, and not affected by the fire. For details, refer to Page 50 and 51.

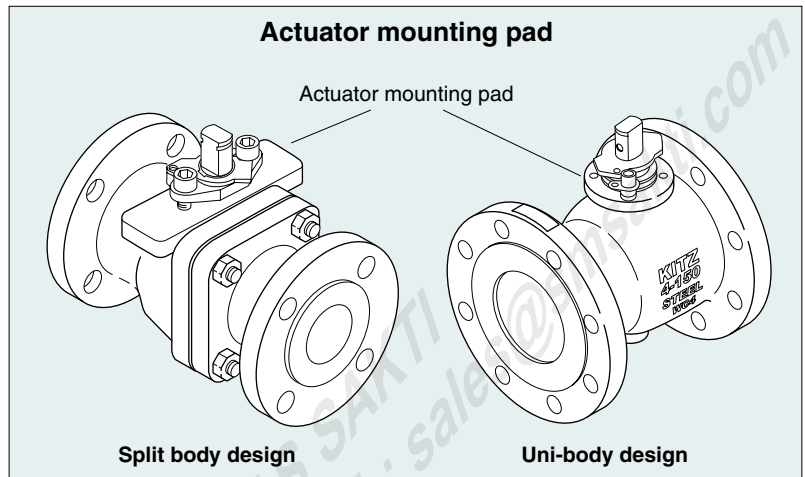
6. The surface of stem and stuffing box, and interface clearance of stem-to-gland, stem-to-body and gland-to-stuffing box are precision controlled on machining and assembly for **low emission service**. For uni-body, end-entry design, a Belleville spring washer is employed for live loading on gland packing rings, to minimize need of gland retightening for **low emission service**.
7. A provision of **cavity pressure relief** is incorporated into precision engineered KITZ **HYPATITE® PTFE** ball seats for the ultimate safety. Refer to Page 13 for details.



## Integral Actuator Mounting Pads

KITZ split body design ball valves are furnished with integral pads for provision of actuator mounting, which may be drilled to customers' requirement. This is standard for 150/300 SCTB Series (carbon steel valves), or option for 150/300 UTBM Series (stainless steel valves). KITZ uni-body end-entry design ball valves are always furnished with integral actuator mounting pad designed and factory-drilled according to ISO 5211 specification.

**Note:** Customers are requested to prepare mounting brackets and connectors for the actuators chosen for their valve automation. Actuators can be mounted on KITZ ball valves without disassembly of valve glands.

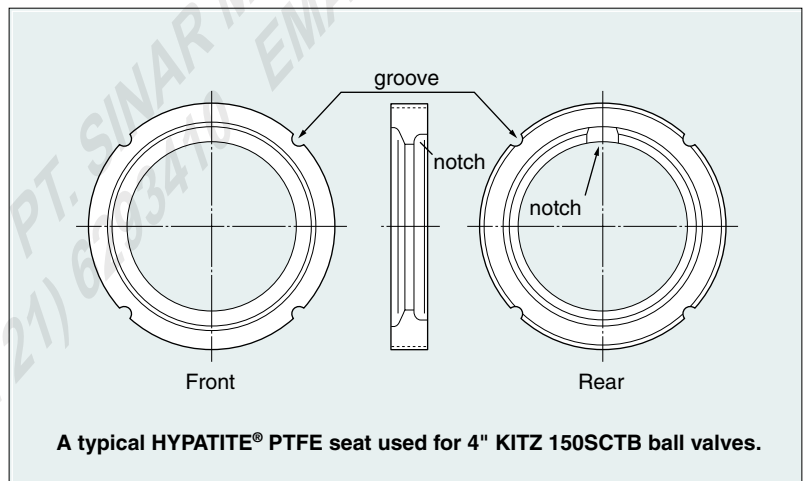


## HYPATITE® PTFE Ball Seats

KITZ ball valves are furnished, as the manufacturer's standard, with **HYPATITE® PTFE** ball seats made of denatured PTFE, a molecularly reinforced PTFE/PFA copolymer, and specially engineered for high performance which include:

- Wide service temperature range of  $-29^{\circ}\text{C}$  ( $-20^{\circ}\text{F}$ ) through  $260^{\circ}\text{C}$  ( $500^{\circ}\text{F}$ ).  
This is for standard valve design and materials used for medium to high temperature services. The lower temperature range can be extended down to  $-196^{\circ}\text{C}$  ( $-321^{\circ}\text{F}$ ) by means of extended bonnet design and special low temperature service materials.
- High chemical resistance is comparable to virgin PTFE.
- Monomer permeability is lower than other PTFE materials.
- Resistance against compression and creeping (cold flow) is higher than other PTFE materials to guarantee long life cycle.
- Specific gravity and friction coefficient are equal to those of virgin PTFE for smooth valve operation.
- Purity of processed products is guaranteed as highly as virgin PTFE.
- Resiliency is as high as other PTFE materials for bubble-tight sealing performance.

★ Refer to Page 48 for more technical deta.



## Optional Ball Seats

In addition to the standard **HYPATITE® PTFE** ball seats, **SWELLESS®** seats are recommended for monomer service. Also virgin PTFE and carbon filled PTFE seats are optionally available for versatility in service applications. Refer to Page 14 for details.

## Cavity Pressure Relief

Some line fluid is usually left trapped inside the ball-body cavity. This fluid can expand under the influence of high ambient or line temperature. An abnormal increase of such cavity pressure may sometimes damage the valve seats or balls, unless the valve has an adequate cavity pressure relief provision. **Trunnion mounted ball valves generally provide perfect protection from this problem.** Refer to KITZ Cat. No. E-202 for technical details of KITZ trunnion mounted ball valves.

In case of floating ball valves, however, their rather simple seating principle requires some special protection from excessive cavity pressure rise **when highly volatile liquid in**

**service is subject to frequent and large temperature variation, while the valve is not frequently operated.** KITZ 150/300 SCTB/UTBM and 150/300 SCTA/UTAM Series ball valves offer **self-relieving of excessive cavity pressure** as a standard feature engineered in **HYPATITE® PTFE** ball seats.

Other general solutions for floating ball valves include employment of automatic pressure relief valves or drilling pressure equalization holes on the ball. If the requirement of automatic cavity pressure relief is as critical as in chlorine service, be sure to contact KITZ Corporation or its distributors for technical advice.

## KITZ Ball Seat Materials

The following seat materials are available.

Material	Features	Maximum Service Temperature
<b>Virgin PTFE</b>	High chemical resistance and operation efficiency	200°C
<b>HYPATITE® PTFE</b>	Monomer permeability is lower and resistance against compression and creeping is higher than other PTFE materials	260°C
<b>Carbon filled PTFE</b>	Excellent heat and abrasion resistance	260°C
<b>* FILLTITE®</b>	Highest heat resistance among PTFE based materials	300°C
<b>Graphite</b>	Excellent for high temperature service	500°C
<b>Metal</b>	Excellent for high temperature and abrasive service	500°C
<b>PEEK</b>	Higher heat resistance and mechanical strength	270°C
<b>SWELLESS®</b>	Modified PFA excellent for monomer service such as butadiene and styrene	260°C
<b>Glass fiber filled PTFE with MoS<sub>2</sub></b>	Higher abrasion resistance and operation efficiency	230°C
<b>Nylon with MoS<sub>2</sub></b>	Higher mechanical strength	140°C

\*: FILLTITE® is a specially reinforced ball seat, made by using more carbon based fillers into PTFE than conventional carbon filled PTFE, which greatly improves heat and abrasion resistance. The material shows excellent operability, durability, chemical resistance and sealing performance at a high temperature of 300°C. In addition, the ball seat is replaceable with the most of our conventional ball seats, so it also has the cost advantage.

## Class 150/300 Carbon Steel Ball Valves

### Full port, Split body, Side entry design

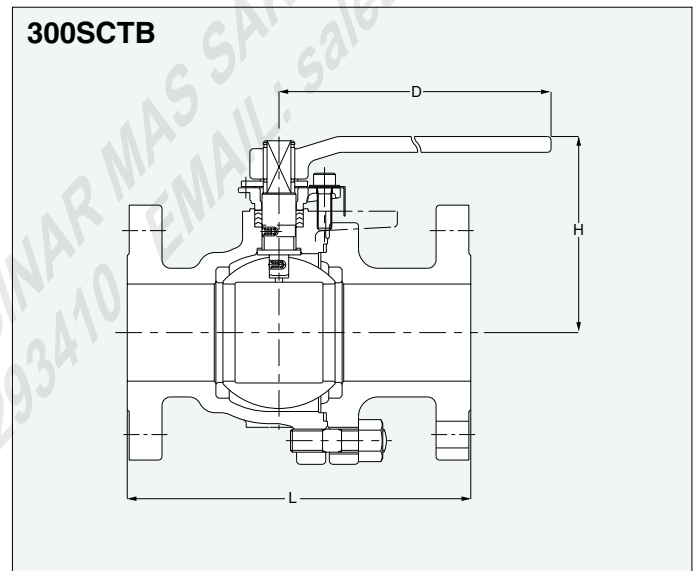
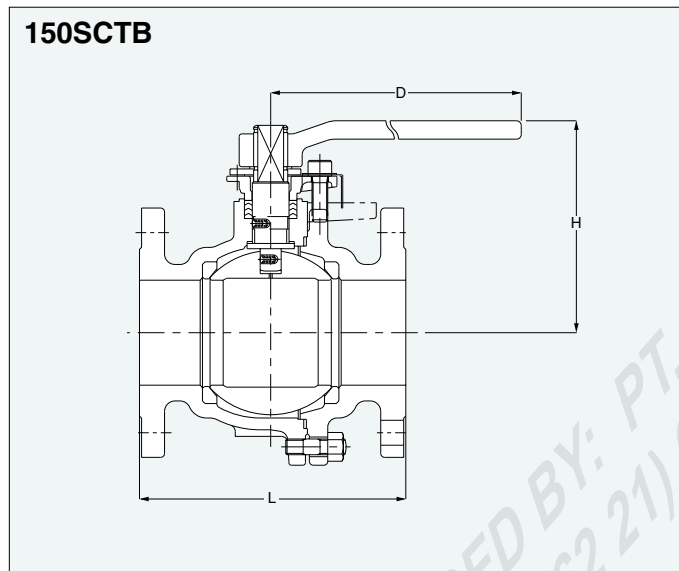
#### Features

- Antistatic device
- Blowout-proof stem
- Fire test certification★
- Double “D” stem head
- High performance **HYPATITE® PTFE** ball seats
- Actuator mounting pad to KITZ standard

Page 6 for Pressure-Temperature Ratings

Page 39 for Construction and Materials

Page 36 for Dimension of Actuator Mounting Pad



#### Dimensions of 150SCTB

Valve Size	in.	1/2	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8	10
	mm	15	20	25	40	50	65	80	100	125	150	200	250
Ball Bore		15	20	25	40	50	65	80	100	125	150	200	250
L		108	117	127	165	178	190	203	229	356	394	457	533
H		102	105	124	115	120	155	165	200	220	295	355	Gear operation
D		130	130	160	230	230	400	400	460	460	1000	1500	Gear operation

Unit: mm

#### Dimensions of 300SCTB

Valve Size	in.	1/2	3/4	1	1 1/2	2	2 1/2	3	4	6	8
	mm	15	20	25	40	50	65	80	100	150	200
Ball Bore		15	20	25	40	50	65	80	100	150	200
L		140	152	165	190	216	241	283	305	403	502
H		102	105	124	115	120	155	165	240	295	355
D		130	130	160	230	230	400	400	750	1000	1500

Unit: mm

#### Gear Operation

Class	150	300	Gear Operator			
			H	D	C	A
Valve Size (inch)	6	6	337	310	165	65.5
	8	8	414	360	210	88.5
	10	—	477	500	363	93.5

Unit: mm

#### Valve operator

- 1/2"~8": Lever operation
- 6"~8": Optional gear operation
- 10": Standard gear operation

#### Test pressure

- Shell (Hydrostatic): 3.10MPa (450psi)
- Seat (Air): 0.55MPa (80psi)

#### Options

- ★ Flexible graphite packing and gasket (See Page 12)
- Ball and stem to CF8M (316)

#### Valve operator

- 1/2"~8": Lever operation
- 6"~8": Optional gear operation

#### Test pressure

- Shell (Hydrostatic): 7.76MPa (1125psi)
- Seat (Air): 0.55MPa (80psi)

#### Options

- ★ Flexible graphite packing and gasket (See Page 12)
- Ball and stem to CF8M (316)

Worm gear operators may be mounted on KITZ ball valves at your option for the smoothest valve operation. Electric or pneumatic actuators are also optionally available. Contact KITZ distributors for appropriate choice and sizing of valve actuators.

## Class 150/300 Carbon Steel Ball Valves

### Regular port, Uni-body, End entry design

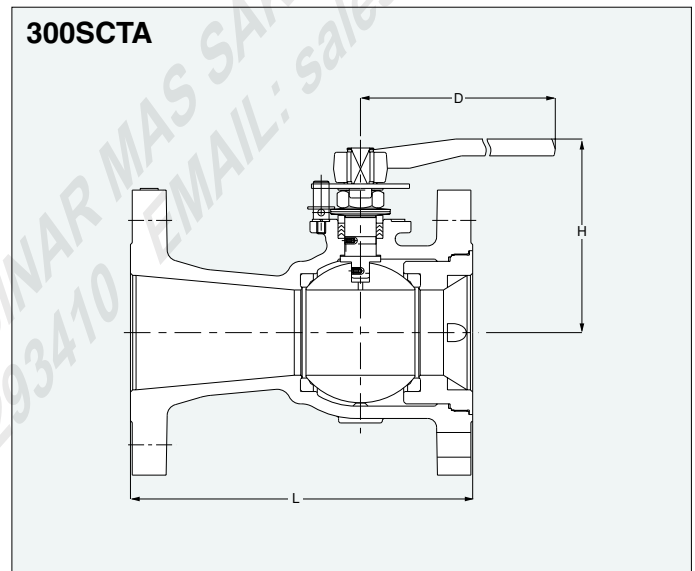
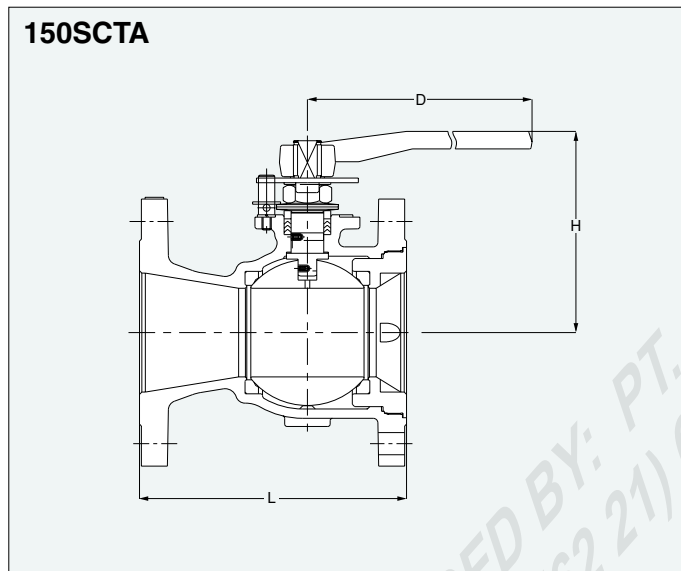
#### Features

- Antistatic device
- Blowout-proof stem
- Fire test certification★
- Double "D" stem head
- High performance **HYPATITE® PTFE** ball seats
- Actuator mounting pad to ISO 5211

Page 6 for Pressure-Temperature Ratings

Page 40 for Construction and Materials

Page 37 and 38 for Dimension of Actuator Mounting Pad



#### Dimensions of 150SCTA

Valve Size	Unit: mm										
	in.	1/2	3/4	1	1 1/2	2	3	4	6	8	10
Ball Bore	mm	15	20	25	40	50	80	100	150	200	250
L		108	117	127	165	178	203	229	267	292	330
H		103	106	116	133	119	157	172	260	298	355
D		140	140	160	160	230	400	400	750	1000	1500

#### Dimensions of 300SCTA

Valve Size	Unit: mm										
	in.	1/2	3/4	1	1 1/2	2	3	4	6	8	10
Ball Bore	mm	15	20	25	40	50	80	100	150	200	250
L		140	152	165	190	216	283	305	403	419	457
H		103	106	116	133	119	157	172	260	298	355
D		140	140	160	160	230	400	400	750	1000	1500

#### Valve operator

1/2"~10": Lever operation  
6"~10": Optional gear operation

#### Test pressure

Shell (Hydrostatic): 3.10MPa (450psi)  
Seat (Air): 0.55MPa (80psi)

#### Options

- ★ Flexible graphite packing and gasket (See Page 12)
- Ball and stem to CF8M (316)

#### Valve operator

1/2"~10": Lever operation  
6"~10": Optional gear operation

#### Test pressure

Shell (Hydrostatic): 7.76MPa (1125psi)  
Seat (Air): 0.55MPa (80psi)

#### Options

- ★ Flexible graphite packing and gasket (See Page 12)
- Ball and stem to CF8M (316)

#### Gear Operation

Class	150	300	Gear Operator			
			H	D	C	A
Valve Size (inch)	6	6	257	300	283	71
	8	8	306	300	283	71
	10	10	364	400	337	86

Worm gear operators may be mounted on KITZ ball valves at your option for the smoothest valve operation. Electric or pneumatic actuators are also optionally available. Contact KITZ distributors for appropriate choice and sizing of valve actuators.

## Class 600/1500 Carbon Steel Ball Valves

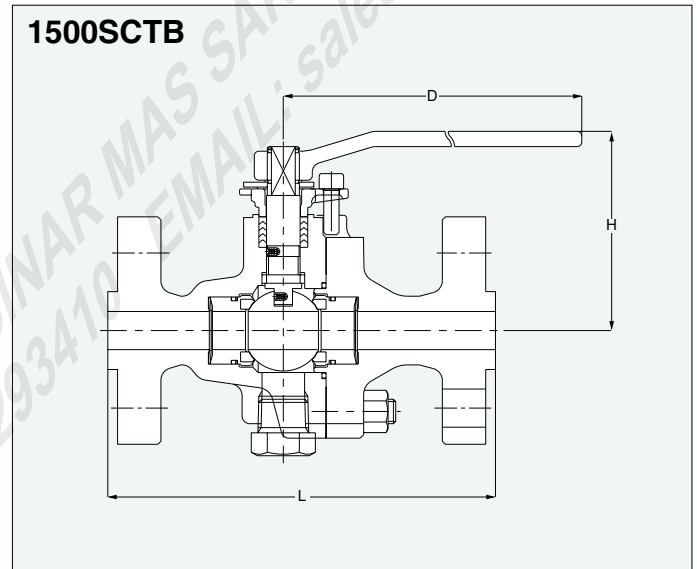
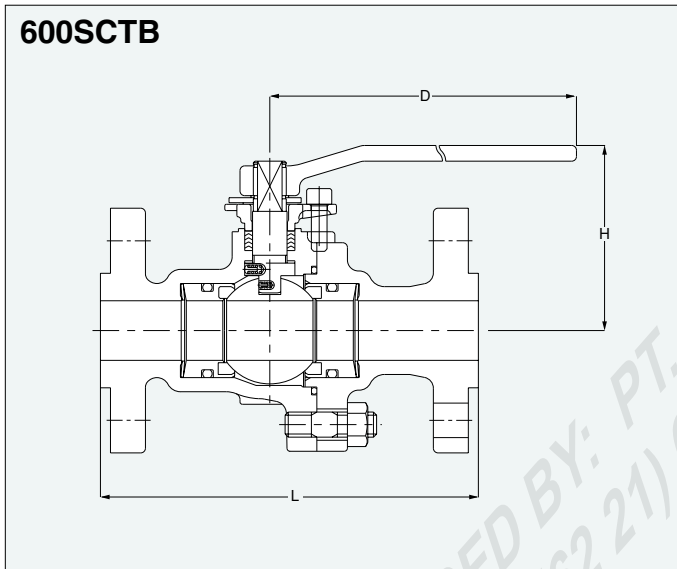
### Full port, Split body, Side entry design

#### Features

- Antistatic device
- Blowout-proof stem
- Fire test certification★
- Double “D” stem head
- Ball seats: Reinforced PTFE with MoS<sub>2</sub> for Class 600  
Nylon with MoS<sub>2</sub> for Class 1500

Page 7 for Pressure-Temperature Ratings

Page 43 and 45 for Construction and Materials



#### Dimensions of 600SCTB

Unit: mm

Valve Size	in.	1/2	3/4	1	1 1/2
	mm	15	20	25	40
Ball Bore		13	19	25	38
L		165	190	216	241
H		105	108	130	118
D		130	130	160	230

#### Valve operator

Lever operation

#### Test pressure

Shell (Hydrostatic): 15.34MPa (2225psi)  
Seat (Air): 0.55MPa (80psi)

#### Options

- ★ Flexible graphite packing and flexible graphite spiral wound gasket (See Page 12 and 43)
- Ball and stem to 316

#### Dimensions of 1500SCTB

Unit: mm

Valve Size	in.	1/2	3/4	1	1 1/2
	mm	15	20	25	40
Ball Bore		13	19	25	38
L		216	229	254	305
H		122	115	122	157
D		160	230	230	400

#### Valve operator

Lever operation

#### Test pressure

Shell (Hydrostatic): 38.43MPa (5575psi)  
Seat (Air): 0.55MPa (80psi)

#### Options

- ★ Flexible graphite packing and flexible graphite spiral wound gasket (See Page 12 and 45)
- Ball and stem to 316

## Class 150/300 Stainless Steel Ball Valves

### Full port, Split body, Side entry design

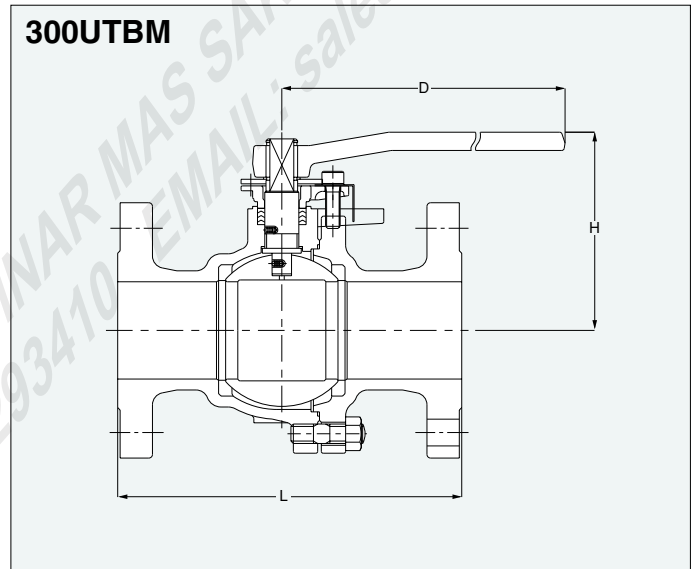
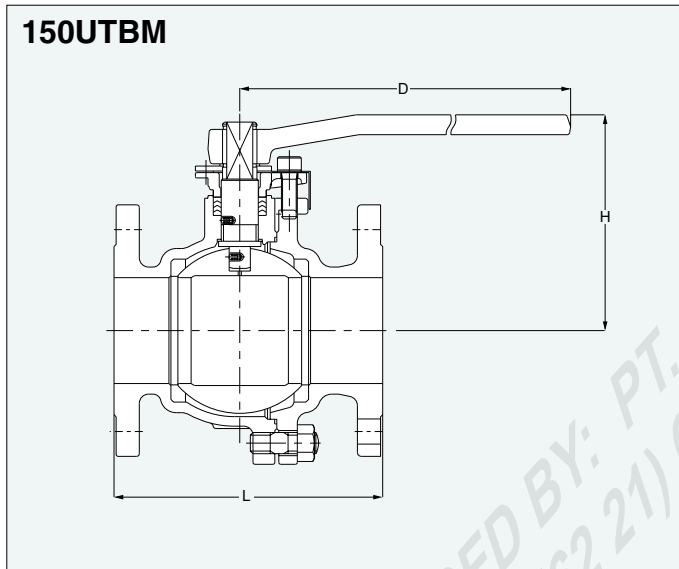
#### Features

- Antistatic device
- Blowout-proof stem
- Fire test certification★
- Double "D" stem head
- High performance **HYPATITE® PTFE** ball seats
- Actuator mounting pad (Option) to KITZ standard

Page 6 for Pressure-Temperature Ratings

Page 41 for Construction and Materials

Page 36 for Dimension of Actuator Mounting Pad



#### Dimensions of 150UTBM

Valve Size	in.	1/2	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8	10
		mm	15	20	25	40	50	65	80	100	125	150	200
Ball Bore		15	20	25	40	50	65	80	100	125	150	200	250
L		108	117	127	165	178	190	203	229	356	394	457	533
H		102	105	124	115	120	155	165	200	220	295	355	Gear operation
D		130	130	160	230	230	400	400	460	460	1000	1500	Gear operation

Unit: mm

#### Dimensions of 300UTBM

Valve Size	in.	1/2	3/4	1	1 1/2	2	3	4	6	8
		mm	15	20	25	40	50	80	100	150
Ball Bore		15	20	25	40	50	80	100	150	200
L		140	152	165	190	216	283	305	403	502
H		102	105	124	115	120	165	240	295	355
D		130	130	160	230	230	400	750	1000	1500

Unit: mm

#### Gear Operation

Class	150	300	Gear Operator			
			H	D	C	A
Valve Size (inch)	6	6	337	310	165	65.5
	8	8	414	360	210	88.5
	10	—	477	500	363	93.5

Unit: mm

#### Valve operator

- 1/2"~8": Lever operation
- 5"~8": Optional gear operation
- 10": Standard gear operation

#### Test pressure

- Shell (Hydrostatic): 2.93MPa (425psi)
- Seat (Air): 0.55MPa (80psi)

#### Option

- ★ Flexible graphite packing and gasket (See Page 12)

#### Valve operator

- 1/2"~8": Lever operation
- 6"~8": Optional gear operation

#### Test pressure

- Shell (Hydrostatic): 7.58MPa (1100psi)
- Seat (Air): 0.55MPa (80psi)

#### Option

- ★ Flexible graphite packing and gasket (See Page 12)

Worm gear operators may be mounted on KITZ ball valves at your option for the smoothest valve operation. Electric or pneumatic actuators are also optionally available. Contact KITZ distributors for appropriate choice and sizing of valve actuators.

## Class 150/300 Stainless Steel Ball Valves

### Regular port, Uni-body, End entry design

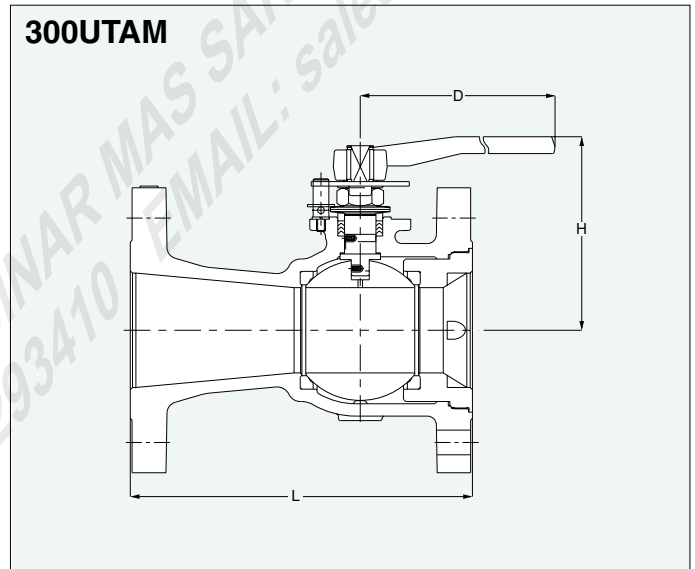
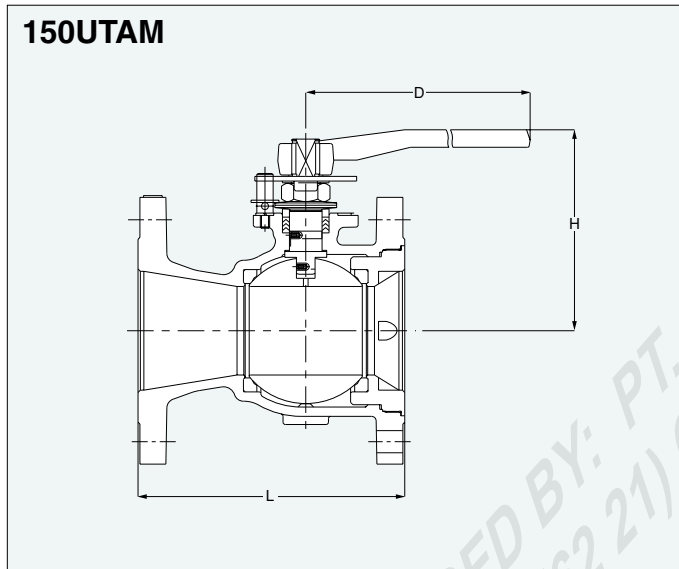
#### Features

- Antistatic device
- Blowout-proof stem
- Fire test certification★
- Double “D” stem head
- High performance **HYPATITE® PTFE** ball seats
- Actuator mounting pad to ISO 5211

Page 6 for Pressure-Temperature Ratings

Page 42 for Construction and Materials

Page 37 and 38 for Dimension of Actuator Mounting Pad



#### Dimensions of 150UTAM

Valve Size	Unit: mm										
	in.	1/2	3/4	1	1 1/2	2	3	4	6	8	10
	mm	15	20	25	40	50	80	100	150	200	250
Ball Bore		10	12.5	17	30	38	58	76	114	144	187
L		108	117	127	165	178	203	229	267	292	330
H		103	106	116	133	119	157	172	260	298	355
D		140	140	160	160	230	400	400	750	1000	1500

#### Dimensions of 300UTAM

Valve Size	Unit: mm										
	in.	1/2	3/4	1	1 1/2	2	3	4	6	8	10
	mm	15	20	25	40	50	80	100	150	200	250
Ball Bore		10	12.5	17	30	38	58	76	114	144	187
L		140	152	165	190	216	283	305	403	419	457
H		103	106	116	133	119	157	172	260	298	355
D		140	140	160	160	230	400	400	750	1000	1500

#### Gear Operation

Class	150	300	Gear Operator			
			H	D	C	A
Valve Size (inch)	6	6	257	300	283	71
	8	8	306	300	283	71
	10	10	364	400	337	86

#### Valve operator

1/2"~10": Lever operation  
6"~10": Optional gear operation

#### Test pressure

Shell (Hydrostatic): 2.93MPa (425psi)  
Seat (Air): 0.55MPa (80psi)

#### Option

★ Flexible graphite packing and gasket  
(See Page 12)

#### Valve operator

1/2"~10": Lever operation  
6"~10": Optional gear operation

#### Test pressure

Shell (Hydrostatic): 7.58MPa (1100psi)  
Seat (Air): 0.55MPa (80psi)

#### Option

★ Flexible graphite packing and gasket  
(See Page 12)

Worm gear operators may be mounted on KITZ ball valves at your option for the smoothest valve operation. Electric or pneumatic actuators are also optionally available. Contact KITZ distributors for appropriate choice and sizing of valve actuators.

## Class 600/1500 Stainless Steel Ball Valves

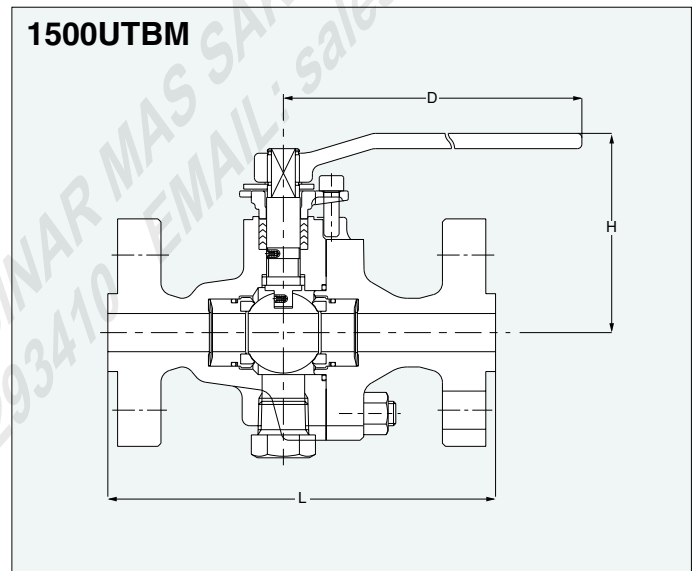
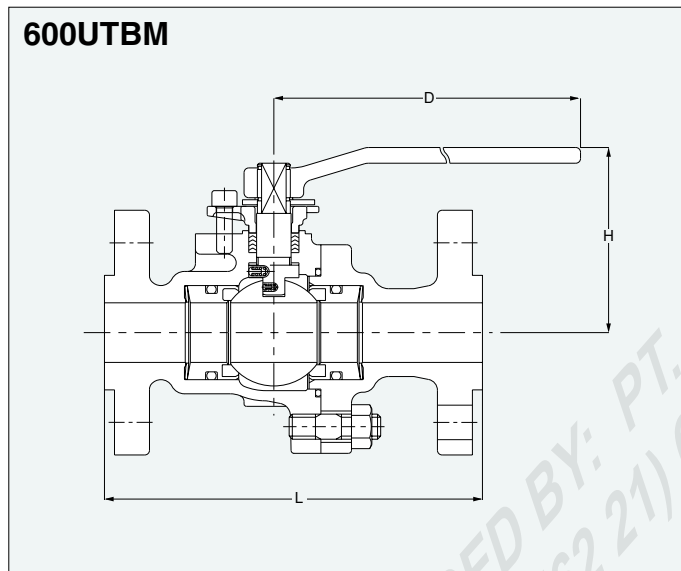
### Full port, Split body, Side entry design

#### Features

- Antistatic device
- Blowout-proof stem
- Fire test certification★
- Double "D" stem head
- Ball seats: Reinforced PTFE with MoS<sub>2</sub> for Class 600  
Nylon with MoS<sub>2</sub> for Class 1500

Page 7 for Pressure-Temperature Ratings

Page 44 and 46 for Construction and Materials



#### Dimensions of 600UTBM

Unit: mm

Valve Size	in.	1/2	3/4	1	1 1/2
	mm	15	20	25	40
Ball Bore		13	19	25	38
L		165	190	216	241
H		105	108	130	118
D		130	130	160	230

#### Valve operator

Lever operation

#### Test pressure

Shell (Hydrostatic): 14.99MPa (2175psi)  
Seat (Air): 0.55MPa (80psi)

#### Option

★Flexible graphite packing and flexible graphite spiral wound gasket  
(See Page 12 and 44)

#### Dimensions of 1500UTBM

Unit: mm

Valve Size	in.	1/2	3/4	1	1 1/2
	mm	15	20	25	40
Ball Bore		13	19	25	38
L		216	229	254	305
H		92	115	122	157
D		160	230	230	400

#### Valve operator

Lever operation

#### Test pressure

Shell (Hydrostatic): 37.23MPa (5400psi)  
Seat (Air): 0.55MPa (80psi)

#### Option

★Flexible graphite packing and flexible graphite spiral wound gasket  
(See Page 12 and 46)

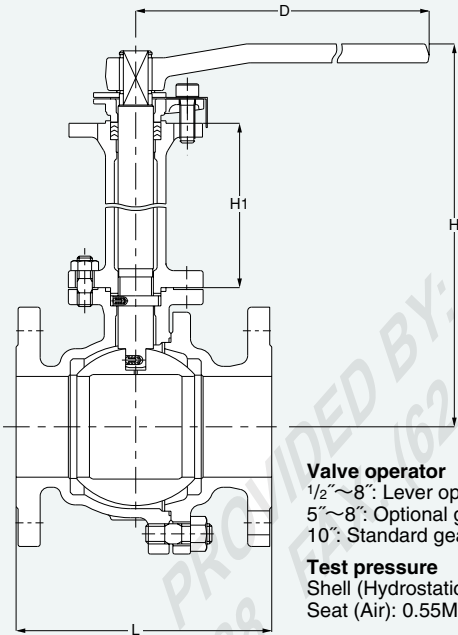
## Class 150 Low Temperature Service Ball Valves

### Features

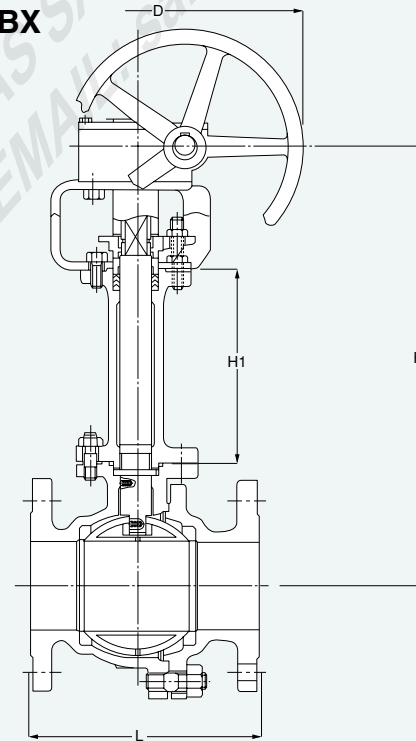
- Long stem extension for assured stem seal and freezing prevention.
- Bolted joint of stem extension with valve body. No welding joint.
- Protection of stem alignment by means of two bearings built on top and bottom of stem extension.

Lowest working temperature:  $-80^{\circ}\text{C}$

### Full Port 150UTBX



### G-150UTBX



**Valve operator**  
 $1/2$ "~8": Lever operation  
 5"~8": Optional gear operation  
 10": Standard gear operation

**Test pressure**  
 Shell (Hydrostatic): 2.93MPa (425psi)  
 Seat (Air): 0.55MPa (80psi)

Refer to Page 41 for the basic construction and materials.

### Dimensions of 150UTBX

Unit: mm

Valve Size	in.	$1/2$	$3/4$	1	$1 1/2$	2	$2 1/2$	3	4	5	6	8
	mm	15	20	25	40	50	65	80	100	125	150	200
Ball Bore		15	20	25	40	50	65	80	100	125	150	200
L		108	117	127	165	178	190	203	229	356	394	457
H		272	275	314	309	314	372	382	445	465	555	615
H1		140	140	150	170	170	190	190	220	220	220	220
D		130	130	160	230	230	400	400	460	460	1000	1500

### Dimensions of G-150UTBX

Unit: mm

Valve Size	in.	5	6	8	10
	mm	125	150	200	250
Ball Bore		125	150	200	250
L		356	394	457	533
H		559	599	676	762
H1		220	220	220	240
D		310	310	360	500

### Standard materials

Parts	Materials
Body	CF8
Body cap	CF8
Bonnet	CF8
Stem	304
Ball	304/CF8
Gland	CF8
Gland packing	PTFE
Ball seat	HYPATITE® PTFE
Gasket	Ceramic filled PTFE
Bonnet bolt/nut	B8/8
Gland bolt	B8
Cap bolt/nut	B8/8

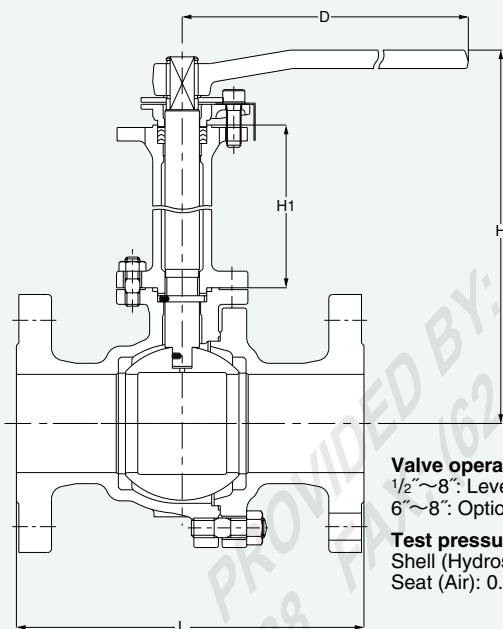
## Class 300 Low Temperature Service Ball Valves

### Features

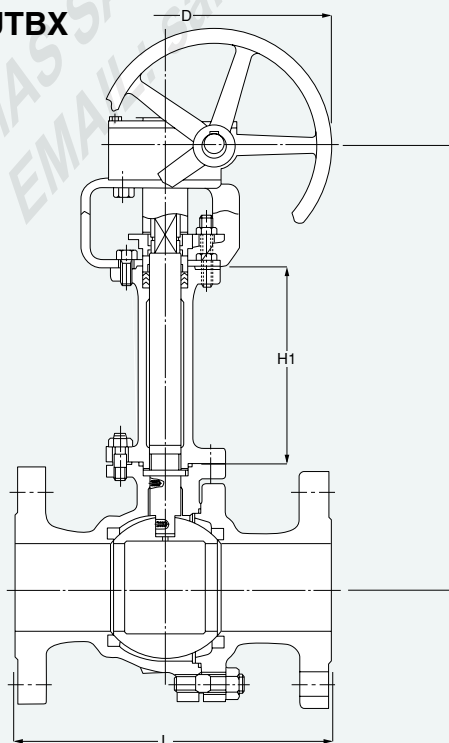
- Long stem extension for assured stem seal and freezing prevention.
- Bolted joint of stem extension with valve body. No welding joint.
- Protection of stem alignment by means of two bearings built on top and bottom of stem extension.

Lowest working temperature:  $-80^{\circ}\text{C}$

### Full Port 300UTBX



### G-300UTBX



**Valve operator**  
 $1/2 \sim 8$ : Lever operation  
 $6 \sim 8$ : Optional gear operation

**Test pressure**  
 Shell (Hydrostatic): 7.58MPa (1100psi)  
 Seat (Air): 0.55MPa (80psi)

Refer to Page 41 for the basic construction and materials.

### Dimensions of 300UTBX

Unit: mm

Valve Size	in.	1/2	3/4	1	1 1/2	2	3	4	6	8
	mm	15	20	25	40	50	80	100	150	200
Bore Size		15	20	25	40	50	80	100	150	200
L		140	152	165	190	216	283	305	403	502
H		272	275	314	309	314	382	485	555	615
H1		140	140	150	170	170	190	220	220	220
D		130	130	160	230	230	400	750	1000	1500

### Dimensions of G-300UTBX

Unit: mm

Valve Size	in.	6	8
	mm	150	200
Bore Size		150	200
L		403	502
H		599	676
H1		220	220
D		310	360

### Standard materials

Parts	Materials
Body	CF8
Body cap	CF8
Bonnet	CF8
Stem	304
Ball	304/CF8
Gland	CF8
Gland packing	PTFE
Ball seat	HYPATITE® PTFE
Gasket	Ceramic filled PTFE
Bonnet bolt/nut	B8/8
Gland bolt	B8
Cap bolt/nut	B8/8

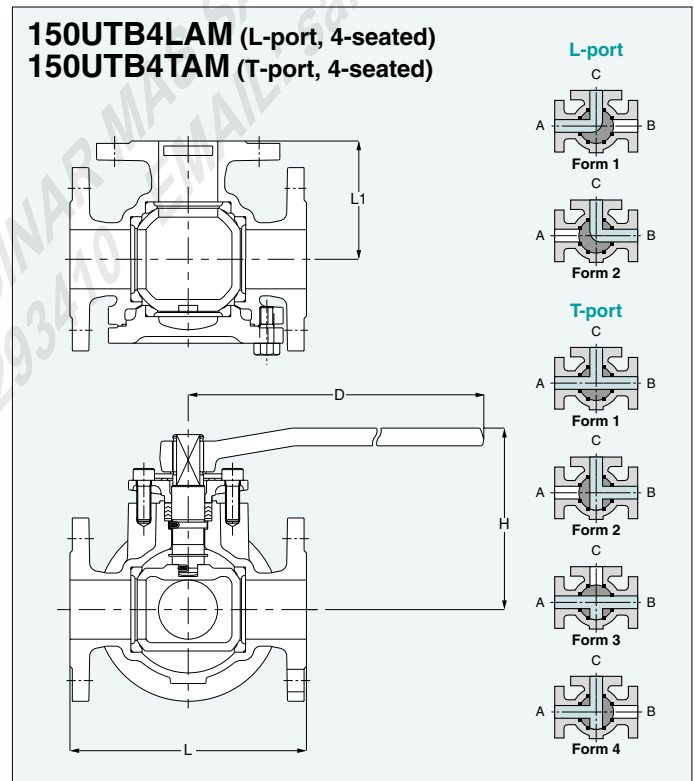
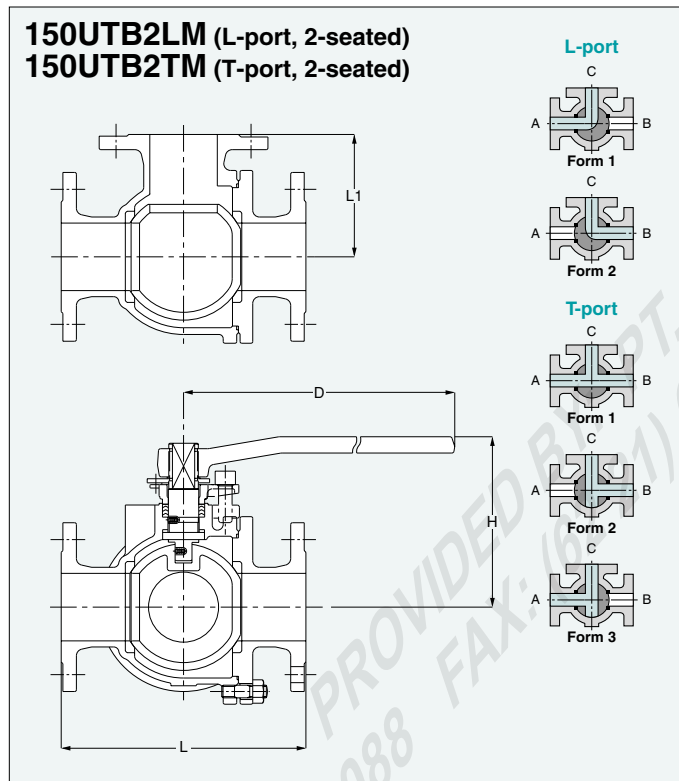
## Class 150 Stainless Steel 3-way Ball Valves

### Full port, 2-seated or 4-seated, Split body, Side entry design

#### Features

- Used for diverting or mixing process media
- One 3-way valve can replace several other valves plus the associated piping pieces
- Antistatic device
- Blowout-proof stem
- Double "D" stem head
- High performance **HYPATITE® PTFE** ball seats
- Actuator mounting pad to KITZ standard

Page 7 for Pressure-Temperature Ratings



#### Dimensions of 150UTB2LM/2TM

Valve Size	Unit:mm							
	in.	1	1½	2	2½	3	4	6*
	mm	25	40	50	65	80	100	150
Ball Bore		25	38	51	65	76	102	127
L		165	210	220	250	262	342	437
L1		83	105	110	125	131	171	218
H		124	115	123	155	165	200	220
D		160	230	230	399	399	460	460

#### Dimensions of 150UTB4LAM/4TAM

Valve Size	Unit:mm											
	in.	½	¾	1	1½	2	2½	3	4	5*	6*	8*
	mm	15	20	25	40	50	65	80	100	125	150	200
Ball Bore		15	19	25	38	51	64	76	102	100	125	150
L		120	135	154	177	200	240	262	342	348	407	463
L1		65	68	77	88	100	120	131	171	174	203	231
H		128	132	135	146	155	185	198	267	267	290	335
D		160	160	160	399	399	460	460	1000	1000	1000	1500

#### Valve operator

1"~6": Lever operation  
6": Optional gear operation

#### Test pressure

Shell (Hydrostatic): 2.93MPa (425psi)  
Seat (Air): 0.55MPa (80psi)

#### Note

\*JIS 10K type is also available.

#### Valve operator

½"~8": Lever operation  
5"~8": Optional gear operation

#### Test pressure

Shell (Hydrostatic): 2.93MPa (425psi)  
Seat (Air): 0.55MPa (80psi)

#### Note

\*JIS 10K type is also available.

\* Regular port

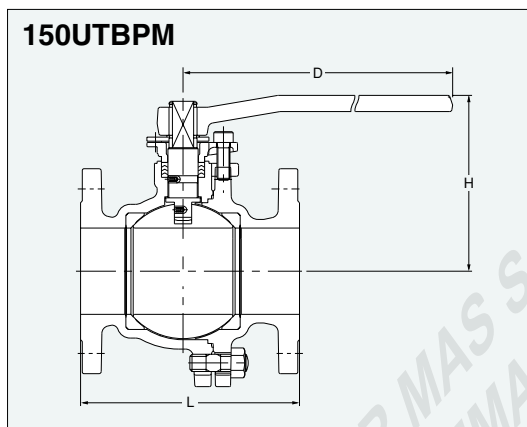
## Class 150 Stainless Steel Pocketless Ball Valves

### Full port, Split body, Side entry design

Page 6 for Pressure-Temperature Ratings

#### Features

- Unique filled cavity provides excellent resistance to media build up and/or stagnation between seats
- Antistatic device
- Blowout-proof stem
- Double "D" stem head
- High performance **HYPATITE®** PTFE ball seats
- Actuator mounting pad to KITZ standard



#### Valve operator

- 1/2"~8": Lever operation
- 5"~8": Optional gear operation

#### Test pressure

- Shell (Hydrostatic): 2.93MPa (425psi)
- Seat (Air): 0.55MPa (80psi)

#### Dimensions

Unit: mm

Valve Size	in.	1/2	3/4	1	1 1/2	2	2 1/2	3	4	5	6	8
	mm	15	20	25	40	50	65	80	100	125	150	200
Ball Bore		15	20	25	40	50	65	80	100	125	150	200
L		108	117	127	165	178	190	203	229	356	394	457
H		102	105	124	115	120	155	165	200	220	295	355
D		130	130	160	230	230	400	400	460	460	1000	1500

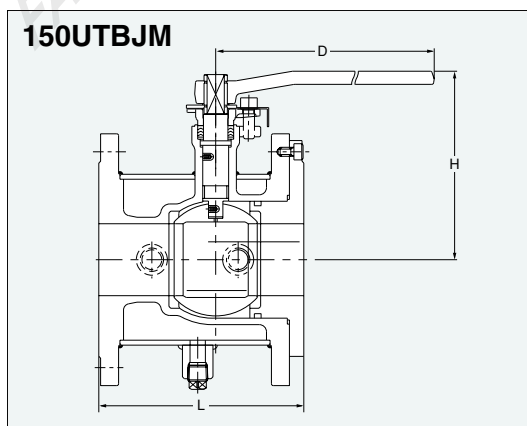
## Class 150 Stainless Steel Jacketed Ball Valves

### Full port

Page 6 for Pressure-Temperature Ratings

#### Features

- Fully jacketed to maintain media temperature
- Antistatic device
- Double "D" stem head
- High performance **HYPATITE®** PTFE ball seats
- Actuator mounting pad to KITZ standard



#### Valve operator

- 1/2"~6": Lever operation
- 6": Optional gear operation

#### Test pressure

- Shell (Hydrostatic): 2.93MPa (425psi)
- Seat (Pneumatic): 0.55MPa (80psi)
- Jacket (Hydrostatic): 2.07MPa (300psi)

#### Note

- Maximum allowable pressure is 1.37MPa (199psi) at 260°C (500°F).
- JIS 10K type is also available.

#### Dimensions

Unit: mm

Valve Size	in.	1/2	3/4	1	1 1/2	2	2 1/2	3*	4*	6*
	mm	15	20	25	40	50	65	80	100	150
Ball Bore		15	20	25	40	50	65	65	80	125
L		110	120	130	165	180	190	200	230	270
H		131	135	150	150	157	188	188	213	258
D		130	130	160	230	230	400	400	400	460

\* Regular port

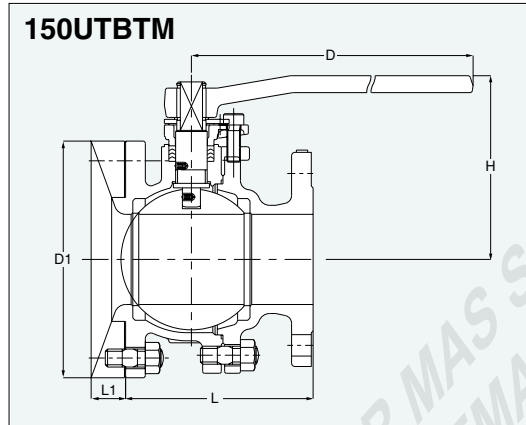
## Class 150 Stainless Steel Tank Ball Valves

### Full port, Split body, Side entry design

Page 6 for Pressure-Temperature Ratings

#### Features

- Direct mounting to tank bottom
- Churning media evenly
- Antistatic device
- Blowout-proof stem
- Double "D" stem head
- High performance **HYPATITE®** PTFE ball seats
- Actuator mounting pad to KITZ standard



#### Valve operator

1"~6": Lever operation

#### Test pressure

Shell (Hydrostatic): 2.93MPa (425psi)

Seat (Air): 0.55MPa (80psi)

Jacket (Hydrostatic): 2.07MPa (300psi)

#### Note

- Maximum allowable temperature is 200°C (392°F).
- Class 300 and JIS 10K/20K types are also available.

#### Dimensions

Unit: mm

Valve Size	in.	1	1½	2	2½	3	4	5	6	8	10
	mm	25	40	50	65	80	100	125	150	200	250
Ball Bore		25	40	50	65	80	100	125	150	For these sizes, please contact KITZ Corporation.	
L		102	125	142	160	171	176	255	292		
H		150	134	143	177	187	222	242	312		
D		160	230	230	400	400	460	460	1000		
L1		35	35	41	43	45	53	53	53		
D1		135	155	175	185	210	280	305	330		

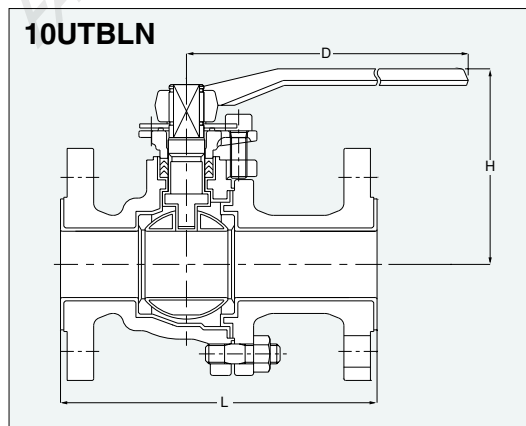
## Class 150 Stainless Steel PFA Lined Ball Valves

### Full port, Split body, Side entry design

Page 7 for Pressure-Temperature Ratings

#### Features

- Highly corrosion-resistant PFA lining
- Fine lining without a pinhole
- Highly heat-resistant PFA
- No additives or paints are included
- Double "D" stem head
- High performance **HYPATITE®** PTFE ball seats
- Actuator mounting pad to KITZ standard



#### Valve operator

½"~4": Lever operation

#### Test pressure

Shell (Hydrostatic): 2.93MPa (425psi)

Seat (Air): 0.55MPa (80psi)

#### Note

- JIS 10K type is also available.

#### Dimensions

Unit: mm

Valve Size	in.	½	¾	1	1½	2	2½	3	4
	mm	15	20	25	40	50	65	80	100
Ball Bore		15	20	25	38.5	51	65	76	102
L		140	152	165	191	216	240	250	280
H		98	105	111	136	146	167	178	207
D		135	135	150	250	250	400	400	500

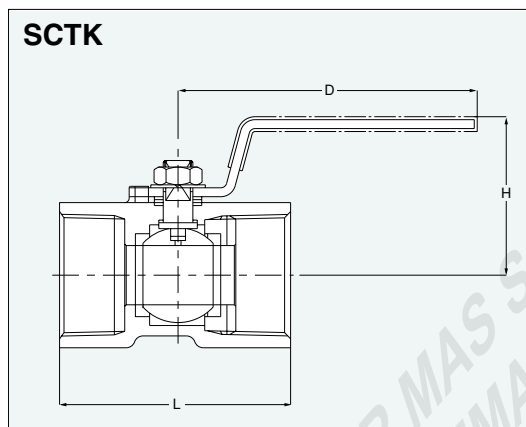
## Type 600/1000 Carbon Steel Ball Valves

### Reduced port, Uni-body design, Threaded ends

Page 8 for Pressure-Temperature Ratings

#### Features

- Blowout-proof stem
- Choice of threaded ends:
  - Rc threads to BS 21 (Fig. SCTK)
  - NPT threads to ASME B1.20.1 (Fig. AKSCTK)



#### Standard materials

Parts	Materials
Body	WCB
Ball	316 or 304*1
Stem	316 or 304*2
Ball seat	Glass filled PTFE or HYPATITE® PTFE*3
Gland packing	Glass filled PTFE
Handle	Plastic covered S.S.

- \* 1 304 for 3/4" & larger
- \* 2 304 for 1/2" & larger
- \* 3 HYPATITE® PTFE for Type 1000

End-to-end dimensions: KITZ standard

#### Dimensions

Valve Size	in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	mm	8	10	15	20	25	32	40	50
Ball Bore		4.5	6.8	9.2	12.5	16	20	24.5	32
L		39	44	56.5	59	71	78	83	100
H		31	36	41	44	48	54	65	72
D		60	70	85	85	100	100	125	125

Unit: mm

#### Valve operator

Lever operation  
T-type handle as option (3/4" & larger only)

#### Test pressure

Shell (Hydrostatic):  
Type 600: 6.20MPa (900psi)  
Type 1000: 10.34MPa (1500psi)  
Seat (Air): 0.55MPa (80psi)

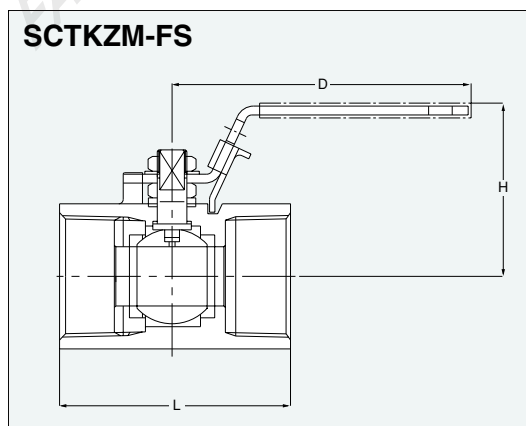
## Type 1500/2000 Carbon Steel Ball Valves

### Reduced port, Uni-body design, Firesafe type, Threaded ends

Page 9 for Pressure-Temperature Ratings

#### Features

- Blowout-proof stem
- API 607 firesafe type
- Choice of threaded ends:
  - Rc threads to BS 21 (Fig. SCTKZM-FS)
  - NPT threads to ASME B1.20.1 (Fig. AKSCTKZM-FS)



#### Standard materials

Parts	Materials
Body	WCB
Insert	316 or CF8M
Ball	316
Stem	316
Ball seat	HYPATITE® PTFE
Gland packing	Flexible graphite*
Handle	Plastic covered C.S.

\* Non-firesafe PTFE packing is optionally available.

End-to-end dimensions: KITZ standard

#### Dimensions

Valve Size	in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	mm	8	10	15	20	25	32	40	50
Ball Bore		4.6	6.9	9.1	12.4	16	20	24.4	32
L		50	52.1	65	70.1	80	95	100.1	114
H		28.4	29.5	49	52.1	54.6	59.4	68.1	73.4
D		71.1	82	89.9	89.9	110	110	140	140

Unit: mm

#### Valve operator

Lever operation with latch lock  
Oval handle as option

#### Test pressure

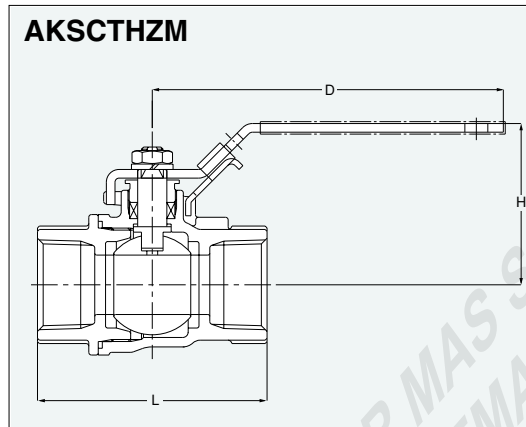
Shell (Hydrostatic):  
Type 1500: 15.51MPa (2250psi)  
Type 2000: 20.68MPa (3000psi)  
Seat (Air): 0.55MPa (80psi)

## Type 1500/2000 Carbon Steel Ball Valves

### Regular port, Split body design, Threaded ends

#### Features

- Blowout-proof stem
- API 607 firesafe type as option
- NPT threaded ends to ASME B1.20.1



#### Dimensions

Valve Size	in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	mm	8	10	15	20	25	32	40	50
Ball Bore		9.4	9.4	10	15	20	25	32	40
L		53.1	53.1	62	71.9	85.1	94	106.9	120
H		50.5	50.5	58.2	62.7	63.5	67.6	83.1	90.9
D		100.1	100.1	115.1	115.1	134.9	134.9	154.9	190

Unit: mm

#### Standard materials

Parts	Materials
Body	WCB
Body cap	WCB
Ball	316
Stem	316
Seat	HYPATITE® PTFE
Gland packing	PTFE*
Gasket	PTFE*
Handle	Plastic covered C.S.

\* API 607 firesafe flexible graphite is optionally available.

End-to-end dimensions: KITZ standard

#### Valve operator

Lever operation with latch lock  
Oval handle as option

#### Test pressure

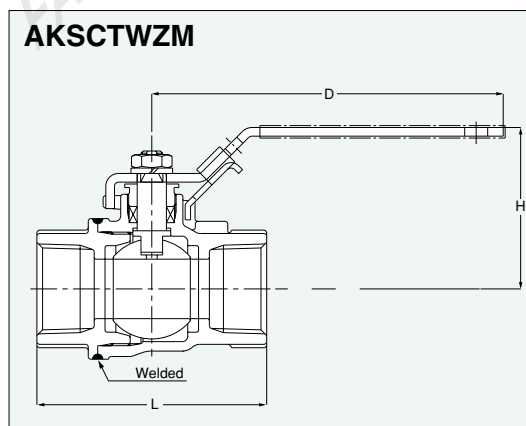
Shell (Hydrostatic):  
Type 1500: 15.51MPa (2250psi)  
Type 2000: 20.68MPa (3000psi)  
Seat (Air): 0.55MPa (80psi)

## Type 1500/2000 Carbon Steel Ball Valves

### Regular port, Welded body design, Threaded ends

#### Features

- Blowout-proof stem
- API 607 firesafe type as option
- NPT threaded ends to ASME B1.20.1



#### Dimensions

Valve Size	in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	mm	8	10	15	20	25	32	40	50
Ball Bore		9.4	9.4	10	15	20	25	32	40
L		53.1	53.1	62	71.9	85.1	94	106.9	120
H		50.5	50.5	58.2	62.7	63.5	67.6	83.1	90.9
D		100.1	100.1	115.1	115.1	134.9	134.9	154.9	190

Unit: mm

#### Standard materials

Parts	Materials
Body	WCB
Body cap	WCB
Ball	316
Stem	316
Seat	HYPATITE® PTFE
Gland packing	PTFE*
Gasket	PTFE*
Handle	Plastic covered C.S.

\* API 607 firesafe flexible graphite is optionally available.

End-to-end dimensions: KITZ standard

#### Valve operator

Lever operation with latch lock  
Oval handle as option

#### Test pressure

Shell (Hydrostatic):  
Type 1500: 15.51MPa (2250psi)  
Type 2000: 20.68MPa (3000psi)  
Seat (Air): 0.55MPa (80psi)

## Class 800 and Type 3000 Carbon Steel Ball Valves

### Regular port, Welded body design, Threaded ends

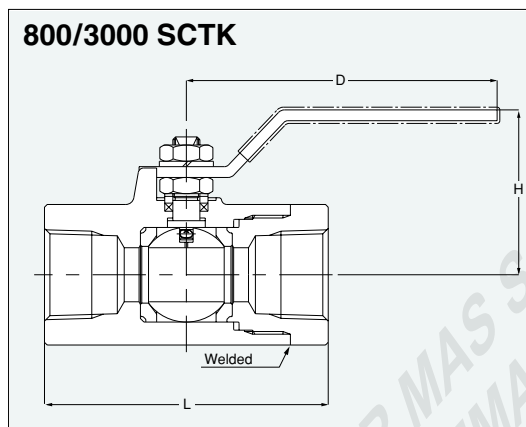
Page 8 for Pressure-Temperature Ratings

#### Features

- Antistatic device
- Blowout-proof stem
- Fire test certification★
- Choice of threaded ends:
  - Rc threads to BS 21 (Fig. 800/3000 SCTK)
  - NPT threads to ASME B1.20.1 (Fig. AK800/3000 SCTK)

#### Note

1. Class 800 ball valves are designed to BS 5351.
2. Type 3000 ball valves are designed to KITZ standard for servicing water, oil and gaseous fluid under the maximum working pressure of 3000psi.



#### Standard materials

Parts	Materials
Body	A105
Body cap	A105
Stem	316 (Class 800) 329 (Type 3000)
Ball	316
Gland packing	PTFE
Ball seat	PTFE (Class 800) PCTFE* (Type 3000)

\* Polychloro-Trifluoro-Ethylene.

#### Valve operator

Lever operation

#### Test pressure

Shell (Hydrostatic):  
 Class 800: 8.27MPa (1200psi)  
 Type 3000: 31.03MPa (4500psi)  
 Seat (Air): 0.55MPa (80psi)

#### Option

★ Flexible graphite packing and gasket.

#### Dimensions

Valve Size	in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
		mm	8	10	15	20	25	32	40
Ball Bore		10	10	10	15	20	25	32	38
L		88	88	88	90	105	117	130	150
H		44	44	44	54	57	64	69	80
D	Class 800	100	100	100	115	115	135	135	150
	Type 3000	100	100	100	115	115	160	160	230

Unit: mm

## Class 800 and Type 3000 Carbon Steel Ball Valves

### Regular port, Split body design, Socket welding ends

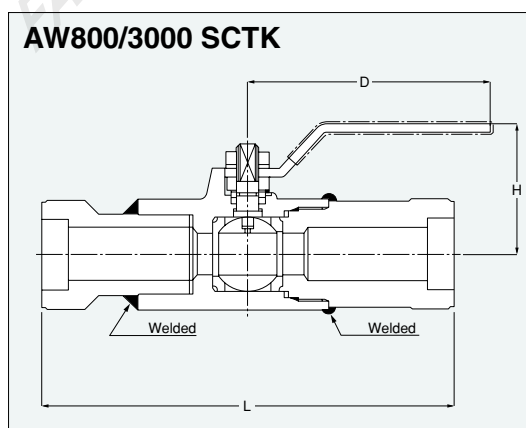
Page 8 for Pressure-Temperature Ratings

#### Features

- Antistatic device
- Blowout-proof stem
- Fire test certification★
- Socket welding ends to ASME B16.11

#### Note

1. Class 800 ball valves are designed to BS 5351.
2. Type 3000 ball valves are designed to KITZ standard for servicing water, oil and gaseous fluid under the maximum working pressure of 3000psi.



#### Standard materials

Parts	Materials
Body	A105
Body cap	A105
Stem	316 (Class 800) 329 (Type 3000)
Ball	316
Gland packing	Flexible graphite
Ball seat	PTFE (Class 800) PCTFE* (Type 3000)

\* Polychloro-Trifluoro-Ethylene.

End-to-end dimensions: KITZ standard

#### Valve operator

Lever operation

#### Test pressure

Shell (Hydrostatic):  
 Class 800: 8.27MPa (1200psi)  
 Type 3000: 31.03MPa (4500psi)  
 Seat (Air): 0.55MPa (80psi)

#### Option

★ Flexible graphite packing and gasket.

#### Dimensions

Valve Size	in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
		mm	8	10	15	20	25	32	40
Ball Bore		10	10	10	15	20	25	32	38
L		170	170	170	176	196	210	226	262
H		44	44	44	54	57	65	70	81
D	Class 800	100	100	100	115	115	135	135	150
	Type 3000	100	100	100	115	115	160	160	230

Unit: mm

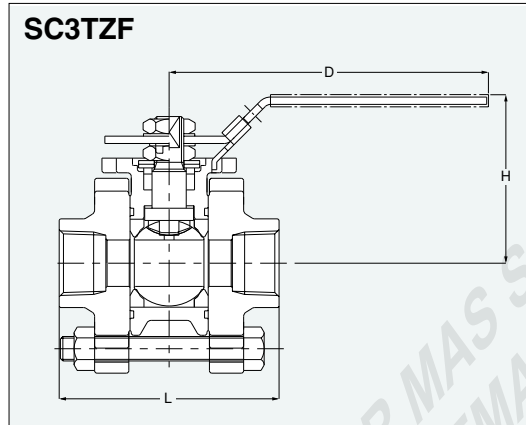
## Type 1000 Carbon Steel Ball Valves

### Full port, Three-piece body design, Threaded or socket welding ends

Page 8 for Pressure-Temperature Ratings

#### Features

- Blowout-proof stem
- Swing-away body for maintenance ease
- Choice of threaded ends:
  - Rc threads to BS 21 (Fig. SC3TZF)
  - NPT threads to ASME B1.20.1 (Fig. AKSC3TZF)
  - Socket welding ends to BS 5351 (Fig. SWSC3TZF)
  - Socket welding ends to ASME B16.11 (Fig. AWSC3TZF)



#### Standard materials

Parts	Materials
Body	WCB
Body cap	WCB
Ball	CF8M/316
Stem	316
Seat	HYPATITE® PTFE
Gland packing	PTFE
Gasket	PTFE
Handle	Plastic covered S.S.

End-to-end dimensions: KITZ standard

#### Dimensions

Valve Size	Unit: mm							
	in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
	mm	8	10	15	20	25	32	40
Ball Bore		10	10	14	19	24	30	38
L		63	63	71	90	103	110	127
H		48	48	60	69	82	88	104
D		120	120	130	130	150	150	180

#### Valve operator

Lever operation  
Oval handle as option

#### Test pressure

Shell (Hydrostatic): 10.34MPa (1500psi)  
Seat (Air): 0.55MPa (80psi)

#### Note

• Use SC3TZ for size 2".

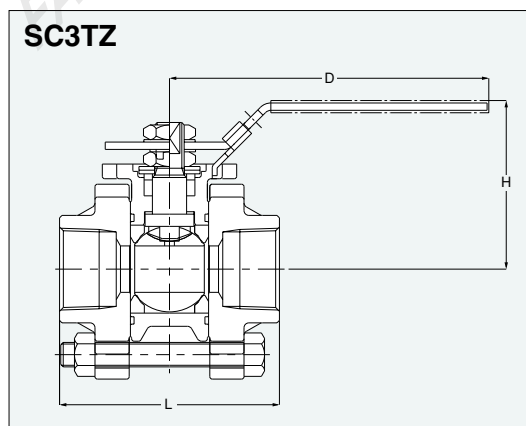
## Type 1000 Carbon Steel Ball Valves

### Regular port, Three-piece body design, Threaded or socket welding ends

Page 8 for Pressure-Temperature Ratings

#### Features

- Blowout-proof stem
- Swing-away body for maintenance ease
- Choice of threaded ends:
  - Rc threads to BS 21 (Fig. SC3TZ)
  - NPT threads to ASME B1.20.1 (Fig. AKSC3TZ)
  - Socket welding ends to BS 5351 (Fig. SWSC3TZ)
  - Socket welding ends to ASME B16.11 (Fig. AWSC3TZ)



#### Standard materials

Parts	Materials
Body	WCB
Body cap	WCB
Ball	CF8M/316
Stem	316
Seat	HYPATITE® PTFE
Gland packing	PTFE
Gasket	PTFE
Handle	Plastic covered S.S.

End-to-end dimensions: KITZ standard

#### Dimensions

Valve Size	Unit: mm					
	in.	1/2	3/4	1	1 1/2	2
	mm	15	20	25	40	50
Ball Bore		10	14	19	30	38
L		63	71	90	110	127
H		48	60	69	82	102
D		120	130	130	150	180

#### Valve operator

Lever operation  
Oval handle as option

#### Test pressure

Shell (Hydrostatic): 10.34MPa (1500psi)  
Seat (Air): 0.55MPa (80psi)

#### Note

• Use SC3TZF for sizes 1/4" & 3/8".

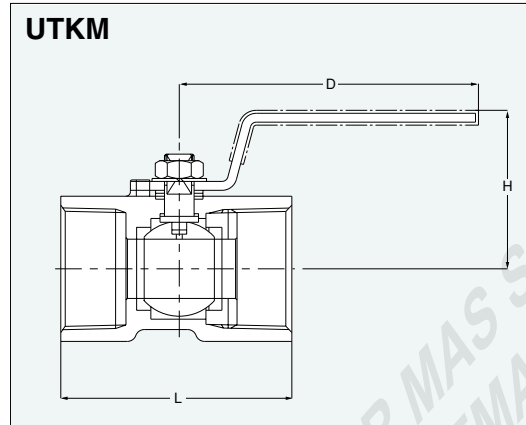
## Type 600/1000 Stainless Steel Ball Valves

### Reduced port, Uni-body design, Threaded ends

Page 8 for Pressure-Temperature Ratings

#### Features

- Blowout-proof stem
- Choice of threaded ends:
  - Rc threads to BS 21 (Fig. UTKM)
  - NPT threads to ASME B1.20.1 (Fig. AKUTKM)



#### Dimensions

Valve Size	in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	mm	8	10	15	20	25	32	40	50
Ball Bore		4.5	6.8	9.2	12.5	16	20	24.5	32
L		39	44	56.5	59	71	78	83	100
H		31	36	41	44	48	54	65	75
D		60	70	85	85	100	100	125	125

Unit: mm

#### Standard materials

Parts	Materials
Body	CF8M
Ball	316
Stem	316
Seat	Glass filled PTFE or HYPATITE® PTFE*
Gland packing	Reinforced PTFE
Handle	Plastic covered S.S.

\* HYPATITE® PTFE for Type 1000

End-to-end dimensions: KITZ standard

#### Valve operator

Lever operation  
T-type handle as option

#### Test pressure

Shell (Hydrostatic):  
Type 600: 6.20MPa (900psi)  
Type 1000: 10.34MPa (1500psi)  
Seat (Air): 0.55MPa (80psi)

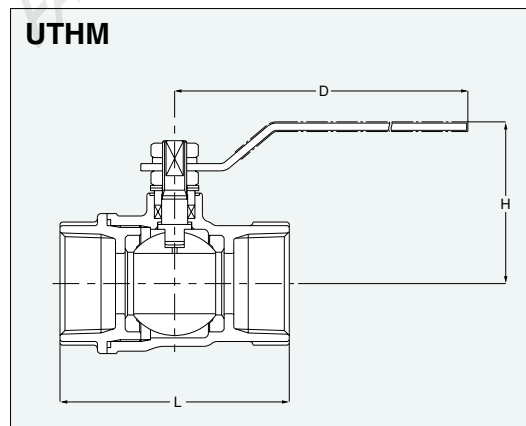
## Type 800 Stainless Steel Ball Valves

### Regular port, Split body design, Threaded ends

Page 8 for Pressure-Temperature Ratings

#### Features

- Blowout-proof stem
- Choice of threaded ends:
  - Rc threads to BS 21 (Fig. UTHM)
  - NPT threads to ASME B1.20.1 (Fig. AKUTHM)



#### Dimensions

Valve Size	in.	1/2	3/4	1	1 1/4	1 1/2	2
	mm	15	20	25	32	40	50
Ball Bore		10	15	20	25	32	40
L		60	70	80	95	108	124
H		47	53	63	67	78	84
D		100	100	130	130	150	150

Unit: mm

#### Standard materials

Parts	Materials
Body	CF8M
Body cap	CF8M
Ball	316
Stem	316 Cr plated
Seat	PTFE
Gland packing	PTFE
Handle	Plastic covered S.S.

End-to-end dimensions: KITZ standard

#### Valve operator

Lever operation

#### Test pressure

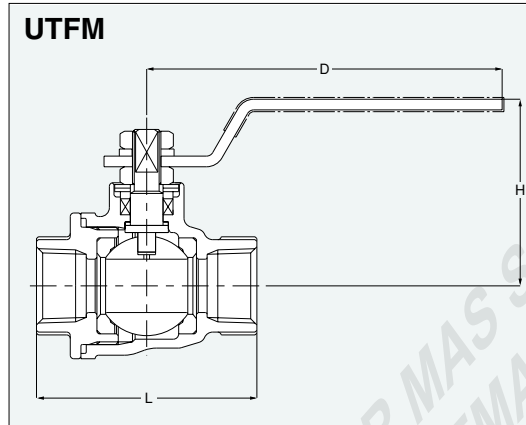
Shell (Hydrostatic): 8.27MPa (1200psi)  
Seat (Air): 0.55MPa (80psi)

## Type 1000 Stainless Steel Ball Valves

### Full port, Split body design, Threaded ends

#### Features

- Blowout-proof stem
- Choice of threaded ends:
  - Rc threads to BS 21 (Fig. UTFM)
  - NPT threads to ASME B1.20.1 (Fig. AKUTFM)



#### Dimensions

Unit: mm

Valve Size	in.	1/2	3/4	1	1 1/4	1 1/2	2
	mm	15	20	25	32	40	50
Ball Bore		15	20	25	32	40	50
L		62	73	85	98	108	124
H		53	58	62	72	78	94
D		100	130	130	150	150	200

#### Standard materials

Parts	Materials
Body	CF8M
Body cap	CF8M
Ball	316
Stem	316 Cr plated
Seat	HYPATITE® PTFE
Gland packing	PTFE
Gasket	PTFE
Handle	Plastic covered S.S.

End-to-end dimensions: KITZ standard

#### Valve operator

Lever operation

#### Test pressure

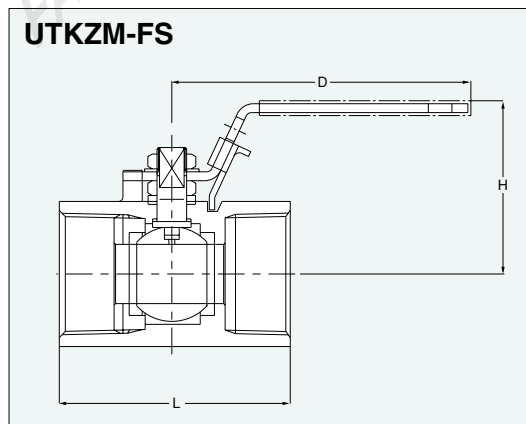
Shell (Hydrostatic): 10.34MPa (1500psi)  
Seat (Air): 0.55MPa (80psi)

## Type 1500/2000 Stainless Steel Ball Valves

### Reduced port, Uni-body design, Firesafe type, Threaded ends

#### Features

- Blowout-proof stem
- API 607 firesafe
- Choice of threaded ends:
  - Rc threads to BS 21 (Fig. UTKZM-FS)
  - NPT threads to ASME B1.20.1 (Fig. AKUTKZM-FS)



#### Dimensions

Unit: mm

Valve Size	in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	mm	8	10	15	20	25	32	40	50
Ball bore		4.6	6.9	9.1	12.4	16	20	24.4	32
L		50	52.1	65	70.1	80	95	100	114
H		28.4	29.5	49	52.1	54.6	59.4	68.1	73.4
D		71.1	82	89.9	89.9	110	110	140	140

Page 9 for Pressure-Temperature Ratings

#### Standard materials

Parts	Materials
Body	CF8M
Insert	316 or CF8M
Ball	316
Stem	316
Seat	HYPATITE® PTFE
Gland packing	Flexible graphite*
Handle	Plastic covered S.S.

\* Non-firesafe PTFE packing is optionally available.

End-to-end dimensions: KITZ standard

#### Valve operator

Lever operation with latch lock  
Oval handle as option

#### Test pressure

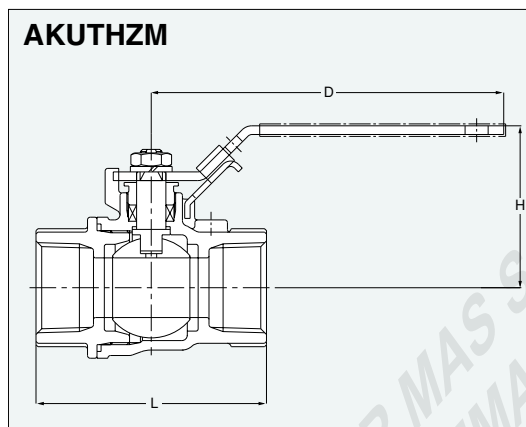
Shell (Hydrostatic):  
Type 1500: 15.51MPa (2250psi)  
Type 2000: 20.68MPa (3000psi)  
Seat (Air): 0.55MPa (80psi)

## Type 1500/2000 Stainless Steel Ball Valves

### Regular port, Split body design, Threaded ends

#### Features

- Blowout-proof stem
- API 607 firesafe type as option
- NPT threads to ASME B1.20.1



#### Dimensions

Valve Size	in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	mm	8	10	15	20	25	32	40	50
Ball Bore		9.4	9.4	10	15	20	25	32	40
L		53.1	53.1	62	71.9	85.1	94	106.9	120
H		50.5	50.5	58.2	62.7	63.5	67.6	83.1	90.9
D		100.1	100.1	115.1	115.1	134.9	134.9	154.9	190

Unit: mm

#### Standard materials

Parts	Materials
Body	CF8M
Body cap	CF8M
Ball	316
Stem	316
Seat	HYPATITE® PTFE
Gland packing	PTFE
Gasket	PTFE
Handle	Plastic covered S.S.

\* API 607 firesafe flexible graphite is optionally available.

End-to-end dimensions: KITZ standard

#### Valve operator

Lever operation with latch lock  
Oval handle as option

#### Test pressure

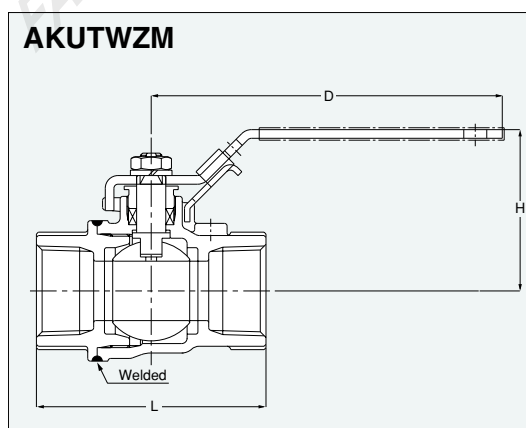
Shell (Hydrostatic):  
Type 1500: 15.51MPa (2250psi)  
Type 2000: 20.68MPa (3000psi)  
Seat (Air): 0.55MPa (80psi)

## Type 1500/2000 Carbon Steel Ball Valves

### Regular port, Welded body design, Threaded ends

#### Features

- Blowout-proof stem
- API 607 firesafe type as option
- NPT threads to ASME B1.20.1



#### Dimensions

Valve Size	in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	mm	8	10	15	20	25	32	40	50
Ball Bore		9.4	9.4	10	15	20	25	32	40
L		53.1	53.1	62	71.9	85.1	94	106.9	120
H		50.5	50.5	58.2	62.7	63.5	67.6	83.1	90.9
D		100.1	100.1	115.1	115.1	134.9	134.9	154.9	190

Unit: mm

#### Standard materials

Parts	Materials
Body	CF8M
Body cap	CF8M
Ball	316
Stem	316
Seat	HYPATITE® PTFE
Gland packing	PTFE
Gasket	PTFE
Handle	Plastic covered S.S.

\* API 607 firesafe flexible graphite is optionally available.

End-to-end dimensions: KITZ standard

#### Valve operator

Lever operation with latch lock  
Oval handle as option

#### Test pressure

Shell (Hydrostatic):  
Type 1500: 15.51MPa (2250psi)  
Type 2000: 20.68MPa (3000psi)  
Seat (Air): 0.55MPa (80psi)

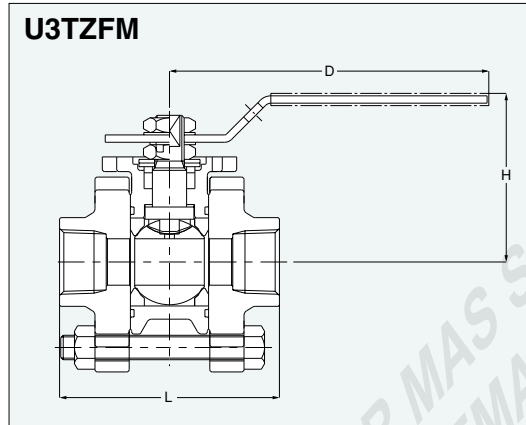
## Type 1000 Stainless Steel Ball Valves

### Full port, 3-pce body design, Threaded or socket welding ends

Page 8 for Pressure-Temperature Ratings

#### Features

- Blowout-proof stem
- Swing-away body for maintenance ease
- Choice of threaded ends:
  - Rc threads to BS 21 (Fig. U3TZFM)
  - NPT threads to ASME B1.20.1 (Fig. AKU3TZFM)
  - Socket welding ends to BS 5351 (Fig. SWU3TZFM)
  - Socket welding ends to ASME B16.11 (Fig. AWU3TZFM)



#### Standard materials

Parts	Materials
Body	CF8M
Body cap	CF8M
Ball	316 or CF8M
Stem	316
Seat	HYPATITE® PTFE
Gland packing	PTFE
Gasket	PTFE
Handle	Plastic covered S.S.

End-to-end dimensions: KITZ standard

#### Dimensions

Valve Size	Unit: mm							
	in.	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2
	mm	8	10	15	20	25	32	40
Ball Bore		10	10	14	19	24	30	38
L		63	63	71	90	103	110	127
H		48	48	60	69	82	88	104
D		120	120	130	130	150	150	180

#### Valve operator

Lever operation  
Oval handle as option

#### Test pressure

Shell (Hydrostatic): 10.34MPa (1500psi)  
Seat (Air): 0.55MPa (80psi)

#### Note

• Use U3TZM for size 2".

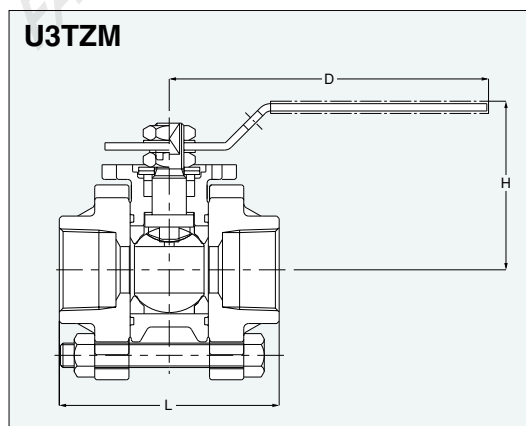
## Type 1000 Stainless Steel Ball Valves

### Regular port, 3-pce body design, Threaded or socket welding ends

Page 8 for Pressure-Temperature Ratings

#### Features

- Blowout-proof stem
- Swing-away body for maintenance ease
- Choice of threaded ends:
  - Rc threads to BS 21 (Fig. U3TZM)
  - NPT threads to ASME B1.20.1 (Fig. AKU3TZM)
  - Socket welding ends to BS 5351 (Fig. SWU3TZM)
  - Socket welding ends to ASME B16.11 (Fig. AWU3TZM)



#### Standard materials

Parts	Materials
Body	CF8M
Body cap	CF8M
Ball	316 or CF8M
Stem	316
Seat	HYPATITE® PTFE
Gland packing	PTFE
Gasket	PTFE
Handle	Plastic covered S.S.

End-to-end dimensions: KITZ standard

#### Dimensions

Valve Size	Unit: mm						
	in.	1/2	3/4	1	1 1/4	1 1/2	2
	mm	15	20	25	32	40	50
Ball Bore		10	14	19	24	30	38
L		63	71	90	103	110	127
H		48	60	69	83	88	104
D		120	130	130	150	150	180

#### Valve operator

Lever operation  
Oval handle as option

#### Test pressure

Shell (Hydrostatic): 10.34MPa (1500psi)  
Seat (Air): 0.55MPa (80psi)

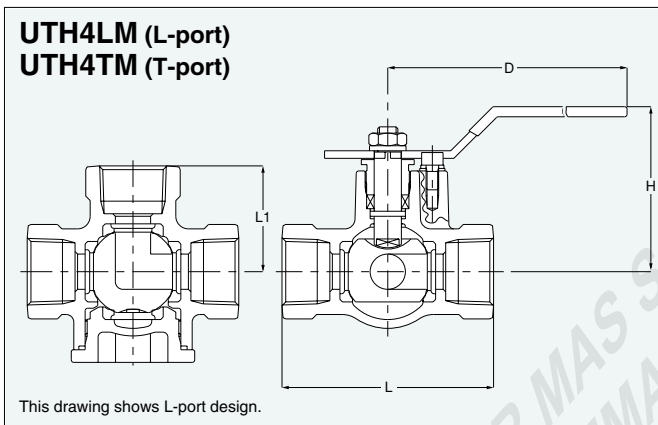
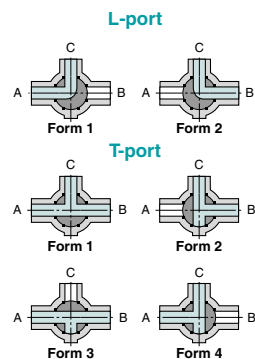
#### Note

• Use U3TZFM for sizes 1/4" & 3/8".

## Type 800 Stainless Steel 3-way Ball Valves

### Regular port, 4-seated, Split body, Threaded ends

- L-port and T-port
- Rc threads to BS 21



#### Dimensions

Valve Size	in.	1/2	3/4	1	1 1/4	1 1/2	2
	mm	15	20	25	32	40	50
Ball Bore		10	14	19	25	32	38
L		69	84	96	114	132	150
L1		34.5	42	48	57	66	75
H		63	65	75.5	79.5	95.5	101
D		130	130	150	150	230	230

Unit: mm

#### Standard materials

Parts	Materials
Body	CF8M
Body cap	CF8M
Ball	316 or CF8M
Stem	316
Seat	HYPATITE® PTFE
Gland packing	PTFE
Gasket	PTFE
Handle	Plastic covered S.S.

End-to-end dimensions: KITZ standard

#### Valve operator

Lever operation

#### Test pressure

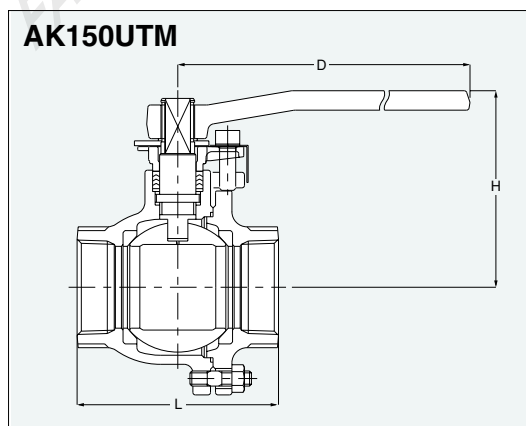
Shell (Hydrostatic): 8.27MPa (1200psi)  
Seat (Air): 0.55MPa (80psi)

Page 8 for Pressure-Temperature Ratings

## Class 150 Stainless Steel Ball Valves

### Full port, Split body, Side entry, Threaded ends

- Choice of threaded ends:
  - Rc threads to BS 21 (Fig. 150UTM)
  - NPT threads to ASME B1.20.1 (Fig. AK150UTM)



#### Dimensions

Valve Size	in.	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
	mm	10	15	20	25	32	40	50	65	80
Ball Bore		10	15	20	25	32	40	50	65	80
L		62	65	80	90	110	120	140	160	182
H		71	102	105	124	130	115	120	155	165
D		130	130	130	160	160	230	230	400	400

Unit: mm

#### Standard materials

Parts	Materials
Body	CF8M
Body cap	CF8M
Ball	316
Stem	316 or CF8M
Seat	PTFE
Gland packing	PTFE
Gasket	PTFE
Handle	Plastic covered S.S.

End-to-end dimensions: KITZ standard  
Wall thickness: ASME B16.34 Class 150

#### Valve operator

Lever operation

#### Test pressure

Shell (Hydrostatic): 2.93MPa (425psi)  
Seat (Air): 0.55MPa (80psi)

#### Note

• JIS 10K type is also available.

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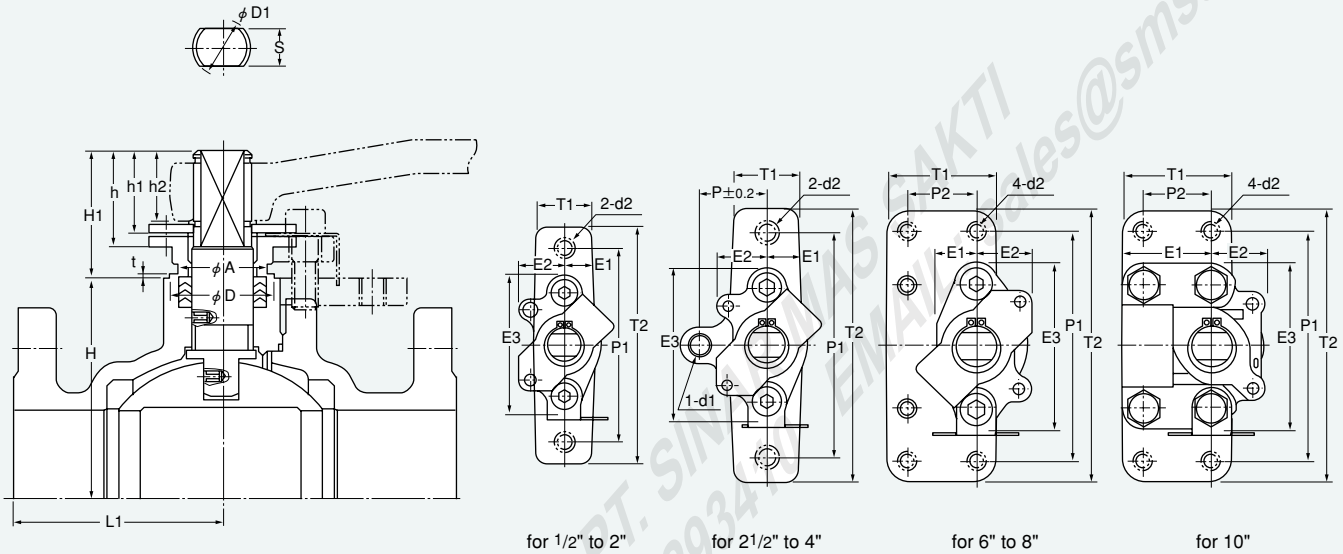
*Memo*

A large grid area for writing a memo, consisting of a grid of small squares. The grid is mostly empty, with a diagonal watermark across it.

PROVIDED BY: PT. SINAR MAS SAKTI  
TEL: (62 21) 6008088 FAX: (62 21) 6293470 EMAIL: sales@smsakti.com

## Dimensions of KITZ Standard Actuator Mounting Pad for Class 150 / 300 Full Port, Split Body, Side Entry Design Ball Valves

d1: Drilled.  
d2: Can be drilled as an option.



### Dimensions

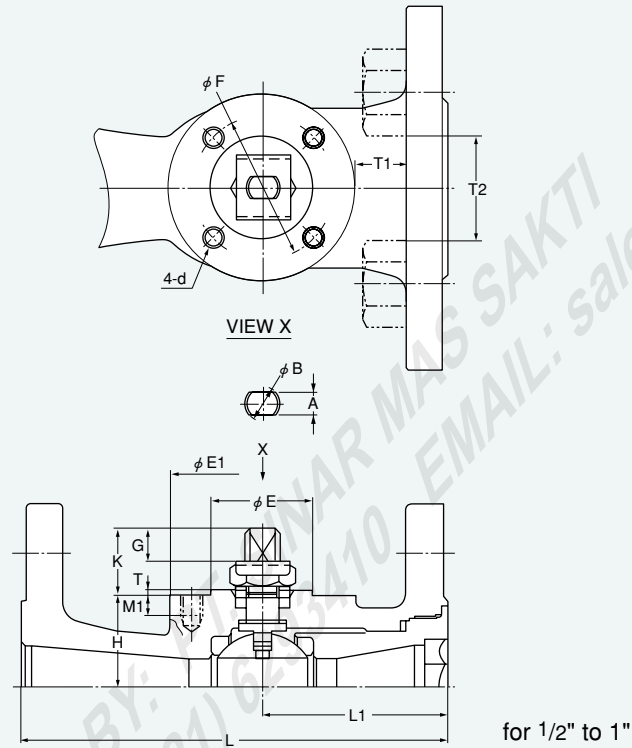
Unit: mm

Nominal size (in.)	H	H1	-0.1 -0.2 φ D	t	h	h1	h2	-0.05 -0.1 S	0 -0.2 φ D1	P	P1	P2	φ A	L1*				E1	E2	E3	T1	T2	d1	d2	
														(1)	(2)	(3)	(4)							M thread	UNC thread
1/2	33	31.5	24	2	23	17.1	14	8	12	—	72	—	19	42	43	58	57	12.5	20	55	21	92	—	M6	1/4-20 UNC
3/4	36	31.5	24	2	23	17.1	14	8	12	—	72	—	19	47	46	64.5	61	12.5	20	55	21	92	—	M6	1/4-20 UNC
1	43	36	30	2	25	19.8	16.5	10	15	—	90	—	24	50	52	69	68	16	23.5	68	25	110	—	M8	5/16-18 UNC
1 1/2	59	45.5	40	2	32	25.8	22	14	21	—	114	—	32	67	67	79.5	80	19.5	28.5	85	34	138	—	M10	3/8-16 UNC
2	66	45.5	40	2	32	25.8	22	14	21	—	114	—	32	74	77	93	85	19.5	28.5	85	34	138	—	M10	3/8-16 UNC
2 1/2	91	57	48	2	42	36	30.5	17	26	42	134	—	40	85	87	—	100	24	33.5	101	41.5	160	M12	M12	7/16-14 UNC
3	100	57	48	2	42	36	30.5	17	26	42	134	—	40	95	100	135	125	24	33.5	101	41.5	160	M12	M12	7/16-14 UNC
4	123	72	58	2	54	45.2	40.5	23	35	54	160	—	50	110	112.5	148	130	29	40	122	50	192	M16	M16	5/8-11 UNC
5	123	72	58	2	54	45.2	40.5	23	35	—	160	50	50	178	—	—	—	29	40	122	50	192	—	M16	5/8-11 UNC
6	168	85	70	2	67	57.2	51	27	40	—	174	55	58	197	197	201.5	190	33	45.5	134	91	210	—	M16	5/8-11 UNC
8	208	96	78	2	74	64	58	32	48	—	184	60	66	228.5	228.5	251	251	37	49	143	96	220	—	M16	5/8-11 UNC
10	268	106	92	2	82	73	66.5	40	58	—	216	75	78	266.5	266.5	—	—	96	57	167	117	258	—	M20	3/4-10 UNC

\* KITZ product codes:

- (1) 150UTBM (Actuator pad as an option)
- (2) 150SCTB (Actuator pad as standard)
- (3) 300UTBM (Actuator pad as an option)
- (4) 300SCTB (Actuator pad as standard)

## Dimensions of ISO 5211 Actuator Mounting Pad for Class 150 / 300 Regular Port, Uni-body, End Entry Design Ball Valves



### Dimensions

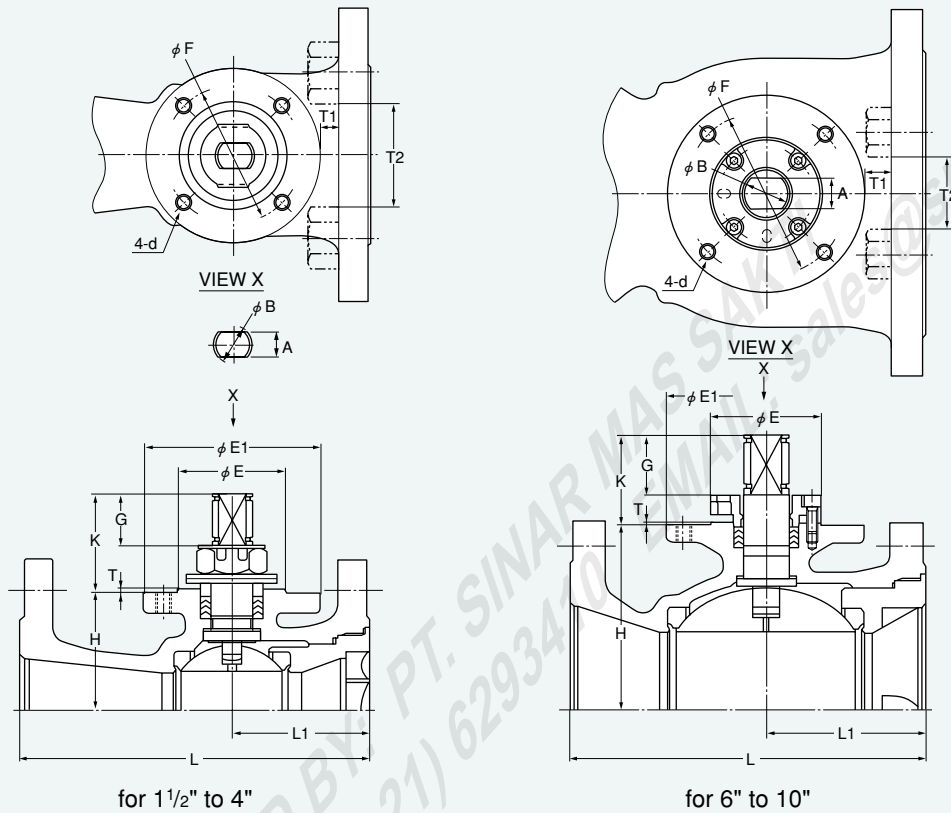
Unit: mm

Class	Nominal size (in.)	-0.02 -0.06 A	-0.1 -0.2 φB	-0.1 -0.2 φE	φE1	±0.2 φF	G	H	K	L	L1	d		M1	T	T1	T2	ISO 5211 flange type
												M thread	UNC thread★					
150	1/2	5	8	25	48	36	7.5	18.5	15	108	48	M6	1/4-20 UNC	5	1.5	11.5	17	F03
	3/4	5	8	25	48	36	7.5	21	15	117	48	M6	1/4-20 UNC	5	1.5	11.5	24	F03
	1	6	10	30	55	42	10	27	20	127	55	M6	1/4-20 UNC	6	1.5	14	30.5	F04
300	1/2	5	8	25	48	36	7.5	18.5	15	140	52	M6	1/4-20 UNC	5	1.5	12	21.5	F03
	3/4	5	8	25	48	36	7.5	21	15	152	57	M6	1/4-20 UNC	5	1.5	14	27	F03
	1	6	10	30	55	42	10	27	20	165	62	M6	1/4-20 UNC	6	1.5	14	31.5	F04

KITZ product codes:  
150SCTA  
150UTAM  
300SCTA  
300UTAM

★UNC threads optionally available.

## Dimensions of ISO 5211 Actuator Mounting Pad for Class 150 / 300 Regular Port, Uni-body, End Entry Design Ball Valves



### Dimensions

Unit: mm

Class	Nominal size (in.)	-0.02 -0.07 A	-0.1 -0.2 φ B	-0.1 -0.2 φ E	φ E1	±0.2 φ F	G	H	K	L	L1	d		T	T1	T2	ISO 5211 flange type
												M thread	UNC thread★				
150	1 1/2	10	14	35	65	50	20.5	48	39.5	165	58	M6	1/4-20 UNC	2	9.5	44	F05
	2	14	20	55	90	70	26.5	59	50	178	70	M8	5/16-18 UNC	2	6	54	F07
	3	17	24	55	90	70	36	84	65.5	203	75	M8	5/16-18 UNC	2	8	76.5	F07
	4	17	24	55	90	70	36	99	65.5	229	85	M8	5/16-18 UNC	2	13	41.5	F07
	6	23	35	85	150	125	43.5	136.5	66.5	267	120	M12	1/2-13 UNC	2	16.5	—	F12
	8	27	40	100	175	140	50	166	76.5	292	131	M16	5/8-11 UNC	2	12	—	F14
	10	32	48	130	210	165	58.5	202	90.5	330	164	M20	3/4-10 UNC	2	27	—	F16
300	1 1/2	10	14	35	65	50	20.5	48	39.5	190	65	M6	1/4-20 UNC	2	9	44	F05
	2	14	20	55	90	70	26.5	59	50	216	90	M8	5/16-18 UNC	2	19.5	17.5	F07
	3	17	24	55	90	70	36	84	65.5	283	98	M8	5/16-18 UNC	2	21.5	27.5	F07
	4	17	24	55	90	70	36	99	65.5	305	100	M8	5/16-18 UNC	2	20.5	39.5	F07
	6	23	35	85	150	125	43.5	136.5	66.5	403	138	M12	1/2-13 UNC	2	23.5	33	F12
	8	27	40	100	175	140	50	166	76.5	419	158	M16	5/8-11 UNC	2	26	43	F14
	10	32	48	130	210	165	58.5	202	90.5	457	189	M20	3/4-10 UNC	2	33.5	28	F16

KITZ product codes:  
150SCTA  
150UTAM  
300SCTA  
300UTAM

★UNC threads optionally available.

## Construction and Materials

No.	Parts	Standard	Super-firesafe
		150SCTB 300SCTB	150SCTB-FS 300SCTB-FS
1	Body	A105 (1/2" ~ 1 1/2")*1	
		A216 Gr. WCB (2" ~ 10")*1	
2	Body cap	A105 (1/2" ~ 1 1/2")*1	
		A216 Gr. WCB (2" ~ 10")*1	
3	Stem	A276 Type 304*2	
4	Ball	A276 Type 304 / A351 Gr. CF8*2	
7	Gland	A351 Gr. CF8	
8	Gland packing	PTFE	Flexible graphite
9	Handle*3	Ductile iron	
16A	Nameplate	Aluminum	
16B	Washer	Carbon steel	
19	Gasket	PTFE	Flexible graphite
20	Packing washer 1/2" ~ 1"	A276 Type 316	
30	Ball seat	HYPATITE® PTFE	
33	Cap nut	A194 Gr. 2H	
35	Cap bolt	A193 Gr. B7	
36	Gland bolt	Cr-Mo steel	
47	Thrust washer 1 1/2" ~ 10"	Reinforced PTFE	
48	Snap ring	Carbon steel	
49	Stopper	A276 Type 304	
67	Stem bearing	Reinforced PTFE	
123	Handle bolt	Carbon steel	
124A	Spring & pin 2 1/2" ~ 10"	A313 & A276 Type 316	
124B	Spring 1/2" ~ 2"	A313 Type 316	

\*1 A350 or A352 low-temperature service materials are optionally available.

\*2 CF8M or Type 316 is optionally available for balls & stems.

\*3 Bar type handle is used for 6" and 8". Worm gear operators are used for 10".

All part numbers are corresponding with those shown in valve assembly drawings.

■ Standard material configuration can be applied to sour service.

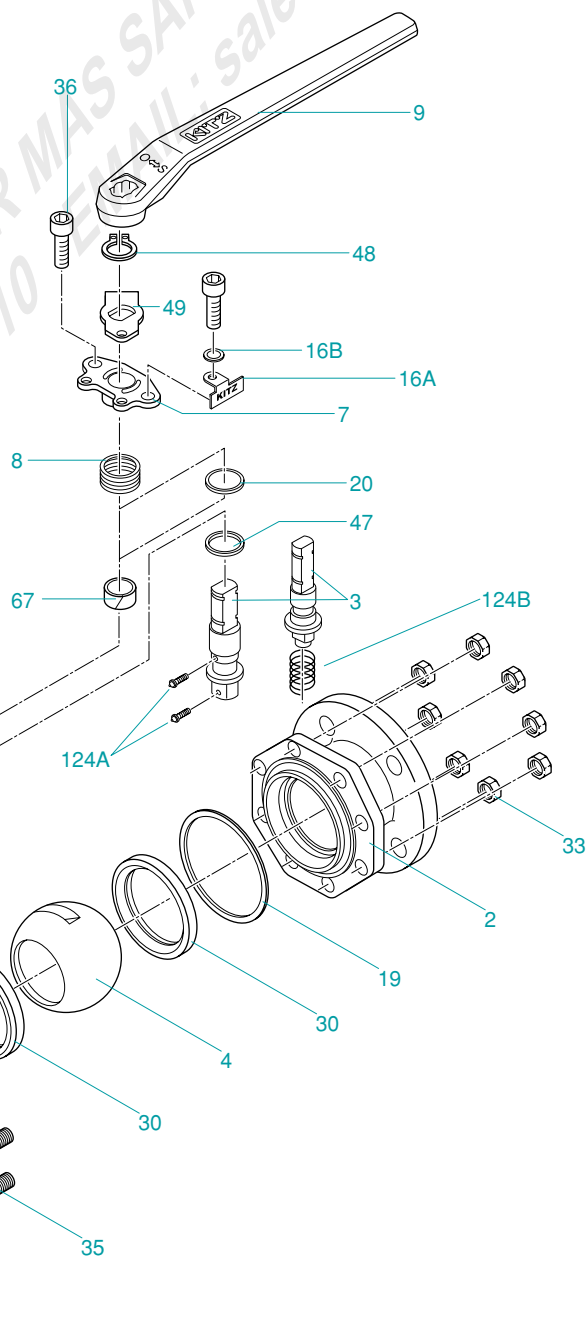


Illustration shows Size 4" design.

## Construction and Materials

No.	Parts	Standard	
		150SCTA 300SCTA	Super-firesafe 150SCTA-FS 300SCTA-FS
1	Body	A216 Gr. WCB*1	
3	Stem	A276 Type 304*2,3	
4	Ball	A276 Type 304 / A351 Gr. CF8	
7	Gland	1/2" ~ 1"	A276 Type 316
		1 1/2" ~ 4"	A276 Type 304*4
		6" ~ 10"	A351 Gr. CF8
8	Gland packing	PTFE	Flexible graphite
9	Handle*5	1/2" ~ 1"	Carbon steel
		1 1/2" ~ 4"	Ductile iron
10	Handle nut	1/2" ~ 1"	Stainless steel
16	Nameplate	Stainless steel	
19A	Primary gasket	PTFE	
19B	Secondary gasket	—	Flexible graphite
20	Packing washer	1 1/2" only	A276 Type 316
29	Body-insert	1/2" ~ 2" 8" 10"	A216 Gr. WCB
		3" ~ 6"	A105N
30	Ball seat	HYPATITE® PTFE	
34	Gland nut	1/2" ~ 1"	Stainless steel
		1 1/2" ~ 4"	Carbon steel
36	Gland bolt	6" ~ 10"	A193 Gr. B8M
40A	Lock plate	1/2" ~ 4"	Stainless steel
40B	Key lock plate	1/2" ~ 4"	Stainless steel
43	Spring washer	1/2" ~ 4"	Stainless steel
47	Thrust washer	Reinforced PTFE	
48	Snap ring	1 1/2" ~ 10"	Carbon steel
49	Stopper	1 1/2" ~ 10"	Stainless steel
67	Stem bearing	1 1/2" ~ 10"	Reinforced PTFE
123	Handle bolt	Carbon steel	
124	Spring + pin	Stainless steel	
126	Stopper pin	Stainless steel	
145	Spring washer	1 1/2" ~ 2"	Carbon steel
		3" ~ 10"	Stainless steel

■ Standard material configuration can be applied to sour service.

\*1 A352 low-temperature service materials are optionally available.  
 \*2 A479 / A479M Type 304 for 3" and larger.  
 \*3 Type 316 is optionally available.  
 \*4 A479 / A479M Type 304 for 3" and 4".  
 \*5 Bar type handles are used for 6" and larger.

All part numbers are corresponding with those shown in valve assembly drawings.

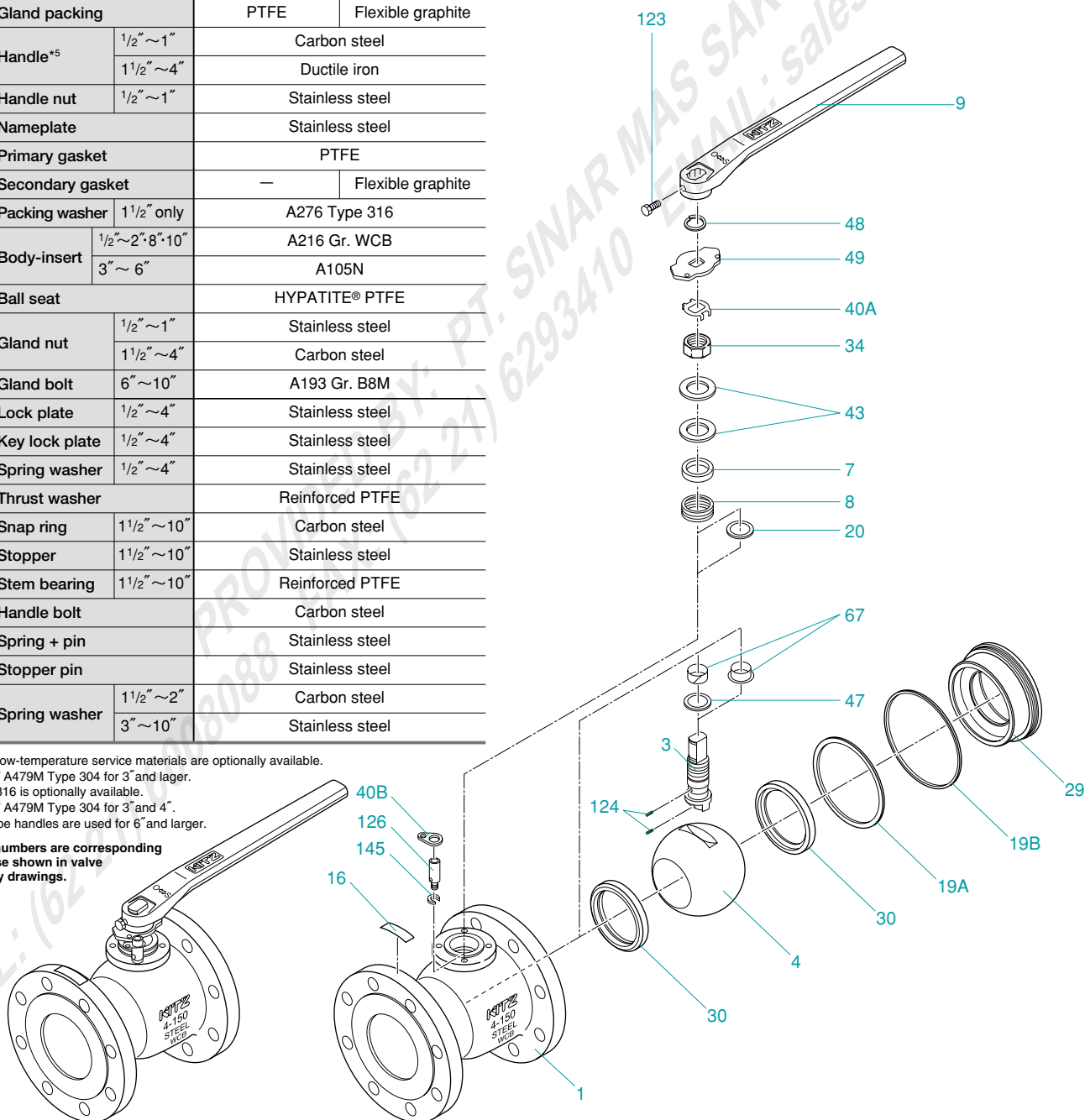


Illustration shows Size 4" design.

## Construction and Materials

No.	Parts	Standard		Super-firesafe
		150UTB 300UTB	150UTBM 300UTBM	150UTB-FS/UTBM-FS 300UTB-FS/UTBM-FS
1	Body	A351 Gr. CF8*1	A351 Gr. CF8M*1	A351 Gr. CF8/CF8M*1
2	Body cap	A351 Gr. CF8*1	A351 Gr. CF8M*1	A351 Gr. CF8/CF8M*1
3	Stem	A276 Type 304*1	A276 Type 316*1	A276 Type 304/316*1
4	Ball	A276 Type 304 or A351 Gr. CF8*1	A276 Type 316 or A351 Gr. CF8M*1	A276 Type 304/316 or A351 Gr. CF8/CF8M*1
7	Gland	A351 Gr. CF8		
8	Gland packing	PTFE		Flexible graphite
9	Handle*4	Ductile iron		
16A	Nameplate	Aluminum		
16B	Washer	Carbon steel		
19	Gasket	PTFE		Flexible graphite
20	Packing washer*2	A276 Type 316		
30	Ball seat	HYPATITE® PTFE*3		
33	Cap nut	A194 Gr. 8		
35	Cap bolt	A193 Gr. B8		
36	Gland bolt	A193 Gr. B8		
47	Thrust washer 4" ~ 10"	Reinforced PTFE		
48	Snap ring	A276 Type 304		
49	Stopper	A276 Type 304		
67	Stem bearing	Reinforced PTFE		
123	Handle bolt 6" ~ 10"	Carbon steel		
124A	Spring & pin 2 1/2" ~ 10"	A313 & A276 Type 316		
124B	Spring 1 1/2" ~ 2"	A313 Type 316		

■ Standard material configuration can be applied to sour service.

\*1 Other stainless steels are available as options.

\*2 Packing washers are used only for 1" and smaller.

\*3 Virgin PTFE for 10" Class 150.

\*4 Bar type handles are used for 6" and 8". Worm gear operations are used for 10".

All part numbers are corresponding with those shown in valve assembly drawings.

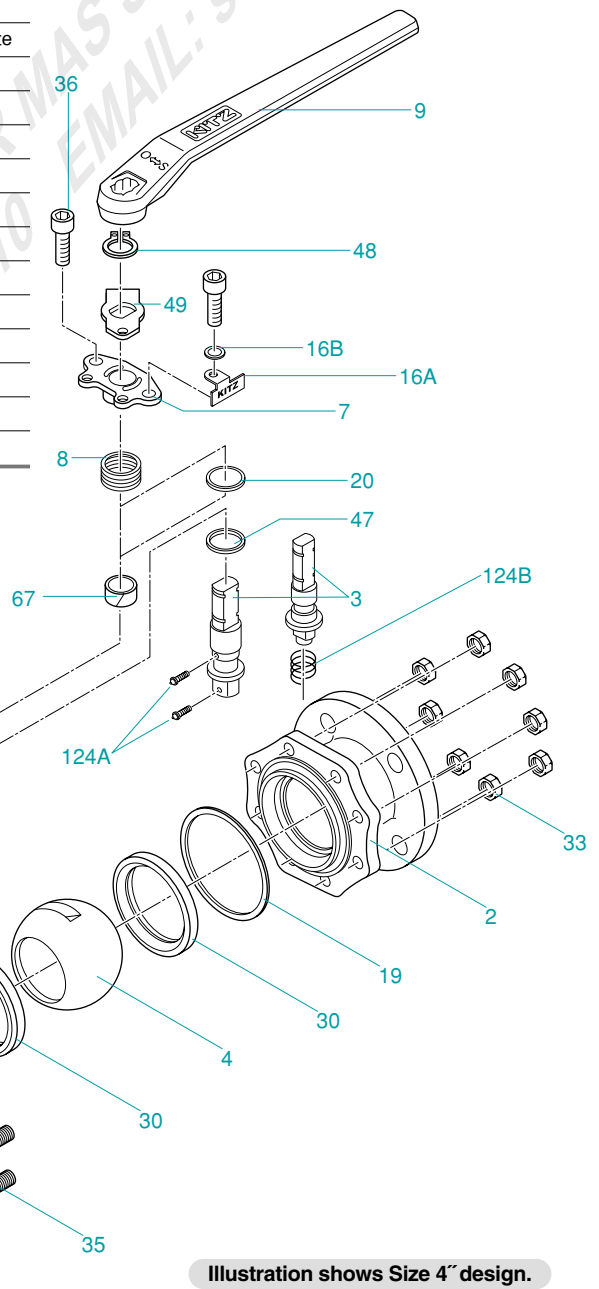


Illustration shows Size 4" design.

## Construction and Materials

No.	Parts	Standard		Super-firesafe	
		150UTA 300UTA	150UTAM 300UTAM	150UTA-FS/UTAM-FS 300UTA-FS/UTAM-FS	
1	Body	A351 Gr. CF8	A351 Gr. CF8M	A351 Gr. CF8/CF8M	
3	Stem	A276 Type 304*1	A276 Type 316*2	A276 Type 304/316*1,2	
4	Ball	A276 Type 304	A276 Type 316	A276 Type 304/316	
		A351 Gr. CF8	A351 Gr. CF8M	A351 Gr. CF8/CF8M	
7	Gland	1/2" ~ 1"	A276 Type 316		
		1 1/2" ~ 4"	A276 Type 304*3		
		6" ~ 10"	A351 Gr. CF8		
8	Gland packing	PTFE		Flexible graphite	
9	Handle*4	1/2" ~ 1"	Stainless steel		
		1 1/2" ~ 4"	Ductile iron		
10	Handle nut	1/2" ~ 1"	Stainless steel		
16	Nameplate	Stainless steel			
19A	Gasket	PTFE			
19B	Secondary gasket	-		Flexible graphite	
20	Packing washer	1 1/2" only	A276 Type 316		
29	Insert	1/2" ~ 2" 8" 10"	A351 Gr. CF8	A351 Gr. CF8M	A351 Gr. CF8/CF8M
		3" ~ 6"	A182 Gr. F304	A182 Gr. F316	A182 Gr. F304/F316
30	Ball seat	HYPATITE® PTFE			
34	Gland nut	1/2" ~ 4"	Stainless steel		
36	Gland bolt	6" ~ 10"	A193 Gr. B8M		
40A	Lock plate	1/2" ~ 4"	Stainless steel		
40B	Key lock plate	1/2" ~ 4"	Stainless steel		
43	Coned disc spring	1/2" ~ 4"	Stainless steel		
47	Thrust washer	Reinforced PTFE			
48	Snap ring	1 1/2" ~ 10"	Stainless steel		
49	Stopper	1 1/2" ~ 10"	Stainless steel		
67	Stem bearing	1 1/2" ~ 10"	Reinforced PTFE		
123	Handle bolt	Carbon steel			
124	Spring & pin	Stainless steel			
126	Stopper pin	Stainless steel			
145	Spring washer	1 1/2" ~ 10"	Stainless steel		

■ Standard material configuration can be applied to sour service.

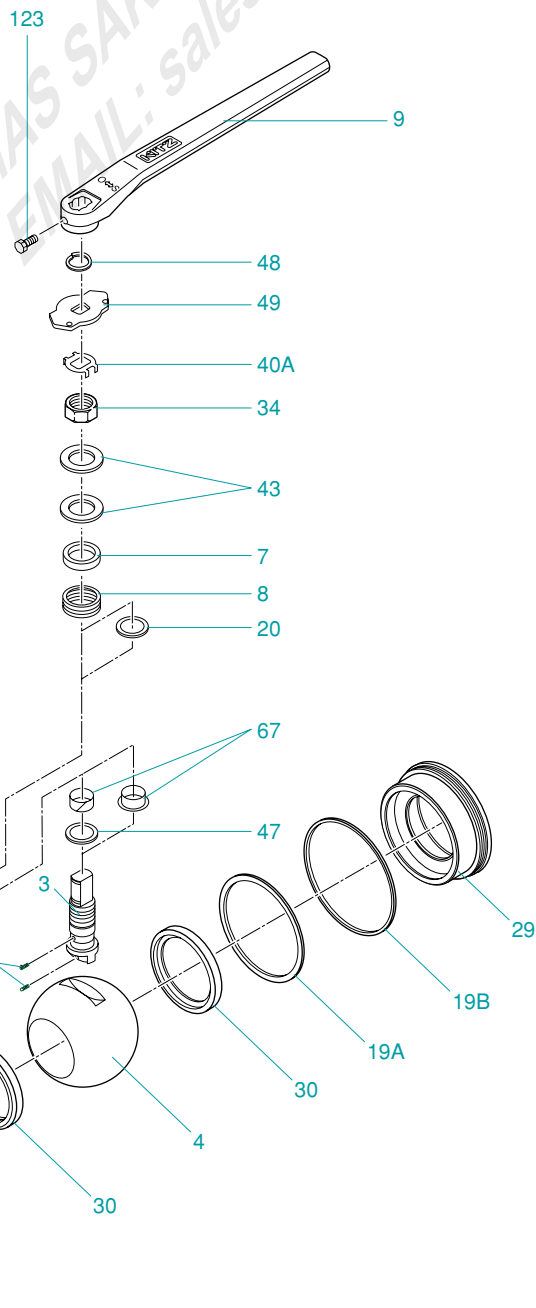


Illustration shows Size 4" design.

\*1 A479 / A479M Type 304 for 3" and larger.  
 \*2 A479 / A479M Type 316 for 3" and larger.  
 \*3 A479 / A479M Type 304 for 3" and 4".  
 \*4 Bar type handles are used for 6" and larger.

All part numbers are corresponding with those shown in valve assembly drawings.

## Construction and Materials

No.	Parts	Standard	Super-firesafe
		600SCTB	600SCTBS
1	Body	A105*1	
2	Body cap		
3	Stem	A276 Type 304*2	
4	Ball		
7	Gland	A351 Gr. CF8	
8	Gland packing	PTFE	Flexible graphite
9	Handle	Ductile iron	
16	Nameplate	Stainless steel	
19	Gasket*3	—	Flexible graphite spiral wound
20	Packing washer 1/2"~1"	A276 Type 316	
30	Ball seat	Reinforced PTFE with MoS <sub>2</sub>	
33	Cap nut	A194 Gr. 2H	
35	Cap bolt	A193 Gr. B7	
36	Gland bolt	Cr-Mo steel	
45A	O-ring	NBR	—
45B	O-ring	NBR	
47	Thrust washer	Metal-backed PTFE	
48	Snap ring	Carbon steel	
49	Stopper	A276 Type 304	
67	Stem bearing	Reinforced PTFE	
124	Spring & pin	A313 & A276 Type 316	
143	Seat spring	A167 Type 304	
150	Seat retainer	A105 Zn plating	
155	Spacer*3	—	PTFE
175	Retainer gland*3	—	A105
176	Retainer packing*3	—	Flexible graphite

■ An optional material configuration is available for your service.

\*1 A350 low-temperature service materials are optionally available.  
 \*2 CF8M or Type 316 and other stainless steels are optionally available for ball & stem.  
 \*3 These parts are used only for super-firesafe provision.

All part numbers are corresponding with those shown in valve assembly drawings.

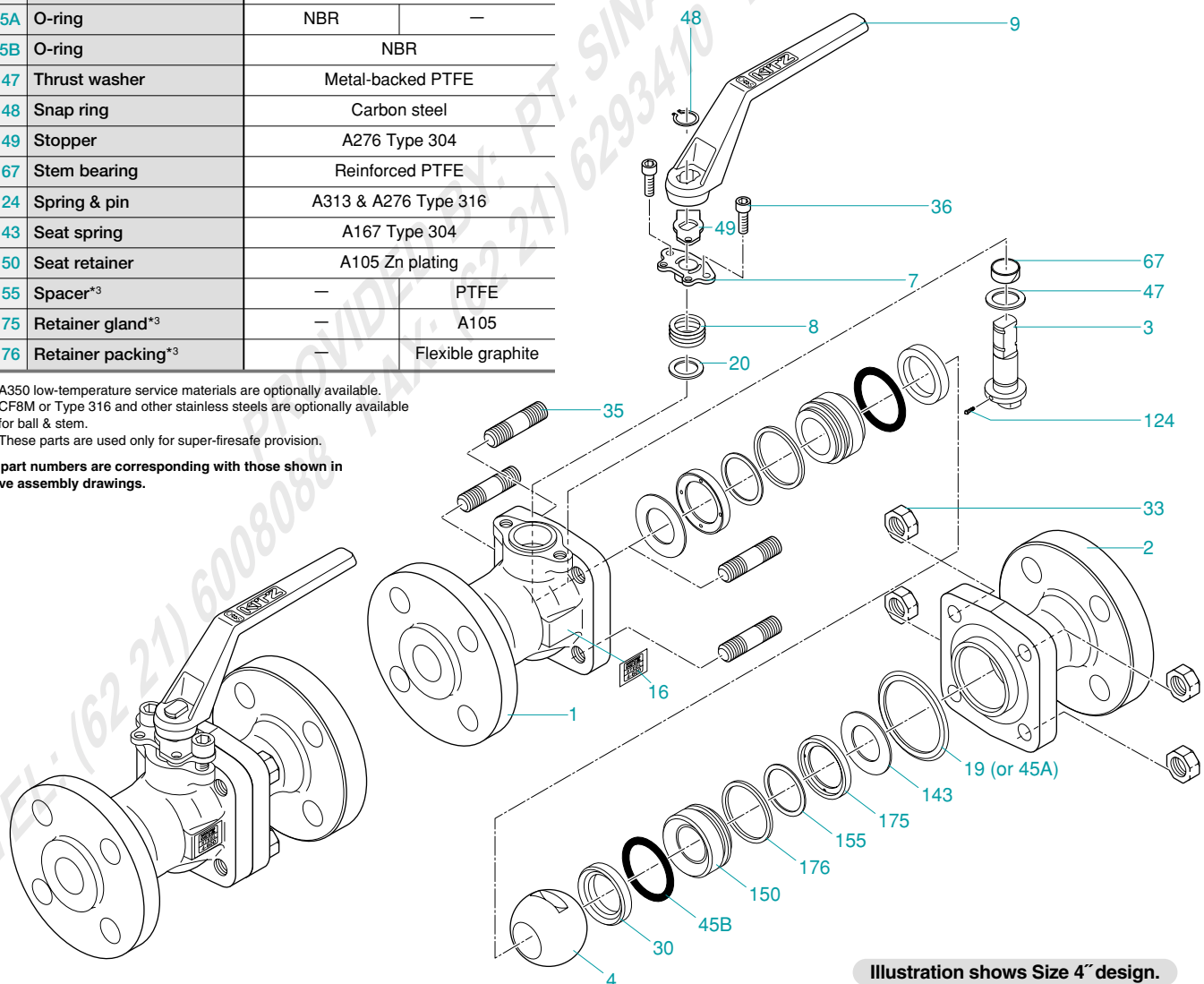


Illustration shows Size 4" design.

## Construction and Materials

■ Standard material configuration can be applied to sour service.

No.	Parts	Standard		Super-firesafe
		600UTB	600UTBM	600UTBS/UTBMS
1	Body	A351 Gr. CF8*2	A351 Gr. CF8M*2	A351 Gr. CF8/CF8M*2
2	Body Cap			
3	Stem	A276 Type 304*2	A276 Type 316*2	A276 Type 304/316*2
4	Ball			
7	Gland	A351 Gr. CF8		
8	Gland packing	PTFE		Flexible graphite
9	Handle	Ductile iron		
16	Nameplate	Stainless steel		
19	Gasket*1	—		Flexible graphite spiral wound
20	Packing washer 1/2" ~ 1"	A276 Type 316		
30	Ball seat	Reinforced PTFE with MoS <sub>2</sub>		
33	Cap nut	A194 Gr. 8		
35	Cap bolt	A193 Gr. B8		
36	Gland bolt	A193 Gr. B8		
45A	O-ring	FPM		—
45B	O-ring	FPM		
47	Thrust washer	Metal-backed PTFE		
48	Snap ring	A276 Type 304		
49	Stopper	A276 Type 304		
67	Stem bearing	Reinforced PTFE		
124	Spring & pin	A313 & A276 Type 316		
143	Seat spring	A167 Type 304	INCONEL X-750	A167 Type 304/ INCONEL X-750
150	Seat retainer	A276 Type 304	A276 Type 316	A276 Type 304/316
155	Spacer*1	—		PTFE
175	Retainer gland*1	—		A276 Type 304
176	Retainer packing*1	—		Flexible graphite

\*1 This parts are used only for super-firesafe provision.

\*2 Other stainless steel are optionally available.

All part numbers are corresponding with those shown in valve assembly drawings.

Refer to the illustration on Page 43.

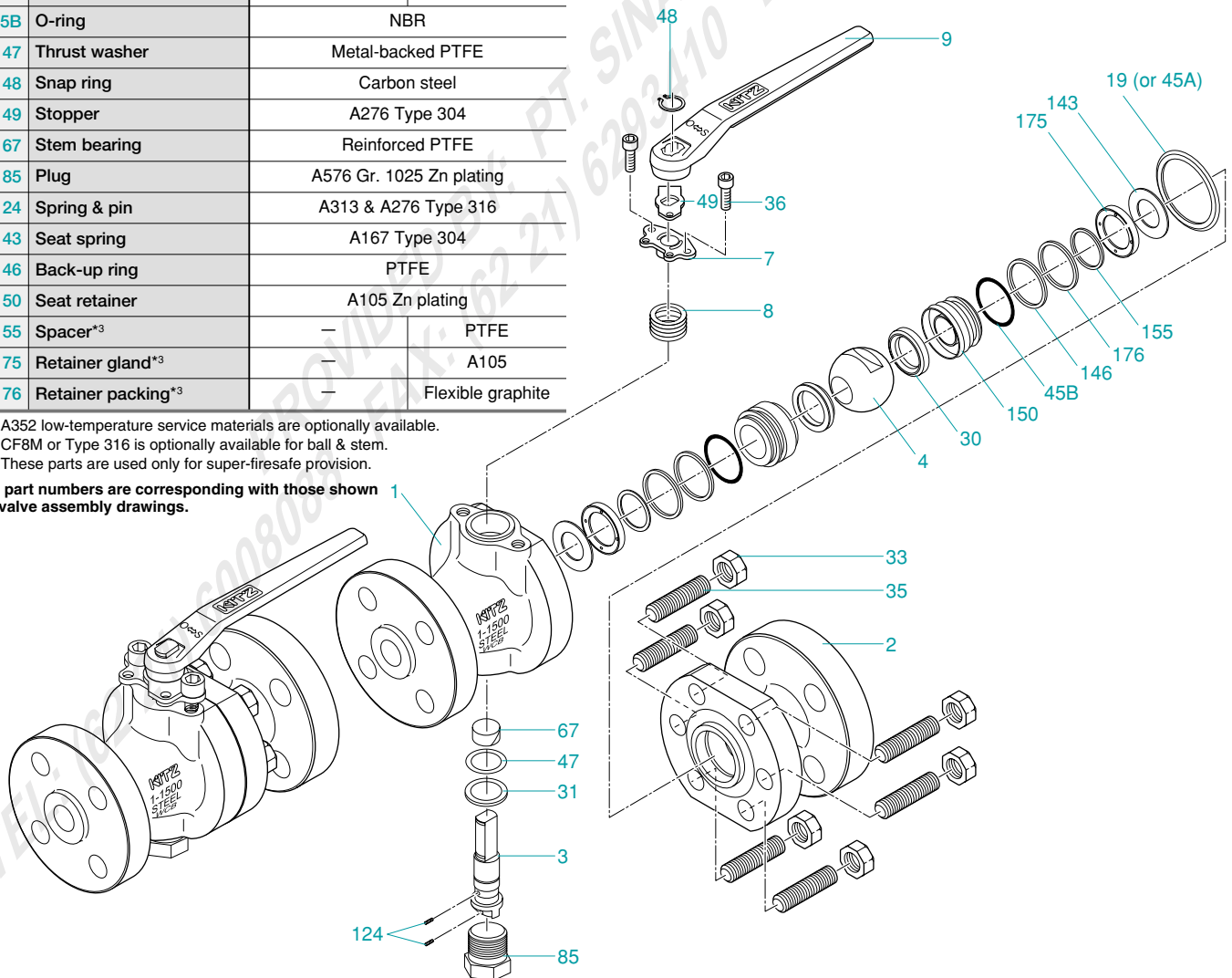
## Construction and Materials

No.	Parts	Standard	Super-firesafe
		1500SCTB	1500SCTBS
1	Body	A216 Gr. WCB*1	
2	Body cap		
3	Stem	A276 Type 304*2	
4	Ball		
7	Gland	A351 Gr. CF8	
8	Gland packing	PTFE	Flexible graphite
9	Handle	Ductile iron	
19	Gasket*3	—	Flexible graphite spiral wound
30	Ball seat	Nylon with MoS <sub>2</sub>	
31	Stem washer	A276 Type 316	
33	Cap nut	A194 Gr. 2H	
35	Cap bolt	A193 Gr. B7	
36	Gland bolt	Cr-Mo steel	
45A	O-ring	NBR	—
45B	O-ring	NBR	
47	Thrust washer	Metal-backed PTFE	
48	Snap ring	Carbon steel	
49	Stopper	A276 Type 304	
67	Stem bearing	Reinforced PTFE	
85	Plug	A576 Gr. 1025 Zn plating	
124	Spring & pin	A313 & A276 Type 316	
143	Seat spring	A167 Type 304	
146	Back-up ring	PTFE	
150	Seat retainer	A105 Zn plating	
155	Spacer*3	—	PTFE
175	Retainer gland*3	—	A105
176	Retainer packing*3	—	Flexible graphite

■ An optional material configuration is available for sour service.

\*1 A352 low-temperature service materials are optionally available.  
 \*2 CF8M or Type 316 is optionally available for ball & stem.  
 \*3 These parts are used only for super-firesafe provision.

All part numbers are corresponding with those shown in valve assembly drawings.



## Construction and Materials

■ Standard material configuration can be applied to sour service.

No.	Parts	Standard		Super-firesafe
		1500UTB	1500UTBM	1500UTBS/UTBMS
1	Body	A351 Gr. CF8*2	A351 Gr. CF8M*2	A351 Gr. CF8/CF8M*2
2	Body Cap			
3	Stem	A276 Type 304*2	A276 Type 316*2	A276 Type 304/316*2
4	Ball			
7	Gland	A351 Gr. CF8		
8	Gland packing	PTFE		Flexible graphite
9	Handle	Ductile iron		
19	Gasket*1	—		Flexible graphite spiral wound
30	Ball seat	Nylon with MoS <sub>2</sub>		
31	Stem washer	A276 Type 316		
33	Cap nut	A194 Gr. 8		
35	Cap bolt	A193 Gr. B8		
36	Grand bolt	A193 Gr. B8		
45A	O-ring	FPM		—
45B	O-ring	FPM		
47	Thrust washer	Metal-backed PTFE		
48	Snap ring	A276 Type 304		
49	Stopper	A276 Type 304		
67	Stem bearing	Reinforced PTFE		
85	Plug	A276 Type 316		
124	Spring & pin	A313 & A276 Type 316		
143	Seat spring	A167 Type 304	INCONEL X-750	A167 Type 304/ INCONEL X-750
146	Back-up ring	PTFE		
150	Seat retainer	A276 Type 304	A276 Type 316	PTFE 304/316
155	Spacer*1	—		PTFE
175	Retainer gland*1	—		A276 Type 304/316
176	Retainer packing*1	—		Flexible graphite

\*1 These parts are used only for super-firesafe provision.

\*2 Other stainless steel are optionally available.

All part numbers are corresponding with those shown in valve assembly drawings.

Refer to the illustration on Page 45.

# Technical Information

■ **Technical Features of KITZ HYPATITE® PTFE and SWELLESS® Ball Seats**

■ **Fire Test Standards**

■ **General Precautions**

■ **Flow Characteristics**

■ **Steel Pipe Flanges**

## Technical Features of KITZ HYPATITE® PTFE and SWELLESS® Ball Seats

KITZ **HYPATITE® PTFE** ball seats are made of denatured PTFE, a molecularly reinforced PTFE/PFA copolymer, and specifically engineered for high sealing performance and prolonged service life of valves, in place of conventional glass-filled PTFE seats. The unique performance features are compared with those of conventional glass-filled or virgin PTFE ball seats below. With the introduction of **HYPATITE® PTFE** ball seats, glass-filled PTFE version is not anymore available from KITZ Corporation, while carbon-filled or virgin PTFE seats remain available for special orders.

As a newly developed option, KITZ **SWELLESS®** ball seats principally made of PFA are recommended specifically for monomer service. This epoch-making new seat maximizes resistance to the permeation of monomer into its molecular structure (generally known as a “swelling” problem) which causes seat deformation and seriously affects shut-off function of valves in styrene and butadiene monomer service.

Our **HYPATITE® PTFE** ball seats also outperform conventional PTFE seats with its monomer resistance feature. However, it has been verified both by laboratory and on-site tests that **SWELLESS®** seats perform much better than **HYPATITE® PTFE** seats, as they indeed deserve the name of “SWELLESS”, their registered tradename Besides, PFA resin, the principal material, assures the known features of fluorine resin such as excellent resistance characteristics to high or low temperatures, creep or compression, abrasion and general chemicals.

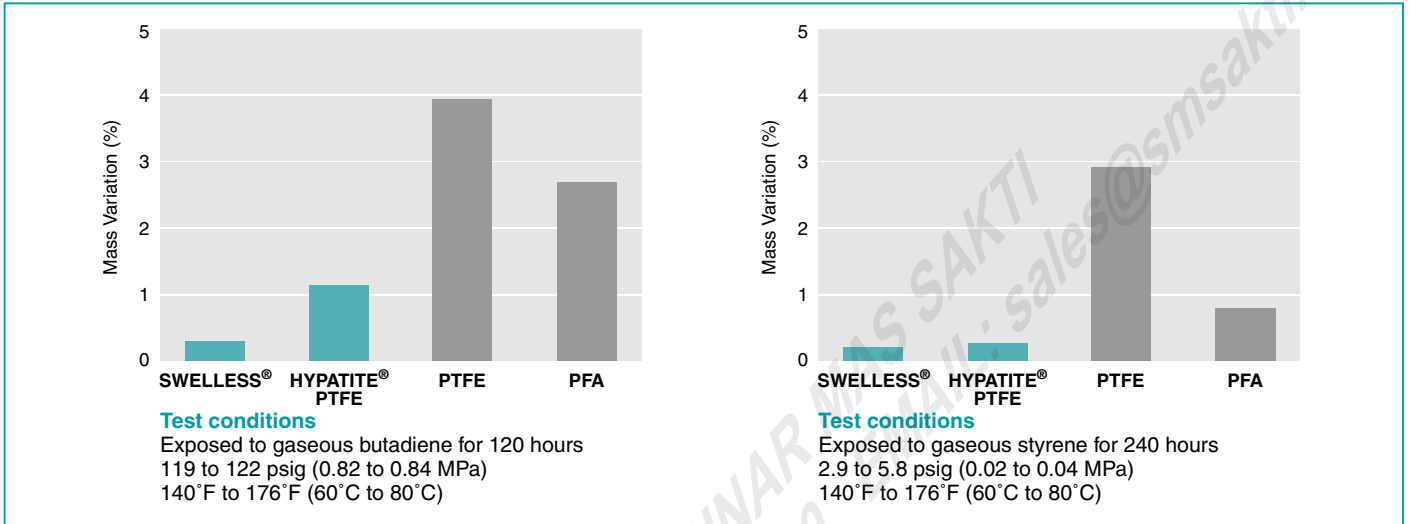
Table 1 and Figure 1, 2 and 3 here explain these technical features of **HYPATITE® PTFE** and **SWELLESS®** ball seats compared with conventional seat materials.

**Table 1. Compared Technical Features of KITZ Ball Seats**

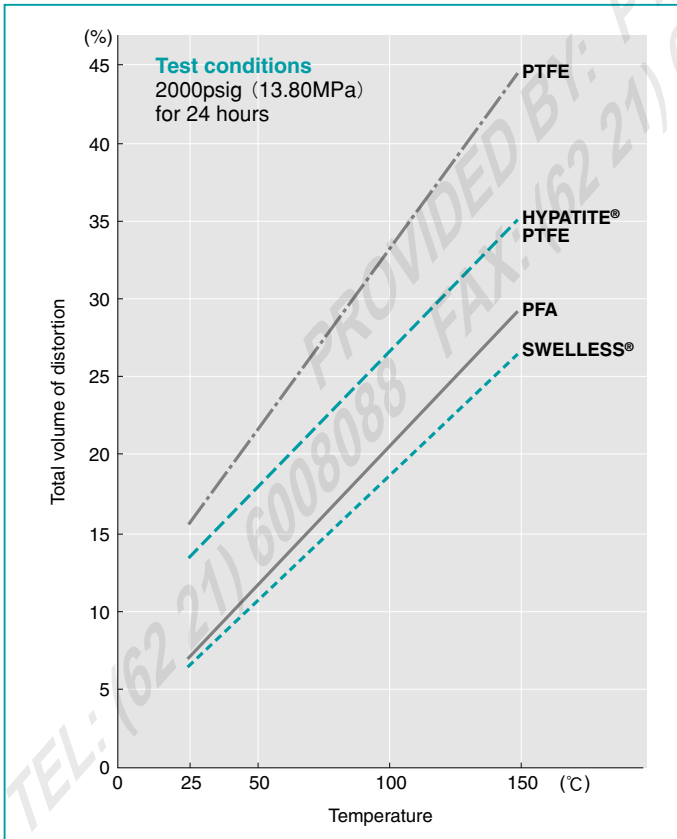
Compared features	HYPATITE® PTFE or SWELLESS® seats	PTFE seats	Glass-filled PTFE seats
Heat resistance	Good	—	Good
Sealing performance	Good	Good	Good
Durability (Pitting-proof)	Good	—	Fair
Creep and compress in resistance	Good	—	Fair
Chemical resistance *	Good	Good	—
Abrasion resistance	Good	Good	Good
Firesafe provision	Good	Good	—
Throttling service	Fair	Fair	Fair
Product contamination	None	None	—
Valve operating torque	Low	Low	Low

\* Refer to the above body text for monomer service characteristics of **SWELLESS®** seats.

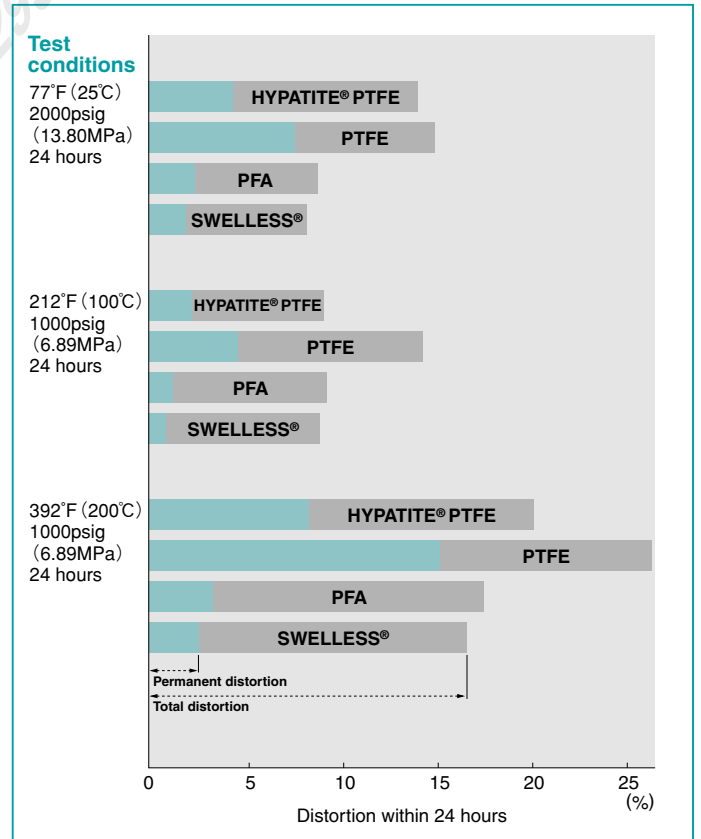
**Fig. 1 KITZ Ball Valve Seats Compared Lab Test Results against Gaseous Butadiene Monomer vs. Styrene Monomer**



**Fig. 2 KITZ Ball Valve Seats Compared Results of Mechanical Load Tests I**



**Fig. 3 KITZ Ball Valve Seats Compared Results of Mechanical Load Tests II**



These data show results of some of the tests carried out at our laboratory under the specific test conditions introduced here. Variation in the kind of test media, the phase of test media (gaseous or liquid), preparation of test specimen and test conditions such as pressure, temperature and duration, may cause the test results quantitatively different from these data, but general monomer resistance levels of the seats introduced here are comparatively as exhibited in these test data.

## Fire Test Standards

January 1, 2003

### 1. Introduction

Plant fires have become an increasingly serious concern due to the installation of a greater number of soft-seated ball and butterfly valves in place of conventional metal-seated gate and globe valves at many refineries and petrochemical plants. Extremely high temperatures usually result in decomposition or deterioration of resilient or non-metallic sealing components such as gland packing rings, O-rings and gaskets, causing leakage of line fluid which, in turn, increases the magnitude of plant fires.

To minimize the extent of damage in such a mishap, soft-seated valves are expected to have the provision for secondary metal-to-metal sealing functions to minimize external and internal (through-the-bore) leakages as well as the provision for undisturbed valve operation during or after the fire enabling emergency shut-off or release of line fluid.

Soft-seated valves may be manufactured to meet such critical fire safety requirements, if designed adequately, machined and assembled correctly, and equipped with proper sealing components.

Valves designed and manufactured in such a way may be called "firesafe valves". Manufacturers' claims of fire safety, however, remain subjective.

To verify the firesafe performance capability, the valve should be subjected to simulated plant fire conditions. API and BSI have developed technical specifications for such destructive tests, which are generally known as fire test standard. Fire test are destructive and cost a lot to carry out due to high test expenses and bills for a third party's certification, let alone the cost of destroyed samples. Such high costs eventually prohibit repetition of fire test. To minimize the frequency of fire tests, all existing fire test standards allow a certain range of sizes and pressure classes be qualified and certified without actual test being carried out, given that valves are designed the same and their non-metallic sealing materials are considered same as the actually tested valves.



### 2. History

**BS 6755, Part 2, 1987** (\*1) was issued to introduce, in a different form of presentation, the technical contents of **API 6FA, 1985** (\*2) and **API 607, 1985** (\*3), with an intention of replacing the requirements of BS 5146, Part 1, 1974, Appendix A.1 (\*4). Until this new British Standards was issued, technical discrepancies existing between British Standards and API Standards had unnecessarily incurred high costs to valve manufacturers who desired to get their products qualified and certified to these standards, and caused confusion to contractors and end-users for evaluation of the products to be purchased.

Even within the United States, valve manufacturers, contractors and end-users used to have similar kinds of difficulties caused by discrepant fire test requirements which had long existed between API Production Department (which is now responsible for API 6FA) and API Refining Department (which has been responsible for API 607).

Following the virtual unification of fire test requirements made by API Production and Refining Departments in their latest 1985 issues. BSI finally launched a major program to adopt American Standards as their own, which shall eventually help realize a globally unified fire test standard through ISO.

\*1 "Testing of valves: Specification for fire type-testing requirements".

\*2 "Specification for fire test for valves". (2nd edition was issued in 1994)

\*3 "Fire test for soft-seated quarter-turn valves". (4th edition issued in 1993 has nullified the qualification made according to this 3rd edition, as of May 1, 1996.)

\*4 "Inspection and test of valves: Specification for steel valves for the petroleum, petrochemical and allied industries: Fire safe testing of soft seated ball valves".

### 3. Objective of Standardization

As high-lighted by all of these standards, the fire test standard is prepared to establish test requirements which cover test procedures, performance requirements or evaluation criteria, product qualification and test certification, for the objective of technical evaluation of pressure-containing capability of valves exposed to pre-determined, simulated fire conditions.

Here, the performance requirements are intended to establish limits of acceptability of valves regardless of size, nominal pressure or class rating. The burn period, or test duration, is decided on the basis that it represents the maximum time required to extinguish most plant fires. Fires of longer duration than specified in the standards shall be, therefore, considered to be of a major magnitude with consequences, or damage, greater than those anticipated in the fire tests.

For this reason, requirements for more or less stringent testing may be negotiated and established by the valve manufacturer and his customer to meet the customer's specific service applications. In fact, API 607 was subjected to a major revision in its 4th Edition issued in 1993 for more realistic test requirements.

### 4. Evaluation of Test Results

The maximum allowable leakage rates in these standards are determined for the defined test temperature, pressure and duration. Here it is noted that leakages under other test conditions may be substantially different. Fire test standards are prepared for just a prototype test of the valve with a size and class rating selected by the manufacturer under pre-determined test conditions assumably representing typical plant fire conditions. This can be translated to mean that test reports certified to any of these fire test standards do not necessarily verify satisfactory performance of the valves that users may purchase from the manufacturer at any given time. As already mentioned, fire test is a kind of destructive test (unlike the pressure test conducted for normal valve shipments), and no one would be willing to purchase such destructively tested valves in a commercial transaction.

It was expressively mentioned by BS 5146, 1974, Appendix A.1 that the "test is intended only as a prototype test and is intended to cover a range of sizes of valves having the same pressure rating, design details and material composition". A test report prepared by BSI for the fire test conducted on KITZ ball valves mentioned that the "report only relates to the actual ball valves which were tested and assessed. The results obtained therefore do not necessarily relate to samples from the production line and in no way imply the performance or quality of the continuing production".

The range of sizes and pressure classes to be automatically qualified by a prototype test of a valve of a certain size and rating is introduced here.

Also it should be noted that potential leakage from pipe-to-valve end-connection joint (either flanged, threaded or welded) cannot be evaluated by these standards, and not included in the allowable external leakages specified. API Production Department issued a standard API Bulletin 6F1 (\*5), for performance evaluation of such valve end connections exposed to the fire.

#### Fire Test Valve Qualification (API 607-1993)

Size qualification		Pressure rating qualification	
Size of test valve (NPS)	Valve sizes qualified (NPS)	Rating of test valve (Class)	Valve sizes qualified (Class)
1/2	3/4" and smaller	150	150, 300
1	3/4", 1", 1 1/4", 1 1/2"	300	300, 400, 600
2	1 1/2", 2", 2 1/2", 3"	400	400, 600, 800
4	3", 4", 5", 6"	600	600, 800, 900
8	6" and larger	800	800, 900, 1500
		1500	1500, 2500

\*5 Bulletin on Performance of API and ANSI End Connections in a Fire Test According to API Specification 6FA, 2nd Edition, Feb. 15, 1994

## General Precautions for Trouble-free Operation of Soft-seated Ball Valves

### 1. Excessive Cavity Pressure

**Refer to Page 13. Very important**

### 2. High-Temperature and High-Pressure Service

The pressure-temperature ratings published by manufacturers are usually considered an appropriate guide to the maximum temperature and pressure that such ball valves may withstand. KITZ recommends, however, reference to the valve distributor or manufacturer for an assurance of suitability when ball valves are to be subjected to the following conditions:

- a: **Floating ball valves** are left closed for a long period of time under high temperature or high differential pressure.
- b: **Floating ball valves** are operated frequently for long period of time under high temperature or high differential pressure.
- c: **Floating ball valves** are subjected to frequent change of the line pressure or service temperature.

### 3. Liquids with High Velocity

When ball valves must be operated frequently on liquids with very high velocity, a check should be made with the valve distributor or manufacturer for appropriate advice to minimize the possibility of seat deformation, especially when they are highly pressurized on high-temperature lines.

### 4. Valve Selection

Be sure to select a valve with design specifications which meet the pressure and temperature conditions required. Take special care to select the valve to be used for the fluid containing abrasives, since the high molecular materials employed in the seats could suffer degradation.

### 5. Valve Mounting

Before mounting the valve, the pipe bore should be checked to confirm that no weld spatter, scale or rust particles remain inside. For mounting flanged valves, diagonally located flange bolts should be tightened evenly.

### 6. Degree of Valve Opening

Ball valves should basically be considered as ON/OFF valves only and care should be taken to ensure that they are fully closed or open. Opening ball valves partially will result in seat erosion and cause seat leakage. Pipelines that require the use of ball valves for throttling service should be designed in consideration of the amount of the seat leakage which may occur in its fully closed position. Note that ball valves should be stored in a fully open position.

### 7. Valve Actuation

Three types of pneumatic valve actuator (KITZ B-Series, F-Series, DAT-Series) are available for our factory mounting. Also KITZ "KELMO" electric actuators are available. Electric actuators or pneumatic actuators of any other specified brands are also available for our factory mounting.

In case of user's mounting their own actuators on KITZ ball valves, however, all users are recommended to contact KITZ or its authorized distributors for adequate technical advice, because any improper sizing of actuators may cause serious problems in the field. It must be carefully noted that the actual value of the operating torque of any given valve may vary, depending on the service conditions listed below:

- (1) Fluid
  - a. Kind of fluid
  - b. Line pressure
  - c. Line temperature
  - d. Fluid volume
- (2) Ambient temperature
- (3) Opening/closing degree
- (4) Type of actuator
- (5) Frequency and pattern of change of line pressure
- (6) Frequency and pattern of change of line and ambient temperatures

### 8. Valve Disassembly

The line fluid should be completely removed from the internal of the valves before they are dismantled from the pipeline for maintenance.

Even after the line fluid has been discharged through the pipeline, some fluid is always trapped inside the body and body cavity (the room surrounded by the body, ball and two seats).

Be sure to completely discharge the pressure trapped in the body cavity, before valve disassembly.

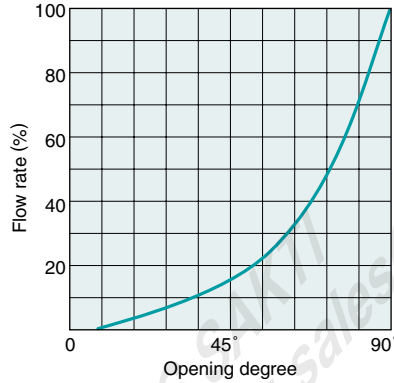
### Inspection and Warranty

Each KITZ ball valve is subjected to 100% in-house inspection designated by API 598 or BS 6755 Part 1. This includes hydrostatic shall tests and pneumatic low-pressure seat test. Manufacturer's material certificates and test reports are available upon request. Each KITZ ball valve is guaranteed for 12 months after placement in service, but not exceeding 18 months after shipment from KITZ factories.

## Flow Characteristics

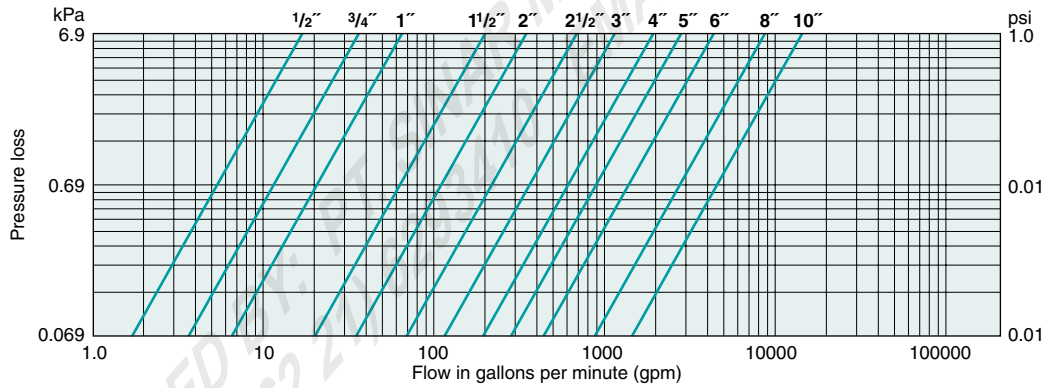
One of the best advantages of ball valves is that every flow per any given bore size is larger than other types of valves. Fluid is much less disturbed by eddy currents or pulsation. To obtain the figure of flow per valve opening, simply multiply the flow rate (%) given here by the corresponding value given in the table of Pressure Loss vs. Flow Rate.

Valve opening vs. flow rate

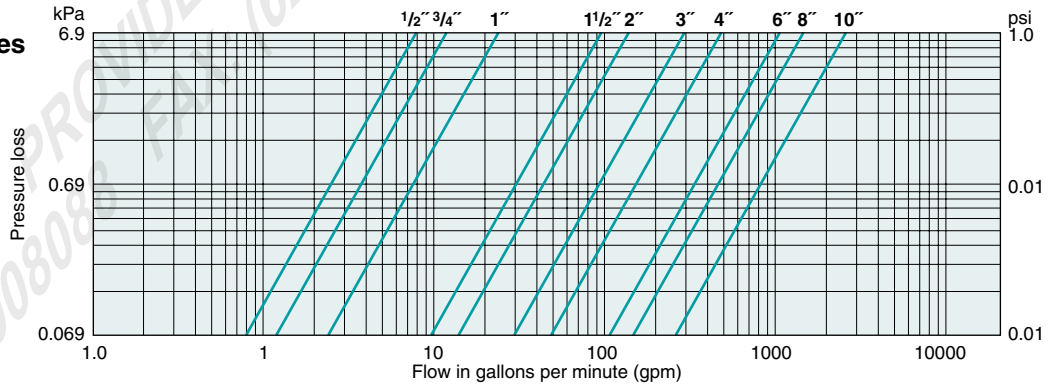


## Pressure Loss vs. Flow Rate

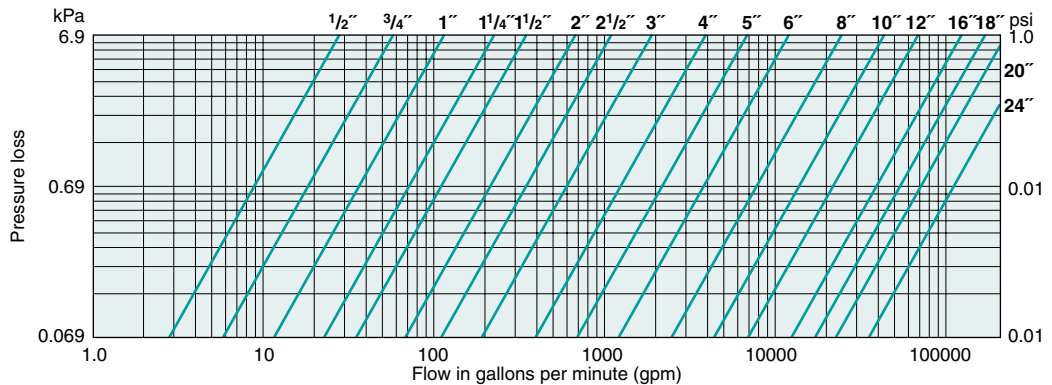
### Full port valves



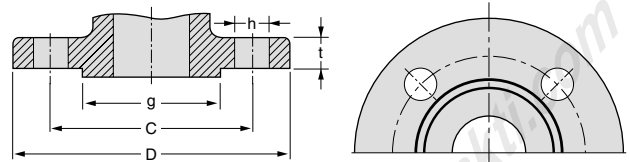
### Reduced port valves



### Schedule 40 steel pipe (10m)



## Steel Pipe Flanges



### ASME B16.5-1996 Class 150 RF, Class 300 RF

#### Class 150 steel pipe flange dimensions

Nominal Size		D		C		g		t		h (Bolt hole)		Bolt	
inch	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	Number	Diam.
1/2	15	3.50	89	2.38	60.5	1.38	35	0.44	11.2	0.62	16	4	1/2
3/4	20	3.88	98	2.75	70.0	1.69	43	0.50(0.44)	12.7(11.2)	0.62	16	4	1/2
1	25	4.25	108	3.12	79.5	2.00	51	0.56(0.44)	14.3(11.2)	0.62	16	4	1/2
1 1/4	32	4.62	117	3.50	89.0	2.50	64	0.62(0.50)	15.9(12.7)	0.62	16	4	1/2
1 1/2	40	5.00	127	3.88	98.5	2.88	73	0.69(0.56)	17.5(14.3)	0.62	16	4	1/2
2	50	6.00	152	4.75	120.5	3.62	92	0.75(0.62)	19.1(15.9)	0.75	19	4	5/8
2 1/2	65	7.00	178	5.50	139.5	4.12	105	0.88(0.69)	22.3(17.5)	0.75	19	4	5/8
3	80	7.50	190	6.00	152.5	5.00	127	0.94(0.75)	23.9(19.1)	0.75	19	4	5/8
4	100	9.00	229	7.50	190.5	6.19	157	0.94	23.9	0.75	19	8	5/8
5	125	10.00	254	8.50	216.5	7.31	186	0.94	23.9	0.88	22	8	3/4
6	150	11.00	279	9.50	241.5	8.50	216	1.00	25.4	0.88	22	8	3/4
8	200	13.50	343	11.75	298.5	10.62	270	1.12	28.6	0.88	22	8	3/4
10	250	16.00	406	14.25	362.0	12.75	324	1.19	30.2	1.00	25	12	7/8
12	300	19.00	483	17.00	432.0	15.00	381	1.25	31.8	1.00	25	12	7/8
14	350	21.00	533	18.75	476.5	16.25	413	1.38	35.0	1.12	29	12	1
16	400	23.50	597	21.25	539.5	18.50	470	1.44	36.6	1.12	29	16	1
18	450	25.00	635	22.75	578.0	21.00	533	1.56	39.7	1.25	32	16	1 1/8
20	500	27.50	698	25.00	635.0	23.00	584	1.69	42.9	1.25	32	20	1 1/8
24	600	32.00	813	29.50	749.5	27.25	692	1.88	47.7	1.38	35	20	1 1/4

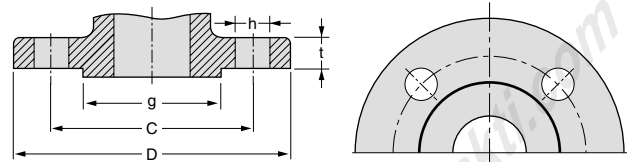
Height of raised face is 0.06 inch (1.6 mm) each. Dimensions in ( ) are for valve flanges.

#### Class 300 steel pipe flange dimensions

Nominal Size		D		C		g		t		h (Bolt hole)		Bolt	
inch	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	Number	Diam.
1/2	15	3.75	95	2.62	66.5	1.38	35	0.56	14.3	0.62	16	4	1/2
3/4	20	4.62	117	3.25	82.5	1.69	43	0.62	15.9	0.75	19	4	5/8
1	25	4.88	124	3.50	89.0	2.00	51	0.69	17.5	0.75	19	4	5/8
1 1/4	32	5.25	133	3.88	98.5	2.50	64	0.75	19.1	0.75	19	4	5/8
1 1/2	40	6.12	156	4.50	114.5	2.88	73	0.81	20.7	0.88	22	4	3/4
2	50	6.50	165	5.00	127.0	3.62	92	0.88	22.3	0.75	19	8	5/8
2 1/2	65	7.50	190	5.88	149.0	4.12	105	1.00	25.4	0.88	22	8	3/4
3	80	8.25	210	6.62	168.0	5.00	127	1.12	28.6	0.88	22	8	3/4
4	100	10.00	254	7.88	200.0	6.19	157	1.25	31.8	0.88	22	8	3/4
5	125	11.00	279	9.25	235.0	7.31	186	1.38	35.0	0.88	22	8	3/4
6	150	12.50	318	10.62	270.0	8.50	216	1.44	36.6	0.88	22	12	3/4
8	200	15.00	381	13.00	330.0	10.62	270	1.62	41.3	1.00	25	12	7/8
10	250	17.50	444	15.25	387.5	12.75	324	1.88	47.7	1.12	29	16	1
12	300	20.50	521	17.75	451.0	15.00	381	2.00	50.8	1.25	32	16	1 1/8
14	350	23.00	584	20.25	514.5	16.25	413	2.12	54.0	1.25	32	20	1 1/8
16	400	25.50	648	22.50	571.5	18.50	470	2.25	57.2	1.38	35	20	1 1/4
18	450	28.00	711	24.75	628.5	21.00	533	2.38	60.4	1.38	35	24	1 1/4
20	500	30.50	775	27.00	686.0	23.00	584	2.50	63.5	1.38	35	24	1 1/4
24	600	36.00	914	32.00	813.0	27.25	692	2.75	69.9	1.62	41	24	1 1/2

Height of raised face is 0.06 inch (1.6 mm) each.

## Steel Pipe Flanges



### Class 600 RF

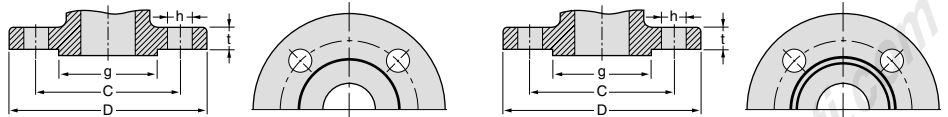
#### Class 600 steel pipe flange dimensions

Nominal Size		D		C		g		t		h (Bolt hole)		Bolt	
inch	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	Number	Diam.
1/2	15	3.75	95	2.62	66.5	1.38	35	0.56	14.3	0.62	16	4	1/2
3/4	20	4.62	117	3.25	82.5	1.69	43	0.62	15.9	0.75	19	4	5/8
1	25	4.88	124	3.50	89.0	2.00	51	0.69	17.5	0.75	19	4	5/8
1 1/4	32	5.25	133	3.88	98.5	2.50	64	0.81	20.7	0.75	19	4	5/8
1 1/2	40	6.12	156	4.50	114.5	2.88	73	0.88	22.3	0.88	22	4	3/4
2	50	6.50	165	5.00	127.0	3.62	92	1.00	25.4	0.75	19	8	5/8
2 1/2	65	7.50	190	5.88	149.0	4.12	105	1.12	28.6	0.88	22	8	3/4
3	80	8.25	210	6.62	168.0	5.00	127	1.25	31.8	0.88	22	8	3/4
4	100	10.75	273	8.50	216.0	6.19	157	1.50	38.1	1.00	25	8	7/8
5	125	13.00	330	10.50	266.5	7.31	186	1.75	44.5	1.12	29	8	1
6	150	14.00	356	11.50	292.0	8.50	216	1.88	47.7	1.12	29	12	1
8	200	16.50	419	13.75	349.0	10.62	270	2.19	55.6	1.25	32	12	1 1/8
10	250	20.00	508	17.00	432.0	12.75	324	2.50	63.5	1.38	35	16	1 1/4
12	300	22.00	559	19.25	489.0	15.00	381	2.62	66.7	1.38	35	20	1 1/4
14	350	23.75	603	20.75	527.0	16.25	413	2.75	69.9	1.50	38	20	1 3/8
16	400	27.00	686	23.75	603.0	18.50	470	3.00	76.2	1.62	41	20	1 1/2
18	450	29.25	743	25.75	654.0	21.00	533	3.25	82.6	1.75	45	20	1 5/8
20	500	32.00	813	28.50	724.0	23.00	584	3.50	88.9	1.75	45	24	1 5/8
24	600	37.00	940	33.00	838.0	27.25	692	4.00	101.6	2.00	51	24	1 7/8

Height of raised face is 0.25 inch (6.4 mm) each.

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 TEL: (62 21) 6008088 FAX:

## Steel Pipe Flanges



Class 600 to 1500

Class 150, 300

### Class 1500 RF

#### Class 1500 steel pipe flange dimensions

Nominal Size		D		C		g		t		h (Bolt hole)		Bolt	
inch	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	Number	Diam.
1/2	15	4.75	121	3.25	82.5	1.38	35	0.88	22.4	0.88	22	4	3/4
3/4	20	5.12	130	3.50	89.0	1.69	43	1.00	25.4	0.88	22	4	3/4
1	25	5.88	149	4.00	101.5	2.00	51	1.12	28.5	1.00	25	4	7/8
1 1/4	32	6.25	159	4.38	111.0	2.50	64	1.12	28.5	1.00	25	4	7/8
1 1/2	40	7.00	178	4.88	124.0	2.88	73	1.25	31.8	1.12	29	4	1
2	50	8.50	216	6.50	165.0	3.62	92	1.50	38.1	1.00	25	8	7/8
2 1/2	65	9.62	244	7.50	190.5	4.12	105	1.62	41.2	1.12	29	8	1
3	80	10.50	267	8.00	203.0	5.00	127	1.88	47.8	1.25	32	8	1 1/8
4	100	12.25	311	9.50	241.5	6.19	157	2.12	53.9	1.38	35	8	1 1/4
5	125	14.75	375	11.50	292.0	7.31	186	2.88	73.2	1.62	41	8	1 1/2
6	150	15.50	394	12.50	317.5	8.50	216	3.25	82.6	1.50	38	12	1 3/8
8	200	19.00	483	15.50	393.5	10.62	270	3.62	92.0	1.75	45	12	1 5/8
10	250	23.00	584	19.00	482.5	12.75	324	4.25	108.0	2.00	51	12	1 7/8
12	300	26.50	673	22.50	571.5	15.00	381	4.88	124.0	2.12	54	16	2
14	350	29.50	749	25.00	635.0	16.25	413	5.25	133.4	2.38	60	16	2 1/4
16	400	32.50	826	27.75	705.0	18.50	470	5.75	146.1	2.62	67	16	2 1/2
18	450	36.00	914	30.50	774.5	21.00	533	6.38	162.1	2.88	73	16	2 3/4
20	500	38.75	984	32.75	832.0	23.00	584	7.00	177.8	3.12	79	16	3
24	600	46.00	1168	39.00	990.5	27.25	692	8.00	203.2	3.62	92	16	3 1/2

Height of raised face is 0.25 inch (6.4 mm) each.

### ASME B16.47-1996 (Series A)

#### Class 150 steel pipe flange dimensions

Nominal Size		D		C		g		t		h (Bolt hole)		Bolt	
inch	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	Number	Diam.
26	650	34.25	870	31.75	806.5	29.50	749	2.69	68.4	1.38	35	24	1 1/4
28	700	36.50	927	34.00	863.5	31.50	800	2.81	71.4	1.38	35	28	1 1/4
30	750	38.75	984	36.00	914.5	33.75	857	2.94	74.7	1.38	35	28	1 1/4
32	800	41.75	1060	38.50	978.0	36.00	914	3.18	80.8	1.62	41	28	1 1/2
34	850	43.75	1111	40.50	1029.0	38.00	965	3.25	82.6	1.62	41	32	1 1/2
36	900	46.00	1168	42.75	1086.0	40.25	1022	3.56	90.5	1.62	41	32	1 1/2

Height of raised face is 0.06 inch (1.6 mm) each.

#### Class 300 steel pipe flange dimensions

Nominal Size		D		C		g		t		h (Bolt hole)		Bolt	
inch	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	Number	Diam.
26	650	38.25	972	34.50	876.5	29.50	749	3.12	79.3	1.75	45	28	1 5/8
28	700	40.75	1035	37.00	940.0	31.50	800	3.38	85.9	1.75	45	28	1 5/8
30	750	43.00	1092	39.25	997.0	33.75	857	3.62	92.0	1.88	48	28	1 3/4
32	800	45.25	1149	41.50	1054.0	36.00	914	3.88	98.6	2.00	51	28	1 7/8
34	850	47.50	1207	43.50	1105.0	38.00	965	4.00	101.6	2.00	51	28	1 7/8
36	900	50.00	1270	46.00	1168.5	40.25	1022	4.12	104.7	2.12	54	32	2

Height of raised face is 0.06 inch (1.6 mm) each.

#### Class 600 steel pipe flange dimensions

Nominal Size		D		C		g		t		h (Bolt hole)		Bolt	
inch	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	Number	Diam.
26	650	40.00	1016	36.00	914.5	29.50	749	4.25	108.0	2.00	51	28	1 7/8
28	700	42.25	1073	38.00	965.0	31.50	800	4.38	111.3	2.12	54	28	2
30	750	44.50	1130	40.25	1022.5	33.75	857	4.50	114.3	2.12	54	28	2

Height of raised face is 0.25 inch (6.4 mm) each.

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