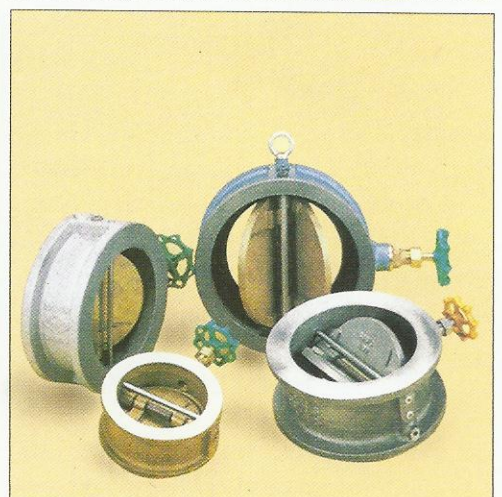
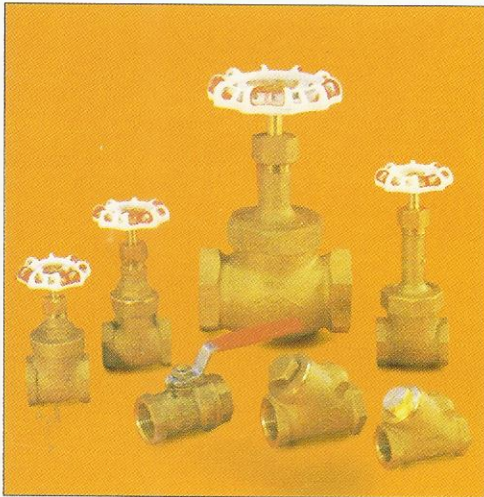




Toyo Product Catalog



RED-WHITE®



Toyo Valve Co.,Ltd

Contributing to tomorrow's soc



Notes

- 1) Refer to the individual specification sheet or the drawing for details of a product.
- 2) Main units of this catalog are shown in SI (MPa, °C, millimeter) and psig., °F.
- 3) Refer to the attached P-T ratings about applicable pressure and temperature.
- 4) The non-asbestos product is used for the gland packing and gasket of bronze, brass and cast iron valves as a manufacturer's standard. Please consult about other products.
- 5) Bronze and cast iron strainers have the perforated metal screen equivalent to 14-16 meshes. Other meshes of the screen are also available upon request. Please contact us.
- 6) Legends
 - d: Port diameter (mm)
 - w: Net weight (kg)
- 7) Teflon is Du Pont's tradename.

Products guarantee

Term of a guarantee: Within one year after the date of delivery from our factory to the original customer.

Contents of a guarantee: If the installations and the service conditions (such as pressure, temperature, fluid, etc.) are proper, necessary replacement and repair of our product will be carried out without charge.

Guarantee exceptions: Please keep in mind that the above articles of guarantee will not apply to the case owing to the following reasons:

- 1) Non-compliance of the customer with the technical instructions furnished by our catalog and specification sheet
- 2) Natural disaster incidents, such as a fire, flood damage, an earthquake, and falling stone
- 3) Reconstruction or repair by any third party other than Toyo Valve Co., Ltd.
- 4) Deterioration (such as shot rust, degradation, chemical changes, etc.)
- 5) Any other matter resulting from the damage not being regarded as manufacturer's responsibility

In addition, you will be required necessary charge for repair or exchange of parts on failure or damage by the guarantee exceptions. Please contact our sales staff or agency for details.

The specification and the performance term of our product indicated in this catalog are based on the internationally governed standards and specifications, our products experience or the design calculation and our in-house examination.

ity as a fluid control specialist



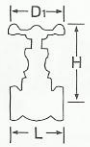
SUWA PLANT





When using the product beyond the service conditions mentioned in this catalog, users are requested to consult Toyo Valve for further advice in advance, or to conduct the verification or evaluation for the performance under users' responsibility. We shall not be liable for any damages resulting from lack of aforementioned procedures by the customer.





Items mentioned in this catalog are subject to change without prior notice to the customers.

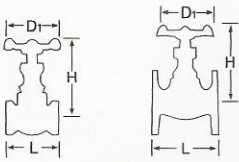
INDEX	
Bronze & Brass Valves.....	P4~7
JIS Standard Bronze Valves.....	P8
Core-Tight® Valves.....	P9
Ball Valves.....	P10~11
Toyo Standard Cast Iron Valves.....	P12~14
Aluminium Butterfly Valves	P15
Cast Iron Butterfly Valves.. ..	P16
Cast Iron Valve 125/PN16	P17
Ductile & Malleable Iron Valve.....	P18~19
Cast Steel Valves.....	P21~21
Annex.....	P22~27

Bronze & Brass Valves



Design		TOYO Standard												MSS SP-80			
Type		Gate Valves															
Class		125															
																	
Fig.		275A				206A				272A				280A			
Size		L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W
8 (mm)	1/4"	40	74	48	0.26	42	77	48	0.25	38	73	48	0.22	43	91	48	0.28
10	3/8"	43	77	48	0.28	42	77	48	0.26					45.5	91	48	0.30
15	1/2"	43	77	48	0.32	44	81	48	0.29	42	77	48	0.27	50	96	55	0.39
20	3/4"	48	87	55	0.34	49	94	55	0.40	47	87	55	0.38	56	110	63	0.53
25	1"	53	100	63	0.45	56	108	63	0.58	50	100	63	0.49	65	124	70	0.79
32	1 1/4"	60	117	70	0.72	61	125	70	0.82	60	117	70	0.73	72	143	80	1.11
40	1 1/2"	63	128	70	0.90	66	138	80	1.14	63	128	70	1.01	79	164	90	1.61
50	2"	71	152	80	1.37	73	169	90	1.79	72	152	80	1.62	85	193	100	2.42
65	2 1/2"	87	180	90	2.33	90	205	100	3.11	80	177	100	2.35	106.5	236	110	3.80
80	3"	96	209	100	3.54	100	243	125	4.60	90	203	110	3.19	116	272	125	5.65
100	4"	116	281	125	7.28	140	311	160	11.20								
Material	Body	Bronze				Bronze				Brass				Bronze			
	Stem	Brass				Brass				Brass				Brass			
	Disc	Bronze				Bronze				Brass				Bronze			
Service conditions		1.37MPa (200psi) WOG non-shock 0.86MPa (125psi) Saturated steam															
Remarks																	

Design		MSS SP-80															
Type		Gate Valves															
Class		150				125				150				125			
																	
Fig.		204A				208A				209A				293			
Size		L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W
8 (mm)	1/4"	45.2	91	48	0.32												
10	3/8"	45.2	91	48	0.30	45	114	48	0.40					47	121	48	0.39
15	1/2"	50	96	55	0.39	50	131	55	0.44	50	131	55	0.44	54	138	55	0.50
20	3/4"	56	110	63	0.54	56	152	63	0.57	56	152	63	0.59	58	158	63	0.71
25	1"	65	124	70	0.94	65	176	70	0.88	65	176	70	0.89	67	193	70	1.09
32	1 1/4"	72	143	80	1.15	72	212	80	1.24	72	212	80	1.27	73	221	80	1.49
40	1 1/2"	79	164	90	1.69	79	249	90	1.79	79	249	90	1.90	77	250	90	1.97
50	2"	85	193	100	2.58	85	296	100	2.65	85	296	100	2.82	84	305	100	3.05
65	2 1/2"	114	248	125	5.12	115	381	125	5.40	120	425	140	7.65	106	368	125	5.10
80	3"	130	281	140	7.78	130	436	140	7.88	140	478	160	10.76	115	426	125	7.01
100	4"	170	354	180	16.37												
Material	Body	Bronze				Bronze				Bronze				Bronze			
	Stem	Brass				Bronze				Bronze				Bronze			
	Disc	Bronze				Bronze				Bronze				Bronze			
Service conditions		2.06MPa (300psi) WOG non-shock 1.03MPa (150psi) Saturated steam				1.37MPa (200psi) WOG non-shock 0.86MPa (125psi) Saturated steam				2.06MPa (300psi) WOG non-shock 1.03MPa (150psi) Saturated steam				1.37MPa (200psi) WOG non-shock 0.86MPa (125psi) Saturated steam			
Remarks																	

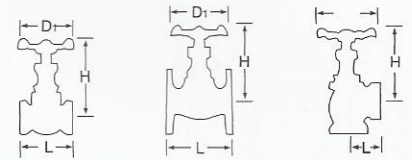


Bronze Valves

Design		MSS SP-80															
Type		Gate Valves															
Class		150				200				300				150			
Fig.		298				314				318A				205A			
Size		L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W
8 (mm)	1/4"																
10	3/8"	47	121	48	0.39												
15	1/2"	54	133	55	0.50	60	138	63	0.48	60	138	63	0.48	75	96	55	1.32
20	3/4"	58	158	63	0.72	68	162	70	0.67	68	162	70	0.67	80	110	63	1.65
25	1"	67	193	70	1.09	78	190	80	1.02	78	190	80	1.02	95	124	70	2.65
32	1 1/4"	73	221	80	1.50	86	225	90	1.55	86	225	90	1.55	110	143	80	3.56
40	1 1/2"	77	250	90	1.95	94	254	100	2.18	94	254	100	2.18	120	164	90	4.38
50	2"	84	304	100	2.99	108	310	100	3.40	108	310	110	3.40	140	193	100	6.33
65	2 1/2"	106	368	125	5.13									165	248	125	10.07
80	3"	115	426	125	7.14									190	281	140	12.85
100	4"													230	354	180	23.25
125	5"													230	420	250	44.70
150	6"													250	485	280	63.70
Material	Body	Bronze				Bronze				Bronze				Bronze			
	Stem	Bronze				Bronze				Bronze				Brass			
	Disc	Bronze				Bronze				Bronze				Bronze			
Service conditions		2.06MPa (300psi) WOG non-shock 1.03MPa (150psi) Saturated steam				2.75MPa (400psi) WOG non-shock 1.37MPa (200psi) Saturated steam				6.89MPa (1000psi) WOG non-shock 2.06MPa (300psi) Saturated steam				1.55MPa (225psi) WOG non-shock 1.03MPa (150psi) Saturated steam			
Remarks						Body seat ring: SUS403				Body seat ring: SUS403				JIS 10K flange available			

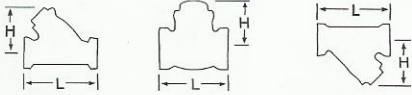
Design		TOYO Standard				MSS SP-80											
Type		Globe Valves															
Class		100				125				150				200			
Fig.		210A				211A				213A				214			
Size		L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W
8 (mm)	1/4"	40	67	48	0.17	42	67	48	0.18	42	67	48	0.18	58	119	63	0.56
10	3/8"	42	67	48	0.19	46	74	55	0.22	46	74	55	0.23	58	119	63	0.58
15	1/2"	48	74	55	0.27	55	77	55	0.29	55	83	63	0.29	68	131	70	0.64
20	3/4"	53	77	55	0.31	65	89	63	0.43	65	102	70	0.50	80	153	80	1.16
25	1"	63	89	63	0.44	76	110	70	0.67	76	116	80	0.72	95	168	90	1.59
32	1 1/4"	73	110	70	0.73	85	131	80	1.03	85	142	90	1.14	108	190	100	2.44
40	1 1/2"	82	131	80	1.07	98	144	90	1.44	98	157	100	1.64	120	209	110	3.51
50	2"	98	144	90	1.61	115	167	100	2.29	115	179	110	2.59	145	235	125	5.48
65	2 1/2"	115	171	100	2.47	142	204	125	4.10	142	210	125	4.31	185	265	140	9.37
80	3"	135	206	125	4.10	165	222	140	6.40	165	232	160	6.68	210	307	160	13.85
100	4"					195	248	160	12.00								
Material	Body	Bronze				Bronze				Bronze				Bronze			
	Stem	Brass				Brass				Brass				Brass			
	Disc	Brass or Bronze				Brass or Bronze				Brass or Bronze				SUS403			
Service conditions		1.03MPa (150psi) WOG non-shock 0.68MPa (100psi) Saturated steam				1.37MPa (200psi) WOG non-shock 0.86MPa (125psi) Saturated steam				2.06MPa (300psi) WOG non-shock 1.03MPa (150psi) Saturated steam				2.75MPa (400psi) WOG non-shock 1.37MPa (200psi) Saturated steam			
Remarks						100A: 120MPa (175psi) WOG								Body seat ring: SUS403			

Bronze Valves


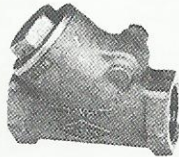







Design		MSS SP-80															
Type		Globe Valves								Angel Valves							
Class		300				150				300							
Fig.																	
Size		335				215A				260A				340			
Size		L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W
8 (mm)	1/4"	51	106	55	0.38					22	64	48	0.18				
10	3/8"	59	123	55	0.52	73	74	55	1.03	25	70	55	0.22				
15	1/2"	58	131	63	0.65	85	83	63	1.20	27.5	77	63	0.29	32	129	63	0.67
20	3/4"	75	162	80	0.99	95	102	70	1.60	32.5	96	70	0.49	38	159	80	1.00
25	1"	89	176	90	1.49	108	116	80	2.60	38	108	80	0.69	45	176	90	1.38
32	1 1/4"	103	202	100	2.37	120	142	90	3.70	44	132	90	1.12	53	204	100	2.42
40	1 1/2"	118	227	125	3.37	135	157	100	4.40	49.5	146	100	1.64	59	228	125	3.18
50	2"	146	267	140	6.00	155	179	110	6.20	59	168	110	3.17	73	266	140	5.51
65	2 1/2"					175	210	125	9.00	72.5	196	125	4.31				
80	3"					195	232	160	11.30	84.5	217	160	6.68				
100	4"					240	344	200	21.86								
Material	Body	Bronze				Bronze				Bronze				Bronze			
	Stem	Brass				Bronze				Bronze				Brass			
	Disc	Bronze				Brass or Bronze				Brass or Bronze				Bronze			
Service conditions		4.18MPa (600psi) WOG non-shock 2.06MPa (300psi) Saturated steam				1.55MPa (225psi) WOG non-shock 1.03MPa (150psi) Saturated steam				2.06MPa (300psi) WOG non-shock 1.03MPa (150psi) Saturated steam				3.44MPa (500psi) WOG non-shock 2.06MPa (300psi) 288°C (550°F) Saturated steam			
Remarks		JIS 10K flange available															

Design		MSS SP-80															
Type		Globe Valves with PTFE seat															
Class		125				150											
Fig.																	
Size		220A				221				221A				223			
Size		L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W
8 (mm)	1/4"					58	104	63	0.42								
10	3/8"	58	106	63	0.40	58	104	63	0.40					72	104	63	1.10
15	1/2"	58	92	63	0.39	65	121	70	0.57	62	98	70	0.41	82	121	70	1.45
20	3/4"	67	100	70	0.57	80	138	80	0.81	72	120	80	0.65	95	138	80	1.97
25	1"	78	122	80	0.84	95	154	90	1.29	82	130	90	0.91	108	154	90	3.01
32	1 1/4"	88	141	90	1.29	108	176	100	1.92	92	152	100	1.41	120	176	100	4.13
40	1 1/2"	102	158	100	1.87	120	197	110	2.93	106	169	110	2.09	140	197	110	5.11
50	2"	120	180	110	2.93	145	232	125	5.01	125	193	125	3.18	165	230	125	7.61
65	2 1/2"	145	232	125	5.01	170	258	140	7.31					190	253	140	11.87
80	3"	160	258	140	7.31	200	280	160	11.68					220	280	160	16.03
100	4"					245	347	200	23.04					270	347	200	28.24
125	5"													320	398	280	51.00
150	6"													375	446	320	78.50
Material	Body	Bronze				Bronze				Bronze				Bronze			
	Stem	Brass				Brass				Brass				Brass			
	Disc	PTFE or R-PTFE				PTFE				PTFE or R-PTFE				PTFE			
Service conditions		1.37MPa (200psi) WOG non-shock 0.86MPa (125psi) Saturated steam				2.06MPa (300psi) WOG non-shock 1.03MPa (150psi) Saturated steam								1.55MPa (225psi) WOG non-shock 1.03MPa (150psi) Saturated steam			
Remarks		JIS 10K flange available															

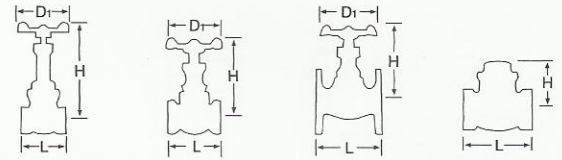






Bronze Valves


Design	TOYO Standard		MSS SP-80												
Type	Lift check Valve		Swing Check Valves												
Class	125						150								
															
Fig.	231		236A			234A			238A			239			
Size	L	W	L	H	W	L	H	W	L	H	W	L	H	W	
8 (mm)	1/4"		56	42	0.28							42	28	0.12	
10	3/8"	50 0.14	56	42	0.27	49	37	0.20	51	39	0.19	46	30	0.16	
15	1/2"	55 0.20	56	42	0.26	56	42	0.27	60	42	0.24	55	33	0.22	
20	3/4"	65 0.30	70	50	0.43	70	50	0.45	70	48	0.41	65	37	0.38	
25	1"	75 0.51	80	58	0.61	80	58	0.75	81	57	0.56	76	42	0.66	
32	1 1/4"	85 0.78	96	69	0.96	96	60	1.00	93	64	0.83	85	50	0.92	
40	1 1/2"	95 1.06	110	81	1.40	110	81	1.43	104	71	1.20	98	58	1.33	
50	2"	110 1.75	128	98	2.27	128	98	2.34	125	85	1.93	115	67	2.00	
65	2 1/2"	130 2.75	156	118	3.96				152	102	3.40	142	82	3.18	
80	3"	150 4.09	184	139	5.68				172	155	4.65	165	90	4.62	
100	4"		232	174	10.98							185	114	9.10	
Material	Body	Bronze		Bronze			Bronze			Bronze			Bronze		
	Pin	—		Brass			Brass			Brass			—		
	Disc	Bronze		Bronze			PTFE			Bronze			Bronze		
Service conditions	1.37MPa (200psi) WOG non-shock 0.86MPa (125psi) Saturated steam						2.06MPa (300psi) WOG non-shock 1.03MPa (150psi) Saturated steam								
Remarks							PTFE seat								

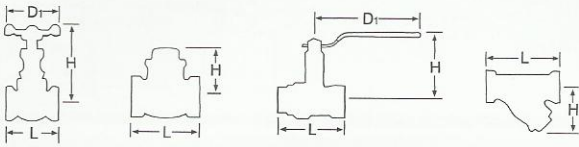
Design	TOYO Standard						
Type	Swing Check Valves			Strainer			
Class	300			150			
							
Fig.	360			380A			
Size	L	H	W	L	H	W	
8 (mm)	1/4"						
10	3/8"			80	49	0.33	
15	1/2"	70	43	0.39	80	49	0.29
20	3/4"	78	50	0.60	100	59	0.47
25	1"	92	57	0.94	115	70	0.75
32	1 1/4"	111	72	1.54	135	81	1.23
40	1 1/2"	122	72	2.15	160	93	1.72
50	2"	148	86	3.42	195	120	2.81
65	2 1/2"				220	147	4.36
80	3"				240	165	6.21
100	4"						
Material	Body	Bronze			Bronze		
	Pin	Brass			SUS304		
	Disc	Bronze					
Service conditions	4.13MPa (600psi) WOG non-shock 2.06MPa (300psi) Saturated steam			2.06MPa (300psi) WOG non-shock 1.03MPa (150psi) Saturated steam			
Remarks				14-16 meshes/perforated screen			

JIS Standard Bronze Valves



Design		JIS Standard															
Type		Gates Valves								Globe Valves							
Class		5K				10K				5K				10K			
																	
		JIS B2011				JIS B2011				JIS B2011				JIS B2011			
Fig.		031				035				001				005			
Size		L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W
8 (mm)	1/4"													50	92	55	0.31
10	3/8"													55	93	65	0.31
15	1/2"	50	133	55	0.43	55	133	55	0.48	60	96	63	0.35	65	96	70	0.45
20	3/4"	60	148	63	0.60	65	157	70	0.69	70	104	70	0.52	80	119	80	0.71
25	1"	65	173	70	0.88	70	182	80	1.02	80	115	80	0.85	90	137	90	1.06
32	1 1/4"	75	212	80	1.37	80	220	90	1.55	100	140	90	1.29	105	164	100	1.74
40	1 1/2"	85	249	90	1.98	90	254	100	2.14	110	147	90	1.79	120	176	110	2.23
50	2"	95	297	100	3.09	100	305	110	3.40	135	177	110	2.76	140	205	125	3.49
65	2 1/2"	115	362	125	5.52	120	371	140	6.20	160	200	125	5.00	180	217	140	6.60
80	3"	130	427	140	8.50	140	439	160	9.40	190	230	140	7.60	120	254	160	11.10
100	4"													260	300	200	20.00
Material	Body	Bronze				Bronze				Bronze				Bronze			
	Stem	Brass				Brass				Brass				Brass			
	Disc	Bronze				Bronze				Brass or Bronze				Brass or Bronze			
Service conditions		120 °C water, no-shock 0.7MPa 120 °C oil, gas, air, water 0.5MPa Saturated steam 0.2MPa				120 °C water, no-shock 1.4MPa 120 °C oil, gas, air, water 1.0MPa Saturated steam 0.7MPa				120 °C water, no-shock 0.7MPa 120 °C oil, gas, air, water 0.5MPa Saturated steam 0.3MPa				120 °C water, no-shock 1.4MPa 120 °C oil, gas, air, water 1.0MPa Saturated steam 1.0MPa			
Remarks																	

Design		JIS Standard		
Type		Swing Check Valve		
Class		10K		
				
		JIS B2011		
Fig.		065		
Size		L	H	W
8 (mm)	1/4"			
10	3/8"	55	39	0.24
15	1/2"	65	43	0.36
20	3/4"	80	50	0.58
25	1"	90	57	0.81
32	1 1/4"	105	71	1.39
40	1 1/2"	120	72	1.89
50	2"	140	86	2.88
65	2 1/2"			
80	3"			
100	4"			
Material		Body: Bronze		
		Stem: Brass		
		Disc: Bronze		
Service conditions		120 °C water, no-shock 1.4MPa 120 °C oil, gas, air, water 1.0MPa Saturated steam 1.0MPa		
Remarks				



—Red Water-Proof Series— Lead-Free Core-Tight® Valves

Design	TOYO Standard																	
Type	Gate Valves												Swing Check Valves					
Class	5K				10K								10K					
Fig.	031SK/031HN				035SK/035HN				206SK/206HN				065SK/065HN					
Size	L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W	L	H	W			
15(mm)	1/2"	63	133	55	0.49	66	133	55	0.54	61	81	48	0.33	82	43	0.43		
20	3/4"	68	148	63	0.63	71	157	70	0.74	64	94	55	0.45	93	50	0.67		
25	1"	77	173	70	0.96	79	182	80	0.13	74	108	63	0.63	105	57	0.81		
32	1 1/4"	88	212	80	1.15	88	220	90	1.71	82	125	70	0.82	118	71	1.59		
40	1 1/2"	94	249	90	2.26	94	254	100	2.28	87	138	80	1.24	135	72	2.11		
50	2"	106	297	100	3.11	106	305	110	3.50	97	169	90	1.93	159	86	3.35		
Material	Body	Lead-Free Bronze				Lead-Free Bronze				Lead-Free Bronze				Lead-Free Bronze				
	Stem	Brass				Brass				Brass				Brass or Bronze				
	Disc	Bronze				Bronze				Bronze				Bronze				
Service conditions	See the following P-T rating																	
Remarks																		

Design	TOYO Standard											
Type	Ball Valves					Strainer						
Class	10K											
Fig.	5011SK/5011HN					380SK/380 HN						
Size	d	L	H	D ₁	W	L	H	W				
15(mm)	1/2"	10	68	71	109	0.4	92	49	0.36			
20	3/4"	15	78	76	109	0.6	106	59	0.56			
25	1"	20	89	80	129	0.8	124	70	0.86			
32	1 1/4"	25	101	95	139	1.2	142	81	1.31			
40	1 1/2"	32	112	101	139	1.7	162	93	1.70			
50	2"	40	128	107	159	2.6	200	120	2.81			
Material	Body	Lead-Free Bronze					Body	Lead-Free Bronze				
	Stem	Brass					Screen	SUS304				
	Ball	SUS304										
	Seat	PTFE										
Service conditions	See the following P-T rating											
Remarks						14-16 meshes/perforated screen						

■ P-T Rating for Core-Tight Valves

SK type (For cold water)

	Nominal Pressure (MPa)	
	5K	10K
40°C water	0.7	1

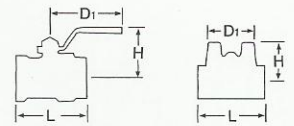
HN type (For heated water)

	Nominal Pressure (MPa)	
	5K	10K
85°C water	0.7	1

■ Application of Lead-Free Copper Alloy to Valves

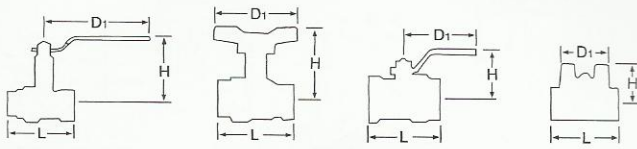
In Japan, the Directive No.43 of March 27, 2003 issued by the Ministry of Welfare and Labor restricts the inclusion of lead from 0.05 mg/L to 0.001 mg/L for the drinking water, which will be effective from April 1, 2003 JIS B 2011 for bronze gate, globe, angle, and check valves is also amended on March 20, 2003 that any copper alloy including not less than 0.25% of lead is prohibited to apply to valves installed in the potable water supply line.

Ball Valves



Design	TOYO Standard																									
Type	Ball Valve																									
Class	600																									
	Full bore					Full bore					Full bore					Reduced bore					Reduced bore					
Fig.	5044E					5044W					5046A					5080					5080W					
Size	d	L	H	D1	W	d	L	H	D1	W	d	L	H	D1	W	d	L	H	D1	W	d	L	H	D1	W	
8 (mm)	1/4"	8	47	42	80	0.19	8	47	40	60	0.19						5	40	31	60	0.1	5	40	30	46	0.1
10	3/8"	10	50	43	80	0.22	10	50	41	60	0.22						7.5	44.5	40	80	0.1	7.5	44.5	33	46	0.1
15	1/2"	15	60	45	100	0.26	15	60	41	60	0.26						9	54.5	42	80	0.2	9	54.5	35	46	0.1
20	3/4"	20	69	48	100	0.39	20	69	44	60	0.39	18	93	52	100	0.50	12.5	61	51	100	0.3					
25	1"	25	80	54	130	0.63	25	80	60	100	0.63	23	109	57	120	0.75	16	75	55	100	0.6					
32	1 1/4"	32	94	59	130	0.91	32	94	65	100	0.91	25	113	59	130	1.05	21	80	66	150	1.1					
40	1 1/2"	40	104	70	150	1.43	40	104	79	120	1.43	32	124	65	130	1.53	24	84	69	150	1.2					
50	2"	50	125	77	150	2.36	50	125	86	120	2.36	40	141	74	150	2.21	32	102	75	150	2.4					
65	2 1/2"	51	142	105	200	4.20																				
80	3"	63.5	162	114	300	6.80																				
Material	Body	Brass					Brass					Brass					Brass					Brass				
	Stem	Brass					Brass					Brass					Brass					Brass				
	Ball	Brass / Chrome Plated					Brass / Chrome Plated					Brass / Chrome Plated					Brass / Chrome Plated					Brass / Chrome Plated				
	Seat	PTFE					PTFE					PTFE					Reinforced PTFE					Reinforced PTFE				
Service conditions	8-50: 4.13 MPa (600psi) WOG non-shock 65 & 80: 2.75 MPa (400psi) WOG non-shock										4.13MPa (600psi) WOG non-shock															
Remarks	65 & 80: R-PTFE seat 65 & 80: Std. bore					T-Handle					W/Cap & Chain					T-Handle										

Design	MSS SP-110															TOYO Standard										
Type	Ball Valve																									
Class	600															400										
	Full bore					Full bore					Full bore					Std bore					Std bore					
Fig.	5026					5044A					5042A					5016					5022					
Size	d	L	H	D	W	d	L	H	D	W	d	L	H	D	W	d	L	H	D	W	d	L	H	D	W	
8 (mm)	1/4"	10	46	35	81	0.15	8	47	42	80	0.19						10	46	40	83	0.15	8	42	38	89	0.15
10	3/8"	10	46	35	81	0.13	10	50	43	80	0.22						10	46	40	83	0.13	10	43	39	89	0.16
15	1/2"	15	57	46	91.5	0.24	15	60	45	100	0.26	15	54	54	92.5	0.26	10	52	40	83	0.17	10	46	40	89	0.17
20	3/4"	20	67	49	91.5	0.34	20	69	48	100	0.39	20	65	57	92.5	0.39	15	58	54	92.5	0.26	15	55	43	109	0.27
25	1"	25	77	53	126.5	0.56	25	80	54	130	0.63	25	74	65	128	0.63	20	66	57	92.5	0.37	20	65	49	109	0.40
32	1 1/4"	32	92	58	126.5	0.90	32	94	59	130	0.91	32	86	71	128	0.91	25	71	65	128	0.54	25	76	54	139	0.66
40	1 1/2"	40	103	73	141.5	1.27	40	104	70	150	1.43	40	99	83	143	1.43	32	82	71	128	0.86	32	86	59	139	0.98
50	2"	50	122	80	141.5	2.00	50	152	77	150	2.36	50	113	91	143	2.36	40	95	83	143	1.33	40	98	70	159	1.58
65	2 1/2"	65	153	102	281.5	3.90	62	152	108	280	4.41						50	117.7	91	143	2.05					
80	3"	80	179	114	281.5	6.50	74	175	117	280	7.34						65	141	119	284	3.61					
100	4"						100	194	134	280	9.21															
Material	Body	Brass					Brass					Brass					Brass					Brass				
	Stem	Brass					Brass					Brass					Brass					Brass				
	Ball	Brass / Chrome Plated					Brass / Chrome Plated					Brass / Chrome Plated					Brass / Chrome Plated					Brass / Chrome Plated				
	Seat	PTFE					PTFE					PTFE					PTFE					PTFE				
Service conditions	4.13MPa (600psi)WOG non-shock															2.75 MPa (400psi)WOG non-shock										
Remarks																W/Locking Handle Automatic drain					T-Handle available					

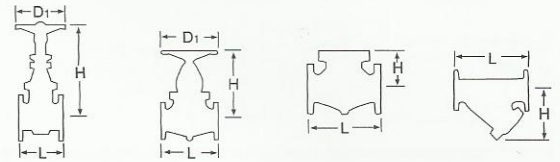


Ball Valves

Design	TOYO Standard																									
Type	Ball Valve																									
Class	400										10K															
	Std. bore					Std. bore					Std. bore					Full bore					Full bore					
Fig.	5011					5011T					5074					5090					5090T					
Size	d	L	H	D1	W	d	L	H	D1	W	d	L	H	D1	W	d	L	H	D1	W	d	L	H	D1	W	
8 (mm)	1/4"																									
10	3/8"																									
15	1/2"	10	56	71	109	0.3	10	56	66	80	0.3	10	91.5	71	109	0.4	10	49	39	80	0.18	10	49	38	60	0.18
20	3/4"	15	65	76	109	0.5	15	65	71	80	0.5	15	105	76	109	0.6	25	62	45	100	0.31	15	62	41	60	0.31
25	1"	20	76	80	129	0.7	20	76	78	90	0.7						20	71	48	100	0.43	20	71	44	60	0.43
32	1 1/4"	25	84	95	139	1.2	25	84	94	100	1.2						25	83	54	130	0.70	25	83	60	100	0.70
40	1 1/2"	32	94	101	139	1.5	32	94	100	100	1.5						32	96	59	130	1.07	32	96	65	100	1.07
50	2"	40	108	107	159	2.2	40	108	106	120	2.2						40	106	70	150	1.65	40	106	79	120	1.65
65	2 1/2"																50	125	77	150	2.68	50	125	86	120	2.68
80	3"																									
Material	Body	Bronze					Bronze					Bronze					Bronze					Bronze				
	Stem	Brass					Brass					Brass					Brass					Brass				
	Ball	SUS304					SUS304					SUS304					Brass/ Chrome Plated					Brass/ Chrome Plated				
	Seat	PTFE					PTFE					PTFE					PTFE					PTFE				
Service conditions	2.75MPa (400psi) WOG non-shock										120° C water, non-shock 1.4 MPa 120° C WOG 1.0 MPa															
Remarks	Long neck for thermal insulation: 30mm (15-25), 40mm (32-50)																									
	T-Handle					Taper female x Nipple join					T-Handle															

Design	TOYO Standard																				
Type	Ball Valve																				
Class	600																				
	Full bore					Full bore					3-way					Split type					
Fig.	5091					5091T					5045A					5002					
Size	d	L	H	D1	W	d	L	H	D1	W	d	L	H	D1	W	d	L	H	D1	W	
8 (mm)	1/4"										5	42	37	69	0.15						
10	3/8"										7	47	38	69	0.18	11	54	51	90	0.33	
15	1/2"	15	73	73	100	0.4	15	73	70	80	0.4	9.5	56	42	89	0.30	11	58	51	90	0.42
20	3/4"	20	81	77	100	0.6	20	81	73	80	0.6	15	65	48	109	0.41	15	68	54	90	0.56
25	1"	25	94	82	120	0.9	25	94	81	90	0.9	19	76	51	109	0.69	20	80	64	115	1.03
32	1 1/4"	32	107	98	130	1.3	32	107	98	100	1.3	24	84	57	139	0.98	25	92	76	142	1.50
40	1 1/2"	40	120	105	130	1.8	40	120	105	100	1.8	31	94	62	139	1.46	31	104	80	142	2.38
50	2"	50	138	112	150	3.0	50	138	112	120	3.0	38	108	73	159	2.19	38	118	94	150	3.47
65	2 1/2"																50	145	123	180	6.00
80	3"																60	165	141	220	9.50
Material	Body	Bronze					Bronze					Bronze					Bronze				
	Stem	Brass					Brass					Brass					Brass				
	Ball	SUS304					SUS304					Brass/ Chrome Plated					Brass/ Chrome Plated				
	Seat	PTFE					PTFE					PTFE					Reinforced PTFE				
Service conditions	120° C water, non-shock 1.4 MPa 120° C WOG 1.0 MPa										2.75MPa (400psi) WOG non-shock										
Remarks	Long neck										8 & 1: R-PTFE seat										
	T-Handle					L-port															

Cast Iron Valves

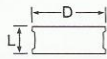
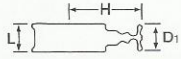


Design	TOYO Standard																
Type	Gate Valve				Globe Valve				Swing Check Valve								
Class	10K																
Fig.																	
Size	L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W	L	H	W		
50(mm)	2"	178	319	180	15	178	357	180	16	203	318	200	23	203	153	14	
65	1 1/2"	190	350	180	20	190	412	180	21	216	333	200	30	216	162	20	
80	2 1/2"	203	401	200	26	203	482	200	27	241	361	200	38	241	176	25	
100	1"	229	457	250	42	229	569	250	44	292	390	250	60	292	220	39	
125	5"	254	523	280	58	254	672	280	60	330	439	300	79	330	226	59	
150	6"	267	602	300	80	267	783	300	83	356	477	300	106	356	307	70	
200	8"	292	711	360	124	291	985	355	132	495	542	360	189	495	325	127	
250	10"	330	842	400	191	330	1196	400	199	622	624	450	302	622	384	185	
300	12"	356	941	450	269	356	1390	450	254	698	735	500	412	698	426	270	
350	14"																
400	16"																
Material	Body	Cast Iron				Cast Iron				Cast Iron				Cast Iron			
	Stem/Pin	Brass				Brass				Brass				Brass			
	Disc	Cast Iron				Cast Iron				Cast Iron				Cast Iron			
	Seat	Bronze				Bronze				Bronze				Bronze			
Service conditions	120°C water, non-shock 1.37 MPa 120°C oil, water, air 0.98 MPa Saturated steam 0.20MPa																
Remarks	Body Marking: MSS standard indicating" 125S 200WOG"																



Design	TOYO Standard			
Type	Strainer			
Class	10K			
Fig.				
Size	L	H	W	
40(mm)	3/4"	225	178	10
50	2"	273	176	16
65	1 1/2"	292	195	23
80	3"	352	246	34
100	4"	391	300	52
125	5"	470	321	70
150	6"	543	398	110
200	8"	660	483	177
250	10"	762	560	295
300	12"			
350	14"			
400	16"			
Material	Body	Cast Iron		
	Stem	SUS304		
Service conditions	120°C water, non-shock 1.37 MPa 120°C oil, water, air 0.98 MPa Saturated steam 0.69MPa			
Remarks	Body Marking: MSS standard			



Trim Combination (JIS Standard)

Fig.	Stem/Pin	Disc	Seat
425J	Brass	C.I./Same material as seat	Bronze
425JS	13%Cr		13%Cr
425JU	SUS304		SUS304
405J	Brass		Bronze
405JS	13%Cr		13%Cr
405JU	SUS304		SUS304
435J	Brass		Bronze
435JS	13%Cr		13%Cr
435JU	SUS304		SUS304

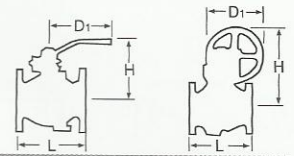


Dual Plate Check /Ball Foot

Design	TOYO Standard													
Type	Dual Plate Check Valves													
Class	10K						150 lbs							
Fig.														
Size	365					440					442			
	L	H	D ₁	W		L	H	D ₁	W		L	D	W	
40(mm)	1 1/2"	54	132	63	1.8	54	132	55	1.6		54	102	2.5	
50	2"	56	147	70	2.3	56	147	70	2.0					
65	2 1/2"	56	154	70	3.0	56	154	70	2.8		54	121	3.0	
80	3"	59	160	70	4.0	59	160	70	3.6		57	133	4.0	
100	4"	66	173	70	5.5	66	173	70	5.0		64	172	6.0	
125	5"	72	187	70	8.0	72	187	70	7.0		70	194	9.0	
150	6"	78	213	80	11.5	78	216	80	10.0		76	219	10.0	
200	8"	96	241	80	18.5	96	243	80	16.0		95	277	18.0	
250	10"	109	289	90	30.0	109	290	90	26.0		108	337	28.0	
300	12"	145	316	90	46.0	145	315	90	40.0		143	407	50.0	
350	14"					184	330	90	60.0					
400	16"					191	355	90	88.0					
450	18"					204	388	90	120.0					
Material	Body	Bronze					Cast Iron					Cast Iron		
	Stem	Bronze					Bronze					Bronze		
	Seat	NBR					NBR					NBR		
Service conditions	80°C water, non-shock 1.4 MPa 80°C water, oil, air 1.0 MPa										1.03MPa (150psi)80°C water			
Remarks	FPM or EPDM seat available													

Design	TOYO Standard										
Type	Ball Foot Valves										
Class	10K										
Fig.											
Size	097					461					
	L	H	W			L	H	W			
40(mm)	1 1/2"	133	121	2.8							
50	2"	148	147	3.6							
65	2 1/2"					173	161	6.5			
80	3"					193	188	8.8			
100	4"					236	229	14.8			
125	5"					271	289	24.5			
150	6"					305	335	36.5			
200	8"					388	449	88.7			
Material	Body	Bronze					Cast Iron				
	Seat	EPDM					EPDM				
	Ball	Polycarbonate					Polycarbonate				
Service conditions	70°C water 0.2MPa										
Remarks											

Cast Iron Ball Valves



Design	TOYO Standard										
Type	Ball Valves										
Class	10K										
Fig.	470L					470G					
Size	L	H	D ₁	W		L	H	D ₁	W		
15(mm)	1/2"	110	74	115	2.2						
20	3/4"	120	78	115	2.8						
25	1"	130	95	150	4.5						
32	1 1/4"	140	100	150	5.8						
40	1 1/2"	165	128	200	7.3						
50	2"	180	136	200	10.2						
65	2 1/2"	190	161	320	15.3						
80	3"	200	171	320	17.9						
100	4"	230	212	450	30.5						
125	5"	300	269	800	51.5	300	293	300	76.0		
150	6"	340	288	800	71.0	340	312	300	96.0		
200	8"	450	374	1120	123.0	450	383	300	145.0		
Material	Body	Cast Iron					Cast Iron				
	Stem	SUS304					SUS304				
	Disc	SUS304 or SCS13					SUS304 or SCS13				
	Seat	PTFE					PTFE				
Service conditions	See P-T rating at page 24										
Remarks	ASME Class 125 flanged ends available										

Toyo Dual Plate Check Valve

- **A water hammer is prevented (Silent Check Type)**

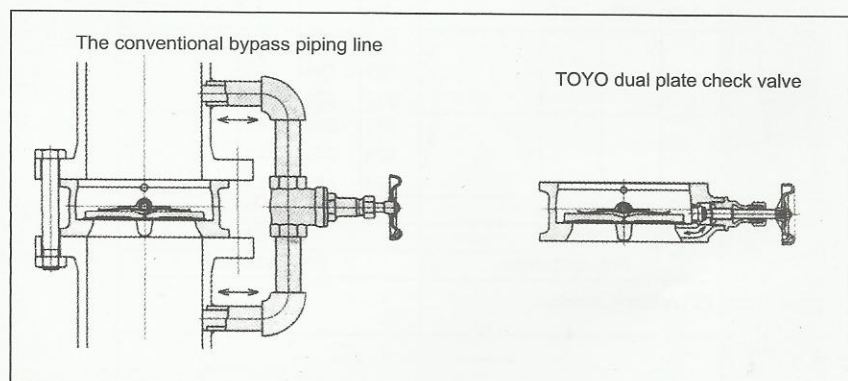
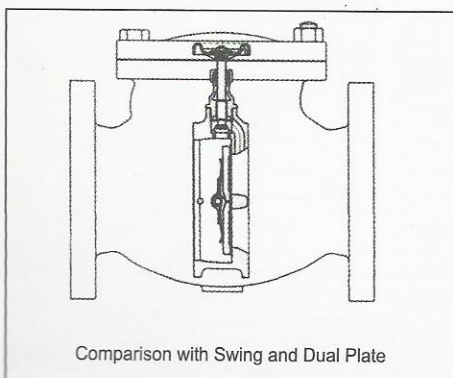
By action of the coil spring built in a valve, plates are gently opened at the time of starting a pump or it closes quickly when a pump stops. For this reason, a water hammer is prevented and generating of a shock pressure is suppressed.

- **It is compact.**

A small and lightweight wafer body, As compared with a swing check, the face-to-face dimension is about 1/4 and the weight is about 1/5. Piping work is easy, and attachment spaces for installation are also a few.

- **By-pass piping is unnecessary. (Fig. 365 and 440)**

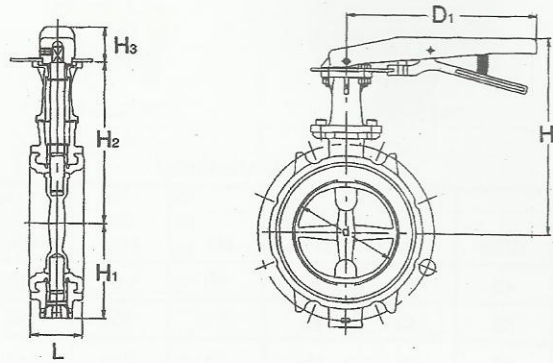
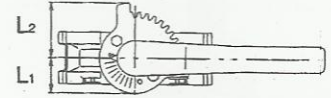
Since the by-pass valve is built in, the by-pass piping for discharge of the fluid in a pipe or priming are unnecessary. It is a big merit on design and construction.



- DEW CONDENSATION-PROOF -
JIS 10K Aluminum Butterfly Valves

10K/150 Lever Operated Aluminum Water Butterfly Valve

Fig. 550LA



(mm)

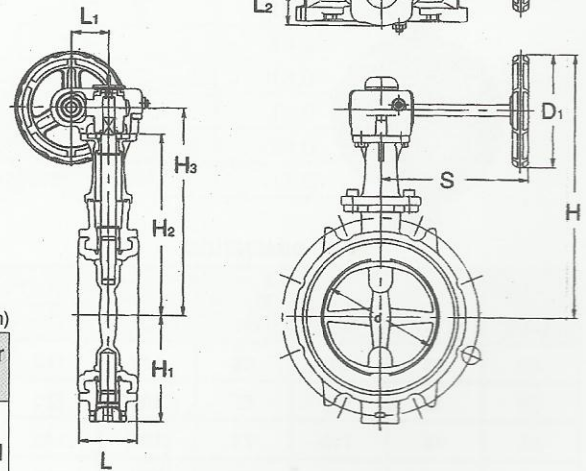
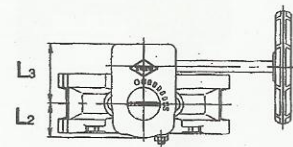
size	d	L	H	H ₁	H ₂	H ₃	L ₁	L ₂	D ₁	Actuator No.
40	42	33	162	40.0	127.5					L-1A
50	50	43	166.5	64.5	132.0					
65	66	46	174.5	72.5	140.0	34.5	35	56	188	
80	79	46	184.5	84.0	150.0					L-1B
100	101	52	194.5	94.0	160.0					
125	125	56	239	124.5	195.0					L-2A
150	148	56	251	136.0	207.0	44.0	48	58	260	

Material	Body	ADC 12
	Disc	SCS14A
	Rubber Seat	EPDM
	O-Ring	EPDM

Test pressure	Shell(Water)	1.5MPa
	Seat(Water)	1.1MPa

10K/150 Gear Operated Aluminum Wafer Butterfly Valve

Fig. 550GA



(mm)

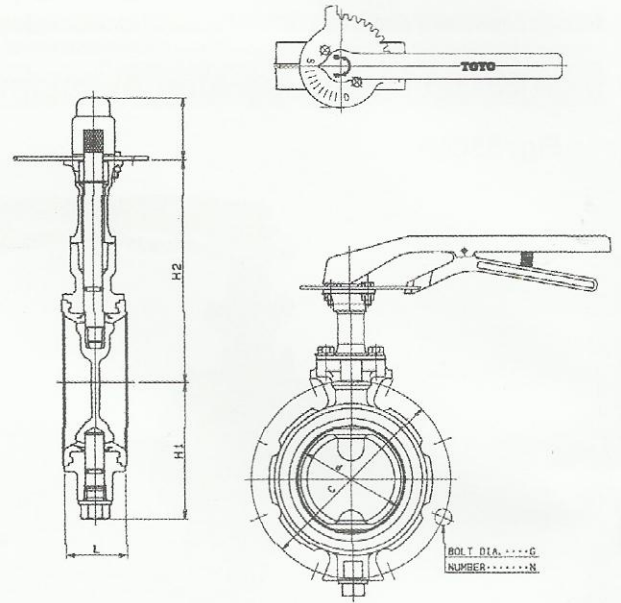
size	d	L	H	H ₁	H ₂	H ₃	L ₁	L ₂	L ₃	S	D ₁	Actuator No.
40	42	33	200.5	40.0	127.5	150.5						G-00AN
50	50	43	205	64.5	132.0	155.0						
65	66	46	213	72.5	140.0	163.0	34	30	52	131		
80	79	46	223	84.0	150.0	173.0					100	G-00BN
100	101	52	233	94.0	160.0	183.0						
125	125	56	269	124.5	195.0	219.0						G-01AN
150	148	56	281	136.0	207.0	231.0	41	39	67	132		
200	198	60	335	165.0	234.0	265.0	58	48	89	149	140	G-02AN
250	245	68	445	238	328	360						No.2
300	295	78	470	263	353	385	63	51	91	180	170	

Material	Body	ADC 12
	Disc	SCS14A
	Rubber Seat	EPDM
	O-Ring	EPDM

Test pressure	Shell(Water)	1.5MPa
	Seat(Water)	1.1MPa

16K Lever Operator Cast Iron Butterfly Valve

Fig. 957A-MESL



DIMENSION

UNIT : mm

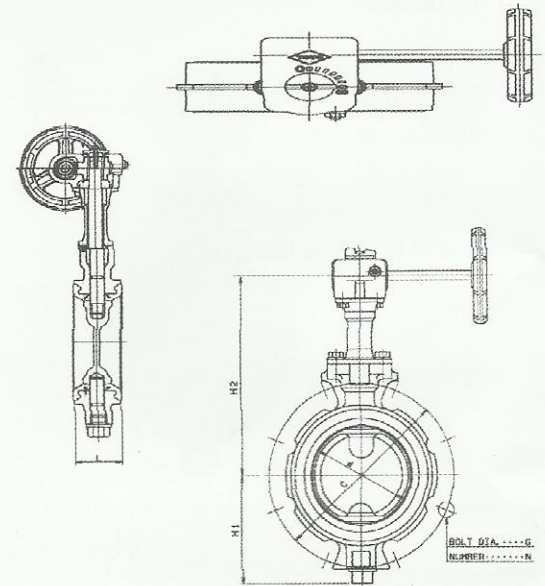
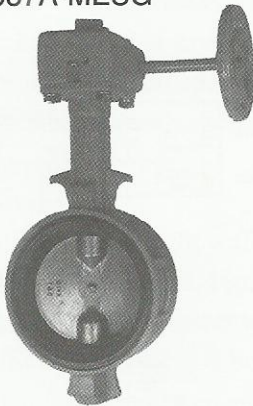
SIZE	L	Ø d	H1	H2	FLANGE PN-16		
					C	N	G
40	33	80	60	180	110	4	M16
50	43	96	65	204	125	4	M16
65	46	110	71	216	145	4	M16
80	46	124	77	223	160	8	M16
100	52	148	107	242	160	8	M16
125	56	180	122	258	210	8	M16
150	56	206	140	271	240	8	M20
200	60	259	165	308	295	12	M20
250	68	320	201	354	355	12	M24
300	78	370	234	377	410	12	M24

Material	Body	FC 200
	Disc	SCS 14
	Rubber Seat	EPDM
	O-Ring	NBR

Test pressure	Shell(Water)	2,4MPa
	Seat(Water)	1,8MPa

16K Gear Operator Cast Iron Butterfly Valve

Fig. 957A-MESG



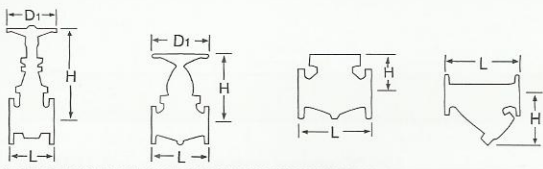
DIMENSION

UNIT : mm





SIZE	L	Ø d	H1	H2	FLANGE PN-16		
					C	N	G
40	33	81	60	157	110	4	M16
50	43	96	65	180	125	4	M16
65	46	110	71	192	145	4	M16
80	46	124	77	199	160	8	M16
100	52	148	107	218	180	8	M16
125	56	180	122	234	210	8	M16
150	56	206	140	247	240	8	M20
200	60	259	165	281.5	295	12	M20
250	68	320	201	327.5	355	12	M24
300	78	370	234	350.5	410	12	M24


Material	Body	FC 200
	Disc	SCS 14
	Rubber Seat	EPDM
	O-Ring	NBR

Test pressure	Shell(Water)	2,4MPa
	Seat(Water)	1,8MPa



Cast Iron Valves

Design		MSS Standard															
Type		Gate Valve				Globe Valve				Swing Check Valve							
Class		125/PN-16															
																	
		MSS SP-70/Non-rising				MSS SP-70/Rising				MSS SP-85				MSS SP-71			
Fig.		415E				421E				400A				435E			
Size		L	H	D ₁	W	L	H	D ₁	W	L	H	D ₁	W	L	H	W	
50(mm)	2"	178	319	180	18	178	357	180	15.6	203	318	200	23	203	153	14	
65	2½"	190	350	180	25	190	412	180	20.8	216	333	200	30	216	162	20	
80	3"	203	401	200	31	203	482	200	27.0	241	351	200	38	241	176	25	
100	4"	229	457	250	47	229	569	250	44.3	292	390	250	60	292	220	39	
125	5"	254	523	280	64	254	672	280	60.2	330	439	300	79	330	226	59	
150	6"	267	602	300	79	267	783	300	82.7	356	477	300	106	356	307	70	
200	8"	292	711	360	141	292	985	355	132.0	495	542	360	189	495	325	127	
250	10"	330	842	400	202	330	1196	400	199.0	622	624	450	302	622	384	185	
300	12"	356	941	450	291	356	1390	450	254.4	698	735	500	412	698	426	270	
350	14"																
400	16"																
Material	Body	Cast Iron				Cast Iron				Cast Iron				Cast Iron			
	Stem/Pin	Brass				Brass				Brass				Brass			
	Disc	Cast Iron				Cast Iron				Cast Iron				Cast Iron			
	Seat	Bronze				Bronze				Bronze				Bronze			

Design		TOYO Standard		
Type		Strainer		
Class		125/PN-16		
				
Fig.		381E		
Size		L	H	W
40(mm)	1½"			
50	2"	225	178	10
65	2½"	273	178	16
80	3"	292	195	23
100	4"	352	245	34
125	5"	391	300	52
150	6"	470	321	70
200	8"	543	398	110
250	10"	660	483	177
300	12"	762	560	295
350	14"			
400	16"			
Material	Body	Cast Iron		
	Screen	SUS304		

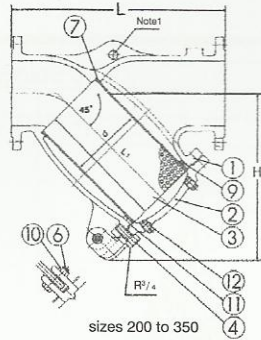
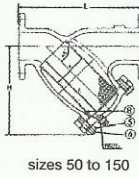
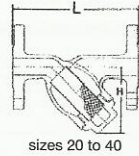
Pressure - Temperature Rating

Service Temperature		Size 2" to 12
°C		Bar
-10 to 120		16.0
150		14.8
180		13.9
200		13.0
220		13.0
Hydrostatic	Shell	24.0
Test Pressure	Seat	17.6

Strainers

16K Ductile Iron Y-Strainer

Fig 638



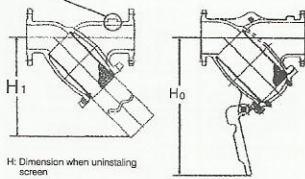
120 °C water, non-shock	2.16MPa
220 °C oil, air, steam, gas	1.96MPa
300 °C oil, air, steam	1.77MPa
350 °C oil, air, steam	1.57MPa

Test pressure	Shell(Water)	3.3
	Seat	—

No.	Parts	Materials
1	BODY	FCD-S
2	COVER	FCD-S
3	SCREEN	SUS 304
4	COVER BOLT	S45C(sizes 40 to 350)
5	COVER BOLT NUT	S45C(sizes 40 to 350)
6	BOLT	SUS 304(sizes 200 to 350)
7	SUPPORT RING	SUS 304
8	SET SCREW	SUS 403(sizes 50 to 150)
9	STOPPER	SUS 304(sizes 200 to 350)
10	U-NUT	SUS 304(sizes 200 to 350)
11	GASKET	T#1100(sizes 20 to 32) V#VF-35E(sizes 40 to 350)
12	DRAIN PLUG	C3604BD(sizes 40 to 350)

Size	L	H	H ₁	H ₀	Screen			W(kg)
					d	L ₁	d ₁ × P	
20mm (3/4")	150	77	108		28	65	1.5 X 2.5	2.4
25 (1)	175	89	128		34	77	1.5 X 2.5	3.4
32 (1 1/4)	200	109	162		42	98	1.5 X 2.5	4.9
40 (1 1/2)	250	162	200		52	122	1.5 X 2.5	8.1
50 (2)	270	185	250		64	153	1.5 X 2.5	12.0
65 (2 1/2)	315	229	306		80	185	1.5 X 2.5	20.6
80 (3)	355	259	345		94	207	1.5 X 2.5	28.0
100 (4)	430	308	420		120	250	1.5 X 2.5	42.3
125 (5)	490	358	498		150	295	1.5 X 2.5	64.1
150 (6)	550	398	562		180	331	1.5 X 2.5	90.3
200 (8)	660	538	685	900	234	398	2X 3	146.0
250 (10)	800	624	836	1045	284	487	2X 3	240.0
300 (12)	900	722	939	1195	340	540	2X 3	327.0
350 (14)	950	778	998	1290	378	568	2X 3.5	417.0

Boss is provided in sizes 65 & larger.



H: Dimension when uninstalling screen

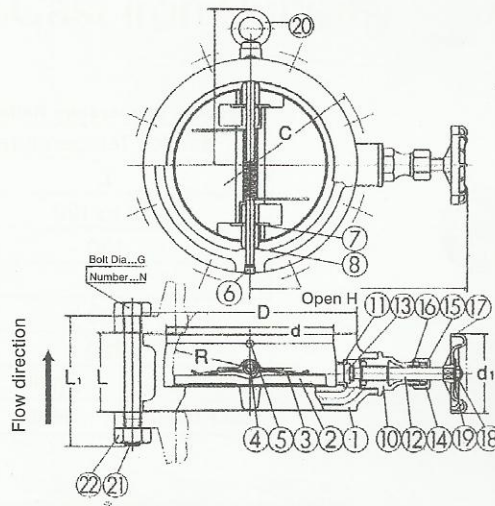
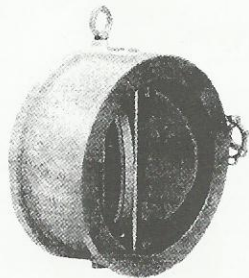
Notes:

- Hanging hole & wing hinge for cover is provided in sizes 200 & larger.
- Cover shape in sizes 40 & 50 is quadrilateral.

Check Valves

20K Ductile Dual Plate Check Valve

Fig 645

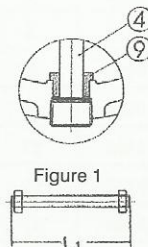


80 °C water, non-shock	2.8MPa
80 °C water, oil, gas	2.0MPa

Test pressure	Shell(Water)	4.2
	Seat(Air)	0.6~0.05

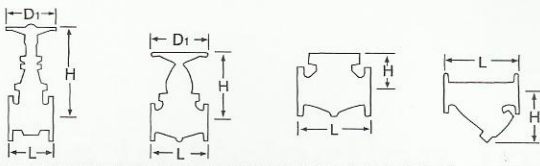
No.	Parts	Materials
1	BODY/SEAT	FCD-S/NBR
2	PLATE	CAC406
3	SPRING	SUS 304WPB
4	HINGE PIN	SUS 304
5	STOP PIN	SUS 304
6	PLUG	S45C
7	PLATE WASHER	Reinforced PTFE®
8	BODY WASHER	CAC406C(sizes 40 to 100)
9	BODY BUSH	CAC406C(sizes 125 to 450)
10	BONNET	C3771BE(sizes 40 to 125) CAC406G(sizes 150 to 450)
11	BODY SEAT RING	DR alloy
12	STEM	DR alloy
13	DISC	DR alloy
14	PACKING NUT	C3771BD
15	GLAND	C3771BD
16	GLAND PACKING	T#2996NA
17	HAND WHEEL	ZDC2(sizes 40 & 50) ADC12(sizes 65 to 450)
18	WHEEL NUT	SS400
19	NAME PLATE	A1100P-H
20	EYE BOLT	SS400(sizes 200 to 450)
21	PIPINGBOLT	SS400
22	NUT	SS400

Size	D	d ₁	D ₁	L	H	R	L ₁	X	W(kg)
40mm (1 1/2")	86	54	55	54	132	26	120	—	1.7
50 (2)	101	63	55	56	138	33	120	—	2.3
65 (2 1/2)	121	77	70	60	154	37	130	—	3.0
80 (3)	137	90	70	67	160	44	150	—	4.0
100 (4)	162	116	70	68	173	55	150	—	5.5
125 (5)	200	143	70	83	187	67	170	—	8.2
150 (6)	235	169	80	95	216	78	190	—	14.0
200 (8)	280	220	80	127	243	105	240	192	24.0
250 (10)	353	273	90	140	292	129	270	233	35.0
300 (12)	403	324	90	181	318	155	320	261	45.0
350 (14)	447	356	90	184	331	170	335	272	66.0
400 (16)	507	406	90	191	358	195	360	302	93.0
450 (18)	572	457	90	204	390	220	380	338	130.0






Note:

- Bush on the body is provided in sizes 125 & larger. (Figure 1)
- Eye bolt is provided in sizes 200 & larger.
- Bolts & Nuts are included.
 - Length of bolt conforms to JIS steel flange.
 - Bolt in sizes 200 & larger is hexagon head screw.
- Nut & bolts are not included on unit weight.



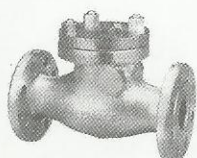


DUCTILE IRON VALVES

Design		Gate Valve				Globe Valve				Swing Check Valve			
Type		16K				16K				16K			
Class.		16K				16K				16K			
Fig.													
Fig.		633				631				635			
Size		L	H	D ₁	W	L	H	D ₁	W	L	H	W	
50 ^(mm)	2"	178	357	180	15.8	203	300	180	18.7	203	117	9.9	
65	2½"	190	412	180	20.1	216	322	180	22.5	216	127	13.6	
80	3"	203	482	200	30.5	241	361	224	30.6	241	158	19.4	
100	4"	229	569	280	46.8	292	415	280	42.0	292	190	31.4	
125	5"	254	672	280	64.0	368	475	355	68.0	330	221	51.0	
150	6"	267	783	315	85.5	406	552	400	104.5	356	306	73.1	
200	8"	292	985	355	133.0	495	662	500	168.0	495	348	121.0	
250	10"	330	1196	400	211.0								
300	12"	356	1390	500	300.0								
Material	Body	Ductile Iron				Ductile Iron				Ductile Iron			
	Stem/Pin	SUS 403				SUS 403				SUS 403			
	Disc	SUS 403				SUS 403				SUS 403			
	Seat	SUS 403				SUS 403				SUS 403			



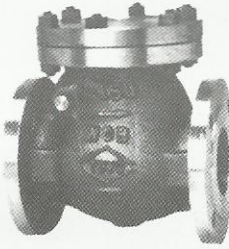
Test pressure	(MPa)	
	Shell(Water)	3.3
	Seat(Water)	2.4
	120°C Water, non-shock 2.16MPa 220°C oil, air, steam 1.96MPa 300°C oil, air, steam 1.77MPa 350°C oil, air, steam 1.57MPa	

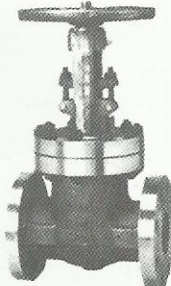
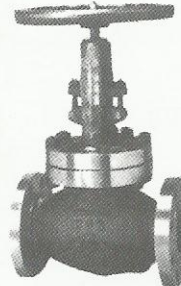
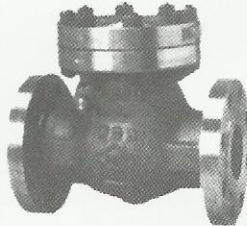
MALLEABLE IRON VALVES

Design		Gate Valve				Globe Valve				Swing Check Valve			
Type		20K				20K				20K			
Class.		20K				20K				20K			
Fig.													
Fig.		653A				651A				655A			
Size		L	H	D ₁	W	L	H	D ₁	W	L	H	W	
50 ^(mm)	2"	216	383	180	17.0	267	329	224	16.5	267	140	15.7	
65	2½"	241	442	180	23.0	292	355	250	28.0	292	150	21.3	
80	3"	283	502	224	31.0	318	390	300	37.0	318	160	31.3	
100	4"	305	591	250	46.0	356	445	315	54.0	356	175	43.7	
125	5"	381	698	300	72.0	400	515	355	75.0	400	215	59.9	
150	6"	403	819	315	102.0	444	595	400	107.0	444	235	99.3	
200	8"	419	1026	450	146.0	559	685	450	180.0	533	275	139.0	
250	10"	457	1238	560	247.0	622	820	560	303.0				
300	12"	502	1440	630	367.0								
Material	Body	Malleable Iron				Malleable Iron				Malleable Iron			
	Stem/Pin	SUS 403				SUS 403				SUS 403			
	Disc	SUS 403				S28C+STL				S28C+STL			
	Seat	SUS 403				S28C+STL				S28C+STL			

Test pressure	(MPa)	
	Shell(Water)	4.1
	Seat(Water)	3.0
	120°C Water, non-shock 2.74MPa 220°C oil, air, steam 2.45MPa 220°C gas 2.35MPa 300°C oil, air, steam 2.25MPa 350°C oil, air, steam 1.96MPa	

CAST STEEL VALVES

Type	Gate	Globe	Check
Class	150 lbs, ASTM A216 WCB		
Fig. No.	703	701	705
Specifications	 <p>Outside screw and yoke, bolted bonnet, 13% Cr. stainless steel trimmed, flanged ends</p>	 <p>Outside screw and yoke, bolted bonnet, 13% Cr. stainless steel trimmed, flanged ends</p>	 <p>Swing type, bolted cover, 13% Cr. stainless steel trimmed, flanged ends</p>
Standard	Valve: ANSI B 16.34 & API std. 600 Face-to face: ANSI B16.10 End flanges: ANSI B16.15, Class 150, 1/16 raised face		
Working Pressure	See Page 21		
Available Size	2" to 12	2" to 12	2" to 12

Type	Gate	Globe	Check
Class	300 lbs, ASTM A216 WCB		
Fig. No.	733	731	735
Specifications	 <p>Outside screw and yoke, bolted bonnet, 13% Cr. stainless steel trimmed, flanged ends</p>	 <p>Outside screw and yoke, bolted bonnet, 13% Cr. stainless steel trimmed, flanged ends</p>	 <p>Swing type, bolted cover, 13% Cr. stainless steel trimmed, flanged ends</p>
Standard	Valve: ANSI B 16.34 & API std. 600 Face-to face: ANSI B16.10 End flanges: ANSI B16.15, Class 300, 1/16 raised face		
Working Pressure	See Page 21		
Available Size	2" to 12	2" to 12	2" to 12

Guide to Selecting Toyo Cast Steel Valves

Material	Type	Class	Specifications			TOYO Fig. No.	Remarks
			End Connection	Trim	Others		
CAST STEEL	GATE	150	Flanged	Stainless steel	OS & Y	703	Valves: ANSI B16.34 Face-to-face: ANSI B16.10 Full bore: Long pattern Reduced bore: Short pattern End flanges: ANSI B16.5
		300	Flanged	Stainless steel	OS & Y	712	
			Flanged	Stainless steel	OS & Y	722	
		600	Flanged	Stainless steel	OS & Y	733	
			Flanged	Stainless steel	OS & Y	762	
		GLOBE	150	Flanged	Stainless steel	OS & Y	
	300		Flanged	Stainless steel	OS & Y	710	
			Flanged	Stainless steel	OS & Y	720	
	600		Flanged	Stainless steel	OS & Y	731	
			Flanged	Stainless steel	OS & Y	760	
	CHECK		150	Flanged	Stainless steel	Swing type	
		300	Flanged	Stainless steel	Swing type	714	
Flanged			Stainless steel	Swing type	724		
600		Flanged	Stainless steel	Swing type	735		
		Flanged	Stainless steel	Swing type	764		
CAST STAINLESS STEEL		BALL	150	Flanged	CF8 Body	Full bore	3131
	300		Flanged	CF8 Body	Reduced bore	3141	
			Flanged	CF8M Body	Full bore	4131	
	600		Flanged	CF8M Body	Reduced bore	4141	
			Flanged	CF8 Body	Full bore	3231	
	BALL		150	Flanged	CF8 Body	Reduced bore	3241
		Flanged		CF8M Body	Full bore	4231	
		300	Flanged	CF8M Body	Reduced bore	4241	
			Flanged	CF8M Body	Reduced bore	4241	

Pressure-Temperature Ratings for Cast Steel Valves (Extracted from ANSI B16.34 — 1981)

- Ratings for all valves are the maximum allowable working pressures, expressed in gauge pressure, at the temperatures shown.
- Ratings are given in U.S. customary units which are regarded as standard.
- Annex G gives the ratings in metric units (temperature in degrees Celsius and pressure in bars).
- The pressure unit of 1 bar is equal to 100,000 pascals (100.0 kpa).
- The conversion factor of 1 bar is equal to 14.5 pounds per square inch.

Working Pressure in PSIG

Temperature in °F	Class 150			Class 300			Class 600			
	Standard Class			Standard Class			Standard Class			
	(a) A216-WCB	(b) A352-LCB	(c) A217-WCI	(a) A216-WCB	(b) A352-LCB	(c) A217-WCI	(a) A216-WCB	(b) A352-LCB	(c) A217-WCI	
- 20 to 100	300	265	265	740	695	695	1480	1390	1390	
200	260	250	260	675	655	680	1350	1315	1360	
300	230	230	230	655	640	655	1315	1275	1305	
400	200	200	200	635	620	640	1270	1235	1280	
500	170	170	170	600	585	620	1200	1165	1245	
600	140	140	140	550	535	605	1096	1065	1210	
650	125	125	125	535	525	590	1075	1045	1175	
700	110	110	110	535	520	570	1085	1035	1135	
750	95	95	95	505	475	530	1010	945	1065	
800	80	80	80	410	390	510	825	780	1015	
850	65	65	65	270	270	485	535	535	975	
900	50	50	50	170	170	450	345	345	900	
950	35	35	35	105	105	280	205	950	560	
1000	20	20	20	50	50	185	105	1000	300	
Test Pressure	Shell (1)	450	400	400	1125	1050	1050	2225	2100	2100
	Seat (2)	315	295	295	815	765	765	1630	1530	1530
	Seat (3)	60— 100	60— 100	60— 100	60— 100	60— 100	60— 100	60— 100	60— 100	60— 100

Note: (a) Permissible, but not recommended for prolonged usage above about 425°C (800°F)
(b) Not to be used over 343°C (650°F)
(c) Permissible, but not recommended for prolonged usage above about 455°C (850°F)

Working Pressure in Bar

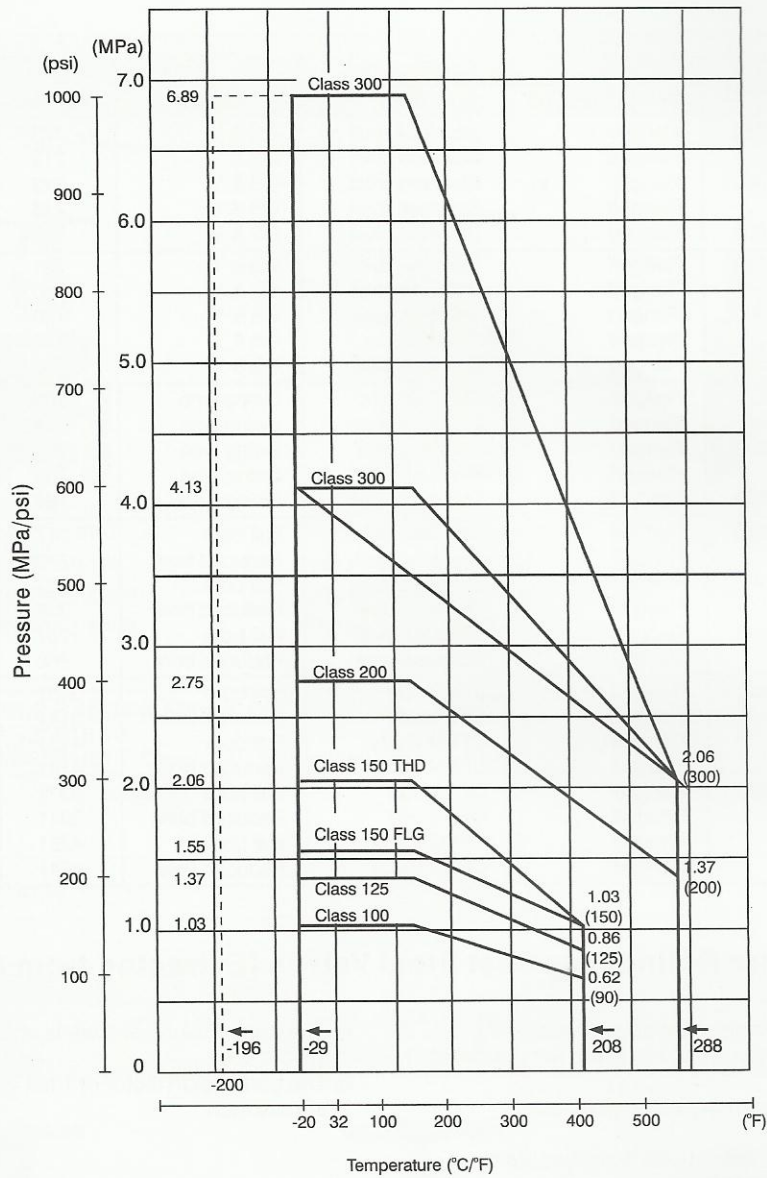
ANNEX G

Temperature in °C	Class 150			Class 300			Class 600			
	Standard Class			Standard Class			Standard Class			
	(a) A216-WCB	(b) A352-LCB	(c) A217-WCI	(a) A216-WCB	(b) A352-LCB	(c) A217-WCI	(a) A216-WCB	(b) A352-LCB	(c) A217-WCI	
- 29 to 38	20.0	18.4	18.4	51.1	47.9	47.9	102.1	95.7	95.8	
50	19.2	18.1	18.3	50.1	47.3	47.6	100.2	94.6	95.3	
100	17.7	17.3	17.7	46.4	45.1	46.6	92.8	90.2	93.2	
150	15.8	15.8	15.8	45.2	44.0	45.0	90.5	87.9	89.9	
200	14.0	14.0	14.0	43.8	42.7	44.2	87.6	85.4	88.4	
250	12.1	12.1	12.1	41.7	40.6	43.1	83.4	81.2	86.2	
300	10.2	10.2	10.2	38.7	37.7	42.0	77.5	75.4	84.1	
350	8.4	8.4	8.4	37.0	36.0	40.2	73.9	71.9	80.5	
375	7.4	7.4	7.4	36.5	35.3	38.6	72.9	70.8	77.6	
400	6.5	6.5	6.5	34.5	32.4	36.6	69.0	64.8	73.2	
425	5.6	5.6	5.6	28.8	27.3	35.1	57.5	54.6	70.2	
450	4.7	4.7	4.7	20.0	19.8	33.6	40.1	39.6	67.6	
475	3.7	3.7	3.7	13.5	13.5	31.7	27.1	27.1	63.3	
500	2.8	2.8	2.8	8.8	8.8	24.1	17.6	17.6	48.1	
525	1.9	1.9	1.9	5.2	5.2	15.0	10.4	10.4	30.1	
540	1.3	1.3	1.3	3.3	3.3	10.7	6.5	6.5	21.4	
Test Pressure	Shell (1)	30	28	28	77	72	72	154	144	144
	Seat (2)	21.5	20.3	20.3	56.3	52.7	52.7	112.4	105.3	105.4
	Seat (3)	4.1— 6.9	4.1— 6.9	4.1— 6.9	4.1— 6.9	4.1— 6.9	4.1— 6.9	4.1— 6.9	4.1— 6.9	4.1— 6.9

(1) SHELL TESTS.....Hydrostatic
(2) SEAT TEST—MSS SP-61 (1985 Edition).....Hydrostatic
(3) SEAT TEST—API STD 600 (Eighth edition, January 1981)
API STD 598 (Fifth edition, December 1982).....Air

Pressure-Temperature Ratings

Bronze and Brass Valves (Extracted from MSS SP-80)



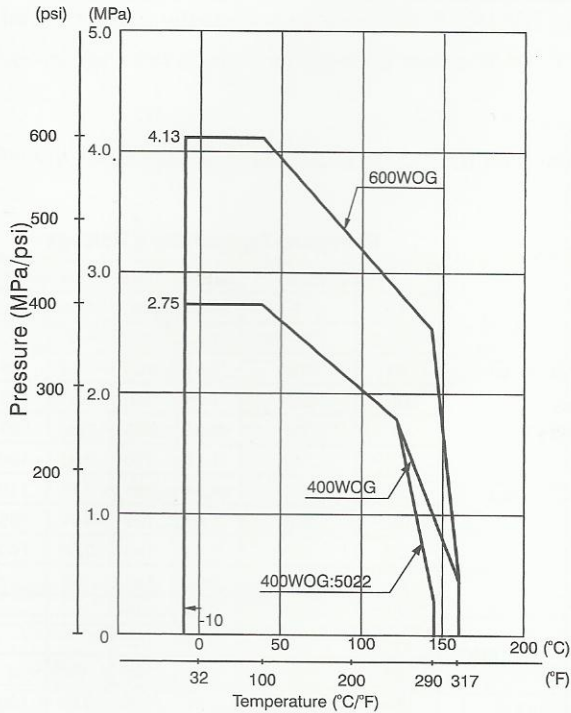
Pressure-Temperature Ratings

Service temperature		100		125		150				200		300			
		THD		FLG		THD		FLG		THD		FLG		THD	
°C	°F	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi	MPa	psi
-29-66	-20-150	1.03	150	1.37	200	2.06	300	1.55	225	2.75	400	4.13	600	6.89	1000
93	200	0.93	136	1.27	185	1.86	270	1.44	210	2.58	375	3.86	560	6.34	920
121	250	0.86	126	1.17	170	1.65	240	1.34	195	2.41	350	3.61	525	5.72	830
149	300	0.79	116	1.06	155	1.44	210	1.24	180	2.24	325	3.37	490	5.10	740
177	350	0.68	100	0.96	140	1.24	180	1.13	165	2.06	300	3.10	450	4.48	650
204	400	0.63	92	-	-	-	-	-	-	1.89	275	2.82	410	3.86	560
208	406	0.62	90	0.86	125	1.03	150	1.03	150	-	-	-	-	-	-
232	450	-	-	-	-	-	-	-	-	1.72	250	2.58	375	3.30	480
260	500	-	-	-	-	-	-	-	-	1.55	225	2.34	340	2.68	390
288	550	-	-	-	-	-	-	-	-	1.37	200	2.06	300	2.06	300
Saturated steam		0.68	100	0.86	125	1.03	150	1.03	150	1.37	200	2.06	300	2.06	300
Test pressure	shell	1.55	225	2.06	300	3.10	450	2.41	350	4.13	600	6.20	900	10.34	1500
	seat	0.55	80	0.55	80	0.55	80	0.55	80	0.55	80	0.55	80	0.55	80

NOTE: Class 100 outside of MSS SP-80

Pressure-Temperature Ratings

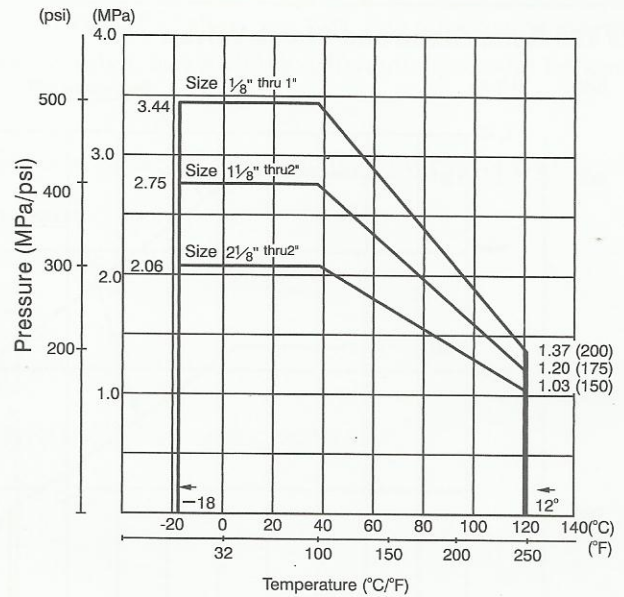
Ball Valves



Pressure-Temperature Ratings

Class	Fig.	WOG 38°C (3°F)		Test pressure				300psi	80psi
				Shell (water)		Seat (air)			
		MPa	psi	MPa	psi	MPa	psi		
400 WOG	5022	2.75	400	4.13	600	0.55	80		
400 WOG	other than 5022	2.75	400	4.13	600	0.55	80		
600 WOG		4.13	600	6.20	900	0.55	80		

Solder



Pressure-Temperature Ratings

Joint material	Working temperature		Maximum working gage pressure				Test pressure	
	°C	°F	MPa	psi	MPa	psi	MPa	psi
	ASTM B32 Alloy Grade 504 (Notes(1),(2))	38	100	1.37	200	1.20	175	1.03
ASTM B32 Alloy Grade 95TA (Notes(2))	66	150	0.68	100	0.62	90	0.51	75
	93	200	0.58	85	0.51	75	0.34	50
	121	250	0.58	85	0.51	75	0.34	50
	38	100	3.44	500	2.75	400	2.06	300
ASTM B32 Alloy Grade 95TA (Notes(2))	66	150	2.75	400	2.41	350	1.89	275
	93	200	2.06	300	1.72	250	1.37	200
	121	250	1.37	200	1.20	175	1.03	150

- (1) The Safe Drinking Water Act Amendment of 1986 prohibits the use in potable water systems of any solder having a lead content in excess of 0.2%.
- (2) The safe working pressure-rating for a solder end valve is restricted to the lower pressure rating.

JIS Standard Valves

Bronze Gate, Globe and Check Valves (JIS B2011)

Service temperature			Maximum working pressure (MPa)	
			5K	10K
Water, Non-shock at less than 120°C			0.7	1.4 1.18(*2)
Oil, gas, air, water at less than 120°C			0.5	1.0 0.85(*3)
Saturated steam*1)			0.3 0.2(*2)	1.0 0.7(*2)
Test pressure	shell	water	1.1	2.1
	seat	air	0.6	0.6

- (*1) Not applied to solder ends
 (*2) Applicable to gate valves
 (*3) Applicable to solder ends 1n size 32mm (1.1/4") and larger

Gray Cast Iron Gate, Globe and Check Valves (JIS B2031)

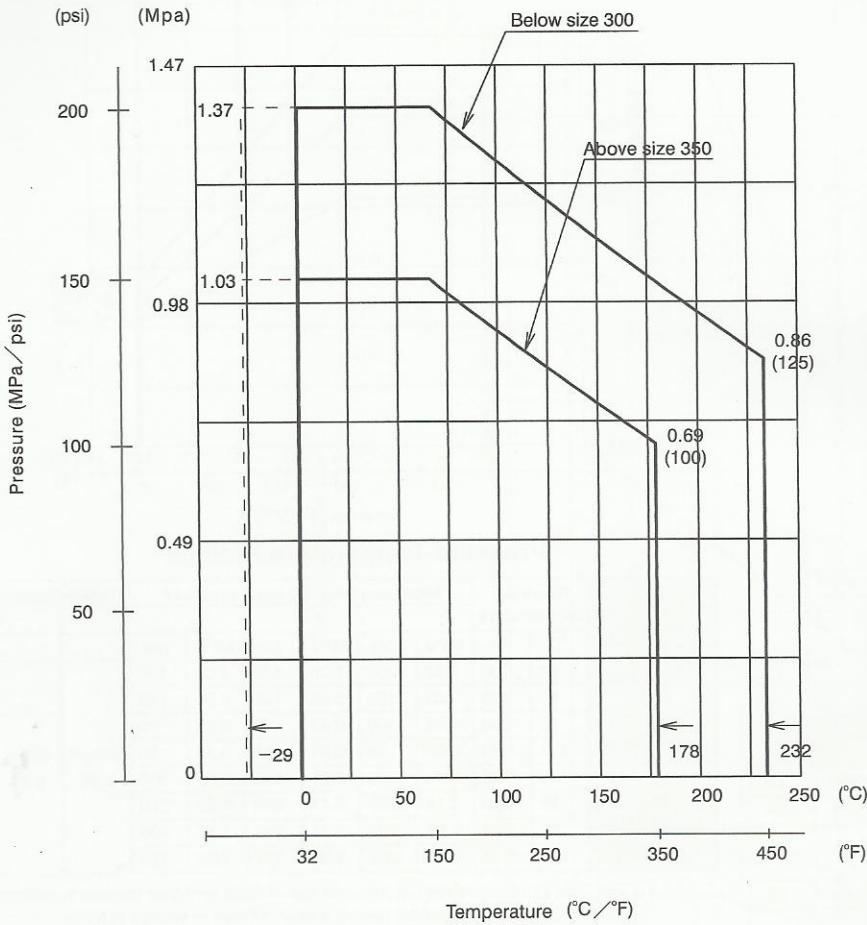
Service temperature			Maximum working pressure (MPa)	
			5K	10K
Water, Non-shock at less than 120°C (*1)			0.69	1.37
Oil, gas, air, water at less than 120°C (*1)			0.49	0.98
Saturated steam			0.20	0.69 0.20(*2)
Test pressure	shell	water	1.1	2.1
	seat	air	0.6	0.6

- (*1) The max. working temperature for nylon lined valves is restricted to 60°C
 (*2) Inside screw gate valves and pressed seat rings only

Pressure-Temperature Ratings

Cast Iron Valves (Extracted from MSS SP-70, 71 & 85)

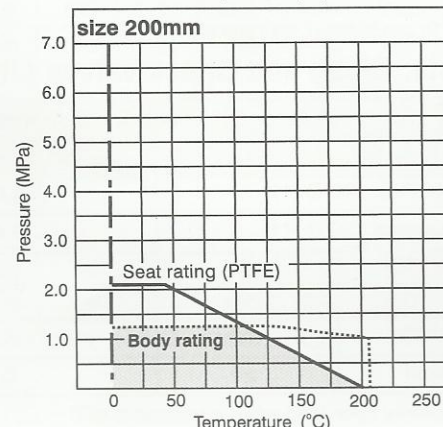
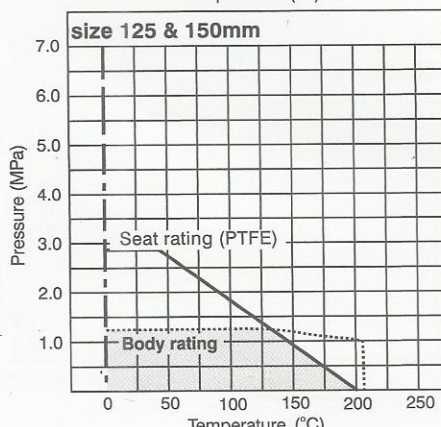
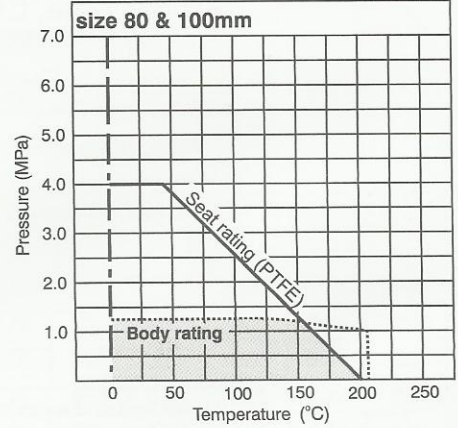
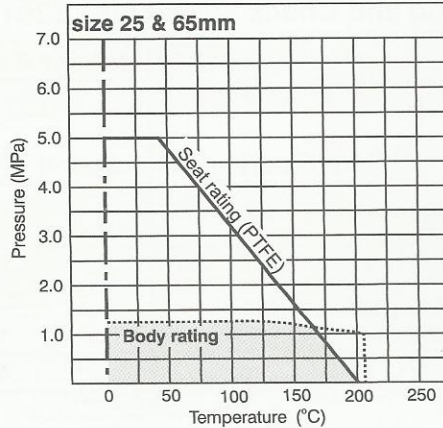
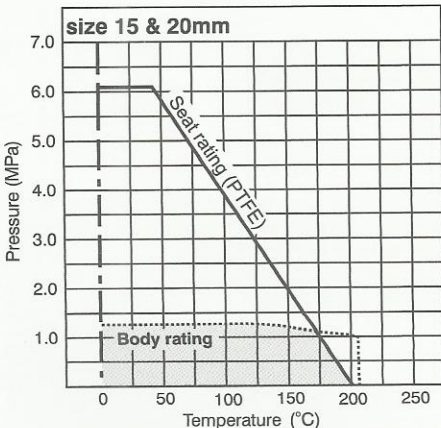
Class 125 Gate, Globe and Check Valves



Pressure-Temperature Ratings

Temperature		Size 50 thru 300		Above size 350	
°C	°F	MPa	psi	MPa	psi
-29-66	-20-150	1.37	200	1.03	150
93	200	1.31	190	0.93	135
107	225	1.24	180	0.90	130
121	250	1.21	175	0.86	125
135	275	1.17	170	0.83	120
149	300	1.14	165	0.76	110
163	325	1.07	155	0.72	105
178	350	1.03	150	0.69	100
191	375	1.00	145		
208	400	0.97	140		
218	425	0.90	130		
232	450	0.86	125		
Saturated steam		0.86	125	0.68	100
Test pressure	shell	2.41	350	1.83	265
	seat	0.55	80	0.55	80

10K Cast Iron Ball Valves



Cv Value

The Cv value - which is used by TOYO VALVE to indicate the capacity of a valve - is a flow rate represented in terms of U.S. gallons per minute when clear water at 60° F flows through a valve, in which the differential pressure between its

The Cv value can be determined by experiment, and the relation between the Cv value and the flow rate or pressure drop,

In case of water, the pressure drop or the flow rate can be obtained by the following formulas.

$$\Delta P = 0.134 \frac{Q^2 G_L}{C_v^2}$$

ΔP = pressure drop (MPa)

Q = flow rate

$$Q = 2.735 C_v \sqrt{\frac{\Delta P}{G_L}}$$

G_L = specific gravity of fluid when setting water to 1

C_v = Cv value

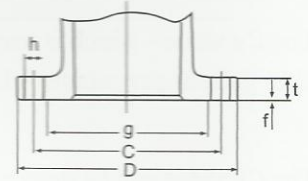
Cast Bronze Valves

Valve type		GATE	GLOBE		ANGELE	CHECK		BALL	STRAINER
Nominal size			206A	210A		211A/213A	260A	LIFT	
mm	Inch	230A			236A			5090	380A
8	1/4	2.8					1.5		
10	3/8	5.7	2	2	2.5	2	2.8		
15	1/2	15	3	3.5	4	3.5	5	26	4.5
20	3/4	18	4.5	6.5	7.5	6.5	9	46	7.5
25	1	29	8.5	12	13	11	20	80	14
32	1 1/4	59	16	21	23	19	36	105	19
40	1 1/2	120	23	30	34	28	51	141	30
50	2	190	38	49	55	46	92	215	47
65	2 1/4	335	64	87	97	81	162		
80	3	486	93		166	123	247		
100	4	772				163			

Cast Iron Valves

Valve type		GATE	GLOBE	CHECK		BALL	STRAINER	BALL FOOT
Nominal size				410E/420E	405E	SWING		
mm	Inch	430E	440			470	450E	461
15	1/2					26		
20	3/4					53		
25	1					95		
32	1 1/4					165		17
40	1 1/2	192	33	54	40	235	51	28
50	2	216	55	110	56	485	80	44
65	2 1/4	345	88	143	93	730	116	75
80	3	495	126	206	157	1240	205	125
100	4	875	224	440	325	2250	325	190
125	5	1370	350	575	540	3550	465	330
150	6	1920	485	830	815	5200	845	380
200	8	3600	920	1500	1450	9900	1350	
250	10	5680	1450	2370	2350		2080	
300	12	8290	2120	3470	3640			
350	14				5480			

Cast Iron Pipe Flanges



Class 125 Pipe Flange Dimensions - ASME B16.1

Size		D		C		t		h		Bolt number
mm	inch	mm	inch	mm	inch	mm	inchi	mm	inch	
40	1½	127	5.00	98.5	3.88	14.3	0.56	16	0.50	4
50	2	152	6.00	120.5	4.75	15.8	0.62	19	0.62	4
65	2½	178	7.00	139.5	5.50	17.6	0.69	19	0.62	4
80	3	190	7.50	152.5	6.00	19.1	0.75	19	0.62	4
100	4	229	9.00	190.5	7.50	23.9	0.94	19	0.62	8
125	5	254	10.00	216.0	8.50	23.9	0.94	22	0.75	8
150	6	279	11.00	241.5	9.50	25.4	1.00	22	0.75	8
200	8	343	13.50	298.5	11.75	28.5	1.12	22	0.75	8
250	10	406	16.00	362.0	14.25	30.3	1.19	25	0.88	12
300	12	483	19.00	432.0	17.00	31.8	1.25	25	0.88	12
350	14	533	21.00	476.0	18.75	35.1	1.38	29	1.00	12
400	16	597	23.50	540.0	21.25	36.6	1.44	29	1.00	16
450	18	635	25.00	578.0	22.75	39.7	1.56	32	1.12	16
500	20	698	27.50	635.0	25.00	43.0	1.69	32	1.12	20
600	24	813	32.00	749.5	29.50	47.8	1.88	35	1.25	20

JIS5K Cast Iron Pipe Flange Dimensions - JIS2239

(mm)

Size		D	t		f	g	Bolt hole			Bolt dia.
mm	inch		Exceptet Gray Iron	Gray Iron			C	Number	h	
50	2	130	14	16	2	85	105	4	15	M12
65	2½	155	14	18	2	110	130	4	15	M12
80	3	180	14	18	2	121	145	4	19	M16
100	4	200	16	20	2	141	165	8	19	M16
125	5	235	16	20	2	175	200	8	19	M16
150	6	265	18	22	2	206	230	8	19	M16
200	8	320	20	24	2	252	280	8	23	M20
250	10	385	22	26	2	317	345	12	23	M20
300	12	430	22	28	3	360	390	12	23	M20


(mm)

Size		D	t		f	g	Bolt hole			Bolt dia.
mm	inch		Exceptet Gray Iron	Gray Iron			C	Number	h	
15	½	95	12	16	1	51	70	4	15	M12
20	¾	100	14	18	1	56	75	4	15	M12
25	1	125	14	18	1	67	90	4	19	M16
32	1½	135	16	20	2	76	100	4	19	M16
40	1½	140	16	20	2	81	105	4	19	M16
50	2	155	16	20	2	96	120	4	19	M16
65	2½	175	18	22	2	116	140	4	19	M16
80	3	185	18	22	2	126	150	8	19	M16
100	4	210	18	24	2	151	175	8	19	M16
125	5	250	20	24	2	182	210	8	23	M20
150	6	280	22	26	2	212	240	8	23	M20
200	8	330	22	26	2	262	290	12	23	M20
250	10	400	24	30	2	324	355	12	25	M22
300	12	445	24	32	3	368	400	16	25	M22
350	14	490	26	34	3	413	445	16	25	M22
400	16	560	28	36	3	475	510	16	27	M24
450	18	620	30	38	3	530	565	20	27	M24
500	20	675	30	40	3	585	620	20	27	M24
550	22	745	32	42	3	640	680	20	33	M30
600	24	795	32	44	3	690	730	24	33	M30

ISO9001 and 14001 authorized

Toyo Valve Co., Ltd. has been approved by Lloyd's Register Quality Assurance limited (LRQA) to the following quality management system of "ISO 9001" and environmental management system of "ISO 14001".

ISO9001


CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

**Toyo Valve Co., Ltd.
Chino Plant
Chino-shi, Nagano-ken
Japan**

has been approved by Lloyd's Register Quality Assurance to the following Quality Management System Standards:


ISO 9001:2000, JIS Q 9001:2000


The Quality Management System is applicable to:

Design and manufacture of cast bronze, forged brass, cast iron, cast ductile, cast steel, stainless steel, forged steel and aluminium valves and strainers.

Approval Certificate No: YKA 0928016	Original Approval: 2 June 1994
	Current Certificate: 1 July 2006
	Certificate Expiry: 30 June 2009

Issued by Lloyd's Register Quality Assurance Limited


UKAS
9001


JAB
9001

This document is subject to the provisions on the reverse.
71, Broadchurch Street, London EC3M 4AS, United Kingdom. Registration Number: 1879235.
We warrant that the information contained in this certificate is true and correct and that the standards mentioned are current and valid.
The use of this certificate does not constitute an endorsement of the products or services of the certificate holder.

ISO14001


CERTIFICATE OF APPROVAL

This is to certify that the Environmental Management System of:

**Toyo Valve Co., Ltd.
Chino-shi, Nagano-ken
Japan**

has been approved by Lloyd's Register Quality Assurance to the following Environmental Management System Standards:

ISO 14001:2004, JIS Q 14001:2004

The Environmental Management System is applicable to:

Design and manufacture of cast bronze, forged brass, cast iron, cast ductile, cast steel, stainless steel, forged steel and aluminium valves and strainers.

Approval Certificate No: YKA 0772984	Original Approval: 21 December 2001
	Current Certificate: 1 January 2008
	Certificate Expiry: 31 December 2010

Issued by Lloyd's Register Quality Assurance Limited


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We warrant that the information contained in this certificate is true and correct and that the standards mentioned are current and valid.
The use of this certificate does not constitute an endorsement of the products or services of the certificate holder.



Project Reference

"TOYO" VALVE

NO	PROJECT	TYPE	LOCATION
1	Citraland	Mall	Jakarta
2	Granada	Building	Jakarta
3	Gedung Mulia	Office Building	Jakarta
4	Bank Indonesia	Office Building	Jakarta
5	Melia Panorama	Hotel	Batam
6	I B I S	Hotel	Pakan Baru
7	Flobamora	Mall	Kupang
8	I A I N	University	Jakarta
9	Gajah Mada	University	Yogyakarta
10	Sincom	Building	Batam
11	Exel Comp	Building	Medan
12	Permata	Building	Jakarta
13	Indorama	Factory	Purwakarta
14	Blok M	Mall	Jakarta
15	B D N	Building	Jakarta
16	Nicco Hotel d/h President	Hotel	Jakarta
17	I K P T	Office Building	Jakarta
18	Taman Anggrek	Mall	Jakarta
19	Pantai Mutiara	Apartment	Jakarta
20	Padang Airport	Airport	Padang
21	Autocomp Industri	Factory	Jawa Timur
22	Honda Prospect	Factory	Karawang
23	Honda M G A	Factory	Cikampek
24	Parker Industry	Factory	Cibitung
25	JST Industry	Factory	Cibitung
26	PGC	Mall	Jakarta
27	Toyo Denso	Factory	Karawang
28	Summi Rubber	Factory	Cikampek
29	Cempaka Mas	Mall	Jakarta
30	Fukoku	Factory	Karawang
31	Mega Mall	Mall	Jakarta
32	Sun Plaza	Mall	Medan
33	Plaza Nusantara	Mall	Jawa Timur

NO	PROJECT	TYPE	LOCATION
34	Sampoerna	Factory	Jawa Timur
35	Gudang Garam	Factory	Bogor
36	Danamon	Building	Surabaya
37	Petra	University	Jakarta
38	Cilandak Mall	Mall	Surabaya
39	Sari Husada	Factory	Jakarta
40	Y A I	University	Jakarta
41	R S U D Cengkareng	Hospital	Jakarta
42	Permata Cibubur	Hospital	Jakarta
43	Exim	Bank	Jakarta
44	Hilton	Hotel	Jakarta
45	Lagon Tower	Apartment	Jakarta
46	Japan Embassy	Building	Jakarta
47	Nikawatek	Factory	Karawang
48	Kondobo	Factory	Cibitung
49	Y K K	Factory	Cimanggis
50	Nissin	Factory	Cikampek
51	Tjutjunaka	Factory	Karawang
52	Kerama Yuda	Office Building	Jakarta
53	Masjid Ibu Tien	Masque	Jakarta
54	Santika	Hotel	Semarang
55	Borobudur	Hotel	Jakarta
56	G K B I	Office Building	Jakarta
57	Lanmark	Office Building	Jakarta
58	Aichitex	Factory	Bandung
59	Aventis	Factory	Jakarta
60	Merck	Factory	Jakarta
61	N S R	Factory	Bogor
62	N S K	Factory	Bogor
63	Kohno	Factory	Karawang
64	Plaza Hayam Wuruk	Office Building	Jakarta
65	F C C	Factory	Karawang
66	MM 2100	Industry Area	Cibitung
67	Sekiso	Factory	Karawang
68	New Summitmas	Office Building	Jakarta
69	Honda Secondary	Factory	Karawang
70	Graha Medika	Hospital	Jakarta
71	Pasar Grosir	Mall	Jakarta
72	Trisakti	University	Jakarta
73	Mulia	Hotel	Jakarta
74	Patra Jasa	Hotel	Bali
75	XL - Office	Office Building	Surabaya

NO	PROJECT	TYPE	LOCATION
76	Hitachi	Factory	Cikarang
77	Graha Cempaka	Office Building	Jakarta
78	Honda Lock	Factory	Cakung
79	Sindengen	Factory	Cikarang
80	D P R D Riau	Office Building	Riau
81	B T C	Trade Centre	Jakarta
82	Darmawangsa	Trade Centre	Jakarta
83	Pemda Depok	Office Building	Jakarta
84	U I	University	Depok
85	Dian Almahri	Islamic Centre	Depok
86	Unocall	Office Building	Jakarta
87	Shangrilla	Hotel	Jakarta
88	Mabes Polri	Building	Jakarta
89	Mabes TNI	Building	Cilangkap
90	Daihatsu	Factory	Karawang
91	MPR / DPR	Building	Jakarta
92	Indomobil	Show Room	Jakarta
93	Pindodeli I	Factory	Karawang
94	Thamrine Nine	Office Building	Jakarta
95	Plaza Indonesia	Mall	Jakarta
96	Mabes Polri	Office Building	Jakarta
97	Tarumanegara	University	Jakarta
98	Departemen Keuangan II	Office Building	Jakarta
99	MPR/DPR	Office Building	Jakarta
100	Plaza BBD	Office Building	Jakarta
101	Mall Kelapa Gading 1 - 5	Mall	Jakarta
102	The Summit	Hotel & Apartment	Jakarta
103	Gading Serpong	Mall	Tangerang
104	CBD	Mall	Ciledug
105	Pacific Place	Mall & Hotel	Jakarta
106	Kantor Pajak Pusat	Office Building	Jakarta
107	Sukarno Hatta	Bandara Terminal 3	Jakarta
108	Unicharm Industrial	Paper Industrial	Karawang
109	Djarum Kudus	Cigarette Industrial	Kudus
110	Universitas Diponegoro	University	Semarang
111	Hotel Sentra	Hotel	Jakarta
112	Departemen Keuangan AB	Office Building	Jakarta
113	Bank Tabungan Negara	Office Building	Jakarta
114	Akademi Penerbangan	Office Building	Lampung
115	BPPT	Office Building	Jakarta
116	Pindodeli II	Paper Industrial	Karawang
117	Giant Hyper Mart	Hyper Mart	Bintaro

NO	PROJECT	TYPE	LOCATION
118	Universitas Airlangga	University	Surabaya
119	The Equity	Office Building	Jakarta
120	Hotel Palangkaraya	Hotel	Palangkaraya
121	RS. Mojokerto	Hospital	Jawa Timur
122	Teaching Hospital	Hospital	Makasar
123	Titan Office	Office Building	Bintaro
124	Sahid Hotel	Hotel	Jakarta
125	Sahid Residence	Appartment	Jakarta
126	STAN	Office Building	Bintaro
127	RS. Harapan Kita Ext	Hospital	Jakarta
128	RS. Royal Taruma Ext	Hospital	Jakarta
129	MRRCC SILOAM	Hospital	Jakarta
130	Kopi Torabika	Industrial	Tangerang
131	RS. Wahidin	Hospital	Makasar
132	Kala Tower	Office Building	Makasar
133	Universitas Hasanudin	University	Makasar
134	Fahrenheitg	Industrial	Tangerang
135	RS. Hasan Sadikin	Hospital	Bandung
136	RS. Mayapada (Modern)	Hospital	Tangerang
137	RSCM	Hospital	Jakarta
138	Ritz Cartlton Hotel	Hotel	Jakarta
139	PUSRI Office	Office Building	Jakarta
140	Bagendang	Industrial	Kalimantan
141	Marunda School	Maritim School	Jakarta
142	Podium Thamrine Nine	Plaza	Jakarta
143	FX. Residence	Mall & Residence	Jakarta
144	RUSUN T. Cakung	Residence	Jakarta
145	Biofarma	Industrial	Bogor
146	DEPTAN	Office Building	Jakarta
147	BEA CUKAI	Office Building	Bogor
148	PALAZO Residence	Appartment	Jakarta
149	Walikota JakBar	Office Building	Jakarta
150	TRANS Studio	TV Studio	Makasar
151	Grand Paragon	Residence	Semarang
152	DEPERINDAG	Office Building	Jakarta
153	RUSUNAWA	Residence	Jember
154	Carefour Central Park	Hypermart	Jakarta
155	Mandau Town Squere	Mall & Residence	Kalimantan
156	Tarjun	Mining	Kalimantan
157	Giant Jababeka	Mall	Cikarang
158	Eisai Indonesia	Factory	Citeureup
159	Gedung Parking Yarsi	Parking	Jakarta

NO	PROJECT	TYPE	LOCATION
160	Parking Klub Kelapa Gading	Parking	Jakarta
161	Loreal	Factory	Cikarang
162	Kantor Ciputat	Office	Jakarta
163	Rs Carolus	Hospital	Serpong
164	Thai Embassy	Office	Jakarta
165	Yamaha Musik	Office	Jakarta
166	Unicharm	Factory	Karawang
167	Sanyo Jaya CI	Factory	Cibitung
168	Hero Gatot Subroto	Office	Jakarta
169	Giant Buaran	Mall	Jakarta
170	Trimitra	Factory	Cibitung
171	Tata Logam	Office	Jakarta
172	Sttd Sibitung	School	Cibitung
173	Siloam Jambi	Hospital	Jambi
174	Chm Cirebon	Office	Cirebon
175	Ohm Panakukang	Office	Makasar
176	Kramat Jati Indah	Office	Jakarta
177	Lotte Mart Makasar	Mall	Makasar
178	Chm Medan	Office	Medan
179	Torabika	Factory	Tangerang
180	Hotel Manado	Hotel	Manado
181	Rs. Husada Balikpapan	Hospital	Balikpapan
182	Hotel SSS	Hotel	Jakarta
183	Danamon	Office	Jakarta
184	Besmino	Factory	Cibitung
185	Senayan Residence	Apartemen	Jakarta
188	Menara Bakri	Office	Jakarta
189	UIN Ciputat	University	Tangerang
190	RS Semen Padang	Hospital	Padang
191	Plaza Mandiri	Office	Jakarta
192	RS Trisakti Cimone	Hospital	Tangerang
193	RS USU	Hospital	Medan
194	Aston Purwokerto	Hotel	Purwokerto
195	RSCM	Office	Jakarta
196	Hotel Royal - Kuningan	Hotel	Jakarta
197	Kantor Pajak Pemerintah	Office	Banjarmasin
198	Bank Mandiri - Tanah Abang	Bank	Jakarta
199	Gudang PGM	Work Shop	Tangerang
200	Gajah Mada Tower	Building	Jakarta
201	Cassana Office	Office	Jakarta
202	Wisma BCA	Building	Jakarta
203	K - Link Tower	Building	Jakarta

NO	PROJECT	TYPE	LOCATION
204	Graha XC	Building	Jakarta
205	Menara Satu	Building	Jakarta
206	Summarecon Mall Serpong 2	Mall	Tangerang
207	BPPT - Serpong	Lab	Tangerang
208	Orchad Junction - Kelapa Gading	Mall	Jakarta
209	RS Mayapada	Hospital	Jakarta
210	Hotel Haris	Hotel	Jakarta
211	RS Tanjung Pinang	Hospital	Pekan Baru
212	Living Word - Alam Sutra	Mall	Tangerang
213	Pahoa I - Serpong	School	Tangerang
214	Pahoa II - Serpong	School	Tangerang
215	Novotel	Hotel	Bangka
216	ISTW - Pulo Gadung	Industrial	Jakarta
217	Ciputra World	Mall Apartemen	Surabaya
218	Belleza	Apartemen	Jakarta
219	MA Ciraab	PDAM	Garut
220	UIN Makasar	University	Makasar
221	Hotel Seraton	Hotel	Jakarta
222	BPPT Serpong	Laboratorium	Tangerang
223	Kementrian Kelautan	Office	Jakarta
224	LEMHANAS	Office	Jakarta
225	Wisma Barito	Office	Jakarta
226	AQUA	Factory	Cianjur
227	Kantor Balai Kota JakPus	Office	Jakarta
228	Kantor PLN Gatot Subroto	Office	Jakarta
229	Hotel Parahita Sentul	Hotel	Bogor
230	Hotel Green Hill	Hotel	Bogor
231	Frogie Sentul	School	Tangerang
232	Paragon Karawaci	Apartment	Tangerang
233	Emporium Pluit	Mall	Jakarta
234	POP Harris Hotel	Hotel	Yogyakarta
254	Bentoel Factory	Factory	Malang
255	Gudang Garam	Factory	Kediri
256	SOHO Ciputra	Mall & Hotel	Surabaya
257	Waterplace	Apartment	Surabaya
258	PDAM		Mojokerto
259	PDAM		Surabaya
260	Gedung Riset ITS	Fakultas	Surabaya
261	Educity	Apartment	Surabaya
262	Rich Palace Hotel	Hotel	Surabaya
263	IBIS Hotel	Hotel	Surabaya
264	Royal Tapaz	Hotel	Pontianak

NO	PROJECT	TYPE	LOCATION
265	Amaris Kupang	Hotel	Kupang - NTT
266	Widatra	Factory	Pandaan
267	Citihub Hotel	Hotel	Kediri
268	Premier In	Hotel	Jogya
269	Pelindo Perak	Pelabuhan	Surabaya
270	BI Kupang		Kupang - NTT
271	Platinum Hotel	Hotel	Balikpapan
272	Gedung Mandiri		Surabaya
273	Bandara Nugah Rai		Bali
274	Yellow Hotel	Hotel	Surabaya
275	TFC Factory	Factory	Pasuruan
276	Max One	Hotel	
277	Bali Paragon Hotel		Bali
278	Ambarukomo	Mall	Jogya
279	Skyline	Apartmen	Surabaya
280	The Papilio	Apartmen	Surabaya
281	Lombok Raya		Lombok
282	RS. PHC	Rumah Sakit	Surabaya
283	Apartement Sumatera	Apartmen	Surabaya
284	Univ. Trunojoyo	Universitas	Madura
285	Priority One	Factory	Gersik
286	Malang Square	Mall	Malang
287	Unesa	Universitas	Surabaya
288	Zest Hotel	Hotel	Surabaya
289	MPM Honda		Sidoarjo