*u*PVC PIPE

UNILON®

SYMBOL OF HIGH QUALITY PIPE

SAI Global
Assurance Services

Quality System

Quality
Endorsed
Company
Lic.: QEC21530
ISO 9001:2000

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General properties of UNILON® Pipe

0 temperature at °C

Tests		Symbol	Unit	Value at 20°C	Remarks
Hardness	Specific gravity		–	1.38 – 1.45	Most frequent value 1.43 Temperature variations are negligible
	Shore D Rockwell R			70 – 90 110 – 120	Equivalent to aluminium
	Water absorptivity		mg / cm²	1.05	Indicate saturation value (after about 3 months). 0.15 in 7 days
	Flammability			Self extinguishing	Burns near flame but self extinguishes when the flame is removed away
	Weather resistance			Color fading but without degradation in strength	Tensile strength slightly increases but elongation decreases.
Short-term tensile strength Long-term tensile strength Elongation at rupture by short time tension		O_T max O_T T	kg / cm² kg / cm² %	530 270 100 – 150	O_T max. – 660 – 6.650 (same in circumferential direction) Where 0 – 20 – 60 °C O_T – 0.50 max. – 330 – 3320 where 0 – 20 – 40 °C
Young's modulus E (vibration method) Poisson's ratio m		E m	kg / cm²	3.4 x 10⁴ 2.7	E = (3.808 – 0.022 0) x 10⁴ where 0 – 10 – 50 °C m – 2.768 – 0.014 0 m – 2.768 – 0.0014 o where 0 - 80 °C
Bending-strength		O_B max	kg / cm²	900 – 1100	
Shearing-strength		O_H max	kg / cm²	650	
Change by temperature	Secondary (glass) transition point		C	5 – 155	Segment is frozen and shows brittleness.
	Primary transition (softening) point		C	75 – 80	When subjected to these heats, segment causes thermal vibration and shows marked softening from this point.
	Fabricating temperature		C	110 – 140	Temperature suitable for fabricating through deformation Minimum working through deformation
	Welding temperature		C	180 – 185	Becomes slightly viscous and colors into brown.
	Moulding temperature		C	190 – 200	Becomes pastelike to collapse pipe shape Suitable for molding.
	Decomposition point		C	205 – 210	Scorching by carbonization and dehydrochloration At further higher temperatures the pipe closes.
Specific heat			Kcal / kg-C	0.20 – 0.28	Average specific heat of 0 – 100 °C Mode 0.24
Thermal conductivity			Kcal / m-h-C	0.12 – 0.14	Average specific heat of 0 – 100 °C Mode 0.13
Coefficient of linear expansion			/ °C	6 – 7 x 10 – 5	= (5.8 + 0.0240) x 10 – 5 where 0 – 60 °C
Specific volume resistivity			cm	3 – 5 x 1015	High electric insulator and nonmagnetizing.
Dielectric strength			KV / mm	23 – 28	

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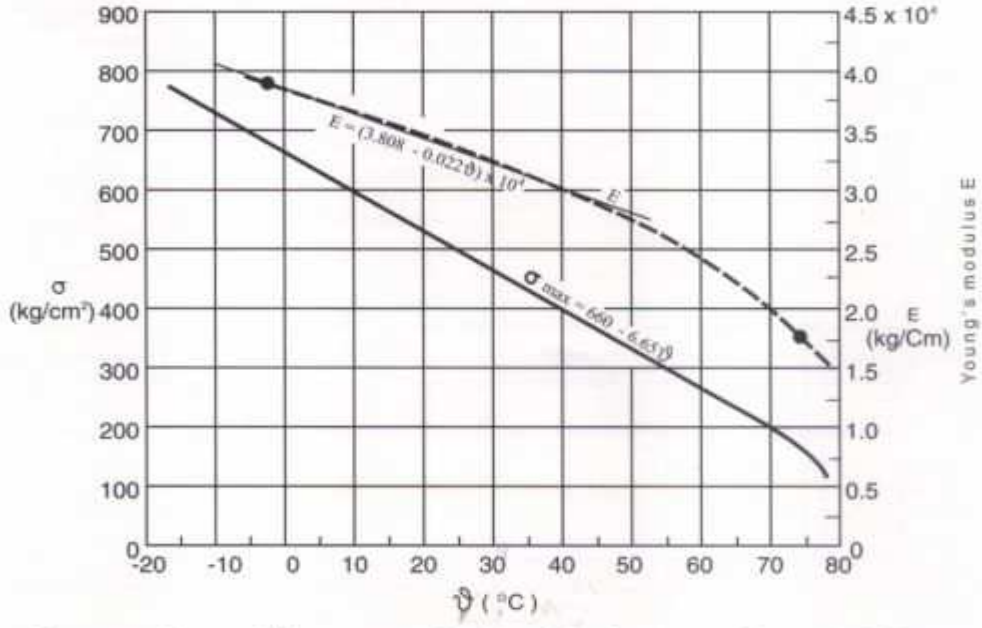
Temperature versus Modulus of Elasticity and Tensile Strength

The modulus of elasticity and tensile strength of PVC Pipe vary with temperature. This is illustrated in Fig. 1. Since PVC pipe is thermoplastics, its mechanical strength changes as temperature varies. The strength tends to decrease as the temperature increases.

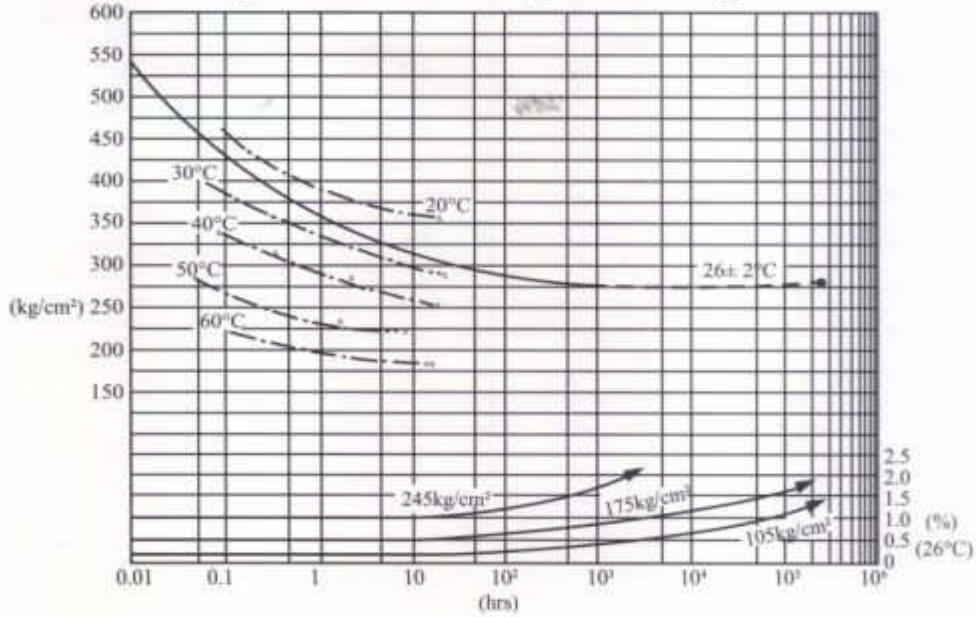
Dependency of Modulus, of Elasticity and Tensile Strength on Temperature.



Time Dependent Change of Tensile Strength and Elongation

The relationship between the long term tensile strength and elongation of PVC pipe are graphed in Fig. 2. The data show the time measured to failure of the PVC pipe which is subjected to various tensile stresses at a prefixed rate. They reveal that failure does not occur at stresses below one half the short time strength. In plastics, the stress under which the equilibrium is reached, is called limit of sustained durability. Elongation, on the other hands, tends to increase as time passed by.

Long-term Tensile Strength and Elongation



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Chemical Resistance UNILON® Pipe

◎ : *Unaffected* ○ : *Unaffected to little affected* △ : *Little affected but recommendable* x : *Not recommendable*

Chemical	Concentration, %		Temperature °C 20	40	60
Inorganic Acids					
Sulfurous acid		100	○	x	x
Hydrochloric acid	Below	30	◎	◎	○
	Above	30	◎	◎	○
Chloric acid	Below	30	◎	◎	○
Chlorine water		sat.	○	△	
Perchloric acid	Below	10	◎	◎	○
		20	◎		△
Mixed chromic acid					
C_rO_3 (25) : H_2SO_4 (20) : aq. (55)			○	○	○
C_rO_3 (40) : H_2SO_4 (20) : aq. (40)			◎	◎	○
Chromic acid		10	◎	◎	△
		50	◎	○	x
Chlorosulfonic acid		100	△		x
Hydrofluosilicic acid		34	◎	◎	△
Mixed acid					
H_2SO_4 (57) : HNO_3 (28) : aq. (55)			◎	○	
H_2SO_4 (15) : HNO_3 (20) : aq. (65)			◎	◎	○
H_2SO_4 (50) : HNO_3 (33) : aq. (17)			◎	○	
H_2SO_4 (49) : HNO_3 (28) : aq. (3)			◎	○	
H_2SO_4 (50) : HNO_3 (50) : aq. (0)			○	x	
H_2SO_4 (10) : HNO_3 (87) : aq. (2)			○		
Hydrobromic acid		40	◎	◎	○
Bromine		100	x		
Bromic acid		10	◎		
Nitric acid	Below	50	◎	◎	○
	50 –	60	◎	○	
		70	△	△	
		96	x		
Blue acid		100	◎		
Carbonic acid		100	◎	◎	◎
Fuming sulfuric acid		10	x		
Arsenic acid	Below	30	◎	◎	○
		75	○		x
Hydrofluoric acid		10	◎		
		20	○	○	○
		40	○		x
Boric acid		sat.	◎	◎	○
Sulfuric acid anhydride		100	◎		
Sulfuric acid	Below	90	◎	◎	○
		96	◎	○	△
		98	○	△	
Phosphoric acid	Below	30	◎	◎	○
	Above	30	◎	○	○

Chemical	Concentration, %		Temperature °C 20	40	60
Organic Acids					
Adipic acid		sat.	◎	◎	○
Benzoic acid		sat.	◎	◎	△
Oleic acid		100	◎	◎	○
Formic acid	Below	50	◎	◎	△
	Above	50	◎		x
Citric acid		25	◎	◎	◎
Succinic acid		sat.	◎	◎	○
Acetic acid	Below	60	◎	◎	○
	85 –	95	◎	○	
	Above	95	○	x	x
Glacial acetic acid		100	△	x	x
Diglycolic acid		20	◎	◎	○
Oxalic acid		9	◎	◎	◎
Tartaric acid		50	◎	◎	◎
Lactic acid		50	◎	◎	◎
		90	x		
Picric acid		5	○		
Phenol		sat.	△		x
Benzene sulfonic acid		10	◎	◎	○
		50	○		
Maliec acid		44	◎	◎	○
Methyl sulfuric acid		50	◎		△
Butyric acid		20	◎		
		100	x		
Alkalies					
Ammonia water		30	◎	◎	○
Potassium hydroxide	Below	40	◎	◎	○
	Above	40	◎	◎	◎
Calcium hydroxide (slaked lime)		sat.	◎	◎	
Sodium hydroxide (caustic soda)	Below	40	◎	◎	◎
	40 –	60	◎	◎	◎
Magnesium hydroxide		sat.	◎	◎	△
Inorganic Salts and other Inorganics					
Sodium sulfite		40	◎	◎	◎
Zinc chloride		sat.	◎	◎	◎
Aluminium chloride		25	◎	◎	△
Ammonium chloride		27	◎	◎	◎
Potassium chloride		sat.	◎	◎	◎
Calcium chloride		sat.	◎	◎	◎
Mercuric chloride		sat.	◎	◎	◎
Stannic chloride		25	◎		△
Ferric chloride		sat.	◎	◎	◎
Cupric chloride		sat.	◎	◎	◎
Sodium chloride (common salt)		sat.	◎	◎	◎

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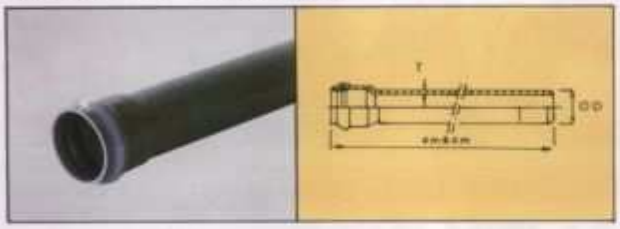
Chemical	Concentration, %	Temperature °C 20	40	60
Barium chloride	sat.	◎	◎	◎
Magnesium chloride	25	◎	◎	◎
Sodium chlorate	sat.	◎	◎	◎
Potassium chlorate	15	◎	◎	◎
Potassium perchlorate	1	◎	○	
Hydrogen proxide	20	◎	◎	○
	40	○	○	
Potassium permanganate	15	◎	○	○
Potassium persulfate	sat.	◎	◎	○
Antimony trioxide	sat.	◎	◎	◎
Potassium hypochloride (bleachhing powder)	30	◎		
Potassium bichromate	5	◎		
	10	○		
Potassium bisulfite	sat.	◎	◎	◎
Potassium nitrate	sat.	◎	◎	◎
Calcium nitrate	50	◎	◎	
Sodium nitrate	sat.	◎	◎	◎
Mercury	100	◎	◎	◎
Ammonium carbonate	sat.	◎	◎	◎
Potassium carbonate	sat.	◎	◎	◎
Potassium ferrocyanide	sat.	◎	◎	◎
Ammonium fluoride	sat.	◎		
Pottasium iodide	sat.	◎	◎	◎
Sodium sulfide	sat.	◎	◎	◎
Zinc sulfate	28	◎	◎	◎
Aluminium sulfate	25	◎	◎	◎
Aluminium potassium sulfate (alum)	sat.	◎	◎	◎
Ammonium sulfate	40	◎		○
Ferrous sulfate	sat.	◎	◎	◎
Ferric sulfate	sat.	◎	◎	◎
Copper sulfate	15	◎	◎	◎
Sodium sulfate	sat.	◎	◎	◎
Nickel sulfate	sat.	◎	◎	◎
Magnesium sulfate	sat.	◎	◎	◎
Ammonium phosphate	sat.	◎	◎	◎
Sodium phosphate	sat.	◎	◎	◎
Organic Solvents and Other Organics				
Acetaldehyde	100	x		
Acetone	100	x		
Aniline	100	x		
Amyl alcohol	100	○		△
Aryl alcohol	100	○		x
Isopropyl alcohol	100	◎		
Ethyl alcohol	100	◎	◎	○
Ethyl ether	100	x		
Ethyl hexanol	100	○		
Ethyl benzene	100	x		
Ethylene glycol	100	◎	◎	
Ethylene chloride	100	x		

Chemical	Concentration, %	Temperature °C 20	40	60
Methylene chloride	100	x		
Octane	100	◎		
Octanol	100	◎	◎	◎
Xylene	100	x		
Glycerine	100	◎	◎	◎
Cresol	sat.	△		x
Chlorobenzene	100	x		
Chloroform	100	x		
Amyl acetate	100	x		
Ammonium acetate	sat.	◎	◎	◎
Ethyl acetate	100	x		
Butyl acetate	100	x		
Carbon tetrachloride	100	x		
Dioctyle phthalate (DOP)	100	x		
Cyclohexanone	100	x		
Cyclohexanol	100	○		△
Cyclohexane	100	○		△
Dibutyl phthalate (DBP)	100	x		
Dimethyl formamide	100	x		
Tetrachloroethylene	100	x		
Trichloroethylene	100	x		
Toluene	100	x		
Nitro benzene	100	x		
Urea	sat.	◎	◎	◎
Carbon bisulfide	100	x		
Pyridine	100	x		
Butane (liquid)	100	◎		
Butanonediol	Below 10	◎		
	60	x		
Butyl alcohol	100	◎	◎	
Furfural	100	x		
Furfuryl alcohol	100	◎		
Propane (liquid)	100	◎		
Benzaldehyde	sat.	x		
Benzene	100	x		
Benzyl alcohol	100	◎		
Formaldehyde	36	◎	◎	○
Methyl alcohol	100	◎	◎	△
Methyl ethyl ketone	100	x		
Gases				
Sulfur dioxide gas	100	◎	◎	◎
Ammonia	100	◎	◎	◎
Methyl chloride	100	x		
Chlorine, dry	10	△	△	x
wet	10	△	△	x
Ozone	1	◎		
Hydrogen	100	◎	◎	◎
Carbon dioxide	100	◎	◎	◎
Propane	100	◎		
Butane	100	◎		
Phosgene	100	◎		○
Hydrogen sulfide	100	◎	◎	◎
Roasting furnace gas	100	◎	◎	◎

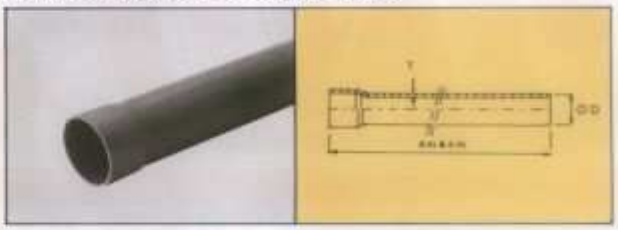
Note : In the concentration column, "sat." means saturated aqueous solution and numbers other than 100 indicate the concentrations of aqueous solution in percentage.

UNILON® uPVC PIPE

RUBBER RING SOCKETING PIPES



SOLVENT CEMENT SOCKETING PIPES



uPVC PIPE ISO 4422 - 1996 (E) SNI - 06 - 0084 - 1987

N.O.D. (mm)	THICKNESS (mm)								
	S - 5	S - 6.3	S - 8	S - 10	S - 12.5	S - 16	S - 20	S - 25	S - 32
16	1.5	1.2	1.0	0.8	0.7	0.5			
20	1.9	1.5	1.2	1.0	0.8	0.7	0.5		
25	2.3	1.9	1.5	1.2	1.0	0.8	0.7	0.5	
32	2.9	2.4	1.9	1.6	1.3	1.0	0.8	0.7	0.5
40	3.7	3.0	2.4	1.9	1.6	1.3	1.0	0.8	0.7
50	4.6	3.7	3.0	2.4	2.0	1.6	1.3	1.0	0.8
63			3.8	3.0	2.4	2.0	1.6	1.3	1.0
75			4.5	3.6	2.9	2.3	1.9	1.5	1.2
90			5.4	4.3	3.5	2.8	2.2	1.8	1.4
110			6.6	5.3	4.2	3.4	2.7	2.2	1.8
125			7.4	6.0	4.8	3.9	3.1	2.5	2.0
140			8.3	6.7	5.4	4.3	3.5	2.8	2.2
160			9.5	7.7	6.2	4.9	4.0	3.2	2.5
200			11.9	9.6	7.7	6.2	4.9	3.9	3.2
225			13.4	10.8	8.6	6.9	5.5	4.4	3.5
250			14.8	11.9	9.6	7.7	6.2	4.9	3.9
280			16.6	13.4	10.7	8.6	6.9	5.5	4.4
315			18.7	15.0	12.1	9.7	7.7	6.2	4.9
355			21.1	16.9	13.6	10.9	8.7	7.0	5.6
400			23.7	19.1	15.3	12.3	9.8	7.8	6.3
450			26.7	21.5	17.2	13.8	11.0	8.8	7.0
500			29.6	23.9	19.1	15.3	12.3	9.8	7.8
630				30.0	24.1	19.3	15.4	12.3	9.8

uPVC Pipe Sewage Used SII 1246 - 1985

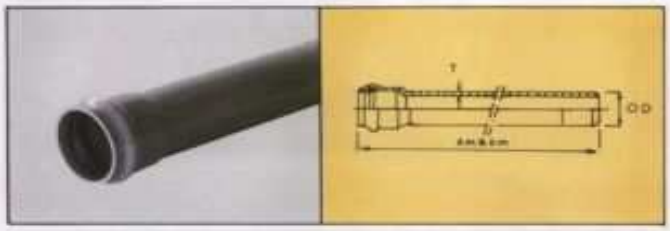
O.D. (mm)	THICKNESS (mm)	
	Class A	Class B
40	1.8	3.2
50	1.8	3.2
63	1.8	3.2
75	1.8	3.2
90	1.8	3.2
110	2.2	3.2
125	2.5	3.2
160	3.2	4.0
200	3.9	4.9
250	4.9	6.2
315	6.2	7.7
355	7.0	8.7
400	7.8	9.8
500	9.8	12.3

PERUMTEL - Standard No. STEL - L - 008

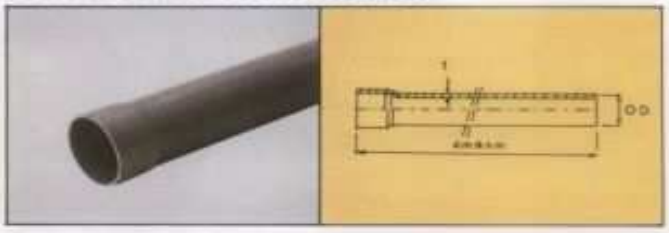
Classification	O.D. (mm)	Wall Thickness	Longs
TYPE I	34	2.0	4000
	68	4.0	4000
	111	5.5	4000
TYPE II	34	2.0	4000
	64	2.0	4000
	106	3.0	4000
TYPE III	33	1.5	4000
	63	1.5	4000
	104	2.0	4000

UNILON® uPVC PIPE

RUBBER RING SOCKETING PIPES



SOLVENT CEMENT SOCKETING PIPES



SPECIFICATION UNILON® uPVC PIPE JIS K 6741 - 1975

NOMINAL DIAMETER		CLASS VP		CLASS VU	
inch	mm	O.D. (mm)	Thickness (mm)	O.D. (mm)	Thickness (mm)
1/2"	16	22	2.7		
3/4"	20	26	2.7		
1"	25	32	3.1		
1¼"	30	38	3.1		
1½"	40	48	3.6	48	1.8
2"	50	60	4.1	60	1.8
2½"	65	76	4.1	76	2.2
3"	75	89	5.5	89	2.7
4"	100	114	6.6	114	3.1
5"	125	140	7.0	140	4.1
6"	150	165	8.9	165	5.1
8"	200	216	10.3	216	6.5
10"	250	267	12.7	267	7.8
12"	300	318	15.1	318	9.2

SPECIFICATION CLASS AW & D

NOMINAL DIAMETER		AW		D	
Inch	mm	O.D. (mm)	Thickness (mm)	O.D. (mm)	Thickness (mm)
1/2"	16	22	1,6	-	-
3/4"	20	26	1,8	-	-
1"	25	32	2,0	-	-
1.1/4"	30	42	2,2	42	1,3
1.1/2"	40	48	2,2	48	1,3
2"	50	60	2,3	60	1,3
2.1/2"	65	76	2,6	76	1,4
3"	75	89	3,1	89	1,6
4"	100	114	4,1	114	2,0
5"	125	140	5,2	140	2,5
6"	150	165	6,2	165	2,9
8"	200	216	7,7	216	3,7
10"	250	267	8,50	267	5,0
12"	300	318	10,5	318	6,0
14"	350	370	14,0	370	8,7
16"	400	420	15,60	420	9,7
18"	450	470	16,80	470	11,5
20"	500	520	18,60	520	13,6
24"	600	630	23,50	630	14,6

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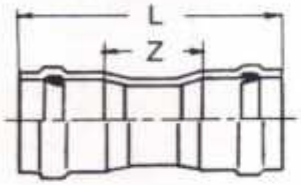
FITTINGS RUBBER RING JOINT / RRJ

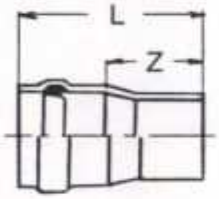
SOCKET RRJ



Unit : mm

Nominal Size	Z	L
63	80	300
75	85	320
90	90	340
110	95	370
140	100	390
160	130	440
200	135	495
250	165	565
315	195	635

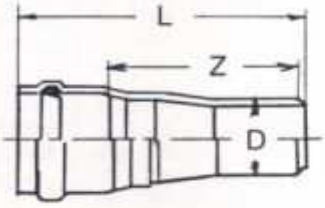
SPIGOT RRJ



Unit : mm

Nominal Size	Z	L
63	95	205
75	100	215
90	110	235
110	140	275
140	165	310
160	200	355
200	285	465
250	355	555
315	415	635

REDUCER SOCKET RRJ



Unit : mm

Nominal Size	D	Z	L
90 x 63	63	230	360
110 x 90	90	235	380
140 x 110	110	260	415
160 x 110	110	325	490
160 x 140	140	280	450
200 x 160	160	390	590
250 x 200	200	430	650

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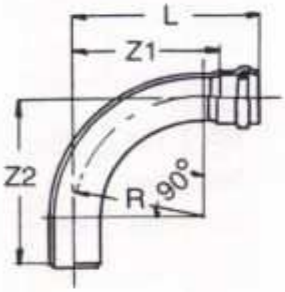
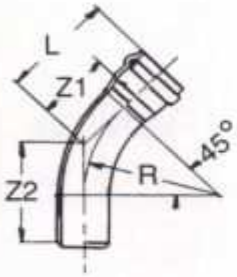
90° BEND RRJ



Unit : mm

Nominal Size	Z_1	Z_2	L	R
63	150	310	260	100
75	170	330	280	120
90	300	470	425	245
110	360	540	500	300
140	460	645	605	400
160	580	755	735	500
200	790	980	980	700
250	950	1150	1150	850

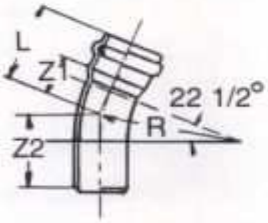
45° BEND RRJ



Unit : mm

Nominal Size	Z_1	Z_2	L	R
63	95	250	205	100
75	120	270	225	120
90	160	325	285	245
110	185	360	325	300
140	225	410	370	400
160	290	465	445	500
200	380	570	560	700
250	455	650	655	850

22½° BEND RRJ



Unit : mm

Nominal Size	Z_1	Z_2	L	R
63	70	230	180	100
75	90	250	200	120
90	105	275	230	245
110	120	295	260	300
140	140	325	285	400
160	180	355	335	500
200	230	420	410	700
250	270	470	470	850

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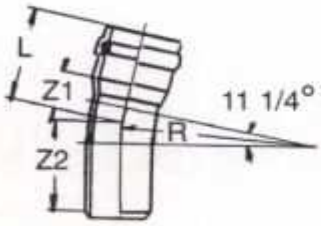
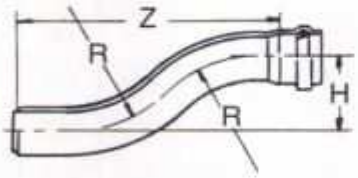
11¹/₄° BEND RRJ



Unit : mm

Nominal Size	Z_1	Z_2	L	R
75	70	230	190	120
90	80	250	205	245
110	90	265	225	300
140	100	285	245	400
160	130	305	285	500
200	160	350	340	700
250	185	385	385	850

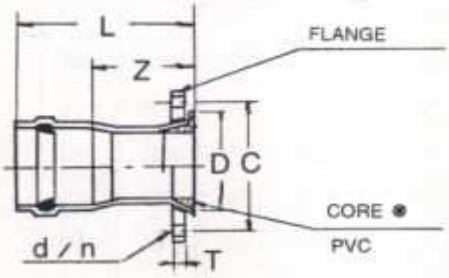
S TRAP RRJ



Unit : mm

Nominal Size	Z	H	R
75	600	300	120
90	685	300	245
110	790	300	300
160	1030	300	500

FLANGE RRJ



Norminal Size	Z	L	D	FLANCE DRINK WATER			
				T	C	d	n
63	100	210	75	18	120	19	4
75	105	210	90	18	140	19	4
90	105	230	125	19	168	19	4
110	125	260	152	19	195	19	4
140	130	275	177	19	220	19	6
160	155	310	204	20	247	19	6
200	190	370	256	21	299	19	8
315	200	400	308	22	360	23	8

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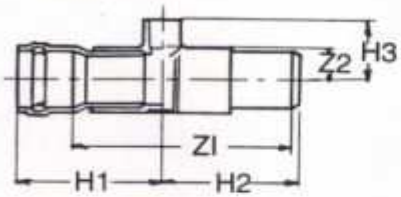
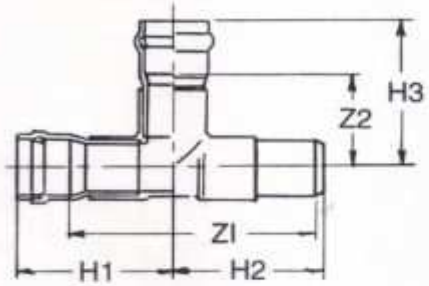
TEE RRJ-BRANCH SC



Unit : mm

Nominal Size	Z_1	Z_2	H_1	H_2	H_3
90 X 50	535	47	265	405	102
90 X 63	545	47	270	410	110
110 X 63	615	59	310	460	122

TEE RRJ



Unit : mm

Nominal Size	Z_1	Z_2	H_1	H_2	H_3
63 X 63	400	130	240	275	240
90 X 63	545	145	270	410	255
90 X 90	575	160	285	425	285
110 X 90	650	170	325	475	295
110 X 110	675	200	335	490	335
140 X 140	725	240	385	500	385
160 X 90	820	195	410	585	320
160 X 110	840	230	420	595	365
160 X 160	890	290	445	620	445

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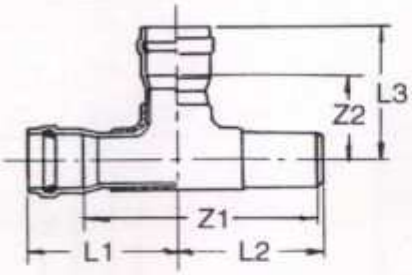
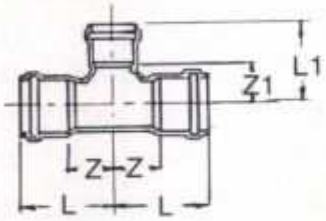
TEE RRJ FRP



Unit : mm

Nominal Size	Z_1	Z_2	L_1	L_2	L_3
200 X 90	450	190	300	350	315
200 X 110	510	330	380	200	335
200 X 140	570	360	410	210	355
200 X 160	610	380	430	230	385
200 X 200	710	495	480	250	430
250 X 90	495	330	390	220	345
250 X 110	555	360	420	230	365
250 X 140	615	390	450	240	385
250 X 160	655	420	470	260	415
250 X 200	755	460	520	270	450
250 X 250	815	490	550	290	490

TEE ALL RRJ FRP



Unit : mm

Nominal Size	Z_1	Z_2	L	L_1
200 X 100	105	150	250	260
200 X 200	170	170	315	315
250 X 160	140	180	300	310
250 X 250	205	205	365	365
315 X 160	140	205	320	335
315 X 315	235	235	415	415

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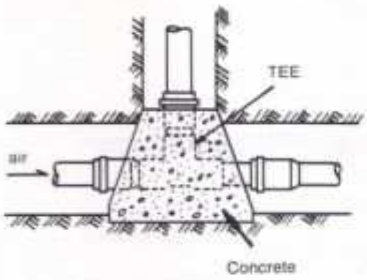
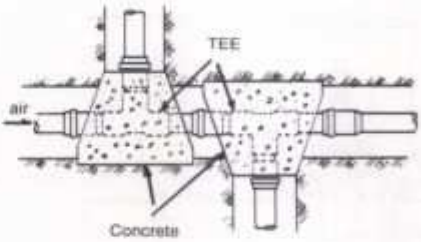
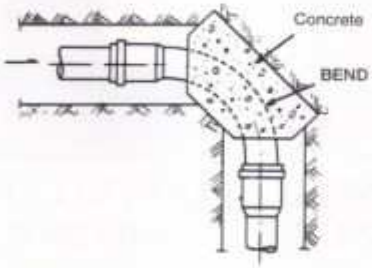
INSTALLATION OF UNILON® uP V C PIPE RUBBER RING JOINT SYSTEM WITH CONCRETE PROTECTION

CONNECTION TEE RRJ

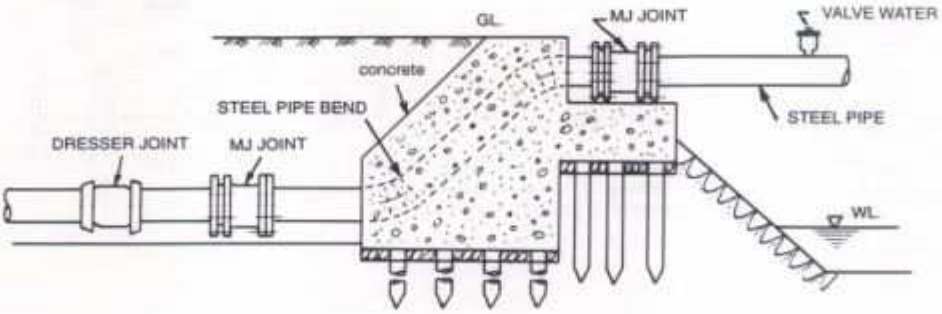




CONNECTION BEND RRJ



CROSSING RIVER



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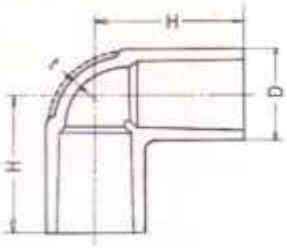
Elbow

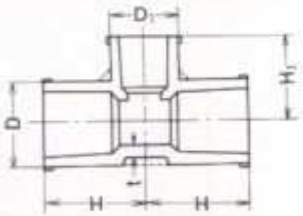


Dimension in mm

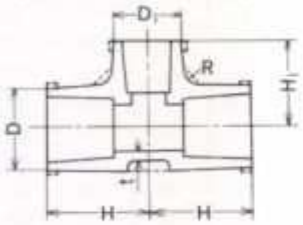
Nominal diameter \ Mark	D	t	H
13	24.0	3.0	36
16	29.0	3.5	43
20	33.0	3.5	50
25	40.0	4.0	58
30	46.0	4.0	65
40	57.0	4.5	82
50	70.0	5.0	96
75	102.0	8.0	120
100	130.0	10.0	155
150	186.0	13.0	227

Remark : Tolerance of H shall be $\pm^{5}_{1}$ mm.

Tees



(nominal dia. 13~50mm)



(Nominal dia. 75~100mm)

Nominal diameter \ Mark	D	t	H	D_1	H_1
13 × 13	24.0	3.0	36	24.0	36
16 × 16	29.0	3.5	43	29.0	43
20 × 13	33.0	3.5	46	24.0	40
20 × 20	33.0	3.5	50	33.0	50
25 × 13	40.0	4.0	51	24.0	43
25 × 20	40.0	4.0	55	33.0	53
25 × 25	40.0	4.0	58	40.0	58
30 × 30	46.0	4.0	65	46.0	65
40 × 40	57.0	4.5	82	57.0	82
50 × 50	70.0	5.0	96	70.0	96
75 × 75	102.0	8.0	120	102.0	120
100 × 100	130.0	10.0	152	130.0	152

Remarks : Tolerance of H, H_1 shall be $\pm^{5}_{1}$ mm.
R shall be more than 10 mm.

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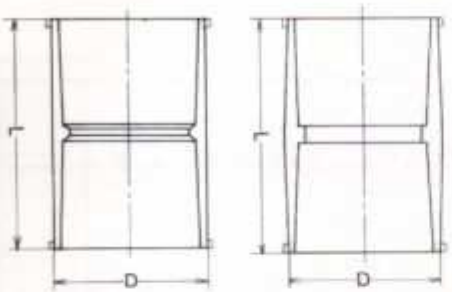
Socket

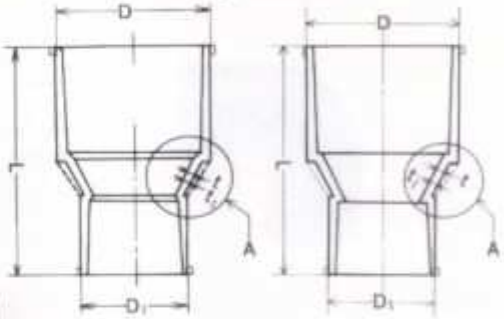


Dimension in mm

Nominal diameter \ Mark	D	L
13	24.0	57
16	29.0	67
20	33.0	77
25	40.0	87
30	46.0	95
40	57.0	117
50	70.0	133
75	102.0	155
100	130.0	200
150	186.0	300

Remark : Tolerance of L shall be ± 4 mm.

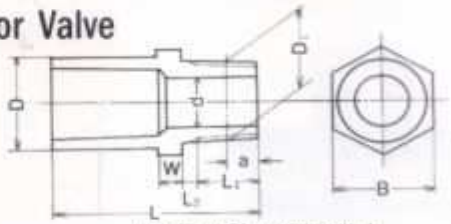
Reducing Socket



Dimension in mm

Nominal diameter \ Mark	D	t	D_1	t_1	L
20 × 13	33	3.5	24	3.0	68
25 × 13	40	4.0	24	3.0	86
25 × 20	40	4.0	33	3.5	84

Socket for Valve



(Hexagonal or octagonal)

Dimension in mm

Nominal diameter \ Mark	D	d	Thread: Standard outer diameter D_1	Thread: Thread numbers (per 25.4mm)	Thread: Position of standard diameter L_1	Thread: Tolerance of L_1	Thread: Effective length of thread L_2	L_3 (Max.)	W	L	B
13 × 1/2	24.0	13	20.955	14	8.2	± 3.6	15	3.5	6	50	24
16 × 1/2	29.0	13	20.955	14	8.2	± 3.6	15	3.5	7	55	29
20 × 3/4	33.0	18	26.441	14	9.5	± 3.6	17	3.5	8	64	33
25 × 1	40.0	23	33.249	11	10.4	± 4.6	19	4.0	8	71	40
30 × 1 1/4	46.0	31	41.910	11	12.7	± 4.6	22	4.0	10	80	46
40 × 1 1/2	57.0	37	47.803	11	12.7	± 4.6	22	5.0	10	92	57
50 × 2	70.0	48	59.614	11	15.9	± 4.6	26	5.0*	12	106	70
75 × 3	102.0	74	86.884	11	20.6	± 6.9	30	6.0	16	128	101
100 × 4	130.0	96	113.030	11	25.4	± 6.9	40	7.0	18	157	129
150 × 6	186.0	144	163.830	11	28.58	± 6.9	44	10.0	25	220	186
200 × 8	236.0	188	214.640	11	38.10	± 10.2	52	15.0	23	265	236

Remarks : 1. The thread is tepered as specified in JIS B 0203.
2. Tolerance of L shall be $\pm\frac{5}{2}$ mm.

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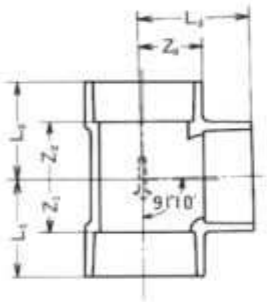
90°Y : DT



Remarks: 1. The tolerance on Z1, Z2 and Z3 shall be ±2mm.
2. The tolerance on the flow angle 91°10 shall be 30.
3. The arrow mark showing flow direction shall be embossed on the outside as shown in the figure.

Dimension in mm

Nominal Size \ Symbol	L_1	L_2	L_3	Z_1	Z_2	Z_3
30	40	40	40	22	22	22
35	44	44	44	24	24	24
40	49	49	49	27	27	27
50	59	59	59	34	34	34
65	77	78	77	42	43	42
75	88	89	88	48	49	48
100	112	113	112	62	63	62
125	140	141	140	75	76	75
150	169	170	169	89	90	89
200	225	226	225	115	116	115
250	271	274	271	141	144	141
300	318	321	318	168	171	168
350	367	370	367	197	200	197
40X 30	44	44	45	22	22	27
50X 30	47	47	51	22	22	33
50X 40	52	52	55	27	27	33
65X 40	62	63	64	27	28	42
65X 50	69	70	67	34	35	42
75X 40	67	68	70	27	28	48
75X 50	74	75	73	34	35	48
75X 65	82	83	83	42	43	48
100X 50	84	85	87	34	35	62
100X 65	92	93	97	42	43	62
100X 75	98	99	102	48	49	62
125X 75	114	116	115	49	51	75
125X 100	127	129	125	62	64	75
150X 75	131	133	128	51	53	88
150X 100	142	145	138	52	65	88
200X 100	172	173	166	62	63	116
200X 125	185	186	181	75	76	116
200X 150	199	200	196	89	90	116
250X 150	220	223	210	90	93	141
250X 200	246	248	240	116	118	141

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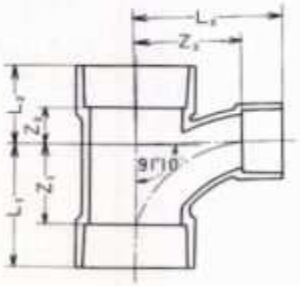
90° LARGE Y : LT



Remarks: 1. The tolerance on Z1, Z2 and Z3 shall be ±2mm.
2. The tolerance on the flow angle 91°10 shall be 30.

Dimension in mm

Nominal Size \ Symbol	L_1	L_2	L_3	Z_1	Z_2	Z_3
30	55	38	55	37	20	37
40	74	45	74	52	23	52
50	91	51	91	66	26	66
65	125	68	125	90	33	90
75	140	70	140	100	30	100
100	178	95	178	128	45	128
125	209	129	212	144	64	147
150	245	157	245	165	77	165
50X 40	77	48	79	52	23	57
65X 40	87	59	88	52	24	66
65X 50	101	62	99	66	27	74
75X 40	92	65	93	52	25	71
75X 50	106	69	104	66	29	79
75X 65	130	72	130	90	32	95
100X 40	102	78	104	52	28	82
100X 50	116	82	115	66	32	90
100X 65	140	86	142	90	36	107
100X 75	150	83	150	100	33	110
125X 65	155	103	155	90	38	120
125X 75	165	107	164	100	42	124
125X 100	193	117	190	128	52	140
150X 65	170	122	165	90	42	130
150X 75	180	125	175	100	45	135
150X 100	208	133	202	128	53	152
150X 125	225	145	225	145	65	145

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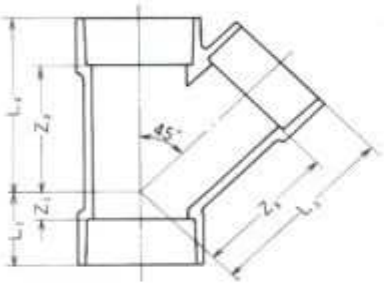
45° Y : Y



Remarks: The tolerance on Z1, Z2 and Z3 shall be ±2mm.

Dimension in mm

Nominal Size \ Symbol	L_1	L_2	L_3	Z_1	Z_2	Z_3
40	34	80	86	12	60	64
50	45	97	103	20	72	78
65	55	127	133	20	92	98
75	66	146	155	26	106	115
100	82	184	194	32	134	144
125	103	237	241	38	172	176
150	120	287	290	40	207	210
40X 30	28	72	76	6	50	58
50X 30	25	81	83	0	56	65
50X 40	33	87	97	8	62	70
65X 40	34	107	104	−1	72	82
65X 50	43	115	113	8	80	88
75X 40	34	118	114	−6	78	92
75X 50	43	126	123	3	86	98
75X 65	54	138	141	14	98	106
100X 50	42	148	143	−8	98	118
100X 65	53	160	160	−3	110	125
100X 75	69	168	172	19	118	132
125X 100	83	217	222	18	152	172

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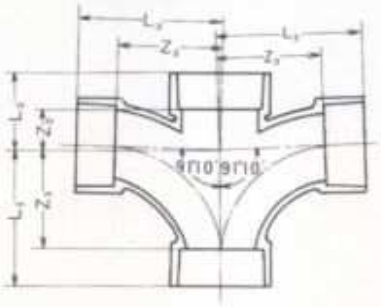
90° LARGE Double Y : WLT

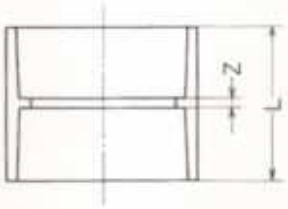


Dimension in mm

Nominal Size \ Symbol	L_1	L_2	L_3	Z_1	Z_2	Z_3
65	125	68	125	90	33	90
75	140	78	140	100	38	100
100	178	95	178	128	45	128
100X 75	150	90	150	100	40	110
125X 100	193	117	190	128	52	140

Remarks: 1. The tolerance on Z1, Z2 and Z3 shall be ±2mm.
2. The tolerance on the flow angle 91°10 shall be 30.

SOCKET : DS



Dimension in mm

Nominal Size \ Symbol	L	Z
30	39	3
35	43	3
40	47	3
50	53	3
65	73	3
75	84	4
100	104	4
125	134	4
150	164	4
200	225	5
250	266	6
300	307	7
350	352	12
400	412	12

Remarks: The tolerance on Z shall be ±2mm.

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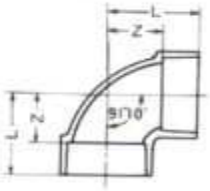
90° ELBOW : DL

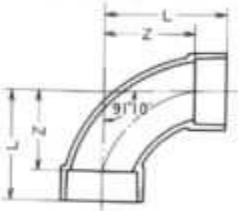


Remarks: 1. The tolerance on Z shall be ±2 mm.
2. The tolerance on the flow angle 91°10 shall be 30.

Dimension in mm

Nominal Size / Symbol	L	Z
30	40	22
35	44	24
40	49	27
50	58	33
65	77	42
75	88	48
100	112	62
125	140	75
150	168	88
200	225	115
250	272	142
300	328	168
350	366	196

90° LARGE TURN ELBOW : LL



Dimension in mm

Nominal Size / Symbol	L	Z
40	74	52
50	91	66
65	125	90
75	140	100
100	178	128
125	205	140
150	250	170
200	305	195

45° ELBOW : 45L

Dimension in mm

Nominal Size / Symbol	L	Z
30	30	12
35	33	13
40	36	14
50	43	18
65	57	22
75	65	25
100	80	30
125	103	38
150	124	44
200	166	56
250	198	68
300	228	78
350	260	90

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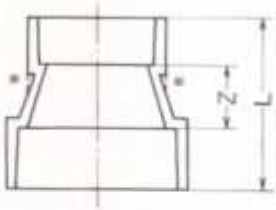
INCREASER : IN



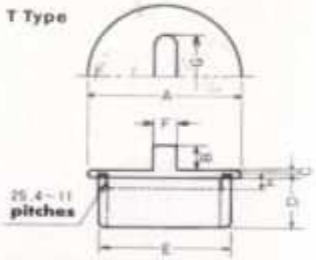
Note : The dotted shape may be permined.

Dimension in mm

Nominal Size \ Symbol	L	Z
40 X 35	62	20
50 X 35	65	20
50 X 40	67	20
65 X 50	80	20
75 X 40	87	25
75 X 50	90	25
75 X 65	100	25
100 X 40	102	30
100 X 50	105	30
100 X 65	115	30
100 X 75	120	30
125 X 65	135	35
125 X 75	140	35
125 X 100	150	35
150 X 75	160	40
150 X 100	170	40
150 X 125	185	40
200 X 125	220	45
200 X 150	235	45
250 X 200	300	60
300 X 250	330	50

Remarks: The tolerance on Z shall be ±2mm.

T Type



TL Type

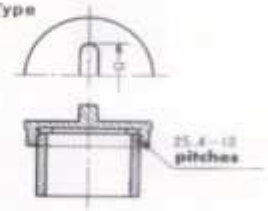


Table of dimensions to CLEAN-OUT

Dimension in mm

Nominal Size \ Symbol	Type	A	B	C	D	E	F X G	Thickness of Packing	H
28	T								
35	T								
40	T	57	11	6	25	48	11 X 40	2	10
50	T	70	13	5	30	60	13 X 42	2	10
65	T	86	14	7	35	76	15 X 55	2	14
75	T	102	16	7	40	89	17 X 67	2 ~ 3	14
100	T	128	17	7	50	114	18 X 85	3	15
125	T	154	23	9	65	140	20 X 104	3	18
150	TL	184	26	8	80	165	26 X 115	3	20
200	T								

Quality Endorsed Company

CERTIFICATE OF REGISTRATION

PT. Harapan Widyatama Pertiwi

Head Office: Agung Karya V, Blok B No. 8-9 Sunter Podomoro Jakarta 14340, INDONESIA

Factory: Jl. Pangkalan V, Desa Cikiwul Kecamatan Bantar Gebang Bekasi, Jawa Barat, INDONESIA

complies with the requirements of

AS/NZS ISO 9001:2000

Quality management Systems – Requirements

for the following capability

The registration covers the Quality Management System for the manufacture and sale of UNILON uPVC, HDPE pipes and fittings

Registered by:

Certificate No.: QEC21539 Issue Date: 24 June 2005 Certified Date: 17 June 2002 Expiry Date: 16 June 2008

Alex Karakiewich
General Manager Certification
for and on behalf of
SAI Global

Authorised Local Signatory, SAI Global

SAI GLOBAL

IQNet

THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

IQNet and SAI Global hereby certify that the organization

PT. Harapan Widyatama Pertiwi

Head Office: Agung Karya V, Blok B No. 8-9 Sunter Podomoro Jakarta 14340, INDONESIA

Factory: Jl. Pangkalan V, Desa Cikiwul Kecamatan Bantar Gebang Bekasi, Jawa Barat, INDONESIA

for the following field of activities

The registration covers the Quality Management System for the manufacture and sale of UNILON uPVC, HDPE pipes and fittings

has implemented and maintains a

Quality Management System

which fulfills the requirements of the following standard

ISO 9001:2000

Certificate No.: AU QEC21539 Issue Date: 24 June 2005 Certified Date: 17 June 2002 Expiry Date: 16 June 2008

IQNet

Dr. Pablo Rovere
President of IQNet

Alex Karakiewich
General Manager Certification
SAI Global Limited

SAI GLOBAL

DISTRIBUTOR :

MANUFACTURED by : P.T. HARAPAN WIDYATAMA PERTIWI
JAKARTA - INDONESIA