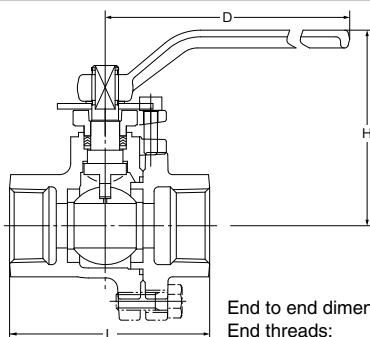


## 20K Ball Valves (Reduced Bore)

### 20ST 20STL (Gas service)



End to end dimensions: KITZ Std.  
End threads: JIS B 0203

#### Maximum Service Pressure

Code	Temperature	Pressure
20ST	110°C W.O.G.	2.8 MPa
	140°C W.O.G.	2.0 MPa
20STL	80°C gas.	2.4 MPa

● Use for lubricating or hydraulic oil is acceptable.

#### Materials

Parts	JIS Material
Body	FCD-S
Body cap	FCD-S
Stem	SUS 403
Ball	SUS 304/SCS 13A
Gland	FCD-S
Gland packing	PTFE
Gasket	PTFE
Ball seat	HYPATITE® PTFE
O ring*	NBR
Gland bolt	SCM 435
Cap bolt	S45C
Handle	FCD 400
Name plate*	SUS 304

\*for 20STL only

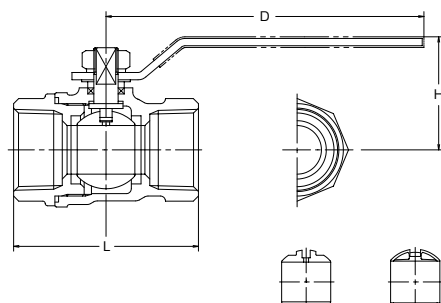
#### Dimensions of 20ST, 20STL

Unit: mm

Nominal Size	NPS	1/2	3/4	1	1 1/4	1 1/2	2
	DN	15	20	25	32	40	50
L		75	80	90	105	115	130
H		106	106	107	129	133	114
D		130	130	130	160	160	230

## Type 400 Ball Valves (Reduced Bore)

### STZ



End to end dimensions: KITZ Std.  
End threads: JIS B 0203

NPS 1 & 1 1/4

NPS 1 1/2 & 2

W.O.G. at Room temp ..... 2.75 MPa  
Saturated steam ..... 0.98 MPa

● Use for lubricating or hydraulic oil is acceptable.

#### Materials

Parts	JIS Material
Body	FCD-S
Cap	FCD-S
Ball	C3771BE* <sup>1</sup>
Stem	C3531* <sup>1</sup>
Gland packing	PTFE
Ball seat	Reinforced PTFE
Gland	C3604BD* <sup>2</sup>
Gasket	PTFE
Handle nut	SS 400* <sup>3</sup>
Handle	SUS 430* <sup>4</sup>

\*<sup>1</sup>Ni + Cr electroplated

\*<sup>2</sup>Zinc electroplated

\*<sup>3</sup>Zinc dichromate electroplated

\*<sup>4</sup>Plastic covering

#### Dimensions of STZ

Unit: mm

Nominal Size	NPS	1/2	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	DN	8	10	15	20	25	32	40	50
L		46	51	57	65	76	86	95	115
H		38	38	42	49	52	57	63	68
D		80	80	100	130	130	130	130	150

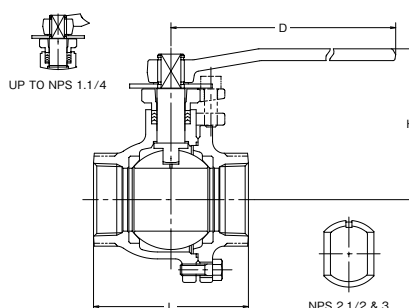
## 10K Iron Threaded Ball Valves (Full Bore)

120°C non-shock water 1.4 MPa, 120°C W.O.G. 1.0 MPa  
Saturated steam 0.7 MPa

### 10FCT



Blowout-proof stem



NPS 2 1/2 & 3

Unit: mm

#### Dimensions of 10FCT

Nominal Size	NPS	3/8	1/2	1/2	1	1 1/4	1 1/2	2	2 1/2	3
	DN	10	15	20	25	32	40	50	65	80
L		72	80	85	95	120	120	140	160	182
H		71	102	105	125	130	115	120	155	165
D		130	130	130	160	160	230	230	400	400

#### Materials

Parts	Material	JIS Spec.
Body	Cast iron	FC200
Body cap	Cast iron	FC200
Stem	Stainless steel	SUS403
Ball	Stainless steel	SCS13A or SUS304 or SUS304TP
Gland packing		PTFE
Gasket		PTFE
Ball Seat		PTFE
Cap bolt	Carbon steel	SS400
Handle	Ductile iron	FCD400

#### Design Specifications

Items	
Shell wall thickness and general valve design	KITZ standard
Face to face dimensions End to end dimensions	KITZ standard
End connection	JIS B0203

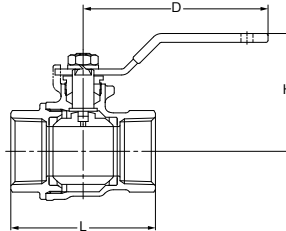
## Type 600 Brass Ball Valves (Full Bore)

W.O.G. non-shock 4.2 MPa (600 psi), Saturated steam pressure 1.05 MPa (150 psi)

Screwed body cap, Blowout-proof stem,  
Threaded ends to ASME B1.20.1

### AKTAF

- Threaded end to ASME B1.20.1



#### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass: Tin-nickel plated (NPS 1/4 to 1) TEA plated (NPS 1 1/4 to 2)
Ball seat	PTFE
Gland packing	PTFE

#### Dimensions of AKTAF

Unit: mm

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	DN	8	10	15	20	25	32	40	50
L		41	42	53	60	72	82	92	105
H		39	39	42	51	59	64	73	80
D		82	82	82	100	130	130	150	150



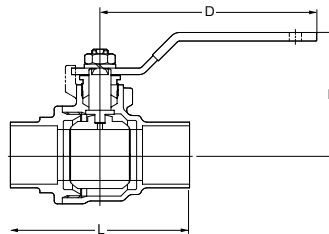
## Type 600 Brass Ball Valves (Full Bore)

W.O.G. non-shock 4.2 MPa (600 psi), Saturated steam pressure 1.05 MPa (150 psi)

Screwed body cap, Blowout-proof stem,  
Solder joint ends to ASME B16.18

### CTAF

- Solder joint end to ASME B16.18



#### Materials

\*NPS 2 1/2 & 3

Parts	Material
Body	Brass/Bronze*
Body cap	Brass/Bronze*
Stem	Dezincification resistant brass
Ball	Brass: Tin-nickel plated (NPS 3/8 to 1) Brass: TEA plated (NPS 1 1/4 to 3)
Ball seat	PTFE
Gland packing	PTFE



Solder joint end valves should not be used in service where the temperature of the line fluid is higher than the softening point of the solder.

#### Dimensions of CTAF

Unit: mm

Nominal Size	NPS	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
	DN	10	15	20	25	32	40	50	65	80
L		46	54	73	88	100	115	140	163	187
H		39	42	51	59	64	73	80	108	122
D		82	82	100	130	130	150	150	200	300



## Type 600 Brass Ball Valves (Full Bore)

W.O.G. non-shock 4.2 MPa (600 psi), Saturated steam pressure 1.05 MPa (150 psi)  
Maximum pressure temperature limitation: 150 psi at 300°F

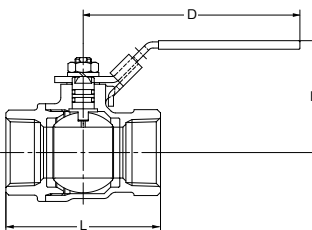
Screwed body cap, Blowout-proof stem,  
Double O-ring stem seals,  
Threaded ends to NPT or solder joint ends

### AKTFLL

- Threaded end to ASME B1.20.1

### CTFLL

- Solder joint end to ASME B16.18



#### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass: Nickel-chrome plating
Ball seat	PTFE
O-ring	NBR, FKM: CTFLL only



Solder joint end valves should not be used in service where the temperature of the line fluid is higher than the softening point of the solder.

#### Dimensions of AKTFLL, CTFLL

Unit: mm

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	DN	8	10	15	20	25	32	40	50
L		41	42	53	60	72	82	92	105
L1 (Solder)				54	73	88	100	115	140
H		35	35	39	47	55	59	67	75
D		82	82	82	100	130	130	150	150



\*AKTFLL only \*\*CTFLL only

## Type 600 Brass Ball Valves (Full Bore)

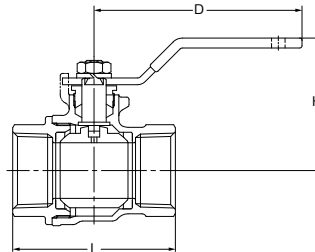
W.O.G. non-shock 4.2 MPa (600 psi), Saturated steam pressure 1.05 MPa (150 psi)

### AKTAFM

- Threaded end to ASME B1.20.1

### CTAFM

- Solder joint end to ASME B16.18



### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Stainless steel (Type 316)
Ball	Stainless steel (Type 316 or Gr. CF8M)
Ball seat	PTFE
Gland packing	PTFE



Solder joint end valves should not be used in service where the temperature of the line fluid is higher than the softening point of the solder.

Unit: mm

### Dimensions of AKTAFM, CTAFM

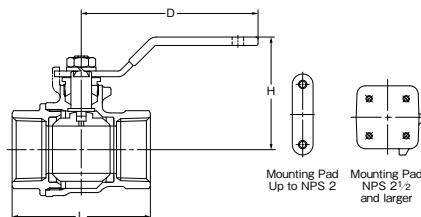
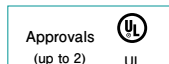
Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	DN	8	10	15	20	25	32	40	50
L		41	42	53	60	72	82	92	105
L1 (Solder)			46	54	73	88	100	115	140
H		39	39	42	51	59	64	73	80
D		82	82	82	100	130	130	150	150

## Type 600 Brass Ball Valves (Full Bore)

W.O.G. non-shock 4.2 MPa (600 psi), Saturated steam pressure 1.05 MPa (150 psi)

### AKTAFP

- Threaded end to ASME B1.20.1



### Materials

Parts	Material
Body	Brass/Bronze*
Body cap	Brass/Bronze*
Stem	Dezincification resistant brass
Ball	Brass: Nickel-chrome plating
Ball seat	PTFE
Gland packing	PTFE

\*NPS 2 1/2 and larger

### Dimensions of AKTAFP

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
	DN	8	10	15	20	25	32	40	50	65	80	100
L		41	42	53	60	72	82	92	105	135	156	192
H		39	39	42	51	59	64	73	80	108	122	140
D		82	82	82	100	130	130	150	150	200	300	300

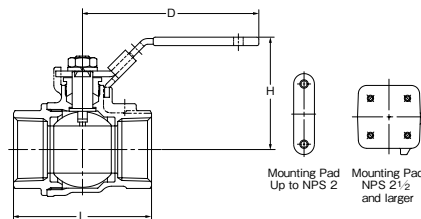
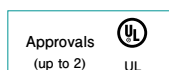
Unit: mm

## Type 600 Brass Ball Valves (Full Bore)

W.O.G. non-shock 4.2 MPa (600 psi), Saturated steam pressure 1.75 MPa (250 psi)

### AKTAFPM

- Threaded end to ASME B1.20.1



### Materials

Parts	Material
Body	Brass/Bronze*
Body cap	Brass/Bronze*
Stem	Stainless steel (Type 316)
Ball	Stainless steel (Type 316 or Gr. CF8M)
Ball seat	Reinforced PTFE
Gland packing	Reinforced PTFE

\*NPS 2 1/2 and larger

### Dimensions of AKTAFPM

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
	DN	8	10	15	20	25	32	40	50	65	80	100
L		41	42	53	60	72	82	92	105	135	156	192
H		39	39	42	51	59	64	73	80	108	122	140
D		82	82	82	100	130	130	150	150	200	300	300

Unit: mm

## Type 600 Brass Ball Valves (Full Bore)

W.O.G. non-shock 4.2 MPa (600 psi), Saturated steam pressure 1.05 MPa (150 psi)

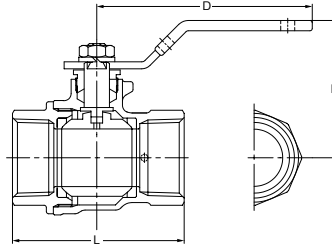
Drainable, Screwed body cap,  
Blowout-proof stem, Drain port,  
Threaded ends to ASME B1.20.1

### AKTAFD

- Threaded end to ASME B1.20.1

### CTAFD

- Solder joint end to ASME B16.18



### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass: Nickel-chrome plated
Ball seat	PTFE
Gland packing	PTFE



Solder joint end valves should not be used in service where the temperature of the line fluid is higher than the softening point of the solder.

Unit: mm

### Dimensions of AKTAFD, CTAFD

Nominal Size	NPS	1/2	3/4	1
	DN	15	20	25
L		55	62	73
L1 (Solder)		54	73	88
H		42	51	59
D		82	100	130

## Type 600 Brass Ball Valves (Full Bore)

W.O.G. non-shock 4.2 MPa (600 psi), Saturated steam pressure 1.05 MPa (150 psi)

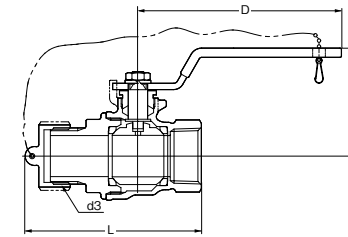
Threaded end 3/4" Hose connection,  
with cap & chain, Blowout-proof stem,  
Threaded/Hose connection  
(ASME B1.20.1/ASME B1.20.7 3/4" 11.5NHR)

### AKTAFD

- Threaded end to ASME B1.20.1

### CTAFD

- Solder joint end to ASME B16.18



### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass: Nickel-chrome plated
Ball seat	PTFE
Gland packing	PTFE



Solder joint end valves should not be used in service where the temperature of the line fluid is higher than the softening point of the solder.

Unit: mm

### Dimensions of AKTAFD, CTAFD

Nominal Size	NPS	1/2	3/4
	DN	15	20
L		74	84
L1 (Solder)		75	90
H		42	51
D		82	100
d3		3/4"-11.5 NHR	3/4"-11.5 NHR

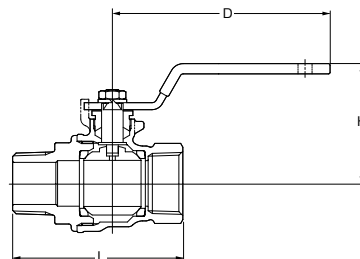
## Type 600 Brass Ball Valves (Full Bore)

W.O.G. non-shock 4.2 MPa (600 psi), Saturated steam pressure 1.05 MPa (150 psi)

Screwed body cap,  
Blowout-proof stem, Male & Female,  
Threaded ends to ASME B1.20.1

### AKTAFO

- Threaded end to ASME B1.20.1



### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass: Nickel-chrome plated
Ball seat	PTFE
Gland packing	PTFE

### Dimensions of AKTAFO

Unit: mm

Nominal Size	NPS	1/4	3/8	1/2	3/4	1
	DN	8	10	15	20	25
L		52	53	66	73	88
H		39	39	42	51	59
D		82	82	82	100	130

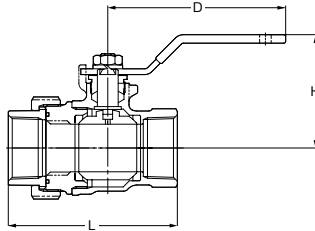
## Type 600 Brass Ball Valves (Full Bore)

W.O.G. non-shock 4.2 MPa (600 psi), Saturated steam pressure 1.05 MPa (150 psi)

Single union, Screwed body cap,  
Blowout-proof stem,  
Threaded ends to ASME B1.20.1

### AKTAFU

- Threaded end to ASME B1.20.1



#### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass: Nickel-chrome plated
Ball seat	PTFE
Gland packing	PTFE

#### Dimensions of AKTAFU

Unit: mm

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	DN	8	10	15	20	25	32	40	50
L		52	52	63	75	88	98	113	126
H		39	39	42	51	59	64	73	80
D		82	82	82	100	130	130	150	150

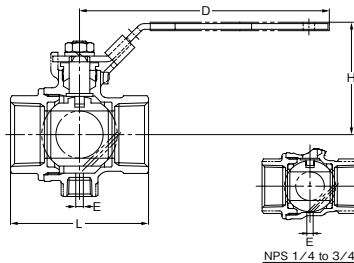
## Type 200 Brass Ball Valves (Full Bore)

W.O.G. non-shock 1.4 MPa (200 psi), -18°C to + 93°C (Avoid freezing the value)

Safety exhaust, Screwed body cap,  
Blowout-proof stem, Latch lock handle,  
Threaded ends to ASME B1.20.1

### AKTAFS

- Threaded end to ASME B1.20.1



#### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass: Nickel-chrome plated
Ball seat	PTFE
Gland packing	PTFE

#### Dimensions of AKTAFS

Unit: mm

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	DN	8	10	15	20	25	32	40	50
L		41	42	53	60	72	82	92	105
H		39	39	42	51	59	64	73	80
E		4	4	4	4	4	4	4	4
D		82	82	82	100	130	130	150	150

● Exhaust hole diameter: 4 mm (all nominal size)

## Type 400/600 Brass Ball Valves (Standard Bore)

**CTH W.O.G. non-shock 4.2 MPa (600 psi), W.O.G. 150°C non-shock 0.7 MPa (100 psi)**  
**TH W.O.G. non-shock 2.8 MPa (400 psi), W.O.G. 150°C non-shock 0.7 MPa (100 psi)**

Screwed body cap, Blowout-proof stem,  
 Double O-ring stem seals,  
 Threaded ends to JIS B0203 (BS21) or solder joint ends

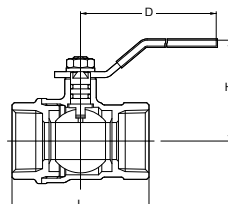
### TH\*

- Threaded end to JIS B0203 (BS21)



### CTH

- Solder joint end to ASME B16.18



### Dimensions of TH, CTH

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
	DN	8	10	15	20	25	32	40	50	65	80
L		44	45	56	63	74	82	91	104	-	-
L1 (Solder)		47	47	54	73	88	98	113	135	147	177
H		41	41	45	48	54	58	63	74	89	103
D		60	60	80	80	110	110	110	140	200	300

\*TH: NPS 1/4 to 2

\*The length of useful threads and the positions of gauge planes are built on KITZ standard.  
 Taper pipe threads for connection shall refer to JIS B0203 standards.

### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass*
Ball seat	PTFE
O-ring	FKM

\*Nickel-Chrome plated

⚠ Solder joint end valves should not be used in service where the temperature of the line fluid is higher than the softening point of the solder.

Unit: mm

## Type 400 Brass Ball Valves (Standard Bore)

**W.O.G. non-shock 2.8 MPa (400 psi), W.O.G. 150°C 0.7 MPa (100 psi)**

Screwed body cap, Blowout-proof stem, Double O-ring stem seals,  
 Threaded ends to JIS B0203 (BS21) or NPT

### T\*

- Threaded end to JIS B0203 (BS21)

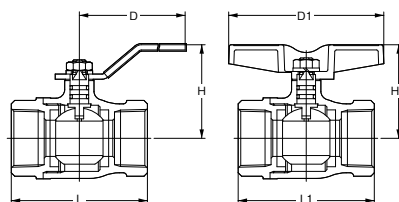
### AKT

- Threaded end to ASME B1.20.1



### TT\*

- Threaded end to JIS B0203 (BS21)



### Dimensions of T, TT, AKT

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
	DN	8	10	15	20	25	32	40	50	65	80	100
L		50	50	65	68	79	86	96	109	127	153	179
L1		50	50	65	68	79	86	96	109	-	-	-
H		45	45	45	50	55	60	65	75	91	105	124
H1		41	41	44	48	55	61	66	80	-	-	-
D		60	60	80	80	110	110	110	140	200	300	400
D1		65	65	80	80	90	105	105	120	-	-	-

\*TT: 1/4 to 2

\*The length of useful threads and the positions of gauge planes are built on KITZ standard.  
 Taper pipe threads for connection shall refer to JIS B0203 standards.

### Materials

Parts	Material
Body	Brass/Bronze*
Body cap	Brass/Bronze*
Stem	Dezincification resistant brass
Ball	Brass**
Ball seat	PTFE
O-ring	FKM

\*NPS 4 only

\*\*Nickel-chrome plated

Unit: mm

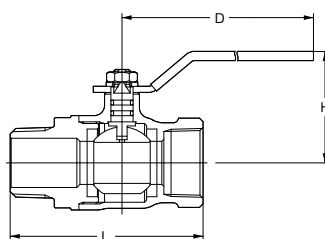
## Type 400 Brass Ball Valves (Standard Bore)

**W.O.G. non-shock 2.8 MPa (400 psi), W.O.G. 150°C 0.7 MPa (100 psi)**

Screwed body cap, Blowout-proof stem,  
 Double O-ring stem seals,  
 Male & Female Threaded ends to JIS B0203 (BS21)

### TO

- Threaded end to JIS B0203 (BS21)



### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass*
Ball seat	PTFE
O-ring	FKM

\*Nickel-chrome plated

### Dimensions of TO

Nominal Size	NPS	1/4	3/8	1/2	3/4	1
	DN	8	10	15	20	25
L		59	60	74	80	94
H		45	45	45	50	55
D		60	60	80	80	110

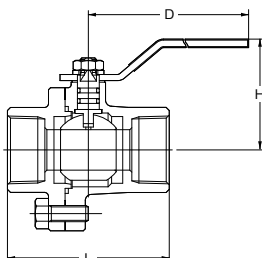
Unit: mm

## Type 400 Brass Ball Valves (Standard Bore)

W.O.G. non-shock 2.8 MPa (400 psi), W.O.G. 150°C 0.7 MPa (100 psi)

**TM\***

- Threaded end to JIS B0203 (BS21)



Bolted body and cap, Blowout-proof stem,  
Double O-ring stem seals, Threaded ends to JIS B0203 (BS21)

### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass*
Ball seat	PTFE
O-ring	FKM

\*Chrome plated or Nickel-chrome plated

### Dimensions of TM

Unit: mm

Nominal Size	NPS	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
	DN	10	15	20	25	32	40	50	65	80
L		56	60	68	80	86	101	117	136	160
H		45	45	49	55	60	65	75	91	105
D		60	80	80	110	110	110	140	200	300

\*The length of useful threads and the positions of gauge planes are built on KITZ standard.  
Taper pipe threads for connection shall refer to JIS B0203 standards.

## Type 600 Brass Ball Valves (Reduced bore)

W.O.G. non-shock 4.2 MPa (600 psi), W.O.G. 150°C 1.05 MPa (150 psi)

**TK**

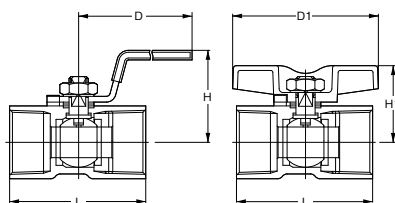
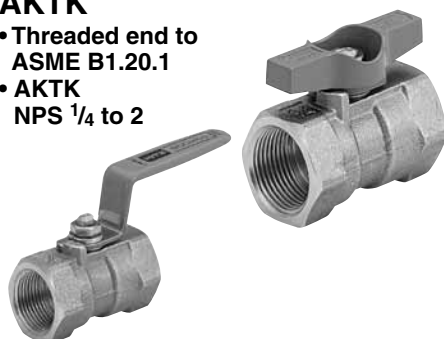
- Threaded end to JIS B0203 (BS21)

**AKTK**

- Threaded end to ASME B1.20.1
- AKTK NPS 1/4 to 2

**TKT**

- Threaded end to JIS B0203 (BS21)



One-piece body, Blowout-proof stem,  
Threaded ends to JIS B0203 (BS21) or NPT

### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass*
Ball seat	G/F PTFE
Grand packing	G/F PTFE

\*Chrome plated or Nickel-chrome plated

### Dimensions of TK, TKT, AKTK

Unit: mm

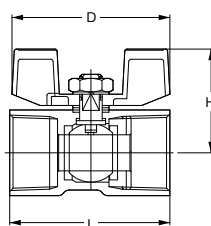
Nominal Size	NPS	1/8	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	DN	6	8	10	15	20	25	32	40	50
L		32	39	44	56.5	59	71	78	83	100
H		31	31	36	41	44	48	54	65	72
H1		23	23	27	31	34	42	48	53	60
D		60	60	70	85	85	100	100	125	125
D1		35	35	40	60	60	76	76	100	100

## Type 600 Brass Ball Valves (Reduced Bore)

W.O.G. non-shock 4.2 MPa (600 psi), W.O.G. 150°C 1.05 MPa (150 psi)

**TKW**

- Threaded end to JIS B0203 (BS21)



One-piece body, Blowout-proof stem, with Wing handle,  
Threaded ends to JIS B0203 (BS21)

### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass*
Ball seat	G/F PTFE
Grand packing	G/F PTFE

\*Chrome plated or Nickel-chrome plated

### Dimensions of TKW

Unit: mm

Nominal Size	NPS	1/8	1/4	3/8	1/2	3/4	1
	DN	6	8	10	15	20	25
L		32	39	44	56.5	59	71
H		25	25	29	35	39	41
D		35	35	40	55	55	69

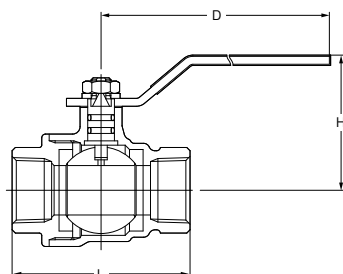


## Type 400 Brass Ball Valves (Full Bore)

W.O.G. non-shock 2.8 MPa (400 psi), W.O.G. 150°C 0.7 MPa (100 psi)

**TF**

- Threaded end to JIS B0203 (BS21)



Screwed body cap, Blowout-proof stem,  
Double O-ring stem seals,  
Threaded ends to JIS B0203 (BS21)

### Materials

Parts	Material
Body	Brass/Bronze*
Body cap	Brass/Bronze*
Stem	Dezincification resistant brass
Ball	Brass**
Ball seat	PTFE
O-ring	FKM

\*NPS 2 only  
\*\*Nickel-chrome plated

### Dimensions of TF

Unit: mm

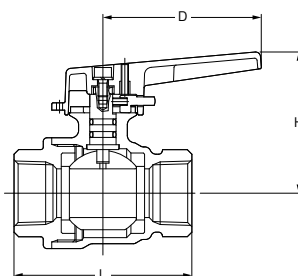
Nominal Size	NPS	1/2	3/4	1	1 1/4	1 1/2	2
	DN	15	20	25	32	40	50
L		62	73	85	98	108	124
H		48	54	58	64	75	84
D		80	110	110	110	140	150

## Type 150 Brass Ball Valves (Full Bore)

W.O.G. non-shock 1.05 MPa (150 psi), W.O.G. 150°C 0.7 MPa (100 psi)

**TFJ**

- Threaded end to JIS B0203 (BS21)



Locking device, Screwed body cap,  
Blowout-proof stem, Double O-ring stem seals,  
Threaded ends to JIS B0203 (BS21)

### Materials

Parts	Material
Body	Brass/Bronze*
Body cap	Brass/Bronze*
Stem	Dezincification resistant brass
Ball	Brass**
Ball seat	PTFE
O-ring	FKM

\*NPS 2 only  
\*\*Nickel-chrome plated

### Dimensions of TFJ

Unit: mm

Nominal Size	NPS	1/2	3/4	1	1 1/4	1 1/2	2
	DN	15	20	25	32	40	50
L		62	73	85	98	108	124
H		53	58	67	72	90	98.5
D		65	65	90	90	110	110

## Type 400 Brass Ball Valves (Standard Bore)

TL, CTL W.O.G. non-shock 2.8 MPa (400 psi), W.O.G. 150°C 0.7 MPa (100 psi),  
TLT W.O.G. non-shock 2.8 MPa (400 psi), W.O.G. 80°C 2.0 MPa (286 psi)

**TL**

- Threaded end to JIS B0203 (BS21)



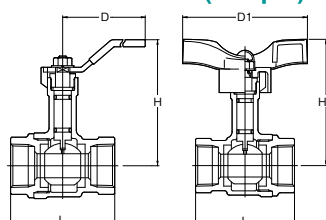
**CTL**

- Solder joint end to ASME B16.18



**TLT**

- Threaded end to JIS B0203 (BS21)



### Dimensions of TL, CTL, TLT

Nominal Size	NPS	1/2	3/4	1	1 1/4	1 1/2	2
	DN	15	20	25	32	40	50
L		56	65	78	86	96	109
L1 (Solder)		58	73	88	99	114	135
H		75	79	83	98	102	109
H1		79	83	90	105	109	124
D		80	80	110	110	110	140
D1		82	82	94	94	94	120

### Materials

Parts	Material
Body	Bronze
Body cap	Bronze
Stem	Dezincification resistant brass
Ball	Stainless steel (Type 304)
Ball seat	PTFE
O-ring	FKM

⚠ Solder joint end valves should not be used in service where the temperature of the line fluid is higher than the softening point of the solder.

Unit: mm



## Type 400 Brass Ball Valves (Standard Bore)

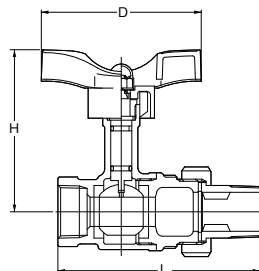
W.O.G. non-shock 2.8 MPa (400 psi), W.O.G. 80°C 2.0 MPa (286 psi)

### TLTU

• Threaded end to JIS B0203 (BS21)

### CTLTU

• Solder joint end to ASME B16.18



Dimensions of TLTU, CTLTU

Nominal Size	in.	1/2	3/4	1
	mm	15	20	25
L		90.5	103.5	119
L1 (Solder)		89.5	107.5	124
H		79	83	90
D		82	82	94

Single union, Screwed body and cap,  
Blowout-proof stem, Double O-ring stem seals,  
Threaded ends to JIS B0203 (BS21) or solder joint ends

### Materials

Parts	Material
Body	Bronze
Body cap	Bronze
Stem	Dezincification resistant brass
Ball	Stainless steel (Type 304)
Ball seat	PTFE
O-ring	FKM

⚠ Solder joint end valves should not be used in service where the temperature of the line fluid is higher than the softening point of the solder.

Unit: mm

## Type 600 Brass Ball Valves (Full Bore)

W.O.G. non-shock 2.8 MPa (600 psi), W.O.G. 150°C 1.05 MPa (150 psi)

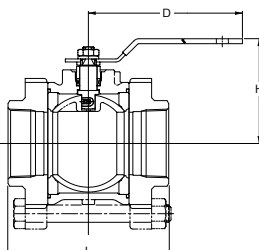
### AK3TM

• Threaded end to ASME B1.20.1

### C3TM\*

• Solder joint end to ASME B16.18

\*C3TM NPS 3/8 to 2 1/2



Dimensions of AK3TM, C3TM

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	DN	8	10	15	20	25	32	40	50
L		49	49	61	70	83	99	117	139
L1 (Solder)		-	49	61	73	88	99	117	139
H		39	39	48	55	63	69	78	85
D		82	82	82	100	130	130	150	150

Three piece body with mounting pad,  
Threaded end to ASME B1.20.1,  
Solder jointed to ASME B16.18

### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass: Tin-nickel plated (NPS 1/4 to 1) TEA plated (NPS 1 1/4 to 2)
Ball seat	PTFE
Grand packing	PTFE

⚠ Solder joint end valves should not be used in service where the temperature of the line fluid is higher than the softening point of the solder.

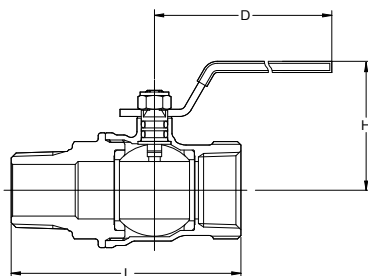
Unit: mm

## Type 600 Brass Ball Valves (Full Bore)

W.O.G. non-shock 4.2 MPa (600 psi), W.O.G. 150°C 1.05 MPa (150 psi)

### ZO

• Threaded end to JIS B0203 (BS21)



Dimensions of ZO

Nominal Size	NPS	1/4	3/8	1/2	3/4	1
	DN	8	10	15	20	25
L		59	60	74	80	94
H		37	37	40	44	50
D		70	70	80	80	110

Screwed body cap, Blowout-proof stem,  
Double O-ring stem seals,  
Male & Female threaded ends to JIS B0203 (BS21)

### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Brass: Nickel plated
Ball	Brass*
Ball seat	PTFE
O-ring	FKM

\*Chrome plated or Nickel-chrome plated

Unit: mm

## Type 400 Brass Ball Valves (Standard Bore)

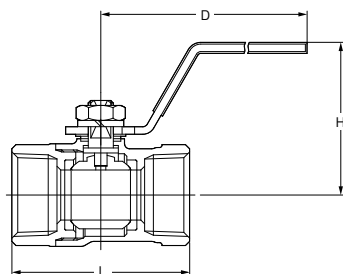
W.O.G. non-shock 2.8 MPa (400 psi), W.O.G. 150°C 0.7 MPa (100 psi), Saturated steam pressure 0.98 MPa (142 psi)

**ZS\***

• Threaded end to JIS B0203 (BS21)



\*The length of useful threads and the positions of gauge planes are built on KITZ standard.  
Taper pipe threads for connection shall refer to JIS B0203 standards.



Screwed body cap, Blowout-proof stem,  
Threaded ends to JIS B0203 (BS21)

### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass*
Ball seat	PTFE
Grand packing	G/F PTFE

\*Chrome plated or Nickel-chrome plated

### Dimensions of ZS

Unit: mm

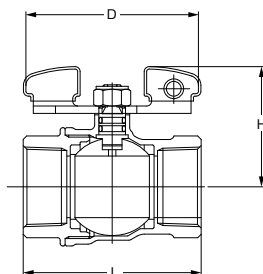
Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	DN	8	10	15	20	25	32	40	50
L		42	43	51	59	71	78	88	99
H		44	44	45	49	63	67	71	76
D		72	72	87	87	116	116	117	117

## Type 600 Brass Ball Valves (Full Bore)

W.O.G. non-shock 4.2 MPa (600 psi), W.O.G. 150°C 1.05 MPa (150 psi)

**ZET**

• Threaded end to JIS B0203 (BS21)



Screwed body cap, Blowout-proof stem,  
Double O-ring stem seals,  
Threaded ends to JIS B0203 (BS21)

### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Brass: Nickel plated
Ball	Brass*
Ball seat	PTFE
O-ring	FKM

\*Chrome plated or Nickel-chrome plated

### Dimensions of ZET

Unit: mm

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	DN	8	10	15	20	25	32	40	50
L		42	42	53	60	72	84	92	110
H		35	35	41	45	54	59	75	82
D		55	55	70	70	100	100	130	130

## Type 600 Brass Ball Valves (Full Bore)

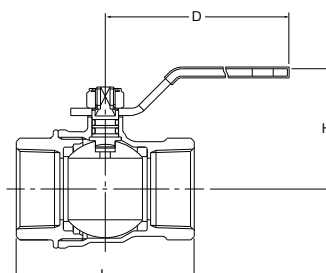
W.O.G. non-shock 4.2 MPa (600 psi)\*, W.O.G. 150°C 1.05 MPa (150 psi)

**AKSZA**

• Threaded end to ASME B1. 20. 1

**CSZA**

• Solder joint to ASMB 16.18



Screwed body and cap, Blowout-proof stem, Double O-ring stem,  
seals, Threaded ends to ASME B1.20.1 or solder joint ends

\*NPS 4 : W.O.G. non-shock 2.8 MPa (400 psi), W.O.G. 150°C 0.7 MPa (100 psi)

### Materials

Parts	Material
Body	Brass/Bronze*
Body cap	Brass/Bronze*
Stem	Brass: Nickel plated
Ball	Brass: Tin-nickel plated (NPS 1/4 to 1) TEA plated (NPS 1 1/4 to 3) Brass: Nickel-chrome plated (NPS 4)
Ball seat	PTFE
O-ring	FKM

\*NPS 4 only

Solder joint end valves should not be used in service where the temperature of the line fluid is higher than the softening point of the solder.

### Dimensions of AKSZA, CSZA

Unit: mm

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4
	DN	8	10	15	20	25	32	40	50	65	80	100
L		42	42	53	60	72	84	92	110	138	167	193
L1 (Solder)			46	54	73	88	100	115	140	164	187	
H		37	37	40	44	50	55	65	72	101	113	131
D		70	70	80	80	110	110	150	150	200	300	300

Approvals  
(up to 2)



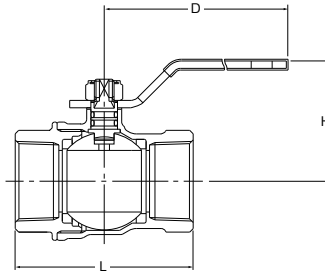
\*AKSZA only

## Type 600 Brass Ball Valves (Full Bore)

W.O.G. non-shock 4.2 MPa (600 psi), W.O.G. 150°C 1.05 MPa (150 psi)

### SZA

- Threaded end to JIS B0203 (BS21)



Screwed body and cap, Blowout-proof stem,  
Double O-ring stem seals,  
Threaded ends to JIS B0203 (BS21)

### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Brass: Nickel plated
Ball	Brass*
Ball seat	PTFE
O-ring	FKM

\*Nickel-chrome plated

### Dimensions of SZA

Unit: mm

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	DN	8	10	15	20	25	32	40	50
L		42	42	53	60	72	84	92	110
H		37	37	40	44	50	55	65	72
D		70	70	80	80	110	110	150	150

## Type 600 Brass Ball Valves (Full Bore)

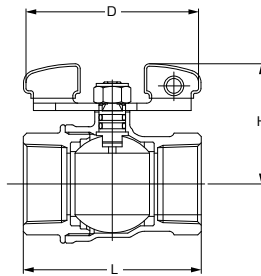
W.O.G. non-shock 4.2 MPa (600 psi), W.O.G. 150°C 1.05 MPa (150 psi)

### AKSZAW

- Threaded end to ASME B1. 20. 1

### CSZAW

- Solder joint to ASME B16.18



Screwed body and cap, Blowout-proof stem,  
Double O-ring stem seals,  
Threaded ends to ASME B1.20.1 or  
solder joint ends to ASME B16.18.

### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Brass: Nickel plated
Ball	Brass: Tin-nickel plated (NPS 1/4 to 1) TEA plated (NPS 1 1/4 to 2)
Ball seat	PTFE
O-ring	FKM

### Dimensions of AKSZAW, CSZAW

Unit: mm

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2
	DN	8	10	15	20	25	32	40	50
L		42	42	53	60	72	84	92	110
L1 (Solder)			46	54	73	88	100	115	140
H		35	35	41	45	54	59	75	82
D		55	55	70	70	100	100	130	130

Approvals  
(up to 2)



\*AKSZAW only

## Type 400 3-Way Brass Ball Valves (Standard Bore)

W.O.G. non-shock 2.8 MPa (400 psi), W.O.G. 150°C 0.7 MPa (100 psi)

### TN\*

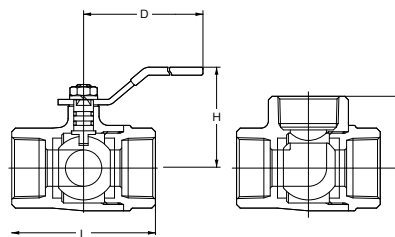
- Threaded end to JIS B0203 (BS21)

### AKTN

- Threaded end to ASME B1.20.1

### CTN

- Solder joint end to ASME B16.18
- CTN NPS 1/2 to 2



Screwed body cap, 2-seat, L-port design,  
Blowout-proof stem, Double O-ring stem seals\*,  
Threaded ends to JIS B0203 (BS21) or NPT, or solder joint ends

\*NPS 1/2 and larger

### Materials

Parts	Material
Body	Brass/Bronze*
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass**
Ball seat	PTFE
O-ring	FKM

\*NPS 2 1/2 and 3

\*\*Chrome plated or Nickel-chrome plated



Solder joint end valves should not be used in service where the temperature of the line fluid is higher than the softening point of the solder.

### Dimensions of TN, CTN, AKTN

Unit: mm

Nominal Size	NPS	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
	DN	8	10	15	20	25	32	40	50	65	80
L		40	46	67	68	79	89	100	115	138	166
L1 (Solder)		20	23	33.5	34	39.5	44.5	50	57.5	69	83
H		30	35	45	48	55	60	65	75	91	105
D		60	70	80	80	110	110	110	140	200	300

\*The length of useful threads and the positions of gauge planes are built on KITZ standard.  
Taper pipe threads for connection shall refer to JIS B0203 standards.

## Type 400 3-Way Bronze Ball Valves (Standard Bore)

W.O.G. non-shock 2.8 MPa (400 psi), W.O.G. 150°C 0.7 MPa (100 psi)

### T4T

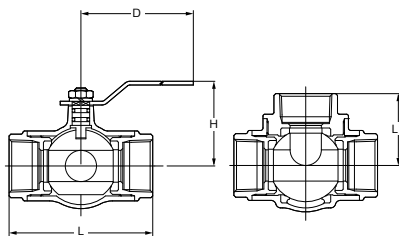
- Threaded end to JIS B0203 (BS21)

### AKT4T

- Threaded end to ASME B1.20.1

### T4L

- Threaded end to JIS B0203 (BS21)



### Materials

Parts	Material
Body	Bronze
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass*
Ball seat	PTFE
O-ring	FKM

\*Chrome plated or Nickel-chrome plated

Unit: mm

### Dimensions of T4T, AKT4T, T4L

Nominal Size	NPS DN	1/2	3/4	1	1 1/4	1 1/2	2
L		70	85	100	115	130	150
L1		35	42.5	50	57.5	65	75
H		52	56	63	68	94.5	102
D		130	130	150	150	230	230

Page 118 for Allowable Port Orientation.

## Type 400 3-Way Bronze Ball Valves, with Mounting Pad (Standard Bore)

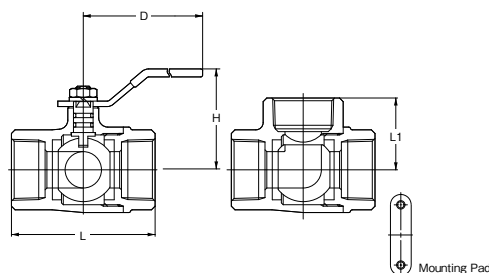
W.O.G. non-shock 2.8 MPa (400 psi), W.O.G. 150°C 0.7 MPa (100 psi)

### AKTNP

- Threaded end to ASME B1.20.1

### CTNP

- Solder joint end to ASME B16.18



Screwed body cap, 2-seat, L-port design,  
Blowout-proof stem, Double O-ring stem seals,  
Threaded ends to NPT

### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass*
Ball seat	PTFE
O-ring	FKM

\*Chrome plated or Nickel-chrome plated

Solder joint end valves should not be used in service where the temperature of the line fluid is higher than the softening point of the solder.

Unit: mm

### Dimensions of AKTNP, CTNP

Nominal Size	NPS DN	1/2	3/4	1	1 1/4	1 1/2	2
L		67	68	79	89	100	115
L1		33.5	34	40	44.5	50	57.5
H		45	48	55	60	65	75
D		80	80	110	110	130	140

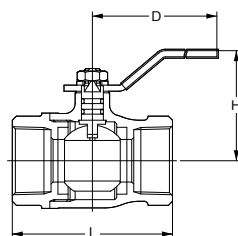
Page 118 for Allowable Port Orientation.

## Brass Ball Valves, Designed for Gas Service (Standard Bore)

Gas service 40°C 1.0 MPa (142 psi)

### TG\*

- Threaded end to JIS B0203 (BS21)



Screwed body cap,  
Blowout-proof stem, Double O-ring stem seals,  
Threaded ends to JIS B0203 (BS21)

### Materials

Parts	Material
Body	Brass
Body cap	Brass
Stem	Dezincification resistant brass
Ball	Brass*
Ball seat	PTFE
O-ring	NBR

\*Nickel-chrome plated

### Dimensions of TG

Unit: mm

Nominal Size	NPS DN	1/4	3/8	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3
L		50	50	65	68	79	86	96	109	127	153
H		45	45	45	50	55	60	65	75	91	105
D		60	60	80	80	110	110	110	140	200	300

\*The length of useful threads and the positions of gauge planes are built on KITZ standard.  
Taper pipe threads for connection shall refer to JIS B0203 standards.



# Technical Information

■ **KITZ Ball Seat Materials**

■ **Technical Data**

■ **Dimension of Actuator Mounting Pads**

■ **Pressure-Temperature Ratings**

■ **Allowable Port Orientation**

■ **General Precautions**

■ **Flow Characteristics**

## 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 /270°C *1
<b>Carbon filled PTFE</b>	Excellent heat and abrasion resistance	260°C /270°C *1
<b>FILLTITE® *</b>	Highest heat resistance among PTFE based materials	300°C *2
<b>Graphite</b>	Excellent for high temperature service	500°C
<b>Metal</b>	Excellent for high temperature and abrasive service	500°C /525°C *3
<b>PEEK</b>	Higher heat resistance and mechanical strength	270°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 interchangeable with the most of our conventional ball seats, so it also has the cost advantage.

\*1 270°C: SCTDZ/UTDZM Series only.

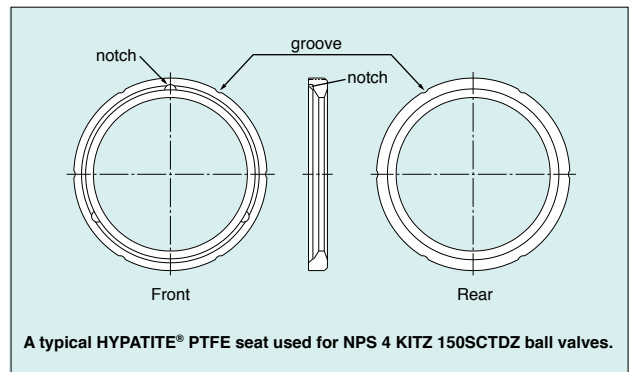
\*2 Uni-body design: 260°C

\*3 525°C: T60M/SF3TC 6H UF3TC6HM Series only.

### HYPATITE® PTFE Ball Seats (Carbon and Stainless Steel Valves)

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

- Wide service temperature range of -29°C (-20°F) through 270°C (518°F) SCTDZ/UTDZ(M) Series, 260°C (500°F) UTB and SCTAZ/UTAZ(M) Series.  
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°C (-321°F) by means of extended bonnet design and special low temperature service materials.
- High chemical resistance comparable to virgin PTFE.
- Monomer permeability lower than other PTFE materials.
- High mechanical strength against compression and creeping (cold flow), superior to other PTFE materials for long life cycle.
- Smooth operation, as it possesses specific gravity and friction coefficient equal to those of virgin PTFE.
- Prevention of contamination for process line because of its stability, the performance comparable to virgin PTFE.
- High sealing performance brought by its resiliency, the typical feature of PTFE.



### FILLTITE® Ball Seats

Highest heat resistance among PTFE based materials.

■ Service temperature range: -29°C to 300°C

■ Trim symbol: 1H



## Technical Data

### 1. Choice of trim for heated abrasive service

Metal seated ball valves are guaranteed for a maximum service temperature of 300°C (572°F) (Trim symbol 5H) and 500°C (932°F) (Trim symbol 6H\*1\*2). For hard graphite seated ball valves, a maximum service temperature of 500°C (932°F) is also guaranteed (Trim symbol 3H\*2). Heat resistant sealing and trim materials qualify these valves for heated and abrasive service which cannot be properly handled by conventional soft seated ball valves due to the limited heat resistant characteristics and mechanical properties of their soft seats.

"FILLTITE<sup>®</sup>" 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 interchangeable with the most of our conventional ball seats, so it also has the cost advantage.

\*1 Temperature is limited to 450°C (842°F) for trunnion mounted ball valves with trim 6H

\*2 Shell material WCB: Upon prolonged exposure to temperatures above 425°C (797°F), the carbide phase of steel may be converted to graphite.

Permissible, but not recommended for prolonged usage above 425°C (797°F).

### 2. Unconditional fire-safe provision

While metal or hard graphite seats are extremely heat resistant, other sealing components such as gland packing and flange gaskets are made of flexible graphite, another heat resistant material, so that no part of the valve will be affected by extraordinarily heated environments. Also the provision of an anti-static device is not required because of inter-component electric conductivity.

### 3. Maintenance ease

Split body construction of the valve body provides the convenience of easy maintenance, a critical requirement for handling slurries and other viscous fluids.

### 4. Valve automation

Quarter-turn valve drive mechanism makes mounting of valve automation measures such as electric and pneumatic actuators technically easier. KITZ floating ball valves employ integral actuator mounting pads, complying with ISO 5211 and CAPI, for easy, safe and assured on-the-spot actuator mounting without disassembly of valve glands.

### 8. Metal seated ball valves (Trim 5H/6H)

Rigid construction with full metallic contact between the ball and seats, and high durability of trim materials make KITZ metal seated ball valves ideally suited to highly abrasive services handling slurries and other viscous fluids.

#### ● Trim materials

Valve Design		Floating Ball Valve		Trunnion Mounted Ball Valve	
Trim symbol		5H	6H *3	6H	
Temp.		300°C	500°C	525°C	
		572°F	932°F	977°F	
Seat leakage*1		ANSI FCI 70-2 Class VI		ISO 5208 RateD/ANSI FCI 70-2 Class VI *4	
Parts	Ball	ASTM A276 Type 316 or ASTM A351 CF8M + Cr plated	ASTM A276 Type 316 or A351 Gr.CF8M + SFNi *2	ASTM A276 Type 304 + SFNi *2	316 Stainless steel + SFNi *2
	Ball seat	ASTM A276 Type 316 + SFNi *2	ASTM A276 Type 316 + SFNi *2	ASTM A276 Type 304 + SFNi *2	316 Stainless steel + SFNi *2
	Stem	ASTM A 564 Type 630	ASTM A 564 Type 630	ASTM A276 Type 304 + SFNi *2	~343°C/649°F : ASTM A564 Type 630 ~525°C/977°F : EN 1.4980

\*1 Maximum allowable seat leakage \*2 Ni-Cr alloy thermal spraying

\*3 Shell material WCB: Upon prolonged exposure to temperatures above 425°C (797°F), the carbide phase of steel may be converted to graphite. Permissible, but not recommended for prolonged usage above 425°C (797°F).

\*4 Please contact your local KITZ agents or distributors.

● Durable metal seat design and material also provides fully guaranteed throttling service performance, which makes KITZ metal seated ball valves function as a reliable control valve.

● Bi-directional flow.

#### Caution:

● Use a gear operator or valve actuator to fix the valve position when used for throttling service.

### 5. High flow efficiency

Full port design provides maximized and linear flow characteristic with minimal pressure loss as the line flow travels through the valve bore. This is a necessary design requirement particularly for trouble-free service of slurries and other viscous fluids.

### 6. FILLTITE<sup>®</sup> seated ball valves (Trim 1H)

● Highest heat resistance among PTFE based materials.

Valve Design		Floating Ball Valve	Trunnion Mounted Ball Valve
Trim symbol		1H	
Temp.		300°C	
		572°F	
Parts	Ball	ASTM A276 Type 304*1 or A351 Gr.CF8*1	
	Ball seat	FILLTITE <sup>®</sup> PTFE	
	Stem	ASTM A276 Type 304*2 ASTM A276 Type 316*2	

\*1 Shell material CF8M; Ball Type 316 or CF8M

\*2 Shell material CF8M; Stem Type 316



### 7. Hard graphite seated ball valves (Trim 3H)

● Bi-directional flow.

● Recommended for low abrasion service.

Valve Design		Floating Ball Valve	
Trim symbol		3H*5	
Temp.		500°C	
		932°F	
Seat leakage*1		ANSI FCI 70-2 Class VI	
Parts	Ball	ASTM A276 Type 304*1 or A351 Gr.CF8*2	
	Ball seat	Carbon + JIS SUS329J1*3	
	Stem	ASTM A276 Type 304*4	

\*1 Maximum allowable seat leakage \*2 Shell material CF8M; Ball Type 316 or CF8M

\*3 Equivalent to AISI Type 329 \*4 Shell material CF8M; Stem Type 316

\*5 Shell material WCB: Upon prolonged exposure to temperatures above 425°C (797°F), the carbide phase of steel may be converted to graphite. Permissible, but not recommended for prolonged usage above 425°C (797°F).

#### Caution:

● Not recommended for throttling service.

● Not recommended for high abrasion service.

● Maximum working temperature for oxidizing service, such as high temperature air, is 450°C (842°F).

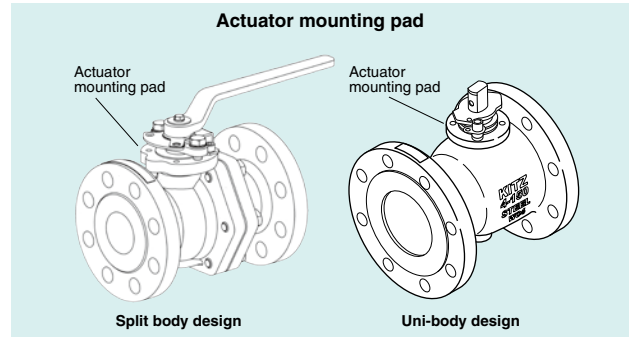


## Dimension of Actuator Mounting Pads

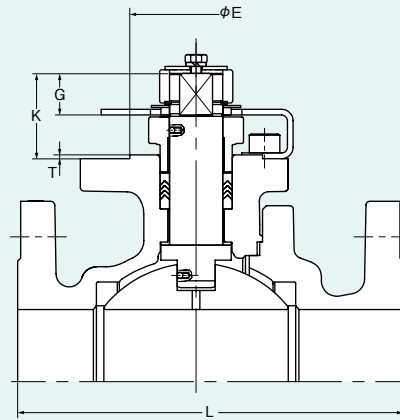
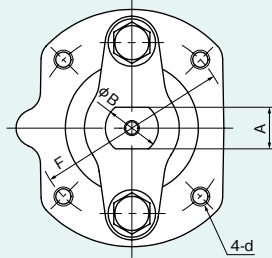
### Integral Actuator Mounting Pads

KITZ 150/300 SCTDZ/UTDZM series and 150/300 SCTAZM/UTAZM series ball valves are furnished with an integral actuator mounting pad designed and factory-drilled according to ISO 5211 specification. This feature facilitates the installation of actuators with ISO 5211 mounting flange to the valves. Mounting pad and stem head dimension also conforms to CAPI ADDS 2.02.

**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.



### Dimensions of ISO 5211 Actuator Mounting Pad for Class 150 / 300 Full Port, Split Body, Side Entry Design Ball Valves



#### Dimensions

Unit: mm

Nominal Pressure	Nominal Size (NPS)	-0.05 -0.10 A	-0.1 -0.2 ΦB	-0.1 -0.2 ΦE	±0.2 ΦF	G	K	L	d M Thread	T	ISO 5211 Flange Type
Class 150	1/2	9	12	25	36	9	22	108	M5	1	F03
	3/4	9	12	25	36	9	22	117	M5	1	F03
	1	14	18	35	50	14	30	127	M6	1.5	F05
	1 1/4	14	18	35	50	14	30	140	M6	1.5	F05
	1 1/2	17	22	55	70	17	34	165	M8	1.5	F07
	2	17	22	55	70	17	34	178	M8	1.5	F07
	2 1/2	22	28	70	102	22	45	190	M10	2	F10
	3	22	28	70	102	22	45	203	M10	2	F10
	4	27	36	85	125	27	52	229	M12	2	F12
	5	27	36	85	125	27	52	356	M12	2	F12
	6	36	48	100	140	36	63	394	M16	2	F14
Class 300	8	46	60	130	165	46	79	457	M20	2	F16
	10	46	60	130	165	46	79	533	M20	2	F16
	1/2	9	12	25	36	9	22	140	M5	1	F03
	3/4	9	12	25	36	9	22	152	M5	1	F03
	1	14	18	35	50	14	30	165	M6	1.5	F05
	1 1/2	17	22	55	70	17	34	190	M8	1.5	F07
	2	17	22	55	70	17	34	216	M8	1.5	F07
	2 1/2	22	28	70	102	22	45	241	M10	2	F10
	3	22	28	70	102	22	45	283	M10	2	F10
	4	27	36	85	125	27	52	305	M12	2	F12
	6	36	48	100	140	36	63	403	M16	2	F14
	8	46	60	130	165	46	79	502	M20	2	F16

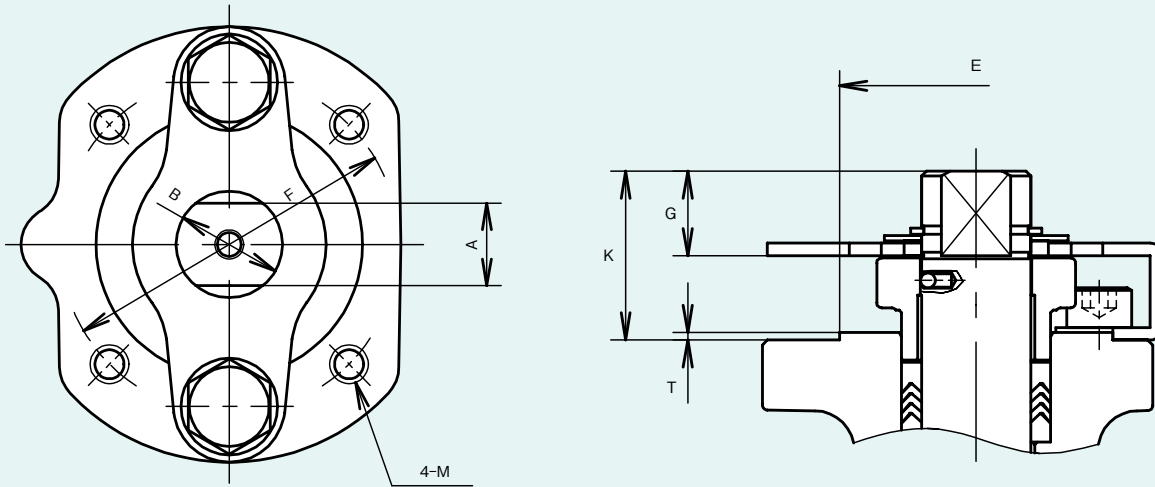
#### \*KITZ product codes:

- (1) 150UTDZ(M) (4) 300SCTDZ  
 (2) 150SCTDZ (5) 150UTDZXL(M)  
 (3) 300UTDZ(M) (6) 300UTDZXL(M)

**Note:** Dimension of stem head are in accordance with CAPI ADDS 2.02, but the maximum specified dimension in CAPI ADDS 2.02 is "F14". For NPS 8 and 10, mounting pads are F16/ISO 5211.

## Dimension of Actuator Mounting Pads

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



#### Dimensions

Unit: mm

Nominal Pressure	Nominal Size (NPS)	Mounting Dimensions for Actuator								ISO 5211 Flange Type
		A	B	E	F	G	K	T	M	
Class 150	1/2	7	10	25	36	8.5	18	1	M5	F03(2)
	3/4	7	10	25	36	8.5	18	1	M5	F03(2)
	1	9	12	25	36	9	22	1	M5	F03
	1 1/2	14	18	35	50	14	30	1.5	M6	F05
	2	17	22	55	70	17	34	1.5	M8	F07
	3	22	28	70	102	22	45	2	M10	F10
	4	22	28	70	102	22	45	2	M10	F10
	6	27	36	85	125	27	52	2	M12	F12
	8	36	48	100	140	36	63	2	M16	F14
	10	46	60	130	165	46	79	2	M20	F16
Class 300	1/2	7	10	25	36	8.5	18	1	M5	F03(2)
	3/4	7	10	25	36	8.5	18	1	M5	F03(2)
	1	9	12	25	36	9	22	1	M5	F03
	1 1/2	14	18	35	50	14	30	1.5	M6	F05
	2	17	22	55	70	17	34	1.5	M8	F07
	3	22	28	70	102	22	45	2	M10	F10
	4	22	28	70	102	22	45	2	M10	F10
	6	27	36	85	125	27	52	2	M12	F12
	8	36	48	100	140	36	63	2	M16	F14
	10	46	60	130	165	46	79	2	M20	F16

\* These dimensions are specified as F03S by CAPI.

★UNC threads optionally available.

#### KITZ product codes:

(1) 150SCTAZ (3) 300SCTAZ  
(2) 150UTAZ(M) (4) 300UTAZ(M)

## 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.

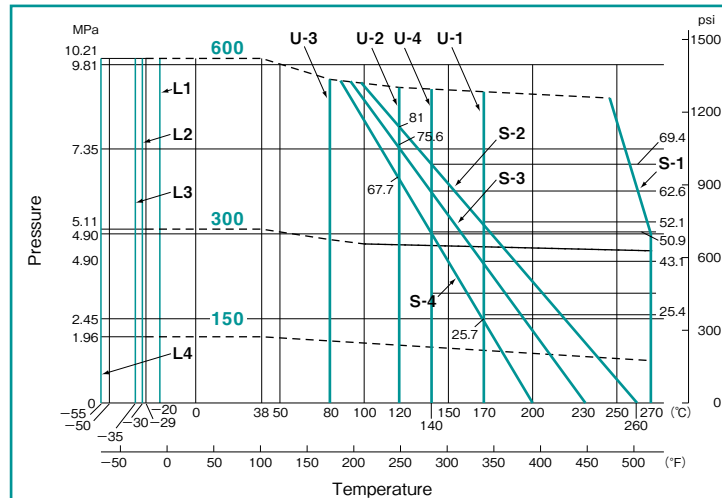
In case of extraordinary service conditions as mentioned below, contact KITZ Corporation or its distributors for technical advice:

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 interchangeable with the most of our conventional ball seats, so it also has the cost advantage.

### Class 150/300/600/SCTCS/SCTCRS/UTCS/UTCRS/SF3TCS/SF3TCRS/UF3TCSM/UF3TCRSM



#### Ball Seat Rating

- S-1 : Modified PEEK\*
- S-2 : Carbon-filled PTFE
- S-3 : (1) KITZ HYPATITE®  
(2) Glass-filled PTFE  
(3) Glass-filled PTFE with MoS<sub>2</sub>  
(Standard for Class 150,300,&600)
- S-4 : Virgin PTFE
- S-5 : Reinforced Nylon  
(Standard for Class 900&1500)

Modified PEEK\* : Lower temperature limit is -30°C (-22° F).

Special care should be taken to select modified PEEK based on chemical compatibility with the service.

Contact KITZ Corporation for application engineering details.

Modified PEEK is available for NPS12 and smaller valves.

\* Poly Ether Ether Ketone.

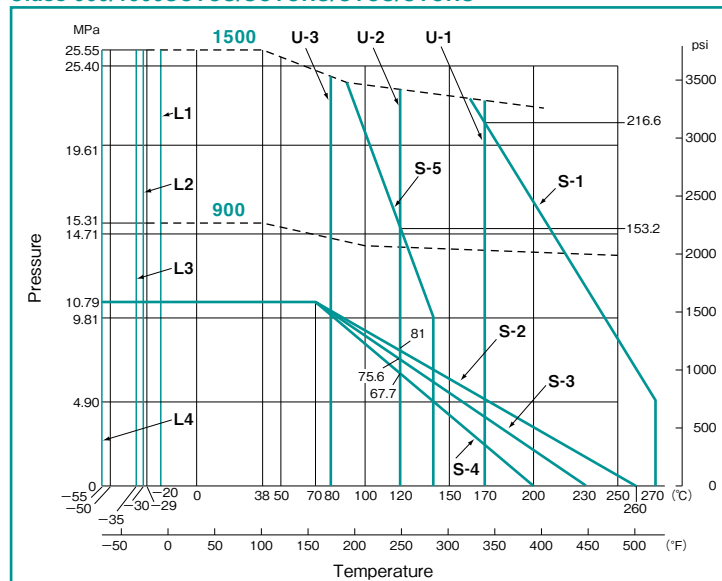
#### O-ring Upper Limits

- U-1 : (1) FKM(Standard for stainless steel valves)  
(2) Low-temperature FKM
- U-2 : (1) EPDM
- U-3 : (1) NBR(Standard for carbon steel valves)  
(2) Low-temperature NBR  
(3) Low-temperature HNBR
- U-4 : (1) HNBR

#### O-ring Lower Limits

- L-1 : (1) FKM(Standard for stainless steel valves)
- L-2 : (1) EPDM  
(2) NBR(Standard for carbon steel valves) , HNBR
- L-3 : Low-temperature FKM
- L-4 : (1) Low-temperature NBR  
(2) Low-temperature HNBR

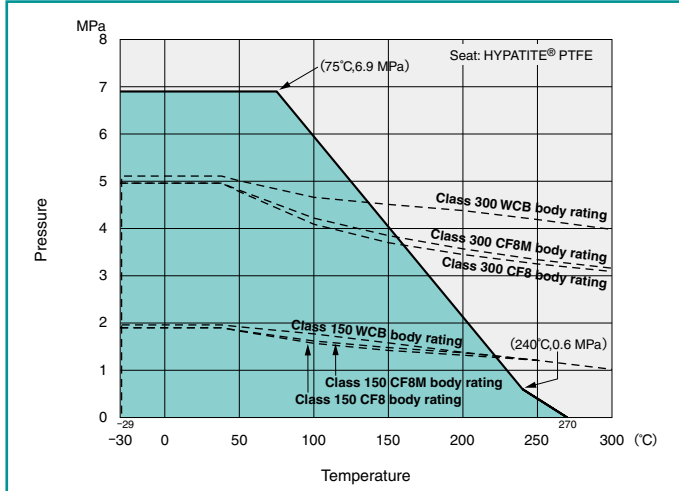
### Class 900/1500SCTCS/SCTCRS/UTCS/UTCRS



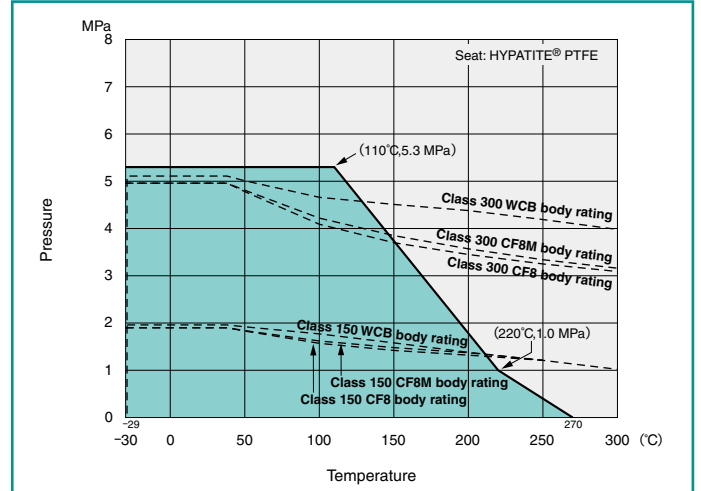
Body ratings shown above are for ASTM A216 Gr.WCB. For ratings of other valve shell materials, refer to the latest edition of ASME B16.34.

## Pressure-Temperature Ratings

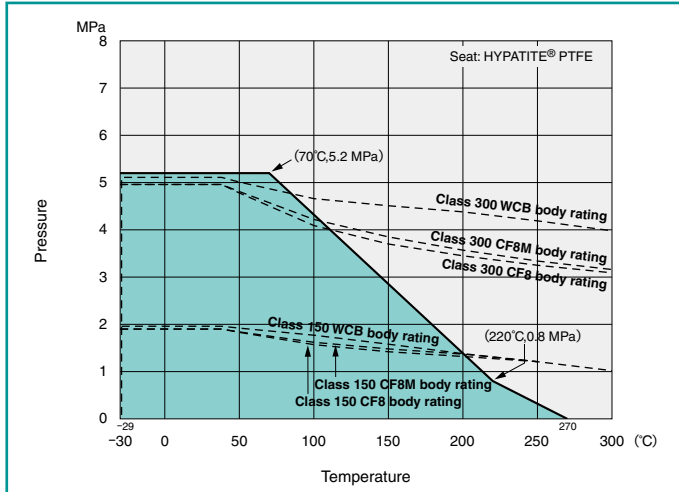
**150/300UTDZ(M)/SCTDZ : NPS 1/2, 3/4**



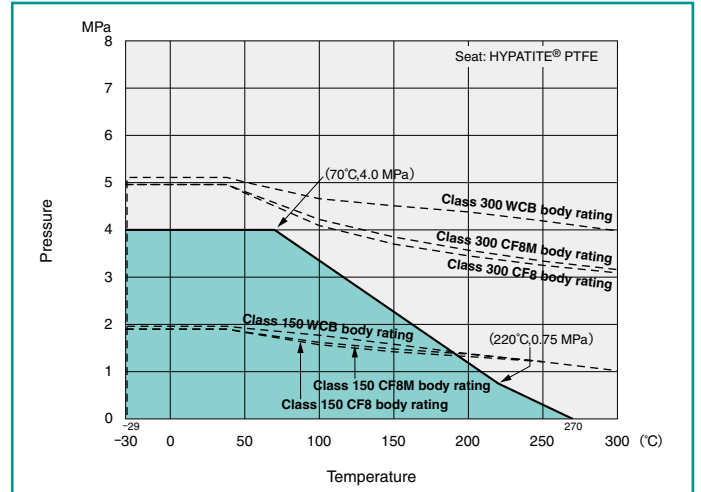
**150/300UTDZ(M)/SCTDZ : NPS 1 to 2 1/2**



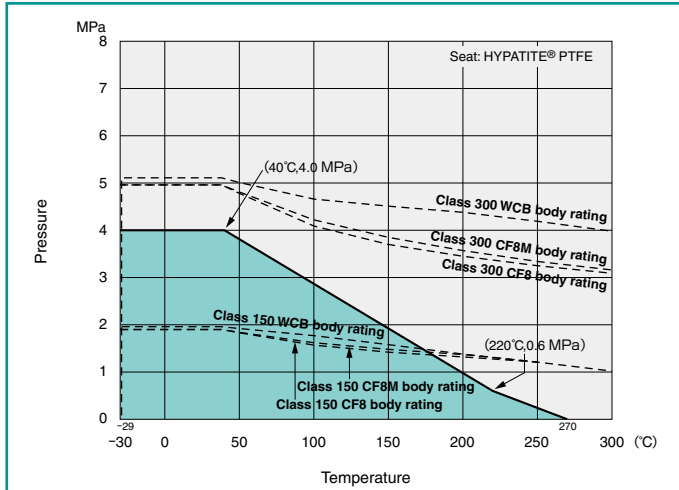
**150/300UTDZ(M)/SCTDZ : NPS 3, 4**



**150/300UTDZ(M)/SCTDZ : NPS 5, 6**



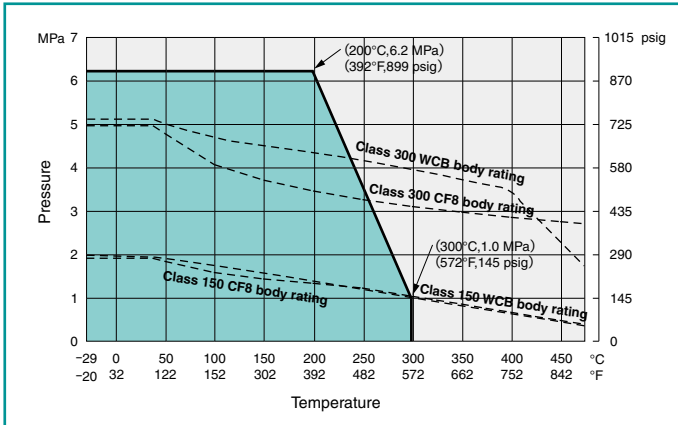
**150/300UTDZ(M)/SCTDZ : NPS 8, 10**



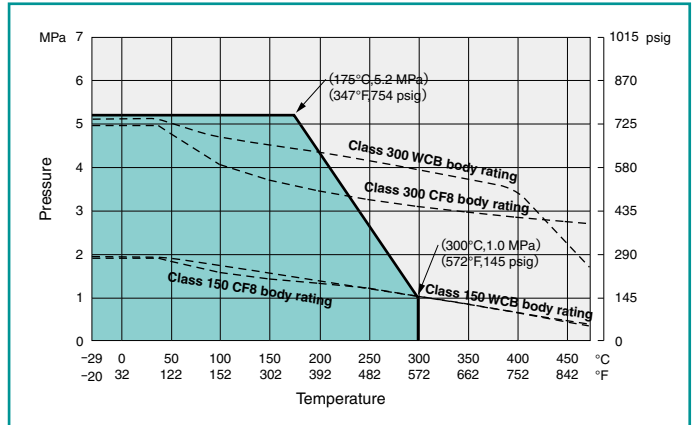
Note: Lowest working temperature for WCB is -29°C.

## Pressure-Temperature Ratings

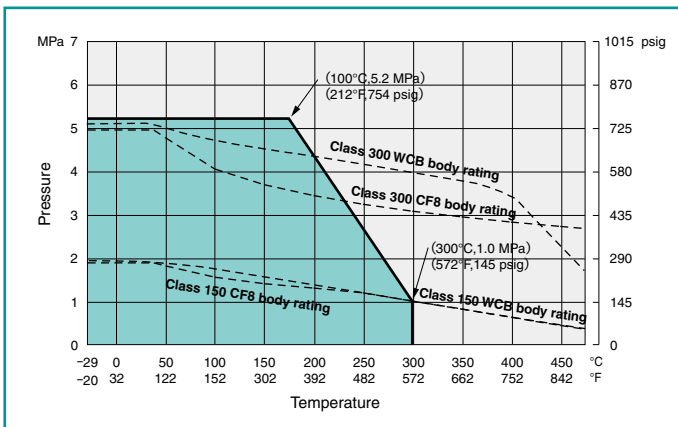
### ● FILLTITE® seated floating ball valves: Trim 1H: NPS 1 to 2½



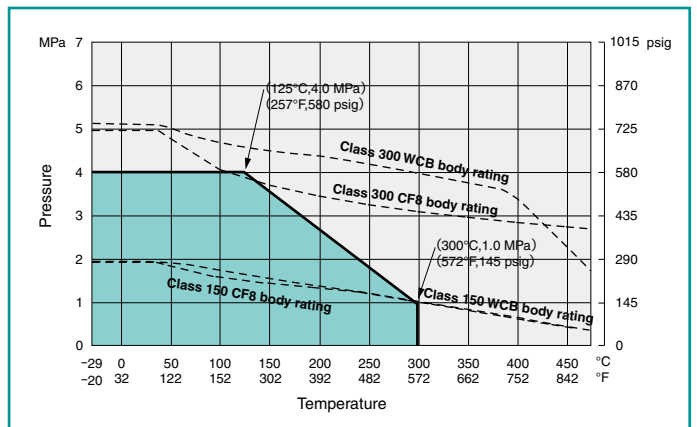
### ● FILLTITE® seated floating ball valves: Trim 1H: NPS 3, 4



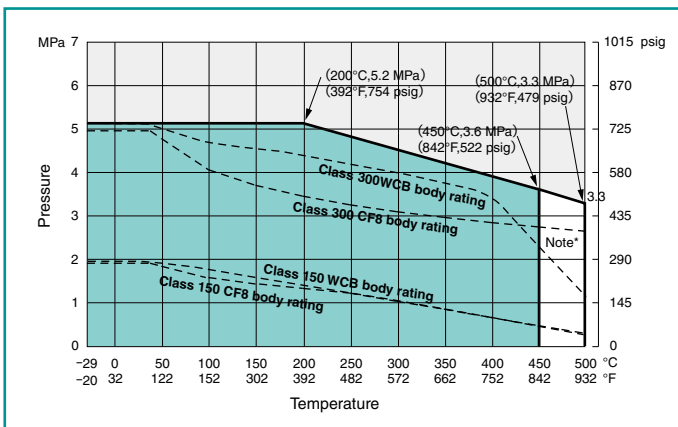
### ● FILLTITE® seated floating ball valves: Trim 1H: NPS 5, 6



### ● FILLTITE® seated floating ball valves: Trim 1H: NPS 8, 10



### ● Hard graphite seated floating ball valves: Trim 3H



Note\* Maximum working temperature for oxidizing service, such as high temperature air, is 450°C (842°F).

Note: 3H Maximum working temperature for oxidizing service, such as high temperature air, is 450°C (842°F).

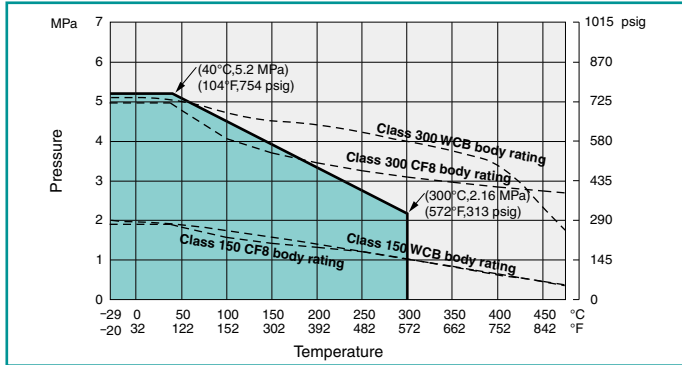
Note: 3H/6H Serviceable temperature terminates at 300°C (572°F) for JIS 10K and at 425°C (797°F) for JIS 20K.

Note: 3H/6H Shell material WCB: Upon prolonged exposure to temperatures above 425°C (797°F), the carbide phase of steel may be converted to graphite.

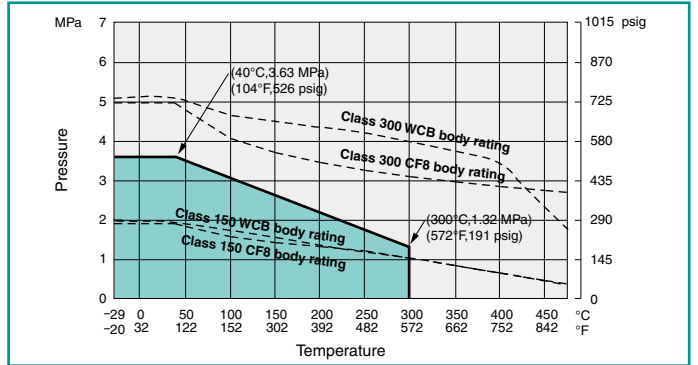
Permissible, but not recommended for prolonged usage above 425°C (797°F).

## Pressure-Temperature Ratings

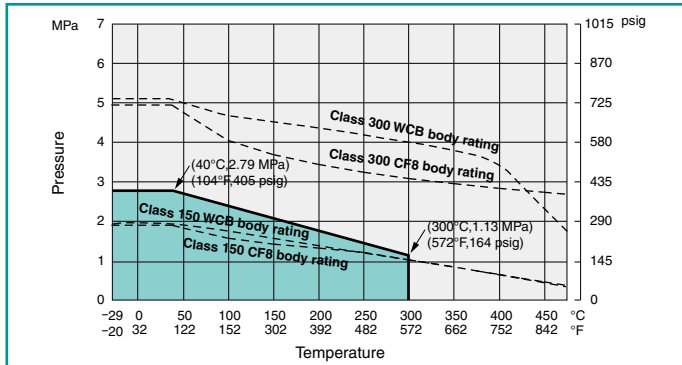
### ● Metal seated floating ball valves: Trim 5H: NPS 1/2 to 1 1/4



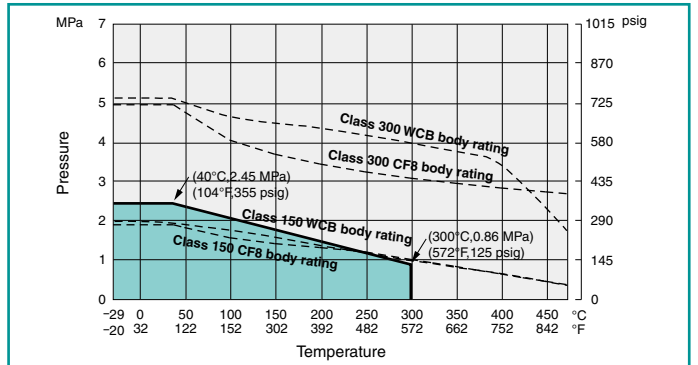
### ● Metal seated floating ball valves: Trim 5H: NPS 1 1/2, 2



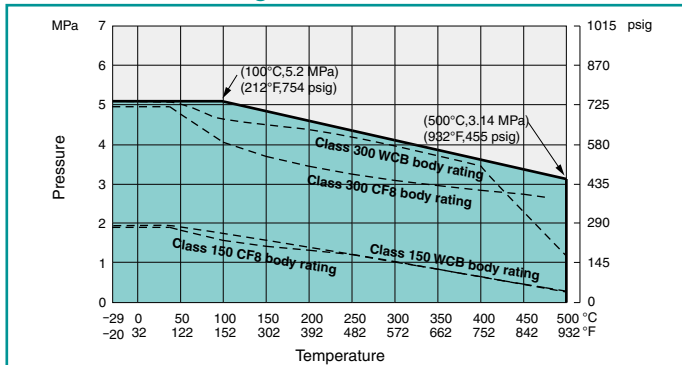
### ● Metal seated floating ball valves: Trim 5H: NPS 2 1/2, 4



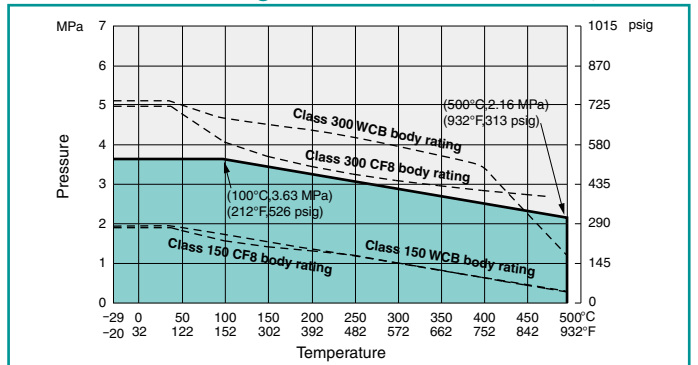
### ● Metal seated floating ball valves: Trim 5H: NPS 5 to 8



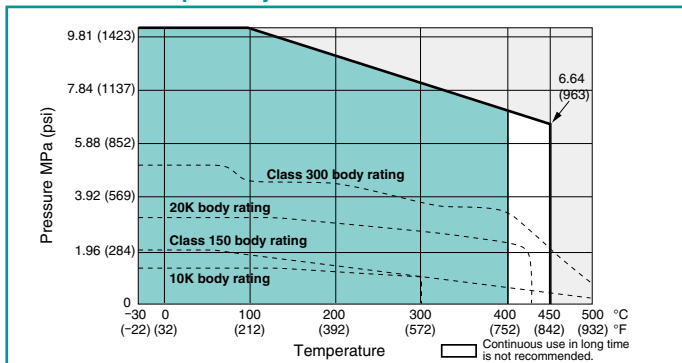
### ● Metal seated floating ball valves: Trim 6H: NPS 1/2 to 5



### ● Metal seated floating ball valves: Trim 6H: NPS 6, 8



### ● Metal seated split body trunnion mounted ball valves: Trim 6H



### ● Metal seated 3-Piece body trunnion mounted ball valves: Trim 6H



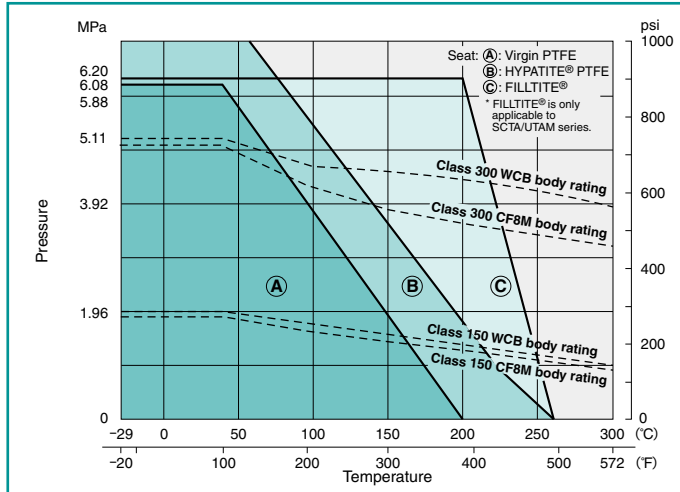
Note: Maximum working temperature for oxidizing service, such as high temperature air, is 400°C (752°F).



## Pressure-Temperature Ratings

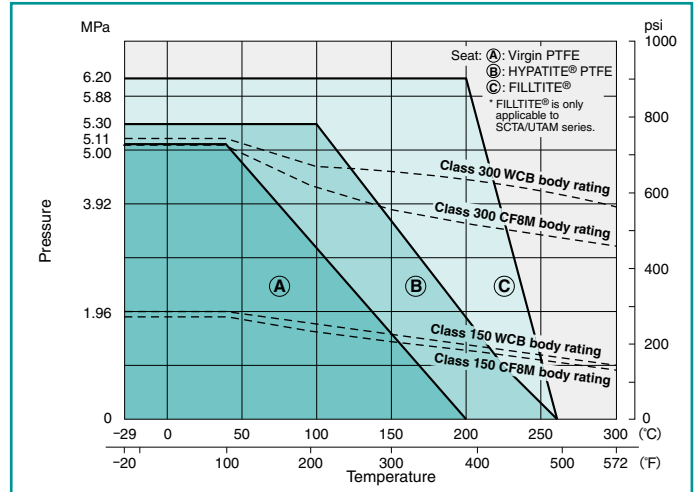
**150UTB(M) : NPS  $\frac{1}{2}$ ,  $\frac{3}{4}$**

**150/300SCTAZM/UTAZM : NPS  $\frac{1}{2}$  to 1**



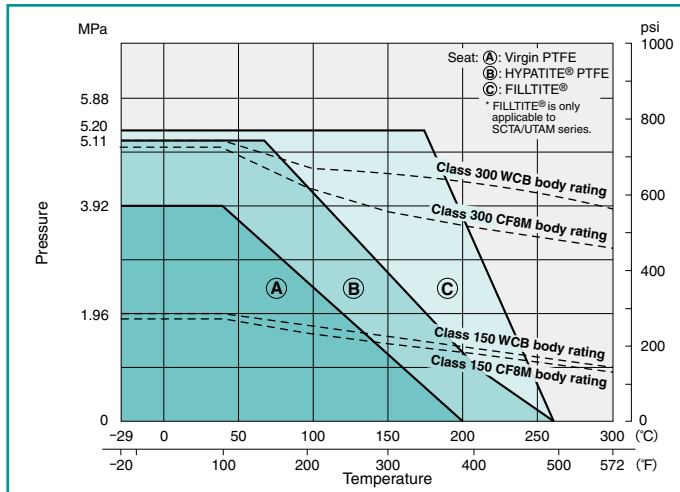
**150UTB(M) : NPS 1 to 2  $\frac{1}{2}$**

**150/300SCTAZM/UTAZM : NPS  $\frac{1}{2}$  to 3**



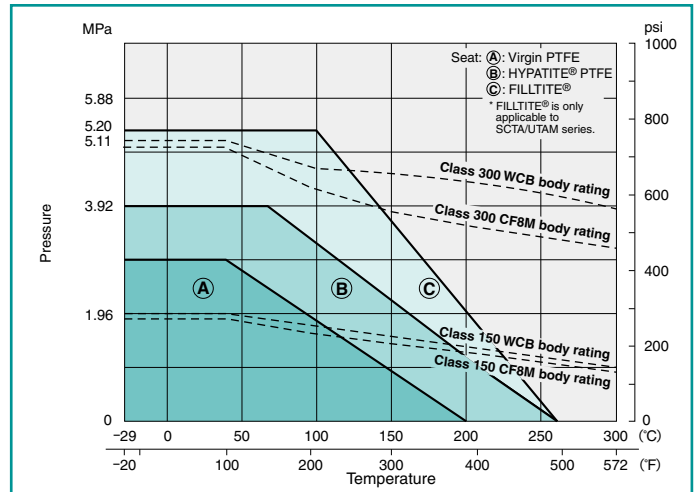
**150UTB(M) : NPS 3, 4\***

**150/300SCTAZM/UTAZM : NPS 4, 6**

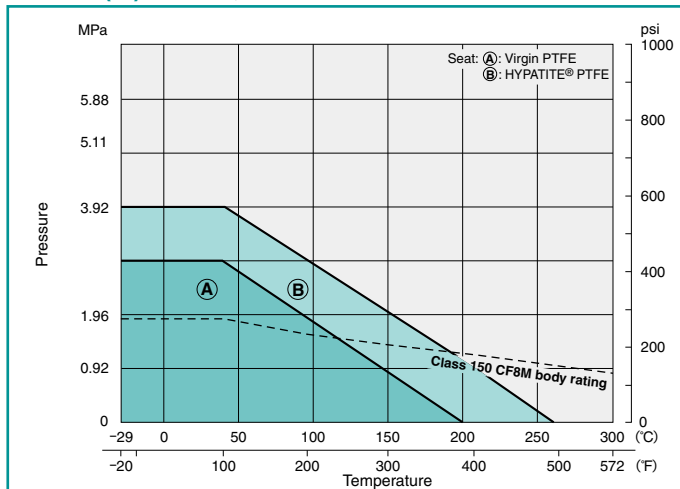


**150UTB(M) : NPS 5, 6**

**150/300SCTAZM/UTAZM : NPS 8, 10**

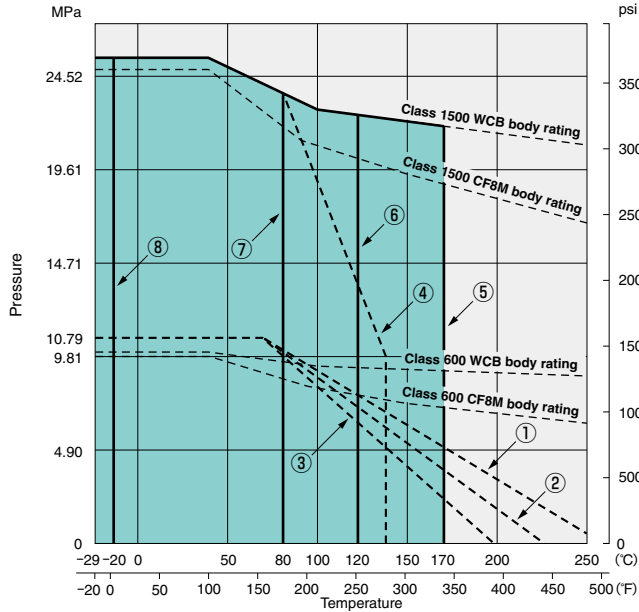


**150UTB(M) : NPS 8, 10**



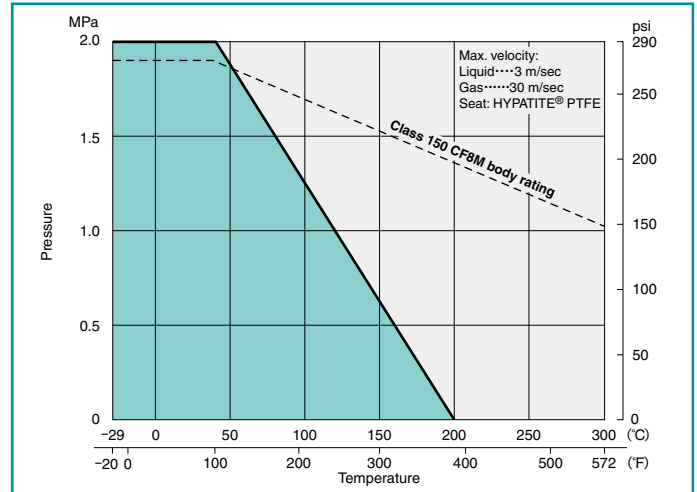
## Pressure-Temperature Ratings

### 600/1500SCTB/UTBM

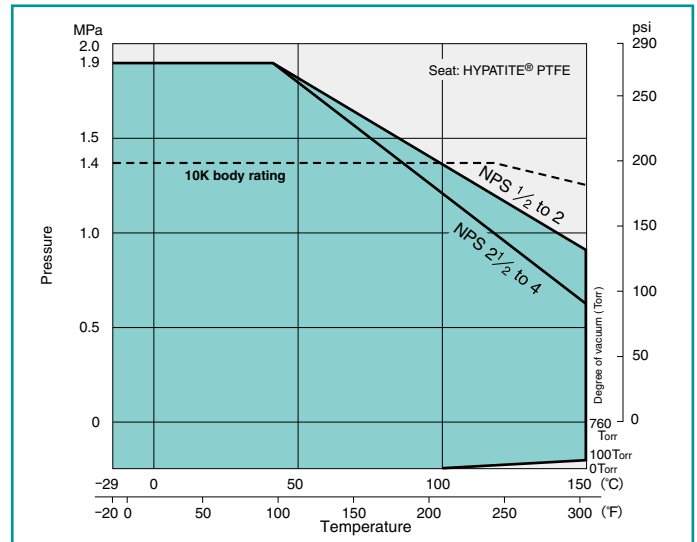


### 3-way: 150UTB4LAM/4TAM

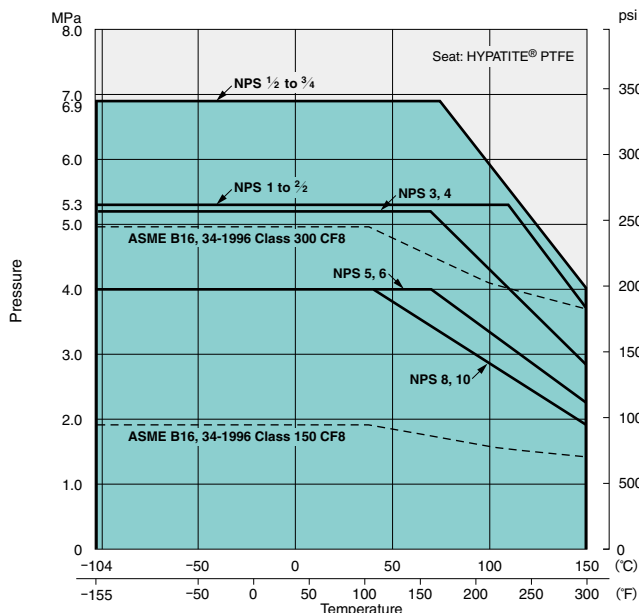
\*Refer to 150UTBM ratings for 150UTB2LM/2TM



### PFA Lined: 10UTBLN

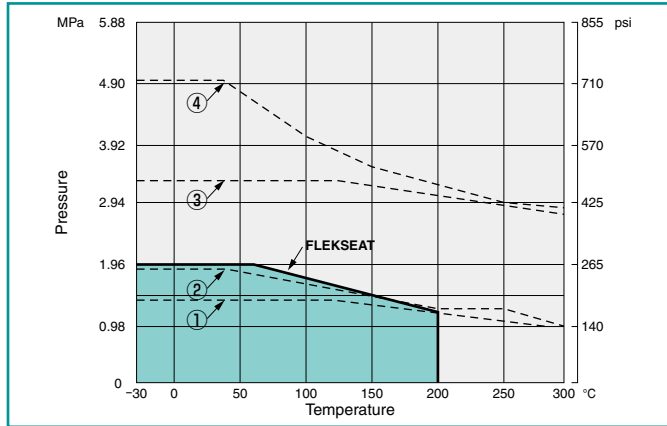


### 150/300UTDZXL



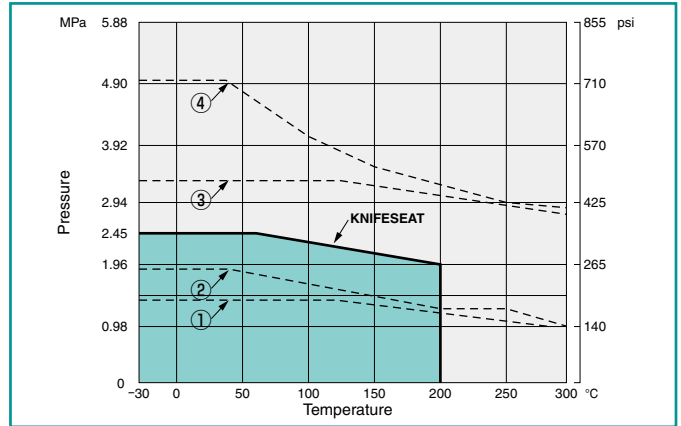
## Pressure-Temperature Ratings

### 150/300UVC 60/20UVC



- ①: Valve body rating to JIS B2220 10K steel
- ②: Valve body rating to ASME B16.34 Class 150 CF8
- ③: Valve body rating to JIS B2220 20K steel
- ④: Valve body rating to ASME B16.34 Class 300 CF8

### 150/300UVCT 10/20UVCT

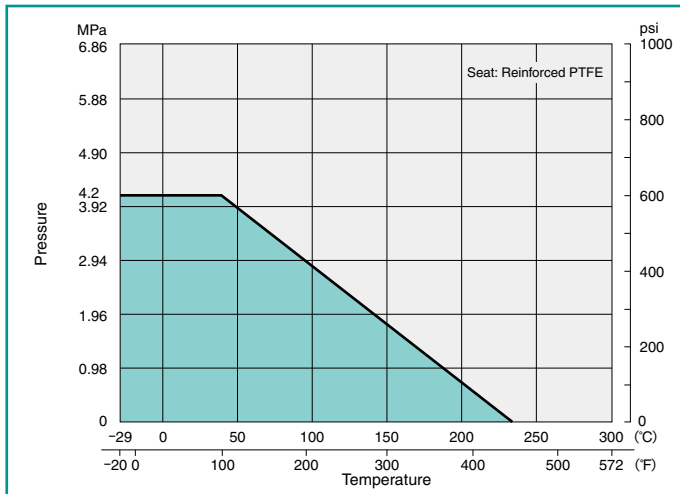


- ①: Valve body rating to JIS B2220 10K steel
- ②: Valve body rating to ASME B16.34 Class 150 CF8
- ③: Valve body rating to JIS B2220 20K steel
- ④: Valve body rating to ASME B16.34 Class 300 CF8

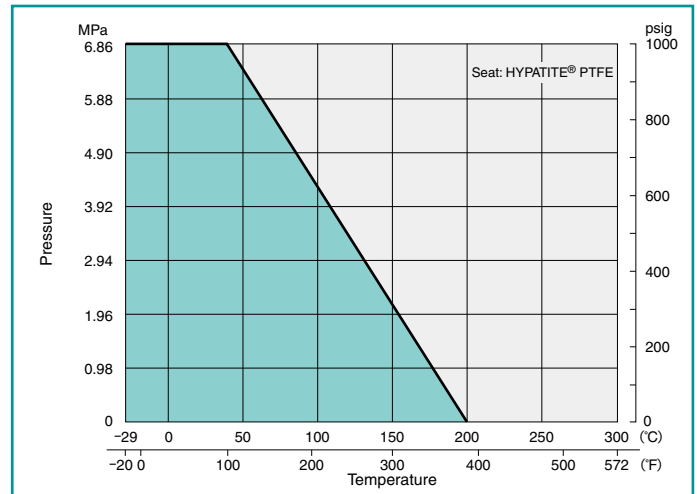
The products introduced in this catalog are all covered by the ISO 9001 Certification awarded KITZ Corporation in 1989, the earliest in the valve industry in Japan.

## Pressure-Temperature Ratings

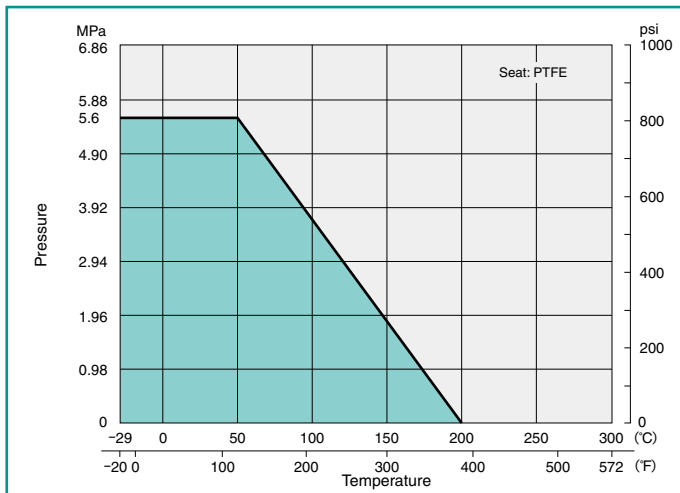
**Type 600 : SCKT/UTKM**



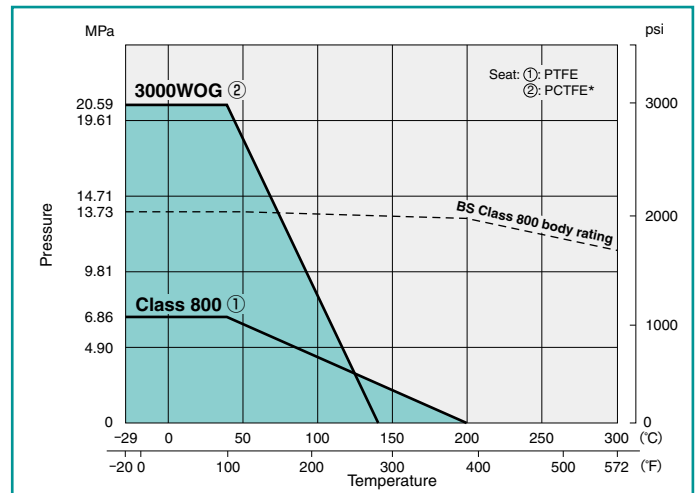
**Type 1000 : UTM**



**Type 800 : UTHM**

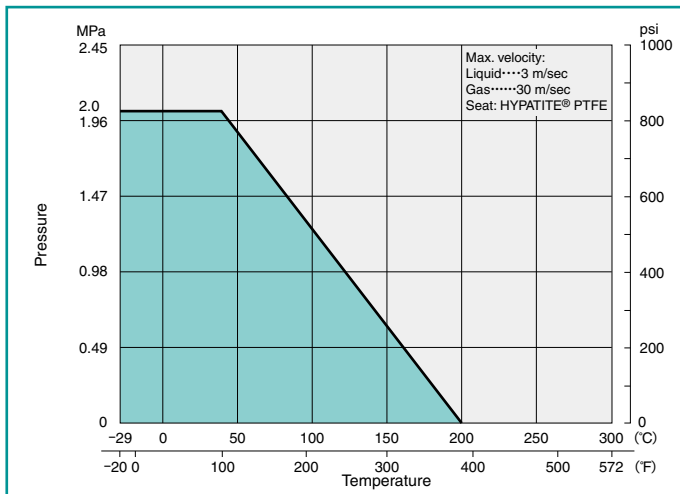


**Class 800 and Type 3000 : SCKT**

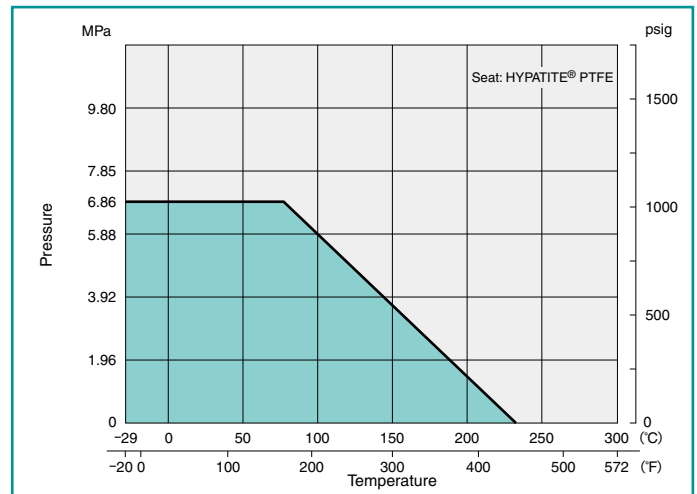


\* Polychloro-Trifluoro-Ethylene

**Type 800 : UTH4LM/4TM**



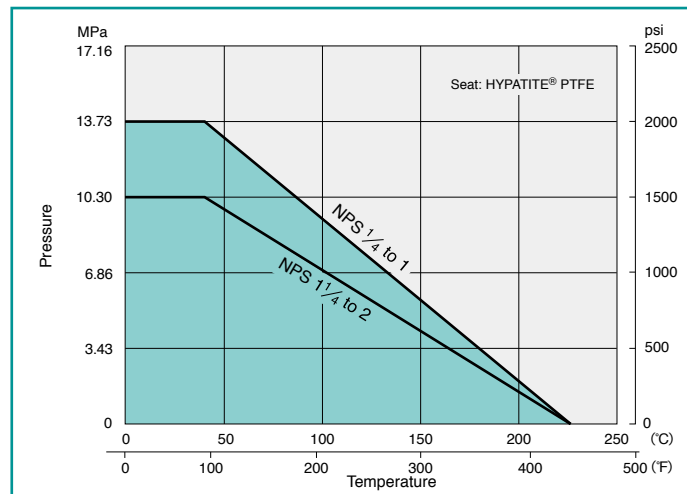
**Type 1000 : SC3TZ/U3TZ Series**



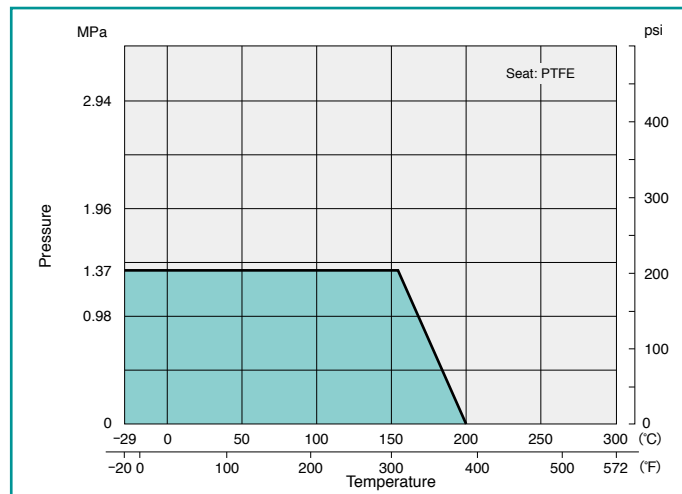
Note: Type 1500 is optionally available

## Pressure-Temperature Ratings

### Type 1500/2000: AKSCTHZM/AKSCTHWZM/AKUTHZM/AKUTHWZM

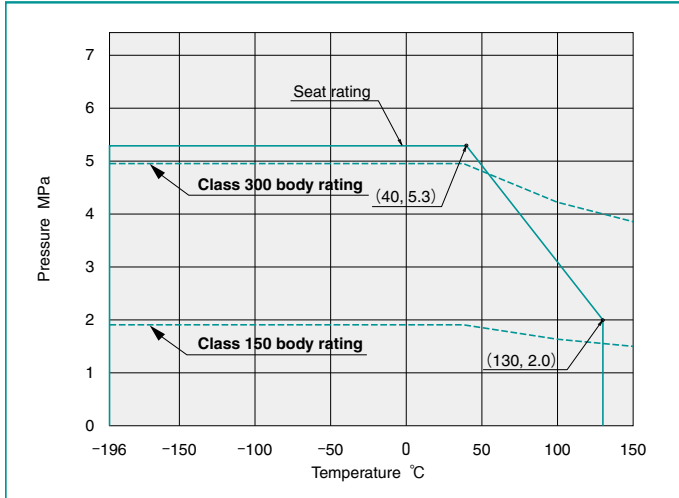


### Class 150: AK150UTM

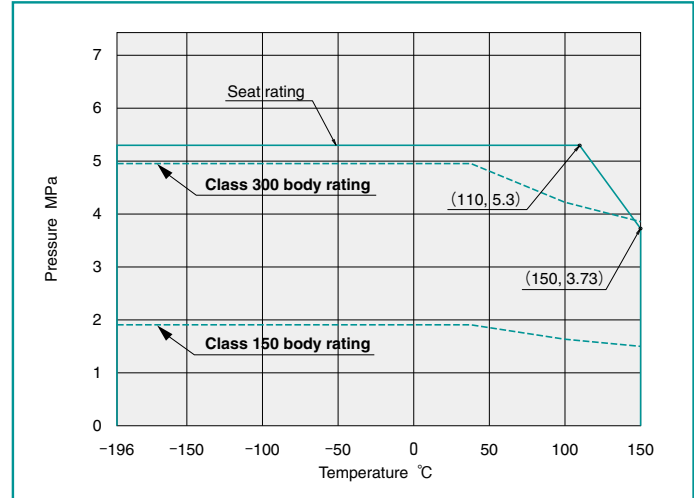


## Pressure-Temperature Ratings (Seat rating)

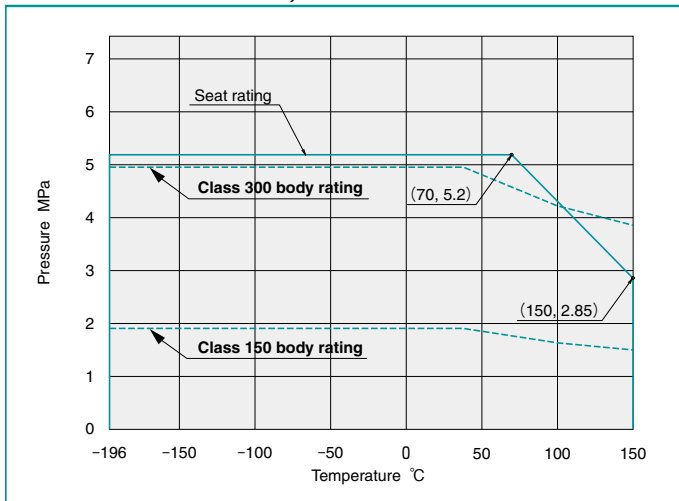
**150/300UTAZLM: NPS 1½ to 11½**



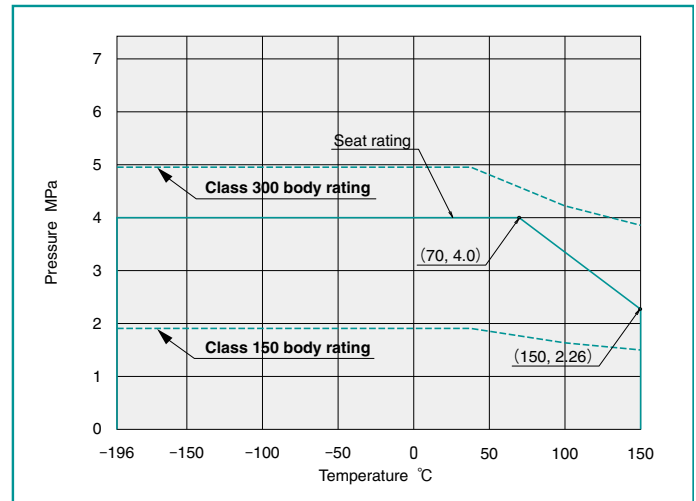
**150/300UTAZLM: NPS 2, 2½**



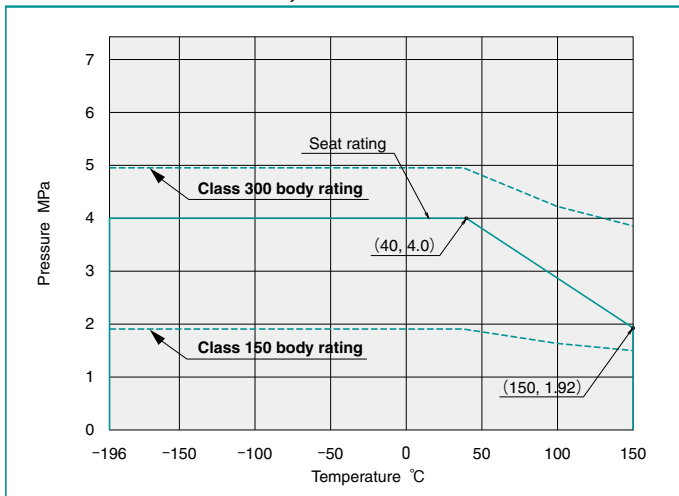
**150/300UTAZLM: NPS 3, 4**



**150/300UTAZLM: NPS 6**

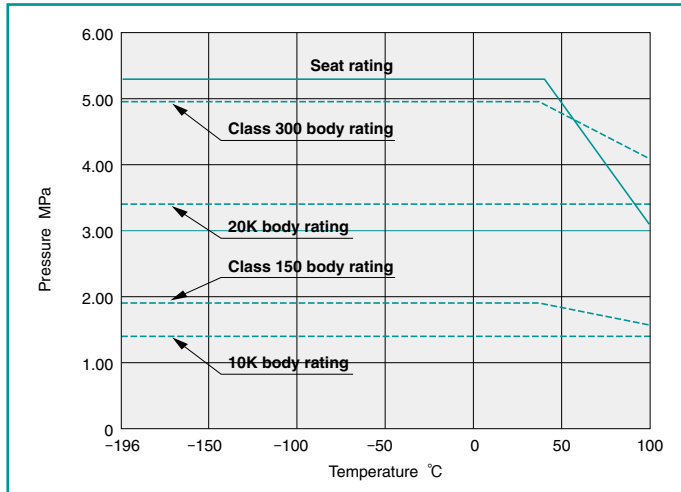


**150/300UTAZLM: NPS 8, 10**

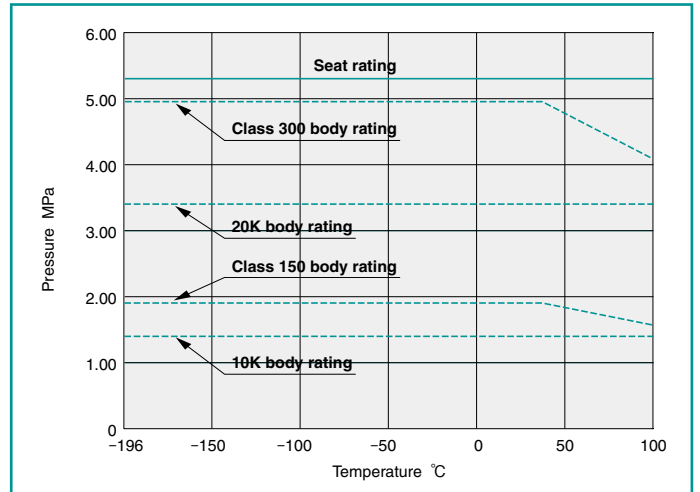


## Pressure-Temperature Ratings (Seat rating)

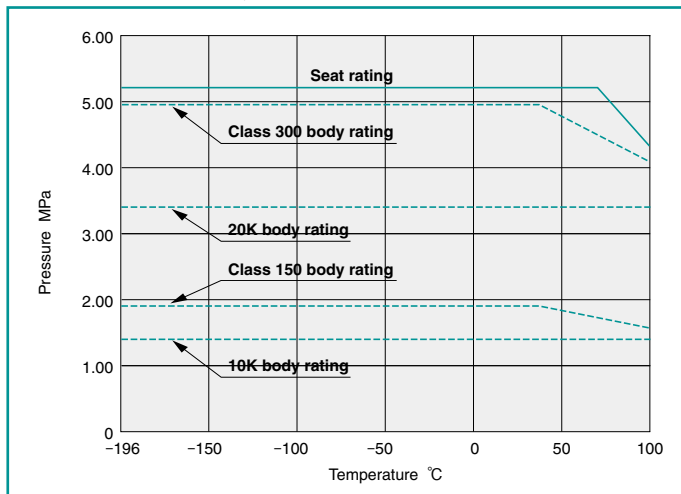
**150/300UTDZL: NPS 1½ to 11½**  
**10/20UTDZL: DN 15 to 40**



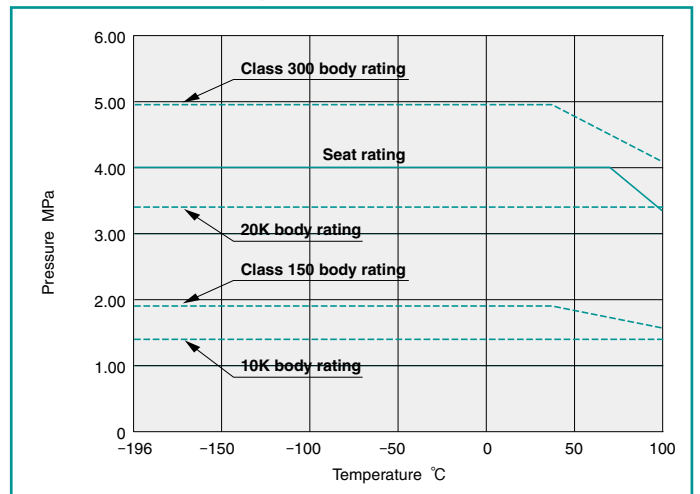
**150/300UTDZL: NPS 2, 2½**  
**10/20UTDZL: DN 50, 65**



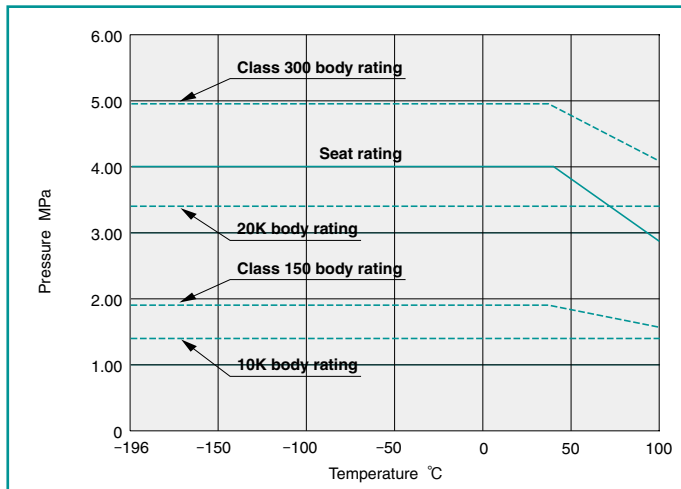
**150/300UTDZL: NPS 3, 4**  
**10/20UTDZL: DN 80, 100**



**150/300UTDZL: NPS 5, 6**  
**10/20UTDZL: DN 125, 150**

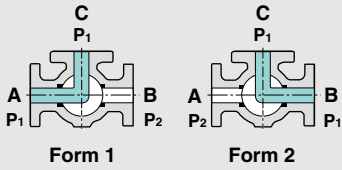
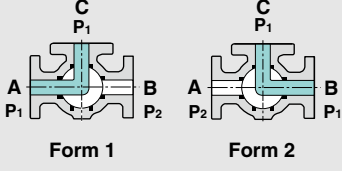
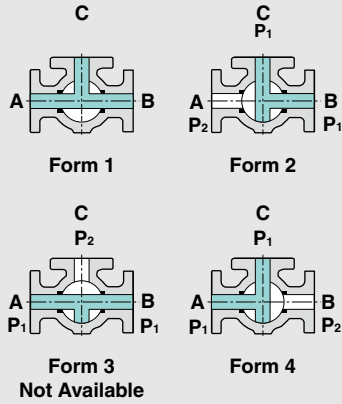
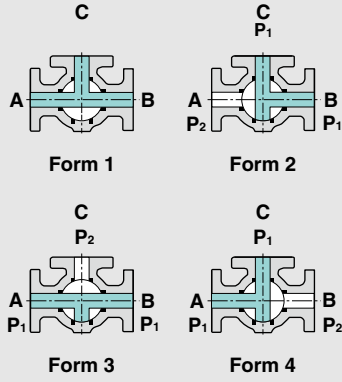


**150/300UTDZL: NPS 8, 10**  
**10/20UTDZL: DN 200, 250**





## Allowable Port Orientation

Valve Design	Form	Fluid Passage
3-Way 2-Seat L-port ball valve	<p>Top View</p>  <p>Form 1      Form 2</p>	<p>1 Flow in Form 1 is between Ports "A" and "C". Flow in Form 2 is between Ports "B" and "C". The flow paths in Form 1 and Form 2 can be exchanged.</p> <p>2 When the fluid pressure P2 in the closed path is higher than P1 in the open path, slight fluid leakage may occur to P1 through the ball seat of the closed path.</p>
3-Way 4-Seat L-port ball valve	<p>Top View</p>  <p>Form 1      Form 2</p>	<p>1 Flow in Form 1 is between Ports "A" and "C". Flow in Form 2 is between Ports "B" and "C". The flow paths in Form 1 and Form 2 can be exchanged.</p> <p>2 When the fluid pressure P2 in the closed path is higher than P1 in the open path, slight fluid leakage may occur to P1 through the ball seat of the closed path.</p>
3-Way 2-Seat T-port ball valve	<p>Top View</p>  <p>Form 1      Form 2</p> <p>Form 3      Form 4</p> <p>Not Available</p>	<p>1 In Form 1, all ports are open. Flow in Form 2 is between Ports "B" and "C". Flow in Form 4 is between Ports "A" and "C". Flow can be switched from Form 1 to Form 2, (standard operation pattern) or from Form 1 to Form 4 in either direction. The stopper is assembled for the standard operation pattern.</p> <p>2 When the fluid pressure P2 in the closed path is higher than P1 in the open path, slight fluid leakage may occur to P1 through the ball seat of the closed path.</p> <p>■ Available operation patterns</p> <ul style="list-style-type: none"> <li>• Pattern 1: From Form 1 to Form 4</li> <li>• Pattern 2: From Form 1 to Form 2 (Standard)</li> </ul> <p>Please select one of the above operation patterns at the time of order.</p>
3-Way 4-Seat T-port ball valve	<p>Top View</p>  <p>Form 1      Form 2</p> <p>Form 3      Form 4</p>	<p>1 In Form 1, all ports are open. Flow in Form 2 is between Ports "B" and "C". Flow in Form 3 is between Ports "A" and "B". Flow in Form 4 is between Ports "A" and "C". All forms are available for switching, diverging, or mixing of flows. The stopper is assembled for a standard operation pattern to switch flow from Form 1 to Form 2.</p> <p>2 When the fluid pressure P2 in the closed path is higher than P1 in the open path, slight fluid leakage may occur to P1 through the ball seat of the closed path.</p> <p>■ Available operation patterns</p> <ul style="list-style-type: none"> <li>• Pattern 1: From Form 1 to Form 4</li> <li>• Pattern 2: From Form 1 to Form 2 (Standard)</li> <li>• Pattern 3: From Form 3 to Form 4</li> <li>• Pattern 4: From Form 2 to Form 3</li> </ul> <p>Please select one of the above operation patterns at the time of order.</p>

### 1. Excessive Cavity Pressure

**Refer to Page 8. 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

Two types of pneumatic valve actuator (KITZ B-Series, F-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 space surrounded by the body, ball and two seats).

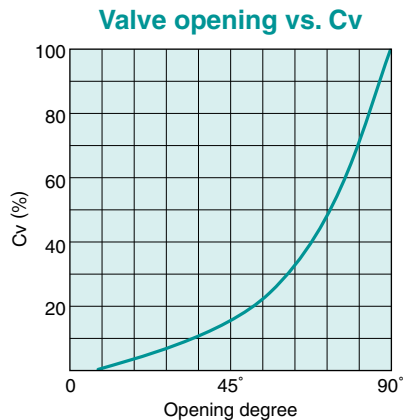
Be sure to completely discharge the pressure trapped in the body cavity, before valve disassembly.

### 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 shell 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.

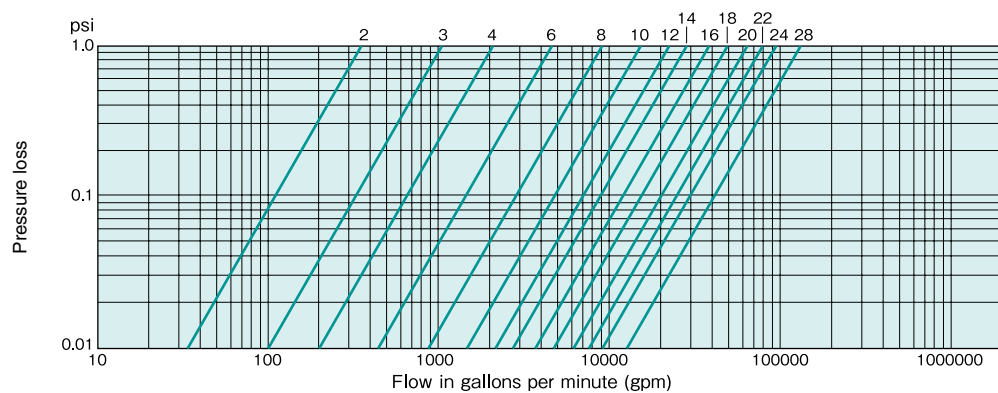
## Flow Characteristics

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.

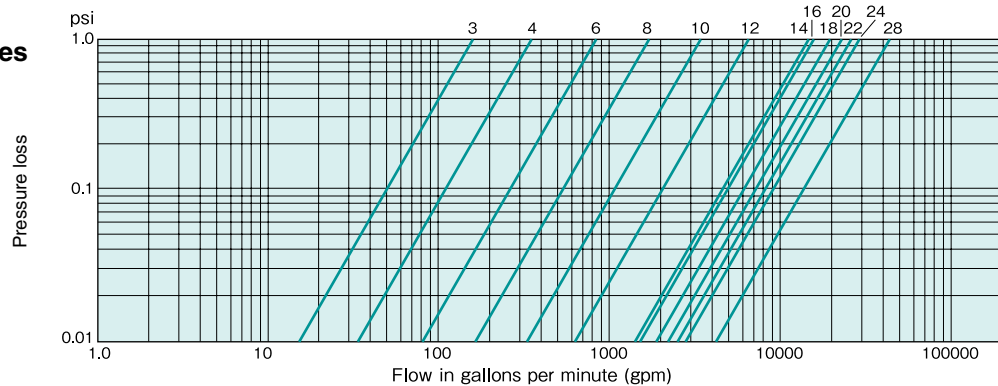


### Pressure Loss vs. Flow Rate

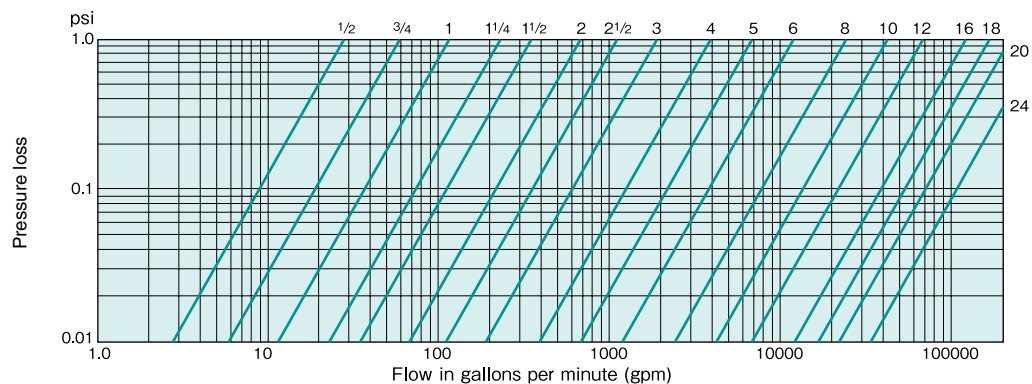
#### Full port valves



#### Reduced port valves



#### Schedule 40 steel pipe (10m)





## CAUTION

Pressure-temperature ratings and other performance data published in this catalog have been developed from our design calculation, in-house testing, field reports provided by our customers and/or published official standards or specifications. They are good only to cover typical applications as a general guideline to users of KITZ products introduced in this catalog.

For any specific application, users are kindly requested to contact KITZ Corporation for technical advice, or to carry out their own study and evaluation for proving the suitability of these products to such an application. Failure to follow this request could result in property damage and/or personal injury, for which we shall not be liable.

While this catalog has been compiled with the utmost care, we assume no responsibility for errors, impropriety, or inadequacy. Any information provided in this catalog is subject to from-time-to-time change without notice for error rectification, product discontinuation, design modification, new product introduction or any other cause that KITZ Corporation considers necessary. This edition cancels all previous issues.

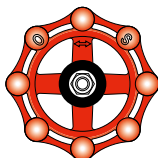
Read the instruction manual carefully before use.

## NOTICE

If any products designated as strategic material in the Foreign Exchange and Foreign Trade Law, Cabinet Order Concerning Control of Export Trade, Cabinet order Concerning Control of Foreign Exchange and other related laws and ordinances ("Foreign Exchange Laws") are exported to any foreign country or countries, an export license issued by the Japanese Government will be required under the Foreign Exchange Laws.

Further, there may be cases where an export license issued by the government of the United States or other country will be required under the applicable export-related laws and ordinances in such relevant countries.

The contract shall become effective subject to the fact that a relevant export license is obtained from the Japanese Government.



*A chrysanthemum-handle is a symbol of KITZ,  
the brand of valve reliability*

ISO 9001 certified since 1989

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