

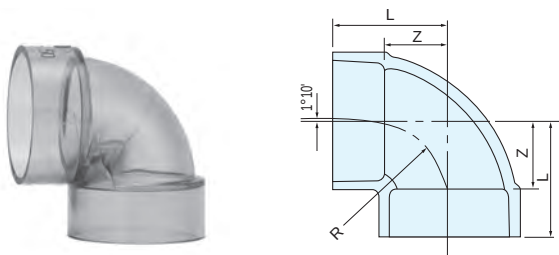
3. Transparent DV and VU-DV Fittings



1. Be sure to use the Color Tough dyne Blue adhesive (see page 36) for the connection of pipes and fittings.
2. These products cannot be used as pressurized pipes such as for water supply and for hot water supply.
3. Store products indoors. Do not store products under the sun or in extremely hot place.

90° Elbows

(Abbreviation : DL)



Transparent DV Fittings Code No. 2151

Unit : mm

Nominal Dia.	Z	L	R(Reference)	Standards
30	22	40	23	JIS K 6739
40	27	49	27	
50	33	58	34	
65	42	77	43	
75	48	88	49	
100	62	112	65	

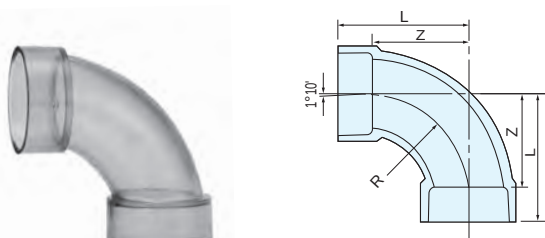
Transparent VU-DV Fittings Code No. 2251

Unit : mm

Nominal Dia.	Z	L	R(Reference)	Standards
50	33	58	31	AS38
75	48	88	54	
100	62	112	70	

90° Large Radius Elbows

(Abbreviation : LL)



Transparent DV Fittings Code No. 2152

Unit : mm

Nominal Dia.	Z	L	R(Reference)	Standards
40	52	74	75	JIS K 6739
50	66	91	88	
65	90	125	108	
75	100	140	119	
100	128	178	152	

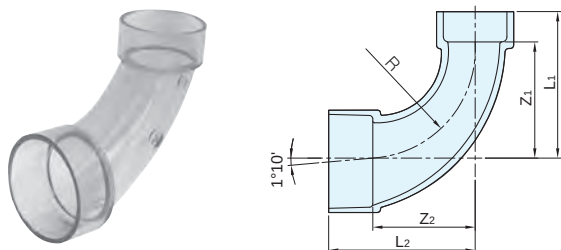
Transparent VU-DV Fittings Code No. 2252

Unit : mm

Nominal Dia.	Z	L	R(Reference)	Standards
50	66	91	85	AS38
75	100	140	120	
100	128	178	159	

90° Large Radius Reducing Elbows

(Abbreviation : LL)



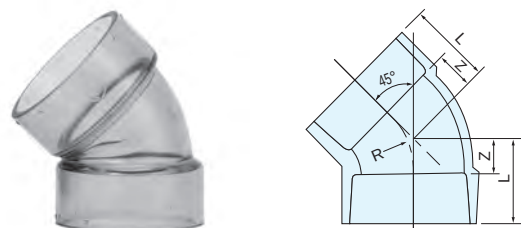
Transparent DV Fittings Code No. 2152

Unit : mm

Nominal Dia.	Z ₁	Z ₂	L ₁	L ₂	R(Reference)	Standards
50×40	66	66	88	91	105	(M)

45° Elbows

(Abbreviation : 45L)



Transparent DV Fittings Code No. 2153

Unit : mm

Nominal Dia.	Z	L	R(Reference)	Standards
30	12	30	30	JIS K 6739
40	14	36	31	
50	18	43	44	
65	22	57	52	
75	25	65	58	
100	30	80	69	

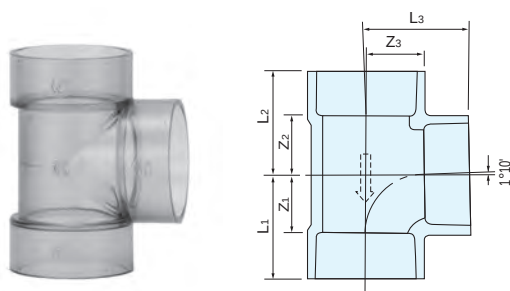
Transparent VU-DV Fittings Code No. 2253

Unit : mm

Nominal Dia.	Z	L	R(Reference)	Standards
50	18	43	45	AS38
75	25	65	60	
100	30	80	69	

90° Y

(Abbreviation : DT)



Transparent DV Fittings Code No. 2154

Unit : mm

Nominal Dia.	Z ₁	Z ₂	Z ₃	L ₁	L ₂	L ₃	Standards
30	22	22	22	40	40	40	JIS K 6739
40	27	27	27	49	49	49	
40×30	22	22	27	44	44	45	
50	34	34	34	59	59	59	
50×40	27	27	33	52	52	55	
65	42	43	42	77	78	77	
65×40	27	28	42	62	63	64	
65×50	34	35	42	69	70	67	
75	48	49	48	88	89	88	
75×50	34	35	48	74	75	73	
100	62	63	62	112	113	112	
100×50	34	35	62	84	85	87	
100×75	48	49	62	98	99	102	
125×100	62	64	75	127	129	125	

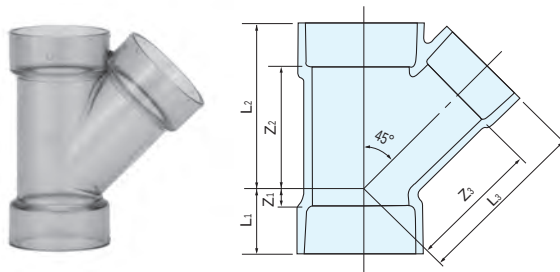
Transparent VU-DV Fittings Code No. 2254

Unit : mm

Nominal Dia.	Z ₁	Z ₂	Z ₃	L ₁	L ₂	L ₃	Standards
50	34	34	34	59	59	59	AS38
75	48	49	48	88	89	88	
75×50	34	35	48	74	75	73	
100	62	63	62	112	113	112	
100×50	34	35	62	84	85	87	
100×75	48	49	62	98	99	102	
150×100	62	63	88	142	143	138	

45° Y

(Abbreviation : Y)



Transparent DV Fittings Code No. 2157

Unit : mm

Nominal Dia.	Z ₁	Z ₂	Z ₃	L ₁	L ₂	L ₃	Standards
40	12	58	62	34	80	84	JIS K 6739
50	20	72	78	45	97	103	
50×40	8	62	70	33	87	92	
65	20	92	98	55	127	133	
65×50	8	80	88	43	115	113	
75	26	106	115	66	146	155	
75×50	3	86	98	43	126	123	
100	32	134	144	82	184	194	
100×50	8	98	118	42	148	143	
100×75	19	118	132	69	168	172	

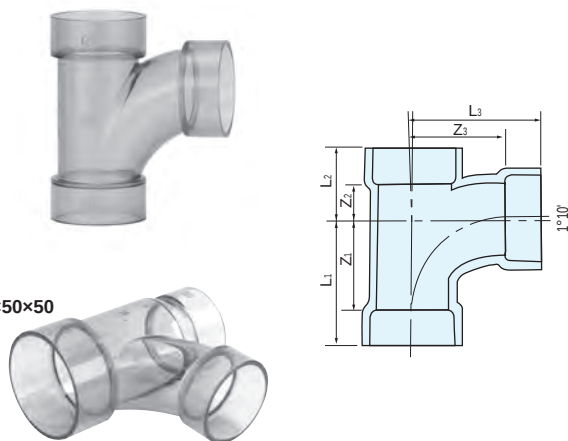
Transparent VU-DV Fittings Code No. 2257

Unit : mm

Nominal Dia.	Z ₁	Z ₂	Z ₃	L ₁	L ₂	L ₃	Standards
50	20	72	78	45	97	103	AS38
75×50	3	86	98	43	126	123	
100	32	134	144	82	184	194	

90° Large Radius Y

(Abbreviation : LT)



Transparent DV Fittings Code No. 2155

Unit : mm

Nominal Dia.	Z ₁	Z ₂	Z ₃	L ₁	L ₂	L ₃	Standards
40	52	23	52	74	45	74	JIS K 6739
50	66	26	66	91	51	91	
50×40	52	23	57	77	48	79	
65	90	33	90	125	68	125	
65×40	52	24	66	87	59	88	
65×50	66	27	74	101	62	99	
75	100	30	100	140	70	140	JIS K 6739
65×50×50	66	31	74	101	56	99	
75×50	66	29	79	106	69	104	
75×65	90	32	95	130	72	130	
100	128	45	128	178	95	178	
100×40	52	28	82	102	78	104	
100×50	66	32	90	116	82	115	
100×65	90	36	107	140	86	142	
100×75	100	33	110	150	83	150	

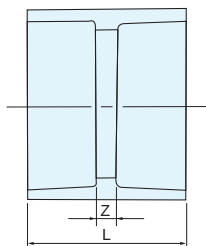
Transparent VU-DV Fittings Code No. 2255

Unit : mm

Nominal Dia.	Z ₁	Z ₂	Z ₃	L ₁	L ₂	L ₃	Standards
50	66	26	66	91	51	91	AS38
75	100	30	100	140	70	140	
75×50	66	29	79	106	69	104	
100	128	45	128	178	95	178	
100×50	66	32	90	116	82	115	
100×75	100	33	110	150	83	150	

Sockets

(Abbreviation : DS)



Transparent DV Fittings

Code No. 2158

Unit : mm

Nominal Dia.	Z	L	Standards
30	3	39	JIS K 6739
40	3	47	
50	3	53	
65	3	73	
75	4	84	
100	4	104	

Transparent VU-DV Fittings

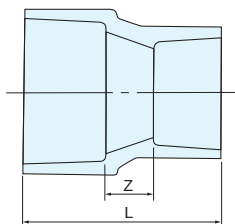
Code No. 2258

Unit : mm

Nominal Dia.	Z	L	Standards
50	3	53	AS38
75	4	84	
100	5	105	

Increasesers

(Abbreviation : IN)



Transparent DV Fittings

Code No. 2159

Unit : mm

Nominal Dia.	Z	L	Standards
40×30	20	60	JIS K 6739
50×40	20	67	
65×50	20	80	
75×50	25	90	
75×65	25	100	
100×50	30	105	
100×75	30	120	

Transparent VU-DV Fittings

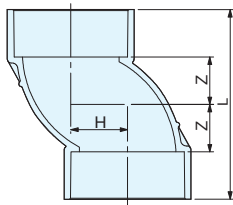
Code No. 2259

Unit : mm

Nominal Dia.	Z	L	Standards
75×50	25	90	AS38
100×75	30	120	

S Sockets

(Abbreviation : SS)



Transparent DV Fittings

Code No. 5437

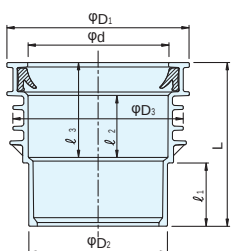
Unit : mm

Nominal Dia.	Z	L	H	Standards
50	25	100	30	(M)

Notes 1. The tolerance for the dimension Z is ± 2 mm.
2. The dimensions L and H are basic dimensions.

Insert Sockets (Expansion Fittings)

(Abbreviation : ES-A)



Transparent DV Fittings

Code No. 2155

Unit : mm

Nominal Dia.	D ₁	D ₂	D ₃	D	L	l ₁	l ₂	l ₃	Standards
75	120	89	114	91.0	114	42	43	65	(M)
100	150	114	140	115.8	134.5	52	51	78	

III. PVC-U Pipes and Fittings for Drain and Vent

1. Pipes

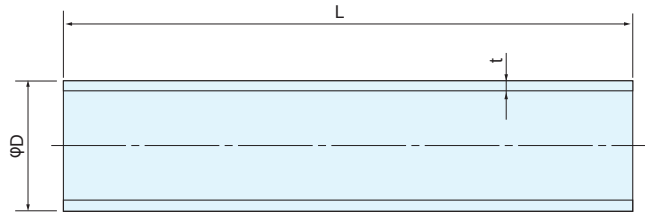
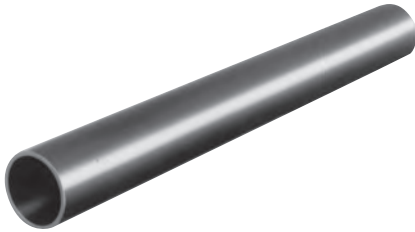
Pipes for General Purposes

Meaning of symbols

JIS K6741 : Product conforms to Japanese Industrial Standards JIS K6741

AS59 : Product conforms to Japan PVC Pipe and Fittings Association's standards AS59

Ⓜ : Product conforms to the manufacturer's standards



VP Pipes

Code No. 1001

Unit : mm

Nominal Dia.	Outside Dia.D			Thickness t		Approx. Inside Dia. (Reference)	Length L ±10	Reference Weight		Standards
	Basic Dimension	Max./Min. OD Tolerance	Average OD Tolerance	Min. Dimension	Tolerance			Weight/m kg/m	Weight/m kg/piece	
40	48	±0.3	±0.2	3.6	+0.8	40	4000	0.791	3.2	JIS K 6741
50	60	±0.4	±0.2	4.1	+0.8	51	4000	1.122	4.5	
65	76	±0.5	±0.3	4.1	+0.8	67	4000	1.445	5.8	
75	89	±0.5	±0.3	5.5	+0.8	77	4000	2.202	8.8	
100	114	±0.6	±0.4	6.6	+1.0	100	4000	3.409	13.6	
125	140	±0.8	±0.5	7.0	+1.0	125	4000	4.464	17.9	
150	165	±1.0	±0.5	8.9	+1.4	146	4000	6.701	26.8	
200	216	±1.3	±0.7	10.3	+1.4	194	4000	10.129	40.5	
250	267	±1.6	±0.9	12.7	+1.8	240	4000	15.481	61.9	
300	318	±1.9	±1.0	15.1	+2.2	286	4000	21.962	87.8	

Note For nominal diameter of 30, use VP pipes for water supply shown on page 5.

VU Pipes

Code No. 1005

Unit : mm

Nominal Dia.	Outside Dia.D		Thickness t		Approx. Inside Dia. (Reference)	Length L ±10	Reference Weight		Standards
	Basic Dimension	Average OD Tolerance	Min. Dimension	Tolerance			Weight/m kg/m	Weight/m kg/piece	
40	48	±0.2	1.8	+0.4	44	4000	0.413	1.7	JIS K 6741
50	60	±0.2	1.8	+0.4	56	4000	0.521	2.1	
65	76	±0.3	2.2	+0.6	71	4000	0.825	3.3	
75	89	±0.3	2.7	+0.6	83	4000	1.159	4.6	
100	114	±0.4	3.1	+0.8	107	4000	1.737	6.9	
125	140	±0.5	4.1	+0.8	131	4000	2.739	11.0	
150	165	±0.5	5.1	+0.8	154	4000	3.941	15.8	
200	216	±0.7	6.5	+1.0	202	4000	6.572	26.3	
250	267	±0.9	7.8	+1.2	250	4000	9.758	39.0	
300	318	±1.0	9.2	+1.4	298	4000	13.701	54.8	
350	370	±1.2	10.5	+1.4	348	4000	18.051	72.2	
400	420	±1.3	11.8	+1.6	395	4000	23.059	92.2	
450	470	±1.5	13.2	+1.8	442	4000	28.875	115.5	
500	520	±1.6	14.6	+2.0	489	4000	35.346	141.4	
600	630	±3.2	17.8	+2.8	592	4000	52.679	210.7	

Meaning of symbols

JIS K6739 : Product conforms to Japanese Industrial Standards JIS K6739

K-1 : Product conforms to Japan Sewage Works Association Standard JSWAS K-1

K-11 : Product conforms to Japan Sewage Works Association Standard JSWAS K-11

AS12 : Product conforms to Japan PVC Pipe and Fittings Association's standards AS12

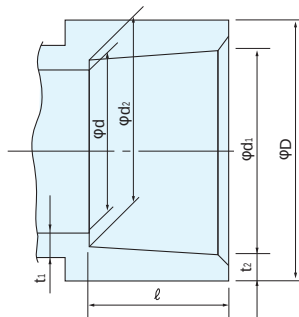
AS38 : Product conforms to Japan PVC Pipe and Fittings Association's standards AS38

Ⓜ : Product conforms to the manufacturer's standards

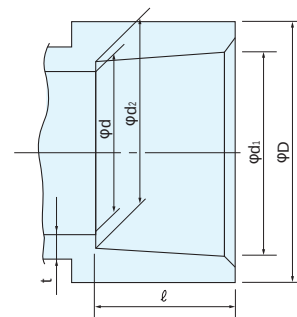
2. DV and VU-DV Fittings

Common joint dimensions

DV fittings



VU-DV fittings



DV Fittings (VP Stoppers)

Unit : mm

Nominal Dia.	d ₁		d ₂		ℓ		D	d		t ₁	t ₂
	Basic Dimension	Tolerance	Basic Dimension	Tolerance	Basic Dimension	Tolerance	Reference Dimension	Basic Dimension	Tolerance	Min. Dimension	Min. Dimension
30	38.25	±0.25	37.85	±0.25	18	±1	44	31.0	±0.8	2.7	2.5
40	48.30	±0.30	47.80	±0.30	22	±1	54	40.0	±0.9	2.7	2.5
50	60.35	±0.30	59.75	±0.30	25	±1	67	51.0	±0.9	3.1	3.0
65	76.40	±0.30	75.70	±0.30	35	±1	83	67.0	±0.9	3.1	3.0
75	89.45	±0.30	88.65	±0.30	40	±2	97	77.2	±0.9	3.6	3.4
100	114.55	±0.35	113.55	±0.35	50	±2	124	98.8	±1.0	4.5	4.3
125	140.70	±0.40	139.40	±0.40	65	±2	151	125.0	±1.2	5.4	4.7
150	165.85	±0.45	164.25	±0.45	80	±2	178	145.8	±1.3	6.3	5.6

VU-DV Fittings (VU Stoppers)

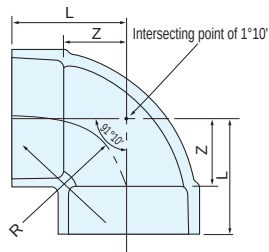
Unit : mm

Nominal Dia.	d ₁		d ₂		ℓ		D	d		t	Nominal Dia.	Dimension ℓ (min.)	DL	LL	45L	DT	DS	IN
	Basic Dimension	Tolerance	Basic Dimension	Tolerance	Basic Dimension	Tolerance	Reference Dimension	Basic Dimension	Tolerance	Min. Dimension								
40	48.30	±0.30	47.80	±0.30	22	±1	54	40(Reference)	—	1.8	200	105	•	•	•	•	•	•
50	60.50	±0.30	59.50	±0.30	25	±3	67	56	—0	2.2	250	125	•	•	•	•	•	•
65	76.60	±0.30	75.40	±0.30	35	±3	83	71	—0	2.5	300	130	•	•	•	•	•	•
75	89.60	±0.30	88.30	±0.30	40	±5	97	83	—0	3.0		140	•	•	•	•	•	•
100	114.80	±0.40	113.20	±0.40	50	±5	124	107	—0	3.5		155	•	•	•	•	•	•
125	140.90	±0.40	139.10	±0.40	65	±5	150	131	—0	4.5								
150	166.10	±0.50	163.90	±0.50	80	±5	178	154	—0	5.5								
200	217.30	±0.55	214.70	±0.55	105	—0	227	202(Reference)	—	5.5(Reference)								
250	268.55	±0.60	265.45	±0.60	125(130)	—0	280	250(Reference)	—	6.5(Reference)								
300	319.75	±0.65	316.25	±0.65	140(155)	—0	333	298(Reference)	—	7.5(Reference)								
350	373.00	±0.70	368.50	±0.70	168	—0	392	347(Reference)	—	9.3(Reference)								
400	423.00	±0.75	417.75	±0.75	200	—0	444	395(Reference)	—	10.5(Reference)								

Note Since the dimension ℓ of the fittings with nominal diameters of 200, 250 and 300 varies depending on the type of fitting, check the "•" mark in the above table for available lengths.

90° Elbows

(Abbreviation : DL•VU-DL)



VU-DV Fittings

Code No. 2251

Unit : mm

Nominal Dia.	Z	L	R(Reference)	Standards
40	27	49	28	AS38
50	33	58	31	
65	42	77	43	
75	48	88	54	
100	62	112	70	
125	75	140	84	
150	88	168	82	M
200	110	216	114	
250	142	267	177	
300	168	308	181	
350	196	366	212	
400	222	422	252	

DV Fittings

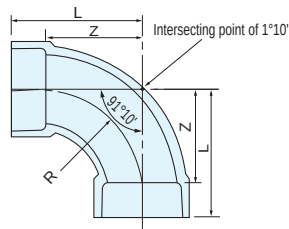
Code No. 2151

Unit : mm

Nominal Dia.	Z	L	R(Reference)	Standards
30	22	40	23	JIS K 6739
40	27	49	27	
50	33	58	34	
65	42	77	43	
75	48	88	49	
100	62	112	65	
125	75	140	79.5	
150	88	168	89.5	

90° Large Radius Elbows

(Abbreviation : LL•VU-LL)



VU-DV Fittings

Code No. 2252

Unit : mm

Nominal Dia.	Z	L	R(Reference)	Standards
50	66	91	85	AS38
75	100	140	120	
100	128	178	159	
125	140	205	180	
150	170	250	240	
200	196	301	270	K-1, AS12
250	225	350	225	
300	250	390	250	

DV Fittings

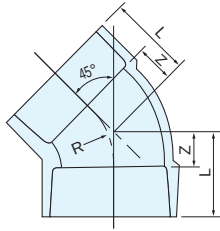
Code No. 2152

Unit : mm

Nominal Dia.	Z	L	R(Reference)	Standards
40	52	74	75	JIS K 6739
50	66	91	88	
65	90	125	108	
75	100	140	119	
75×50	101 (side 75) / 100 (side 50)	141 (side 75) / 125 (side 50)	—	
100	128	178	152	
100×65	128	178 (side 100) / 163 (side 65)	—	
100×75	128	178 (side 100) / 168 (side 75)	—	
125	140	205	180	
150	170	250	210	

45° Elbows

(Abbreviation : 45L•VU-45L)



VU-DV Fittings

Code No. 2253

Unit : mm

Nominal Dia.	Z	L	R(Reference)	Standards
40	14	36	34	AS38
50	18	43	45	
65	22	57	55	
75	25	65	60	
100	30	80	69	
125	38	103	92	
150	44	124	106	AS12
200	48	153	114	
250	58	183	140	
300	70	210	167	M
350	90	258	212	
400	110	310	243	

DV Fittings

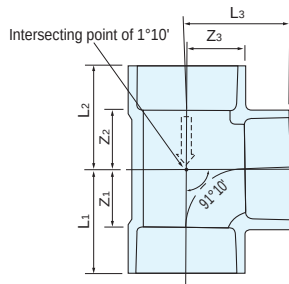
Code No. 2153

Unit : mm

Nominal Dia.	Z	L	R(Reference)	Standards
30	12	30	29	JIS K 6739
40	14	36	30	
50	18	43	42	
65	22	57	52	
75	25	65	58	
100	30	80	69	
125	38	103	90	
150	44	124	109	

90° Y

(Abbreviation : DT•VU-DT)



VU-DV Fittings

Code No. 2254

Unit : mm

Nominal Dia.	Z ₁	Z ₂	Z ₃	L ₁	L ₂	L ₃	Standards
50	34	34	34	59	59	59	AS38
65	42	43	42	77	78	77	
75	48	49	48	88	89	88	
75× 50	34	35	48	74	75	73	
100	62	63	62	112	113	112	
100× 50	34	35	62	84	85	87	
100× 75	48	49	62	98	99	102	AS12
150	89	90	89	169	170	169	
200	113	113	113	218	218	218	AS12
200×100	62	63	116	167	168	166	M
200×125	76	73	115	186	183	180	
200×150	88	88	113	198	198	193	AS12
250	139	139	139	264	264	264	M
250×200	116	118	141	246	248	251	
300	165	165	165	305	305	305	
350	197	200	197	367	370	367	

DV Fittings

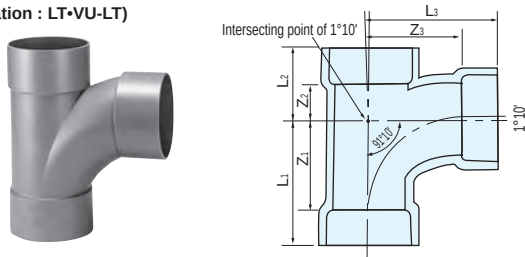
Code No. 2154

Unit : mm

Nominal Dia.	Z ₁	Z ₂	Z ₃	L ₁	L ₂	L ₃	Standards
30	22	22	22	40	40	40	JIS K 6739
40	27	27	27	49	49	49	
40× 30	22	22	27	44	44	45	
50	34	34	34	59	59	59	
50× 30	22	22	33	47	47	51	
50× 40	27	27	33	52	52	55	
65	42	43	42	77	78	77	
65× 40	27	28	42	62	63	64	
65× 50	34	35	42	69	70	67	
75	48	49	48	88	89	88	
75× 40	27	28	48	67	68	70	
75× 50	34	35	48	74	75	73	
75× 65	42	43	48	82	83	83	
100	62	63	62	112	113	112	
100× 40	27	28	62	77	78	84	
100× 50	34	35	62	84	85	87	
100× 65	42	43	62	92	93	97	
100× 75	48	49	62	98	99	102	
125	75	76	75	140	141	140	M
125× 75	49	51	75	114	116	115	
125×100	62	64	75	127	129	125	JIS K 6739
150	89	90	89	169	170	169	
150× 75	51	53	88	131	133	128	M
150×100	62	65	88	142	145	138	

90° Large Radius Y

(Abbreviation : LT-VU-LT)



DV Fittings

Code No. 2155

Unit : mm

Nominal Dia.	Z ₁	Z ₂	Z ₃	L ₁	L ₂	L ₃	Standards
40	52	23	52	74	45	74	JIS K 6739
50	66	26	66	91	51	91	
50× 40	52	23	57	77	48	79	
65	90	33	90	125	68	125	
65× 40	52	24	66	87	59	88	
65× 50	66	27	74	101	62	99	
75	100	30	100	140	70	140	
75× 40	52	25	71	92	65	93	
75× 50	66	29	79	106	69	104	
75× 65	90	32	95	130	72	130	
100	128	45	128	178	95	178	
100× 40	52	28	82	102	78	104	
100× 50	66	32	90	116	82	115	
100× 65	90	36	107	140	86	142	
100× 75	100	33	110	150	83	150	
125	140	50	140	205	115	205	
125× 65	90	38	120	155	103	155	
125× 75	100	42	124	165	107	164	
125×100	128	52	140	193	117	190	
150	170	65	170	250	145	250	
150× 65	90	42	130	170	122	165	
150× 75	100	45	135	180	125	175	
150×100	128	53	152	208	133	202	
150×125	140	60	152	220	140	217	

VU-DV Fittings

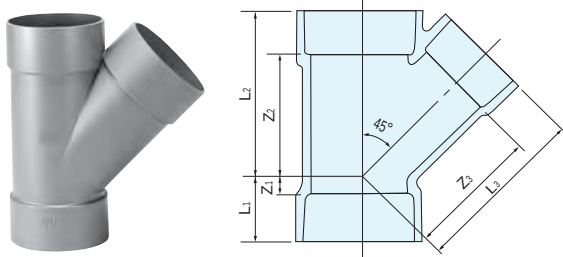
Code No. 2255

Unit : mm

Nominal Dia.	Z ₁	Z ₂	Z ₃	L ₁	L ₂	L ₃	Standards
50	66	26	66	91	51	91	AS38
75	100	30	100	140	70	140	
75× 50	66	29	79	106	69	104	
100	128	45	128	178	95	178	
100× 50	66	32	90	116	82	115	
100× 75	100	33	110	150	83	150	
125	140	50	140	205	115	205	
150	170	65	170	250	145	250	
150×125	140	60	152	220	140	217	
200	196	94	196	301	199	301	
200×100	128	52	176	233	157	226	M
200×150	170	57	196	275	162	276	

45° Y

(Abbreviation : Y-VU-Y)



DV Fittings

Code No. 2157

Unit : mm

Nominal Dia.	Z ₁	Z ₂	Z ₃	L ₁	L ₂	L ₃	Standards
40	12	58	62	34	80	84	JIS K 6739
② 40× 30	6	50	58	28	72	76	
50	20	72	78	45	97	103	
50× 40	8	62	70	33	87	92	
65	20	92	98	55	127	133	
65× 40	-1	72	82	34	107	104	
65× 50	8	80	88	43	115	113	
75	26	106	115	66	146	155	
75× 40	-6	78	92	34	118	114	
75× 50	3	86	98	43	126	123	
75× 65	14	98	106	54	138	141	
100	32	134	144	82	184	194	
100× 40	-14	96	112	36	146	134	
100× 50	-8	98	118	42	148	143	
100× 65	3	110	125	53	160	160	
100× 75	19	118	132	69	168	172	
125	38	172	175	103	237	240	
125×100	19	150	171	84	215	221	
150	44	204	210	124	284	290	
150×100	6	165	185	86	245	235	

VU-DV Fittings

Code No. 2257

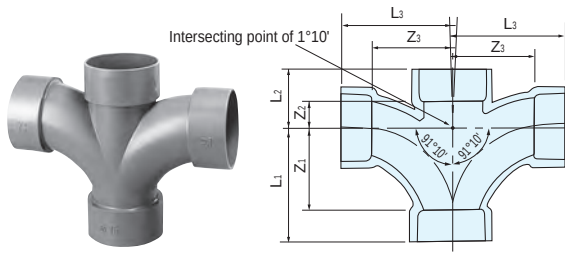
Unit : mm

Nominal Dia.	Z ₁	Z ₂	Z ₃	L ₁	L ₂	L ₃	Standards
50	20	72	78	45	97	103	AS38
75	26	106	115	66	146	155	
75× 50	3	86	98	43	126	123	
100	32	134	144	82	184	194	
100× 50	-8	98	118	42	148	143	
100× 75	19	118	132	69	168	172	
125	38	172	175	103	237	240	
150	44	204	210	124	284	290	
200	42	258	268	147	363	373	
200×100	-15	200	218	90	305	268	
200×150	7	224	243	112	329	323	M

Note The ② mark indicates that the product is manufactured by Maezawa Kasei Industries Co., Ltd.

90° Large Radius Double-Y

(Abbreviation : WLT)



DV Fittings

Code No. 2156

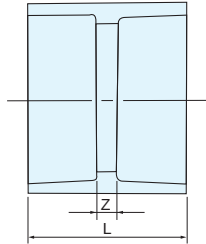
Unit : mm

Nominal Dia.	Z ₁	Z ₂	Z ₃	L ₁	L ₂	L ₃	Standards
65	90	33	90	125	68	125	JIS K 6739
75	100	38	100	140	78	140	
100	128	45	128	178	95	178	
100× 75	100	40	110	150	90	150	
①125×100	128	52	140	193	117	190	

Note The mark ① indicates that the product is manufactured by Toeikanki Co., Ltd.

Sockets

(Abbreviation : DS•VU-DS)



VU-DV Fittings

Code No. 2258

Unit : mm

Nominal Dia.	Z	L	Standards
40	3	47	Ⓜ
50	3	53	AS38
65	3	73	
75	4	84	
100	5	105	
125	5	135	
150	5	165	K-11, AS12
200	5	215	
250	6	270	
300	6	320	
350	12	352	Ⓜ
400	12	412	

DV Fittings

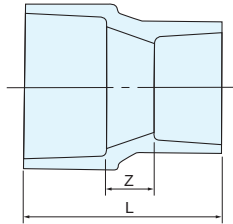
Code No. 2158

Unit : mm

Nominal Dia.	Z	L	Standards
30	3	39	JIS K 6739
40	3	47	
50	3	53	
65	3	73	
75	4	84	
100	4	104	
125	4	134	
150	4	164	

Increaser

(Abbreviation : IN•VU-IN)



VU-DV Fittings

Code No. 2259

Unit : mm

Nominal Dia.	Z	L	Standards
50× 40	20	67	Ⓜ
75× 50	25	90	AS38
75× 65	25	100	
100× 50	30	105	
100× 65	30	115	
100× 75	30	120	
125×100	35	150	
150×100	40	170	
150×125	40	185	
200×100	45	203	Ⓜ
200×125	45	218	
200×150	50	235	
250×200	60	290	AS12

DV Fittings

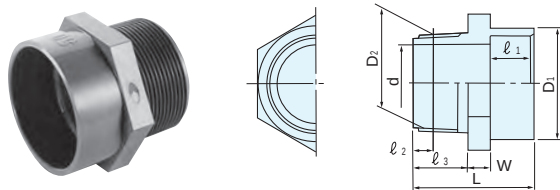
Code No. 2159

Unit : mm

Nominal Dia.	Z	L	Standards
40× 30	20	60	JIS K 6739
50× 30	20	63	
50× 40	20	67	
65× 40	20	77	
65× 50	20	80	
75× 40	25	87	
75× 50	25	90	
75× 65	25	100	
100× 40	30	102	
100× 50	30	105	
100× 65	30	115	
100× 75	30	120	
125× 65	35	135	
125× 75	35	140	
125×100	35	150	
150× 75	40	160	Ⓜ
150×100	40	170	JIS K 6739
150×125	40	185	

Valve Sockets

(Abbreviation : DVS)



- Notes
1. The male threads conform to JIS B0203 (taper pipe threads) male tapered threads (R).
 2. The socket dimensions conform to JIS K6739.
 3. The products with nominal diameters of 50 and less are hexagon-shaped, and the products with nominal diameters of 65 and more are octagon-shaped.

DV Fittings

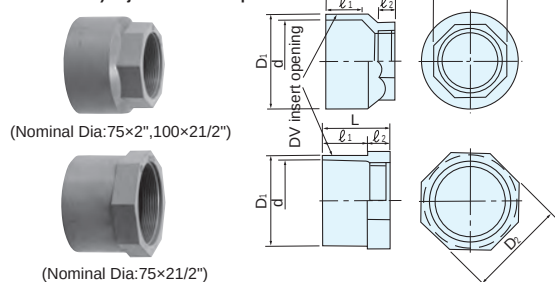
Code No. 2166

Unit : mm

Nominal Dia.	D ₁	d	ℓ ₁	W	L	Threads				Standards
						D ₂	ℓ ₂	ℓ ₃	Number of Thread Crests 25.4mm	
40×11/2"	54	40	22	10	58	47.803	12.70	26	11	M
50×2"	67	51	25	12	68	59.614	15.88	31	11	
65×21/2"	83	68	35	15	85	75.184	17.46	35	11	
75×3"	97	77.2	40	16	95	87.884	20.64	39	11	
100×4"	124	98.8	50	18	115	113.030	25.40	47	11	

Adaptors for Steel Pipes

(Abbreviation : DA) Injection-molded product



DV Fittings

Code No. 2160

Unit : mm

Nominal Dia.	ℓ ₁	ℓ ₂	L	D ₁	D ₂	d	Nominal Thread Dia.	Standards
75×2"	40	16	65	89	72	77.2	Rc2	M
75×21/2"	45	20	65	89	90	77.2	Rc21/2	

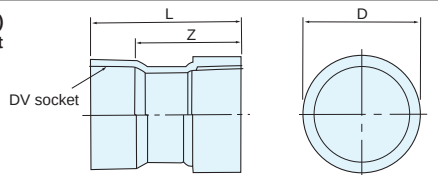
DV Fittings

Code No. 2160

Unit : mm

Nominal Dia.	Z	L	D	Nominal Thread Dia.	Standards
30×11/4"	62	80	45.2	Rc11/4	M
40×11/2"	68	90	56.3	Rc11/2	
50×2"	85	110	69.3	Rc2	
65×21/2"	90	125	85.4	Rc21/2	
75×3"	95	135	101.2	Rc3	
100×4"	100	150	128.0	Rc4	

(Abbreviation : DA)
Fabricated product



- Notes
1. The female threads conform to JIS B0203 (tapered pipe threads) tapered female threads (Rc).
 2. The DV socket dimensions conform to JIS K6739.

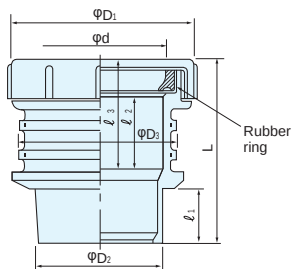
Insert Sockets (Expansion Fittings)

(Abbreviation : ES-A)

Type A



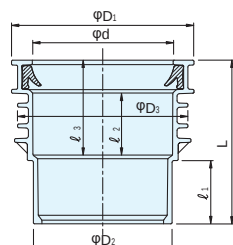
(Nominal Dia: 40~150)



Type B



(Nominal Dia: 75, 100)



- Notes
1. The material of the rubber ring is SBR in the case of Type A and EPDM in the case of Type B.
 2. The pipe end to be inserted into the rubber ring end of the insert socket needs to be chamfered by about 1 to 2 mm. Use V Soap or V Spray as a joint lubricant.
 3. These products can be used for horizontal and vertical piping.
 4. The amount of expansion and contraction of each nominal diameter is shown in the table at the right.

DV Fittings

Code No. 2162

Unit : mm

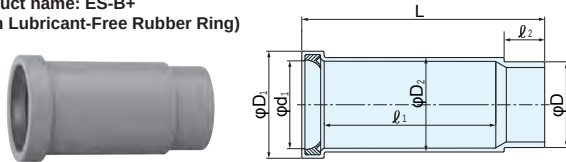
Nominal Dia.	Type	D ₁	D ₂	D ₃	d	L	ℓ ₁	ℓ ₂	ℓ ₃	Standards
40	A	69	48	60	48.9	80	23	34	48	M
50	A	85	60	76	60.8	85.5	26	35	51	
65	A	110	76	86	77.1	103.5	36	37	58	
75	B	120	89	114	91.0	114	42	43	65	
100	B	150	114	140	115.8	134.5	52	51	78	
125	A	181	140	165	141.2	160.5	66	53	83	
150	A	211	165	191	167.0	191.5	83	65	96	

Nominal Dia.	40	50	65	75	100	125	150
Amount of expansion and contraction	±13	±11	±8	±10	±11	±13	±21

Repair Sockets (Expansion Fittings)

(Abbreviation : ES-B)

Product name: ES-B+
(With Lubricant-Free Rubber Ring)



- Notes
1. The material of the rubber ring is self-lubricating chloroprene (CR).
 2. The pipe end to be inserted into the rubber ring socket needs to be chamfered by about 1 to 2 mm.
 3. A lubricant-free rubber ring is used in these products. If it is difficult to insert the pipe, use a lubricant (V Soap or V Spray).
 4. These products can be used with horizontal and vertical piping.

DV Fittings

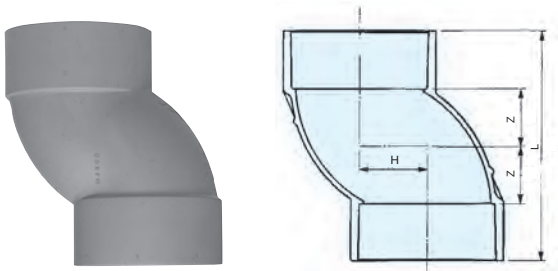
Code No. 2163

Unit : mm

Nominal Dia.	D	d	L	ℓ_1	ℓ_2	D ₁	D ₂	Standards
50	60	62	135	85	26	78	68	Ⓜ
65	76	78	170	107	36	97	86	
75	89	91	198	125	42	111	98	
100	114	116	240	152	52	140	124	
125	140	142	291	183	67	172	151	
150	165	167	351	223	82	201	178	

S Sockets

(Abbreviation : VUSS)



VU-DV Fittings

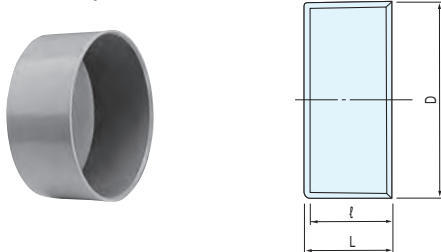
Code No. 5437

Unit : mm

Nominal Dia.	Z	H	L	Standards
40	20	24	84	Ⓜ
50	25	30	100	
65	32	38	134	
75	37.5	44.5	155	
100	47.5	57	195	

VU Caps

(Abbreviation : VU-CAP)



VU-DV Fittings

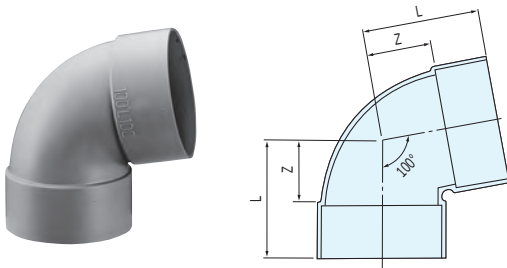
Code No. 2354

Unit : mm

Nominal Dia.	L(Reference)	ℓ	D	Standards
40	25	22	54	Ⓜ
50	27	25	67	
65	37.5	35	83	
75	43	40	97	
100	53.5	50	124	
125	69	65	150	
150	85	80	178	
200	115	110	227	
250	138	128	280	
300	154	145	333	

- Notes
1. In buried applications, these products must not be used to cover vertically buried pipes. When they are used to cover horizontally buried pipes, the following burial depth should be as follows.
Allowable burial depths
1.2 to 2 m when buried under streets and covered with soil
0.6 to 2 m when buried under sidewalks and covered with soil
 2. The shape of caps with nominal diameters of 40, 250 and 300 differ from that shown in the diagram.

100 Elbows



DV Fittings

Code No. 2351

Unit : mm

Nominal Dia.	Z	L	Standards
Ⓜ 100	62	112	Ⓜ

Note The mark Ⓜ indicates that the product is manufactured by Toeikanki Co., Ltd.

VU-DV Fittings

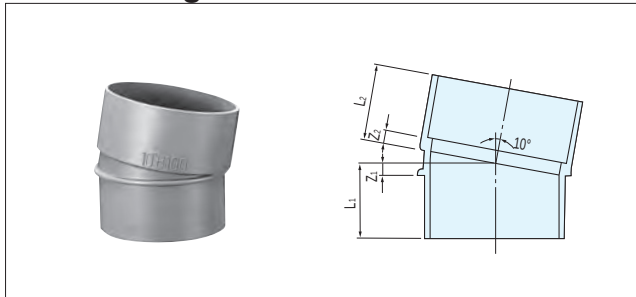
Code No. 2351

Unit : mm

Nominal Dia.	Z	L	Standards
★ 50	31	56	Ⓜ
75	48	88	
100	62	112	

Note The "★" mark indicates a made-to-order product.

10° Bushings



VU-DV Fittings

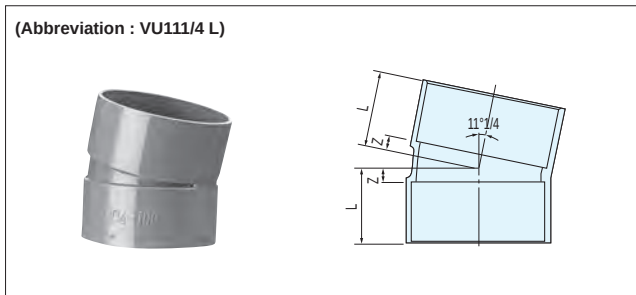
Code No. 2353

Unit : mm

Nominal Dia.	Z ₁	L ₁	Z ₂	L ₂	Standards
50	6.0	31	6.0	31	Ⓜ
75	7.8	47.8	7.8	47.8	
100	2.0	52	14.0	64	

11° 1/4 Elbows

(Abbreviation : VU111/4 L)



VU-DV Fittings

Code No. 5430

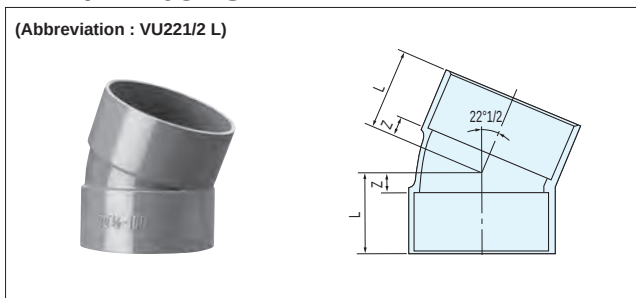
Unit : mm

Nominal Dia.	Z	L	Standards
★ Ⓜ 75	9	49	Ⓜ
100	11	61	
★ 150	17	97	

- Notes
1. The "★" mark indicates a made-to-order product.
 2. The Ⓜ mark indicates that the product is manufactured by Maezawa Kasei Industries Co., Ltd.

22° 1/2 Elbows

(Abbreviation : VU221/2 L)



VU-DV Fittings

Code No. 5431

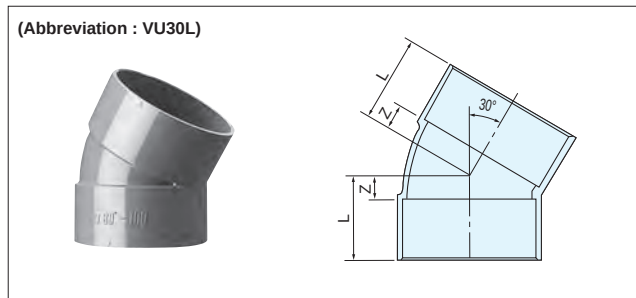
Unit : mm

Nominal Dia.	Z	L	Standards
★ Ⓜ 50	9	34	Ⓜ
Ⓜ 75	13	53	
100	16	66	
150	26	106	

- Notes
1. The "★" mark indicates a made-to-order product.
 2. The Ⓜ mark indicates that the product is manufactured by Maezawa Kasei Industries Co., Ltd.

30° Elbows

(Abbreviation : VU30L)



VU-DV Fittings

Code No. 5432

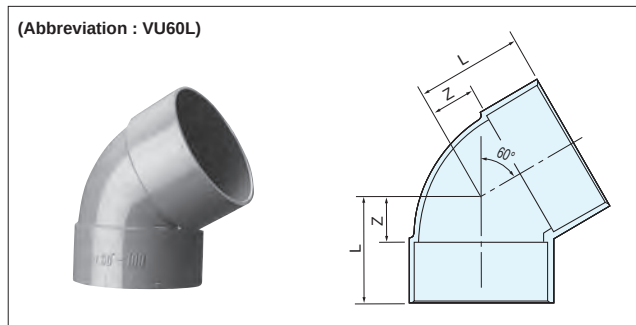
Unit : mm

Nominal Dia.	Z	L	Standards
50	11	36	Ⓜ
★ Ⓜ 75	16	56	
100	19	69	
150	30	110	

- Notes
1. The "★" mark indicates a made-to-order product.
 2. The Ⓜ mark indicates that the product is manufactured by Maezawa Kasei Industries Co., Ltd.

60° Elbows

(Abbreviation : VU60L)



VU-DV Fittings

Code No. 5433

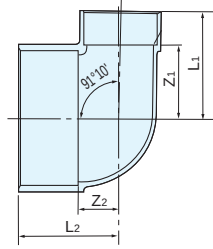
Unit : mm

Nominal Dia.	Z	L	Standards
★ Ⓜ 75	30	70	Ⓜ
100	37	87	

- Notes
1. The "★" mark indicates a made-to-order product.
 2. The Ⓜ mark indicates that the product is manufactured by Maezawa Kasei Industries Co., Ltd.

Reducing Elbows

(Abbreviation : VUL)



VU-DV Fittings

Code No. 5434

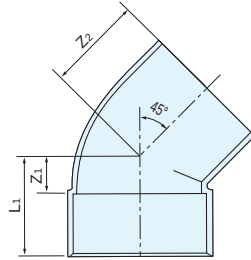
Unit : mm

Nominal Dia.	Z ₁	Z ₂	L ₁	L ₂	Standards
50× 40	32	26	54	51	M
65× 50	41	33	66	68	
★ 75× 40	48	27	70	67	
75× 50	47	32	72	72	
75× 65	48	41	83	81	
100× 50	61	34	86	84	
100× 75	62	47	102	97	
★ 150×100	88	62	138	142	

- Notes
- The "★" mark indicates a made-to-order product.
 - The ② mark indicates that the product is manufactured by Maezawa Kasei Industries Co., Ltd.

45° Single Socket Elbows

(Abbreviation : 45KL)



VU-DV Fittings

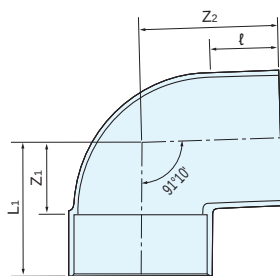
Code No. 5435

Unit : mm

Nominal Dia.	Z ₁	L ₁	Z ₂	Standards
50	18	43	41	M
75	25	65	63	
100	30	80	78	

90° Single Socket Elbows

(Abbreviation : 90KL)



VU-DV Fittings

Code No. 5436

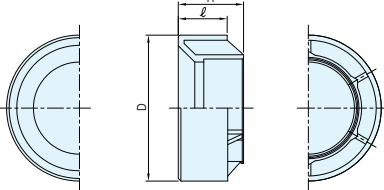
Unit : mm

Nominal Dia.	Z ₁	L ₁	Z ₂	ℓ	Standards
② 40	28	50	52	26	M
50	33	58	62	28	
② 65	41	76	81	39	
75	48	88	93	45	
100	62	112	116	52	

- Notes
- The ② mark indicates that the product is manufactured by Maezawa Kasei Industries Co., Ltd.
 - The products with the ② mark will change to products manufactured by Maezawa Kasei Industries Co., Ltd. when the current stock of products manufactured by Kubota ChemiX runs out.

VU Bushings

(Abbreviation : VUSR)



Code No. 5474

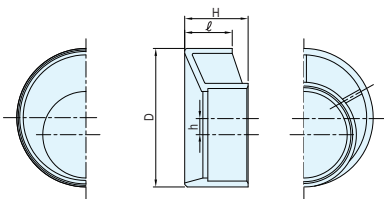
Unit : mm

Nominal Dia.	D	ℓ	H	Standards
② 75×50	88.8	30	40	M
★ ② 100×50	113.8	35	50	
★ ② 100×65	113.8	35	50	
★ ② 100×75	113.8	35	50	

- Notes
- The "★" mark indicates a made-to-order product.
 - The ② mark indicates that the product is manufactured by Maezawa Kasei Industries Co., Ltd.

VU Eccentric Bushings

(Abbreviation : VUHB)



Code No. 5475

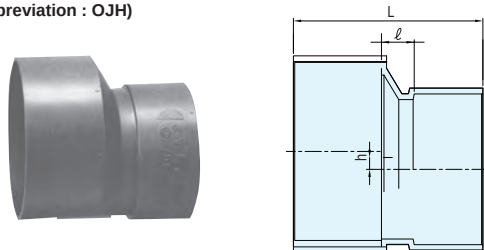
Unit : mm

Nominal Dia.	D	ℓ	h	H	Standards
② 75× 40	88.8	30	18	40	M
② 75× 50	88.8	30	11	40	
② 75× 65	89.0	30	3.5	40	
② 100× 40	113.8	40	30.5	50	
100× 50	113.7	57	23.6	57	
★ ② 100× 65	113.8	40	16	50	
100× 75	113.7	57	8.8	57	
★ ② 125×100	139.8	55	8.4	65	
150×100	164.2	87	20.5	87	
150×125	164.7	80	7.4	80	

- Notes
- The "★" mark indicates a made-to-order product.
 - The ② mark indicates that the product is manufactured by Maezawa Kasei Industries Co., Ltd.

VU Eccentric Sockets

(Abbreviation : OJH)



Code No. 5476

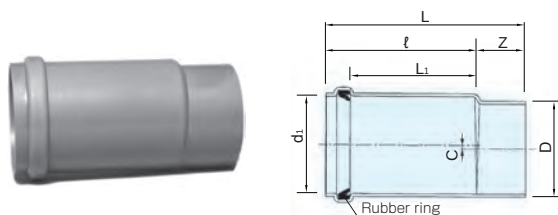
Unit : mm

Nominal Dia.	L	ℓ	h	Standards
⊗ 40× 50	60	13	6	Ⓜ
50× 65	80	20	7	
⊗ 50× 75	95	30	13.5	
⊗ 50×100	115	40	25.5	
⊗ 65× 75	98	23	6	
★ ⊗ 65×100	122	37	18	
⊗ 75×100	125	35	12	
★ ⊗ 100×125	145	30	12	
100×150	170	40	23	
125×150	175	30	11.5	

Notes 1. The "★" mark indicates a made-to-order product.
2. The ⊗ mark indicates that the product is manufactured by Maezawa Kasei Industries Co., Ltd.

VU Eccentric Repair Sockets (Expansion Fittings)

(Abbreviation : SLRP)



Code No. 5531

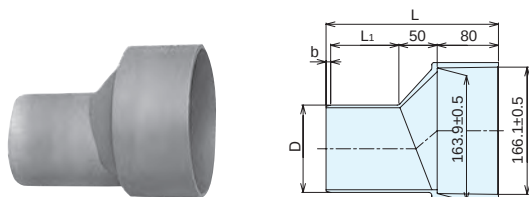
Unit : mm

Nominal Dia.	D	d ₁	L	L ₁	ℓ	C	Z	Standards
★100	114±0.4	115	240	147	181	3.75	59	Ⓜ
150	165±0.5	166	355	218	260	5.75	95	

Note The "★" mark indicates a made-to-order product.

VU Eccentric Socket (Socket End/Pipe End)

(Abbreviation : HENSIN-S)



Code No. 5476

Unit : mm

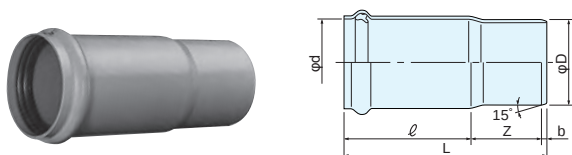
Nominal Dia.	D	L ₁	L	b	Standards
150-100	114±0.4	89	225	6	Ⓜ
★150-125	140±0.5	102	240	8	

Note The "★" mark indicates a made-to-order product.

Repair Sockets (Expansion Fittings)

(Abbreviation : SLR)

Expansion Fittings



Code No. 5531

Unit : mm

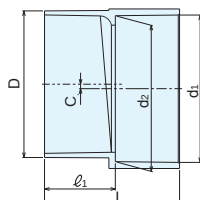
Nominal Dia.	d	D	ℓ	Z	L	b	Standards
100	115.5	114	209	125	340	6	Ⓜ
125	141.5	140	227	140	375	8	
150	166.5	165	270	155	435	10	
*200	218.6	216	308	180	500	12	AS19

Note It would be difficult to install the pipe, if the small amount of V Soap applied to the rubber ring end.

Caution When using on a column pipe, use an insertion jig when connecting.

VU-VP Conversion Sockets

(Abbreviation : VU-VPS)



Code No. 5477

Unit : mm

Nominal Dia.	D	ℓ ₁	d ₁	d ₂	L	C	Standards
★ 100	114	55	114.6	113.5	105	3.5	Ⓜ
★ ⊕ 125	140	72	140.9	139.1	137	2	
★ ⊕ 150	165	110	166.1	163.9	190	4	

Notes 1. The "★" mark indicates a made-to-order product.
2. The "⊕" mark are manufactured by Takiron Co., Ltd.

IV Adhesives

1. Vinyl-Base Adhesives

⚠ The adhesive must not be mixed with other adhesive. If the adhesive is mixed with other adhesive or a solvent, the adhesive strength decreases significantly.

Usage range of nominal diameters covered by supplied brush

Can size	Guideline range of nominal diameter
100g	13~50
500g	13~50
1kg	65~150

Tough dyne HI

Code No. 1039

Product conforms to Japan Water Works Association's standards JWWA S101



100 g can (with brush) 500 g can (with brush) 1 kg can (with brush)

Use Bonding of HI products
(can be used on general pipes and fittings)

Property Low viscosity (A), quick drying (viscosity: 500 MPa·s)

Color Colorless

Tough dyne HI (White)

Code No. 1039

Product conforms to Japan Water Works Association's standards JWWA S101



500 g can (with brush) 1 kg can (with brush)

Use Bonding of HI products
(can be used on general pipes and fittings)

Property Low viscosity (A), quick drying (viscosity: 500 MPa·s)

Color White

Tough dyne Red

Code No. 1039

Product conforms to Japan Water Works Association's standards JWWA S101



500 g can (with brush) 1 kg can (with brush)

Use Bonding of general pipes and fittings

Property High viscosity (B), quick drying (viscosity: 1,700 MPa·s)

Color Colorless

⚠ Caution •This adhesive cannot be used to bond HI products.

Tough dyne Blue

Code No. 1039

Product conforms to Japan Water Works Association's standards JWWA S101



100 g can (with brush) 500 g can (with brush) 1 kg can (with brush)

Use Bonding of general pipes and fittings

Property Low viscosity (A), quick drying (viscosity: 150 MPa·s)

Color Colorless

⚠ Caution •This adhesive dries quickly; therefore, it is not suitable for bonding pipes with nominal diameter of 200 and more.
•This adhesive cannot be used to bond HI products.

Tough dyne HT

Code No. 2039

Product conforms to the manufacturer's standards



100 g can (with brush) 250 g can (with brush) 500 g can (with brush)

Use Bonding of HT products

Property Low viscosity, quick drying (viscosity: 500 MPa·s)

Color Colorless

⚠ Caution •This adhesive cannot be used to bond general pipes/fittings or HI products.

(Note) Expiration date is indicated only on the Tough dyne HT can. Please check the expiration date before using.

Color Tough dyne Blue

Code No. 1039

Product conforms to the manufacturer's standards



500 g can (with brush) 1 kg can (with brush)

Use Bonding of DV fittings

Property Low viscosity, quick drying (viscosity: 500 MPa·s)

Color Blue

⚠ Caution •Use Tough dyne Yellow for drain pipes with nominal diameter of 200 and more.
•This adhesive must not be used to bond pipes and fittings for water supply such as for drinking water.
•Be sure to wipe off the adhesive adhered on the base material.
The dye contained in the adhesive penetrates the sheet over time.
As a result, the blue dye appears on the surface.

Tough dyne Yellow

Code No. 1039

Product conforms to the manufacturer's standards



1 kg can (with brush) 3 kg can

Use Bonding of general pipes and fittings (nominal diameter of 200 and more)

Property High viscosity, slow drying (viscosity: 1,000 MPa·s)

Color Colorless

⚠ Caution •This adhesive must not be used to bond pipes and fittings for water supply such as for drinking water.
•When applying to pipes with large diameters, pour a necessary amount of adhesive into a different metal container and use a large brush.

2. Selection of Vinyl-Base Adhesive to Use

◎Recommended ○Usable × Cannot be used

Pipeline Classification	Pressurized Pipeline						Nonpressurized Pipeline		
Application Classification	Water Supply/Hot Water Supply			General Pressurized Pipe			Drain and Vent		
Pipe Product Classification	HI Product	General Pipe	HT Product	HI Product	General Pipe		HT Product	General Pipe	
Nominal Diameter Classification	150 and less			150 and less	150 and less	200 and more (Note 1)	150 and less	150 and less	200 and more (Note 1)
Tough dyne HI	◎	○	×	◎	○	×	×	○	×
Tough dyne HI (White)	◎	○	×	◎	○	×	×	○	×
Tough dyne Red	×	○ (Note 4)	×	×	○ (Note 4)	◎	×	○ (Note 4)	◎
Tough dyne Blue	×	◎	×	×	◎	×	×	◎	×
Tough dyne HT	×	×	◎	×	×	×	◎ (Note 3)	×	×
Color Tough dyne Blue	×	×	×	×	◎	×	×	◎	×
Tough dyne Yellow	×	×	×	×	×	◎ (Note 2)	×	×	◎

Note 1. When applying the adhesive to pipes with nominal diameter of 200 and more, pour a necessary amount of adhesive into a different metal container and use a large brush.

Note 2. Tough dyne Blue and Color Tough dyne Blue dry quickly; therefore, they are not suitable for bonding pipes with nominal diameter of 200 and more.

Note 3. When bonding HT-DV products to general pipes, such as for the connection of the drain pipe from a dishwasher, use Tough dyne HT.

Note 4. Tough dyne Red is recommended for nominal diameters of 65 and more.

Note 5. Tough dyne Yellow must not be used to bond pipes and fittings for water supply such as for drinking water.

Note 6. Use Tough dyne HI for HI pipes and fittings with nominal diameter of 200 and more.

3. Lubricants for Rubber Ring Joints

V Soap

Code No. 7000

Product conforms to the manufacturer's standards



1 kg resin container (with brush)



2 kg resin container

Use Connecting pipes to fittings with rubber ring
Property Liquid
Main component Potassium soap

V Spray

Code No. 7000

Product conforms to the manufacturer's standards



340ml

Use Connecting pipes to fittings with rubber ring
Property Spray
Main component Silicone oil

4. Amount of Adhesive and Lubricant to Apply

1. The amount of adhesive/lubricant indicated in the tables are guideline figures. When ordering, add 20% to 30% more to compensate for the loss that can occur at the construction site.

2. The indicated amount is the amount applied on the socket and pipe at one location.

Amount of vinyl-base adhesive to apply (reference)

For TS socket

g/location

Nominal Dia.	13	16	20	25	28	30	35	40	50	65	75	100	125	150	200	250	300	350	400	450	500	600
Tough dyne HI/ HI (White)	0.6	0.8	1.1	1.6	—	2.1	—	3.3	4.8	6.6	8.1	13	20	30	55	—	—	—	—	—	—	—
Tough dyne Red	0.9	1.2	1.7	2.4	2.6	3.2	3.5	5.0	7.1	9.9	12	20	30	45	80	130	180	—	—	—	—	—
Tough dyne Blue	0.6	0.8	1.1	1.6	1.7	2.1	2.3	3.3	4.8	6.6	8.1	13	20	30	—	—	—	—	—	—	—	—
Tough dyne HT	0.6	0.8	1.1	1.6	—	2.1	—	3.3	4.8	6.6	8.1	13	20	30	—	—	—	—	—	—	—	—
Tough dyne Yellow	—	—	—	—	—	—	—	—	—	—	—	—	—	—	70	105	150	205	265	330	410	595

Note The indicated amount is for a surface area of 1m². The amount in the table were calculated based on 300 g for Tough dyne Red, 200 g for Tough dyne HI and Tough dyne HI (White), and 250 g for Tough dyne Yellow.

For DV socket

g/location

Nominal Dia.	20	25	40	50	65	75	100	125	150	200	250	300	350	400	450	500	600	700
Tough dyne Blue	—	—	4	5	7	10	15	20	30	—	—	—	—	—	—	—	—	—
Color Tough dyne Blue	—	—	4	5	7	10	15	20	30	—	—	—	—	—	—	—	—	—
Tough dyne HT	0.8	1.1	4	5	—	10	—	—	—	—	—	—	—	—	—	—	—	—
Tough dyne Yellow	—	—	—	—	—	—	—	—	—	55	90	125	175	220	275	350	525	700

Amount of lubricant for rubber ring joint to apply (reference)

g/location

Nominal Dia.	40	50	75	100	125	150	200	250	300	350	400	450	500	600
Amount of V Soap used	5	5	7	10	15	20	25	35	50	65	90	115	140	190

Number of application locations per can

Nominal Dia.	150	200	250
Number of joint location per V Spray can	35	23	15

I Performance and Quality

1. Operating Temperature and Pressure

(1) Operating temperature ranges and operating pressure for HI-VP, VP, VU and major fittings

Pipe	Major fitting	Use	Operating temperature range (see notes)		Operating pressure range (see notes)
HI-VP pipe for water supply	HI-TS fitting	Water pipe	Ordinary temperature (5 - 35°C)		0.75 MPa (hydrostatic pressure)
VP pipe for water supply	TS fitting	Pressure pipe	Ordinary temperature (5 - 35°C)		1.0 MPa (hydrostatic + water hammer pressure)
VP pipe for general purposes	DV fitting	Non-pressure pipe	W/o external pressure	5 - 60 °C	—
			W/ external pressure	5 - 45 °C	
VU pipe for general purposes	VU fitting	Non-pressure pipe	W/o external pressure	5 - 60 °C	—
			W/ external pressure	5 - 45 °C	

Notes: 1. The operating temperature range and pressure may vary with the fitting type or joint technique.

2. Since PVC-U pipes expand and contract due to temperature differences, exposed PVC-U pipes require a means to absorb thermal expansion and contraction.

(2) Maximum operating pressures for HT pipes at various temperature

Use	Nominal Dia	Max. operating pressure various temperatures (hydrostatic + water hammer pressure)				
Pipes for hot water and hot-spring water supply (pressure pipe)	13-50	Operating temperature (°C)	50-40	41-60	61-70	71-90 (see Notes)
		Max. operating pressure	1.0 MPa	0.6 MPa	0.4 MPa	0.2 MPa
	65-150	Operating temperature (°C)	50-40	41-60	61-70	71-85 (see Notes)
		Max. operating pressure	1.0 MPa	0.6 MPa	0.25 MPa	0.15 MPa

Notes: 1. The continuous operating temperature range for pressure pipes is 5 to 85°C for nominal diameters of 13 to 50 and 5 to 80°C for nominal diameters of 65 to 150.

2. Since the thermal expansion coefficient of HT pipes due to temperature differences is four to six times those of copper and steel pipes, a means to absorb thermal expansion and contraction are important for HT pipes.

2. Performance Specification for VP and HI-VP Pipes for Water Supply

(excerpt from JIS K 6742: 2007)

Performance attribute		Performance	Applicable pipe
Tensile yield strength		Min. 45 MPa for the tensile strength at yield at 23°C.	VP
Pressure resistance (hydrostatic pressure 4.0 MPa x 1 min at ordinary temperature) ¹		Min. 40 MPa for the tensile strength at yield at 23°C.	HI -VP
Flatness		There shall be no leaks and other defects.	VP, HI-VP
Impact resistance		There shall be no cracks.	VP, HI-VP
Vicat softening temperature		There shall be no anomalies.	HI-VP
Opacity		Min. 76°C	VP, HI-VP
Leachability	Visible light transmittance shall be 0.2% or less.		VP
	Turbidity	Max. 0.5 degree	VP, HI-VP
	Chromaticity	Max. 1 degree	
	Organic matter (TOC)	Max. 1 mg/L	
	Lead	Max. 0.008 mg/L	
	Zinc	Max. 0.5 mg/L	
	Reduction in residual chlorine	Max. 0.7 mg/L	
	Odor	There shall be no anomalies.	
Taste		There shall be no anomalies.	

Note: 1. 4.0 MPa is the pressure for the hydrostatic pressure test to check product quality. The maximum operating pressure of VP and HI-VP Pipes for water supply is 0.75 MPa and the maximum operating pressure (water hammer + hydrostatic pressure) is 1.0 MPa.

3. Performance Specification for VP Pipes for General Purposes

(excerpt from JIS K 6741: 2007)

Performance attribute	Performance	Applicable pipe
Tensile yield strength	Min. 45 MPa for the tensile strength at yield at 23°C.	VP, VM, VU
Pressure resistance (VP: hydrostatic pressure 2.5 MPa x 1 min at ordinary temperature) ¹	There shall be no leaks or other defects.	VP, VM, VU
Joint pressure resistance ^{1, 2}	There shall be no leaks or other defects.	VP, VM, VU
Flatness	There shall be no cracks.	VP, VM, VU
Vicat softening temperature	Min. 76°C	VP, VM, VU

Notes: 1. 2.5 MPa is the pressure for the hydrostatic pressure test to check product quality. The maximum operating pressure (water hammer + hydrostatic pressure) of VP pipes for general purposes is 1.0 MPa.

2. The joint pressure resistance applies to pipes with rubber ring and bonding-type ends for pressure applications. For these pipes, this joint pressure resistance test may be substituted for a pressure test.

4. Performance Specification for HT-VP Pipes for Hot Water Supply

(excerpt from JIS K 6776: 2007)

Performance attribute		Performance		Applicable pipe
Tensile yield strength		Min. 50 MPa for the tensile strength at yield at 23°C.		HT
Pressure resistance (hydrostatic pressure 4.0 MPa x 1 min at ordinary temperature) ¹		There shall be no leaks other defects.		HT
Hot internal pressure creep performance		There shall be no leaks other defects.		HT
Flatness		There shall be no cracks.		HT
Vicat softening temp erasure		Min. 95°C		HT
Leachability ²	Turbidity	Max. 0.5 degree		HT
	Chromaticity	Max. 1 degree		
	Organic matter (TOC)	Max. 1 mg/L		
	Lead	Max. 0.008 mg/L		
	Zinc	Max. 0.5 mg/L		
	Odor	There shall be no anomalies.		
	Taste	There shall be no anomalies.		
	Reduction in residual chlorine	Leachate at 90±2°C ³ Leachate at ordinary temperature ⁴	Max. 1mg/L Max. 0.7ma/L	

Notes: 1. 4.0 MPa is the pressure for the hydrostatic pressure test to check product quality. The operating temperature and the maximum operating pressure of HT Pipes for hot water supply are as per item1.

2. Unless otherwise specified, a leachate at 90±2°C shall be used in the leaching test.

3. "Leachate at 90±2°C" means a leaching test using a leachate at 90±2°C.

4. "Leachate at ordinary temperature" means a leaching test using a leachate at ordinary temperature.

5. General Properties of VP, HI-VP and HT-VP Products

	Attribute	Units	VP	HI	Test method	HT	Test method
Physical properties	Color	—	Gray	Grayish blue	—	Brown	—
	Specific gravity	—	1.43	1.40	JIS K 7112 Sink-float method 20°C	1.48	ASTM D 792 20°C
	Hardness	Rockwell R	115	115	ASTM D 785 20°C	140	JIS K 7202 20°C
	Water absorption	One week at ordinary temperature mg/cm ²	Max. 0.15	Max. 0.15	—	Max. 0.15	—
Mechanical properties	Tensile strength	MPa (kgf/cm ²)	49-54(500-550)	49-54(500-530)	JIS K 6742 23°C, etc.	49-54 (500-550)	JIS K 6776 20°C
	Longitudinal elastic modulus	MPa (kgf/cm ²)	2942 (3X10 ⁴)	2942 (3X10 ⁴)	JIS K 7113 20°C	2942 (3X10 ⁴)	ASTM D 747 20°C
	Elongation at fracture	%	50-150	50-150	JIS K 6741 20°C	40-80	JIB K 6741 20°C
	Bending strength	MPa (kgf/cm ²)	78.5-98.1 (800-1000)	78.5-98.1 (800-1000)	JIS K 7203 20°C 65%RH	89 (900)	ASTM D 970 20°C
	Bending elastic modulus	MPa (kgf/cm ²)	2746(2.8X10 ⁴)	2746(2.8X10 ⁴)	JIS K 7203 20°C 65%RH	—	—
	Compression strength	MPa (kgf/cm ²)	69(700)	64(650)	JIS K 7208 20°C 85%RH	69 (700)	ASTM D 695 20°C
	Poisson's ratio	—	0.35-0.40	0.35-0.40	—	0.38	—
	Charpy impact strength	kJ/m ² (kgf·cm/cm ²)	6.9-9.8(7-10)	Min. 17.7	—	7.84X10 ⁻² (8.0)	ASTM D 256
Thermal properties	Vicat softening temperature	°C	Min. 76	Min. 76	JIS K 6742	Min. 95	JIS K 6776
	Linear expansion coefficient	1/°C	6-8X10 ⁻⁵	6-8X10 ⁻⁵	—	6-8X10 ⁻⁵	—
	Specific heat	J/(kg·K) (cal/g·°C)	1.05X10 ³ (0.25)	1.05X10 ³ (0.25)	—	1.05X10 ³ (0.25)	—
	Thermal conductivity	W/(m ² ·K) (kcal/m·h·°C)	0.15 (0.13)	0.15 (0.13)	DIN 8061	0.15 (0.13)	DIN 8061
Electrical properties	Combustibility	—	Self-extinguishability	Self-extinguishability	—	Self-extinguishability	—
	Voltage resistance	kV/mm	Min. 40	Min. 40	—	Min. 40	—
	Volume resistivity	Ωcm	5.3X10 ¹⁵	5.3X10 ¹⁵	30°C 65%RH	5.3X10 ¹⁵	ASTM D 257
	Dielectricity 60 Hz	—	3.2	3.2	30°C 55%RH	3.2	ASTM D 150
	Dielectricity 10 ³ Hz	—	3.1	3.1	—	—	—
	Dielectricity 10 ⁶ Hz	—	3.0	3.0	—	—	—
	Power factor 60 Hz	10 ²	1.18	1.18	30°C 55%RH	—	—
	Power factor 10 ³ Hz	10 ²	1.91	1.91	—	—	—
	Power factor 10 ⁶ Hz	10 ²	1.72	1.72	—	—	—

Note: The above values indicate typical values.

6. Chemical Resistance of VP and HI-VP Products



The chemical resistance in the table is only for reference. Please consult us when using VP and HI-VP products for chemicals.

	Chemical name	Temperature (°C)				Chemical name	Temperature (°C)				Chemical name	Temperature (°C)		
		20	40	60			20	40	60			20	40	60
Acids	Hydrochloric acid 35%	○	○	△	Alkali	Aqueous ammonia 30%	○	○	△	Organic chemicals	Ethyl acetate	x	x	x
	Sulfuric acid 60%	○	○	△		Lime milk	○	○	○		Ethylene chloride	x	x	x
	Sulfuric acid 98%	x	x	x		Most metal chlorides, nitrates, sulfates	○	○	○		Formalin	○	○	○
	Nitric acid 70%	○	△	x		Potassium bichromate 10%	○	○	△		Carbon bisulfide	x	x	x
	Nitric acid 95%	x	x	x		Potassium perchlorate 1%	○	△	x		Acetaldehyde	x	x	x
	Mixed acid H ₂ SO ₄ + HNO ₃ 50-10%:20-40%	○	○	○		Potassium permanganate 15%	○	○	△		Gasoline	△		
						Sodium hypochlorite	△*	△*	x		Petroleum	x	x	x
	Mixed acid: CrO ₃ : H ₂ SO ₄ 50%:50%	△	x	x		Methylene chloride	x	x	x		Aromatic hydrocarbon	x	x	x
						Triol (toluene)	x	x	x		Glycerin	○	○	○
						Trichloroethylene	x	x	x		Oil, fat	○	○	○
	Hydrogen fluoride 10%	○	○	△	Organic chemicals	Acetone	x	x	x	Gas	Cresol solution 5%	x	x	x
	Phosphoric acid	○	○	△		Ketones	x	x	x		Lacquer, thinner	x	x	x
	Acetic acid 95%>	○	△	△		Methyl alcohol	○	△	x		Dry chlorine gas 100%	△	x	x
	Acetic acid ≥95%	△	x	x		Ethyl ether	x	x	x		Wet chlorine gas 5%	△	x	x
	Aminoformic acid 50%	○	○	x		Ethyl alcohol	○	○	△		Ammonia, many other gaseous wastes	○	○	○
	Oxalic acid	○	○	○		Butyl alcohol	○	○	△	Other	Seawater, brine	○	○	○
	Lactic acid	○	△	△		Aniline	x	x	x		Ant repellent	x	x	x
	Hydrogen peroxide 30%	○	○	△		Benzene	x	x	x		Wood preservative (creosote)	x	x	x
	Caustic soda 40%≥	○	○	○		Carbon tetrachloride	x	x	x					
	Caustic potash 40%≥	○	○	○		Chloroform	x	x	x					

Notes: ○: not eroded at all ○: not apparently eroded △: slightly eroded x: unusable

For chemical marked with *, VP and HI-VP products may not be used depending on the service conditions. Please consult us.

7. Chemical Resistance of HT-VP Products



The chemical resistance in the table is only for reference. Please consult us when using HT-VP products for chemicals.

	Chemical name	Temperature (°C)					Chemical name	Temperature (°C)					Chemical name	Temperature (°C)			
		20	40	60	80			20	40	60	80			20	40	60	80
Acids	35% hydrochloric acid	○	○	○	○	Alkali	50% caustic soda	○	○	△	x	Organic chemicals	Oil, fat	○	○	○	○
	Nitric acid 70%≥	○	x	x	x		60% caustic potash	○	○	○	○		Ethyl ether	x	—	—	—
	Sulfuric acid 90%≥	○	○	○	△		Saturated ammonia water	○	○	○	○		Hexane	○	—	—	—
	Hypochlorous acid	△	x	x	x		Chlorine, sulfurous acid	○	—	—	—		Creosote	x	x	x	x
	50% chromium acid	△	x	x	x		Ammonia	○	○	○	△		Benzol	x	x	x	x
	Acetic acid 95%≥	○	△	x	x	Salts	Most metal chlorides	○	○	○	○		Formalin	○	○	○	—
	Chloroacetic acid	○	○	○	x		Potassium perchlorate	○	○	○	○	Other	Benzin	x	—	—	—
	Oxalic acid	○	○	○	○	Organic chemicals	Ethanol	○	○	○	△		Ketones	x	—	—	—
	Lactic acid	○	○	○	○		Butanol	○	○	○	○		Plating solutions	○	○	○	○
	Fatty acid	○	○	○	△		Carbon tetrachloride	x	x	x	x		Petroleum	x	x	x	x
	Maleic acid	○	○	○	○		Glycerin	○	○	○	○						

Note: ○: not eroded at all ○: not apparently eroded △: slightly eroded (usable with restrictions on length of period and pressure) x: unusable

2. Installation Design for Drain and Vent Pipes

2.1 Installation design

(1) Pipeline must be protected against expansion and contraction

A PVC-U pipe expands and contracts by about 0.07 mm per meter when the temperature changes by 1°C.

If there is a large temperature difference in the ambient temperature or in the water flowing in the installed drain pipeline, the pipe must be protected against expansion and contraction. Pipes are in a fully expanded condition when they are installed during the mid-summer. Therefore, when the pipes installed in summer contract during the winter and large force is applied to the fittings. This causes breakage in some cases. Be sure to include expansion fittings when designing pipe installation.

(2) Drain water temperature must be lower than 60°C.

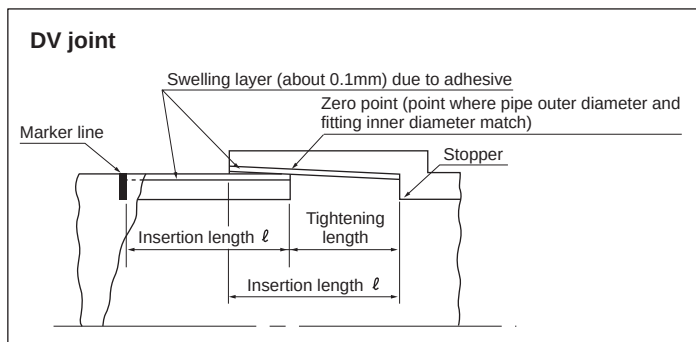
Make sure that the temperature of drain water is lower than 60°C. For drain pipelines for high-temperature miscellaneous waste water, avoid draining high-temperature water or take a measure to reduce the water temperature below 60°C. (* As a general rule, take a measure to reduce the water temperature to lower than 45°C before drainage.)

(3) DV fittings must not be used on pressurized pipelines.

DV fittings are designed for use on drain or vent pipes. Do not use DV fittings on pressurized pipelines. Using DV fittings on a pressurized pipe may cause water leakage or damage to fittings.

3. Bonding DV Products

3.1 Bonding DV products



- Most PVC drain pipes can be joined together using DV fittings. This technique is generally called TS connection, which a pipe is bonded to a DV fitting with a tapered inserted end, using the swelling of the PVC pipe due to the adhesive as well as the elasticity of the pipe.

- When a PVC adhesive is applied to a pipe and fitting, a 0.1 mm thick swelling layer is formed on the surface. These layers facilitate the insertion of the pipe into the fitting. After insertion, the swelling layers of the pipe and the fitting mix and melt to combine the bonding surfaces, resulting in excellent water tightness.
- The insertion lengths of DV fittings are shorter than those of pressure pipe fittings, and the taper angles are smaller than those of pressure pipe fittings (for nominal diameter up to 150 mm). These allow a pipe to be inserted right up to the stopper, forming a flat joint surface. The inner corners of elbows and Y-fittings are round enough to ensure a smooth flow of effluent.

Note: DT fittings are designed for drain and vent applications, and should not be used for pressure pipe applications.

3.2 Cutting and chamfering

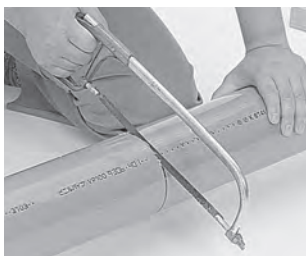
- Determine the cutting length of the pipe, considering the insertion length of the fitting. Draw a cut line all around the pipe with an oil-based pen to ensure that the pipe will be cut at right angles to the longitudinal axis of the pipe. Use a wide piece of paper or tape when drawing the line.



- Remove burrs and shavings on the cut surface. Chamfer the outer circumference with a chamfering tool (about 1 mm size) or a rasp.



- Use a saw with fine teeth. Cut the pipe evenly and shallowly all around the circumference along the cut line rotating the pipe.



- After chamfering the pipe end, measure the insertion length of the fitting and draw a marker line with an oil-based pen.



3.3 Bonding

- Clean the inner surface of the fitting and the outer surface of the inserting end of the pipe with a dry cloth. Wipe off any oil on the pipe with thinner. Make sure that the pipe end has been treated and a marker line indicating the insertion length has been drawn on the pipe.



- Apply the adhesive thinly and evenly to the inner surface of the fitting first and then the outer surface of the inserting end of the pipe. For pipes with large nominal diameters, put the adhesive into a larger can and use a larger brush to work efficiently. An animal hair brush should be used. A plastic brush will melt, which reduces the adhesion of the adhesive.



- After applying the adhesive, immediately push the pipe into the fitting lightly, and align their axes so that there is no twisting. Then, insert the pipe straight into the fitting to the marker line without a pause. For pipes with larger nominal diameters, two persons should work together to ensure that the pipe is inserted in the fitting to the stopper. Do not hammer in the pipe.

- Always keep the force holding the fitting and the pipe together applied for a while after bonding them. Otherwise, the pipe may be disconnected from the fitting due to the tapered inner surface of the fitting. The holding time varies by the amount of adhesive applied, dimensional tolerance and temperature. Typical holding times are shown in the table below. Remove any adhesive coming out the joint surface immediately.



Typical holding time for DV fittings

Nominal Dia.	150 and less	200 and more
Holding time	At least 30 sec. in summer At least 60 sec. in winter	At least 1 min. in summer At least 3min. in winter

Note: For nominal diameters 200 and more, Tough dyne Yellow, a high-viscosity, slow drying adhesive for large pipes, is typically used. Therefore, the holding time becomes longer.

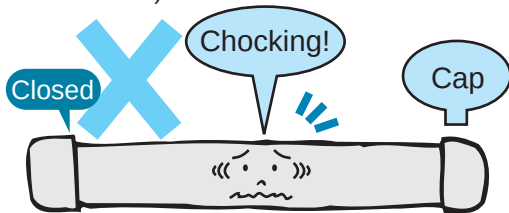
IV Preventing Solvent Cracking

Solvent cracking is a phenomenon which hairline cracks occurs when a solvent is added to objects.

The hairline cracks would grow larger after starting the service and increase the possibility of leakage. For PVC-U or PVC-C pipes, the possibility of leakage increases particularly when the following factors occur.

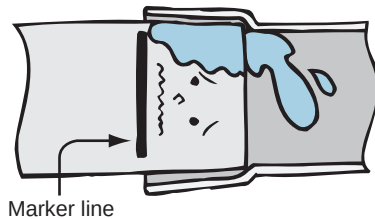
When all these factors are combined, the possibility increases furtherer.

● Pipe clogging after bonding (adhesive residue)



● Presence of solvent

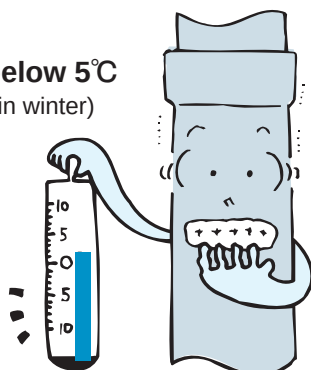
Adhesive coming out of the inner surface of the pipe due to excessive adhesive applied or the presence of chemicals that have adverse effects (such as preservatives) on the surface



● Unreasonable stress being applied (Thermal stress, pipe flattening, pipe bending)



● Low temperature below 5°C (Particularly piping work in winter)

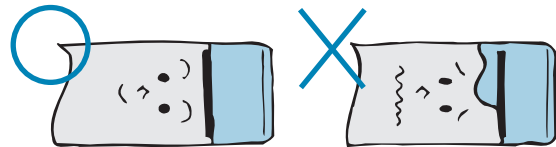


Preventing solvent cracking

During bonding work

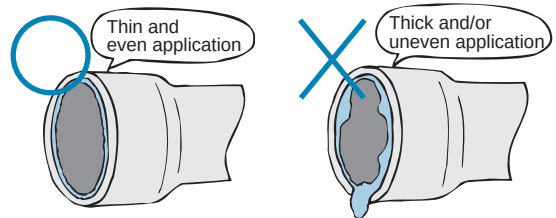
Position to apply the adhesive on the outer surface of the pipe

⚠ Do not apply the adhesive beyond the marker line.



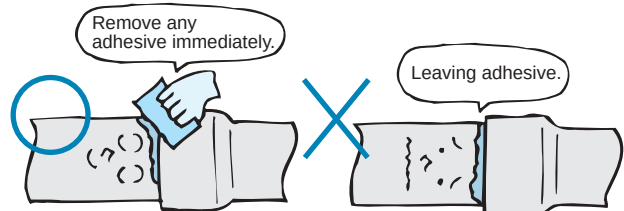
Adhesive coming out to the pipe inner surface

⚠ Apply the adhesive thinly and evenly to the inner surface of the TS fittings.



Removing excessive adhesive

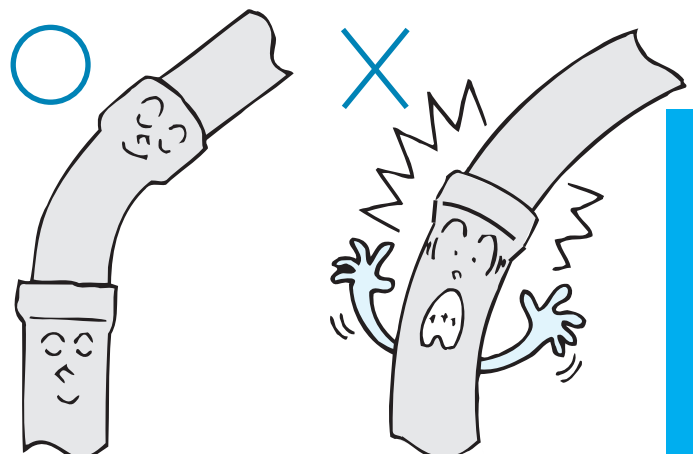
⚠ After inserting the pipe into the fitting, remove adhesive coming out of the joint surface with a cloth.



During piping work

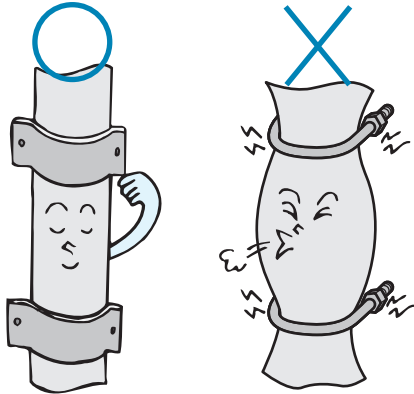
Use bends

⚠ Use bends at pipe corners. Do not bend the pipe.



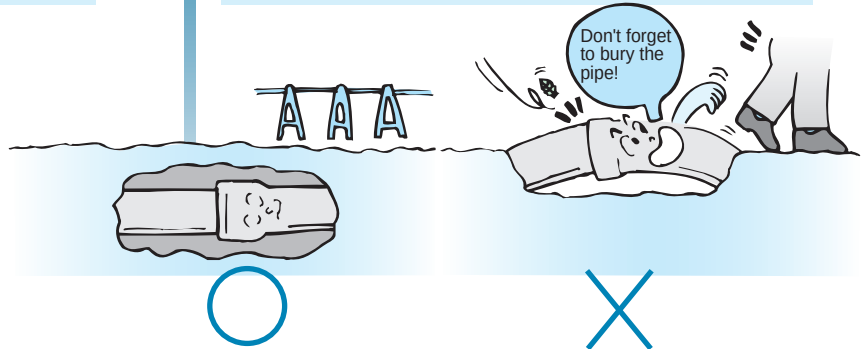
Pipe supports

⚠ When supporting the pipe with saddle bands, use wide fastener bands. Do not use U-bolts. Be careful not to tighten the bands excessively.



Backfilling

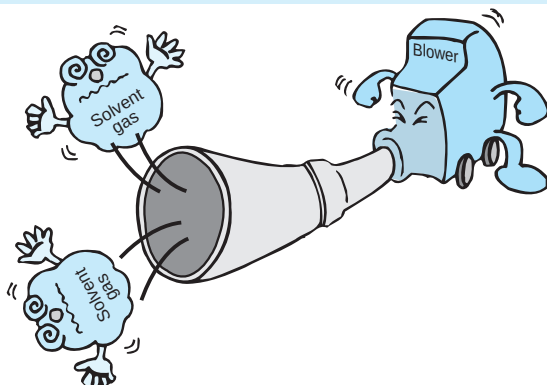
⚠ Backfill the pipe as quickly as possible to prevent thermal stress due to temperature differences or external impact. (Do not let the pipe get cold.)



Removing the solvent gas after bonding work

Ventilation

⚠ After bonding work, remove the solvent gas using a blower (low pressure type) or other means.



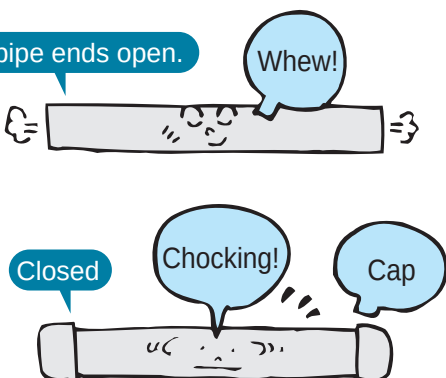
Washing with water avoiding water pressure in the pipe

⚠ Pour water into the pipe 30 minutes after the bonding work for nominal diameter 50 and less and one hour after the bonding work for nominal diameters 65 and more. Do not make any water pressure in the pipe.

Opening the pipe ends

○ Leave the pipe ends open.

X

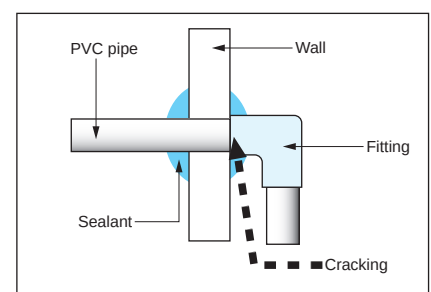


⚠ Do not close the pipe ends. Leave them open to remove the adhesive vapor.

Other important information

There is a recently developed technique which installs a PVC-U or PVC-C pipe through an interior wall and then the gap between the pipe and the wall is filled with a sealant. Some sealants contain a plasticizer, such as DOP and phthalate ester, or a solvent such as xylene and toluene, which may cause solvent cracking to PVC pipes. Usually, these plasticizers and solvents are contained in polyurethane sealants but not in silicon sealants.

However, plasticizers and solvent may be added to silicon sealants to improve their performance in the future. It is advisable to contact the sealant manufacturer for details.



V User Instructions

This section is about do's and don'ts in order to make the most of the performance of Kubota ChemiX PVC-U or PVC-C pipes and fittings. Please read carefully and use the instructions in the safety manual where appropriately.

● Please observe the following instructions.

Classes of actions are represented by the following graphic symbols.



indicates that the action needs to be taken carefully.



indicates that the action is prohibited.



indicates that the action must be taken.

1. Instructions for the treatment of left-over material and scraps



No on-site burning

Do not burn PVC pipes and fittings on site. Toxic chlorine gas will be released into the air, by burning.



Laws and regulations

Left-over and scrapped PVC pipes and fittings should be treated according to local laws and regulations. Do not crush leftovers and scraps with a hammer. Crushed pieces may fly away.

2. Carrying instructions



Wear gloves

Wear rubber-coated gloves with a firm grip to prevent injury.



Careless handling is dangerous

Large PVC pipes are heavy. Also, PVC pipes which are bundled together can be heavier than expected. Handle them with care to prevent injury. Careless handling is dangerous.



Do not step on pipes

Do not step on pipes. The surface of PVC pipes is slippery, which may lead to an accident.



Use a cushion

Place cushions between pipes and the truck bed and on the parts of a pipe that are secured with a rope to prevent scratches and deformation.



Careful handling

When loading and unloading the PVC pipes from truck, do not throw or drag PVC pipes into the truck. Handle with care to prevent scratches and damage to the pipes and injury.



Prevent collapsing during transport

Take measures to stop ropes from becoming loose or coming off to prevent pipes from falling off the truck.



Carefully lift and lower pipes

If a truck with a hoist is used, balance the load when lifting to prevent injury.

3. Storage instructions



When storing pipes horizontally indoors

When storing PVC-U or PVC-C pipes, pile them in a crisscross pattern or in a staggered pattern to prevent them from warping or deforming. Put stoppers at the pipe ends to prevent the pile from collapsing.



When storing pipes outdoors

When storing pipes outdoors, put a simple roof over the storage area or an opaque sheet on the pipes to block direct sunlight. When a sheet is used, provide a good air flow.



Storing pipes vertically

When there is no choice but to store pipes vertically, take measures to prevent them from falling over, such as securing them with ropes.



Storing fittings

Fittings should be stored indoors with the pipes. When there is no choice but to store them outdoors, put a sheet over them to protect from sunlight. Always put a cover on fittings with a rubber ring to protect from direct sunlight which will degrade the performance quality of rubber rings.

4. Installation instructions

Pipes and fittings should be installed using the standard installation techniques recommended by Kubota ChemiX, in order to ensure work safety and the performance of pipe lines. If installation conditions do not allow this, please contact us.



Using the proper tools

Select tools with the proper specifications for tasks such as cutting, drilling and joining. Read and ensure that you fully understand the instruction manuals of the tools before using.



Ventilation after bonding work

After bonding work, ventilate the bonded pipe well. Do not close the bonded pipe. Otherwise, solvent cracking or a bad odor may result. Solvent cracking is a phenomenon which hairline cracks occur in a PVC-U or PVC-C pipe due to residual solvent vapor in the adhesive. Residue of bad odor in drinking-water pipes affects the smell and taste of the water. It should be noted that, particularly in the winter, solvents do not easily evaporate and tend to remain in the pipe.



Caution against the use of organic chemicals

PVC-U or PVC-C pipes and fittings can be eroded by organic chemicals, and should not be allowed to come into contact with creosote (wood preservative), termite and other pesticides or paint. If soil contaminated by these chemicals is expected along the pipe line route, take measures to protect against contamination by avoiding contaminated areas when installing the pipe line.



Treatment for thermal expansion and contraction

For pipes bonded to fittings, expansion fittings should be used to prevent pipes from becoming disconnected from their fittings or damaged due to thermal expansion and contraction.



Do not bend pipes

Do not bend pipes. Otherwise, the strain will remain, causing potential pipe rupture. If curved pipes are required, always use bends.



About thrust protection

For buried pipes subject to hydrostatic pressure, thrust protection should be provided to prevent the pipes from becoming disconnected from their fittings at corners and branches. The standard installation technique recommended by the Japan PVC Pipe and Fittings Association and Kubota ChemiX should be used.



Do not heat pipes on site

Do not heat pipes on site. Pipes may become scorched or burnt, resulting in reduced strength.



About protective insulation cover

Avoid installing pipes near steam and hot-water pipes in order to prevent deformation and damage due to high temperatures. If this is not possible, put a protective insulation cover around the pipe.



Public space used for pipes

When pipes are buried under public roads, follow the burying standards or instructions provided by the road administrator. For siphon pipes across a river and pipes buried under railways, follow the instructions provided by the respective administrators.



Squeeze-off tools

Squeeze-off tools for polyethylene pipes should not be used to repair small water pipes. The ductility of PVC-U or PVC-C pipes is smaller than that of polyethylene pipes. If water sealing work is carried out with squeeze-off tools, whitening due to plastic deformation may occur to the pipe which lead to damage in the future.



Freeze protection

In cold regions, pipes should be buried 20 cm deeper than the maximum freeze depth. Thermal insulation should be wrapped around the exposed part of a vertical water pipe to protect against freezing.



Cutting small pipes

Do not use a pipe cutter to cut small pipes. The cutter may cause chippings or deformation to the cut section of the pipe.



Joining a hydrant

Since a hydrant has parallel pipe threads, water cannot be sealed by inserting the threads into the female threads of a water fitting with sealing tape. When joining a hydrant to a water fitting, place a gasket between the hydrant flange (the face with the gasket on) and the water fitting.



Do not thread PVC pipes and fittings

Do not thread PVC-U or PVC-C pipes and fittings directly. These pipes have a large notch effect, and their strength decreases if cracks or notches are made.



Use of lubricant specifically designed for joining fittings with a rubber ring

A lubricant specifically designed for rubber rings should be used to joint fittings with a rubber ring to a pipe. Do not use adhesive or oil. It may damage the rubber ring.



Insertion force joining pipes to TS fittings

When joining a pipe to a TS fitting, unreasonable stress may be applied to the fitting depending on the dimensional combination of the pipe and the fitting if the pipe is inserted up to the stopper in the fitting. In terms of the relation between the bonding length and the pressure resistance, it has been confirmed that a practically sufficient hydrostatic resistance can be achieved by inserting the pipe up to one-third of the insertion length of the fitting from the insertion length position without any adhesive applied (zero point position).

In order to prevent the bonded pipe from becoming disconnected from the fitting due to the elasticity of the pipe, the insertion force should be applied for over 30 seconds for nominal diameters 50 and less and for over 60 seconds for nominal diameters 65 and more.



Joining steel pipes to fittings with a tapered female thread

Do not insert the tapered male threads of a metal pipe into a hydrant fitting. The joint may be damaged. Normally, a metal socket should be joined to the tapered male thread of the metal pipe. Then, a valve socket should be joined to the metal socket. When strength is required for the inserted section, a valve socket with a metal male thread should be joined to the metal socket.

5. Instructions for handling PVC adhesive



Do not use adhesives for other applications

PVC and plastic adhesives were developed to bond PVC pipes to PVC fittings, and should not be used for other applications.



Use of appropriate adhesives

There are three types of adhesive: one for HI products, one for HT products and one for other products. The adhesives are designed to provide appropriate joint strength to pipes and fittings. Therefore, it is necessary to use the adhesive appropriate for the type of pipe.



If adhesive enters the eye

If adhesive enters the eye, do not rub the eye. Seek medical attention immediately.



Storage according to laws and regulations

Adhesives are hazardous substances under the Fire Defense Law. Follow applicable laws, regulations and municipal ordinances when storing adhesives.



Ventilation and fire prevention

When using an adhesive, ventilation should be provided to prevent intoxication. Also fire sources should be kept away from organic solvents.



Use of gloves

Wear gloves to protect against skin irritation and sores. Do not touch the adhesive directly. If the adhesive touches the skin, wash it off with soap and water immediately.



Washing hands and gargling

After using the adhesive, wash your hands and gargle well.



Store in a cool and dark place away from fire sources

Adhesives contain organic solvents. After using the adhesive close the lid of the can securely and store it in a cool and dark place indoors. Be sure to keep away from fire sources.



Do not use old and expired adhesives

Do not use an old and expired adhesive that has jelled or that has no pungent solvent odor. Do not thin the adhesive with thinner. This will decrease the adhesion, leading to the pipe disconnection from the fitting and causing leakage.