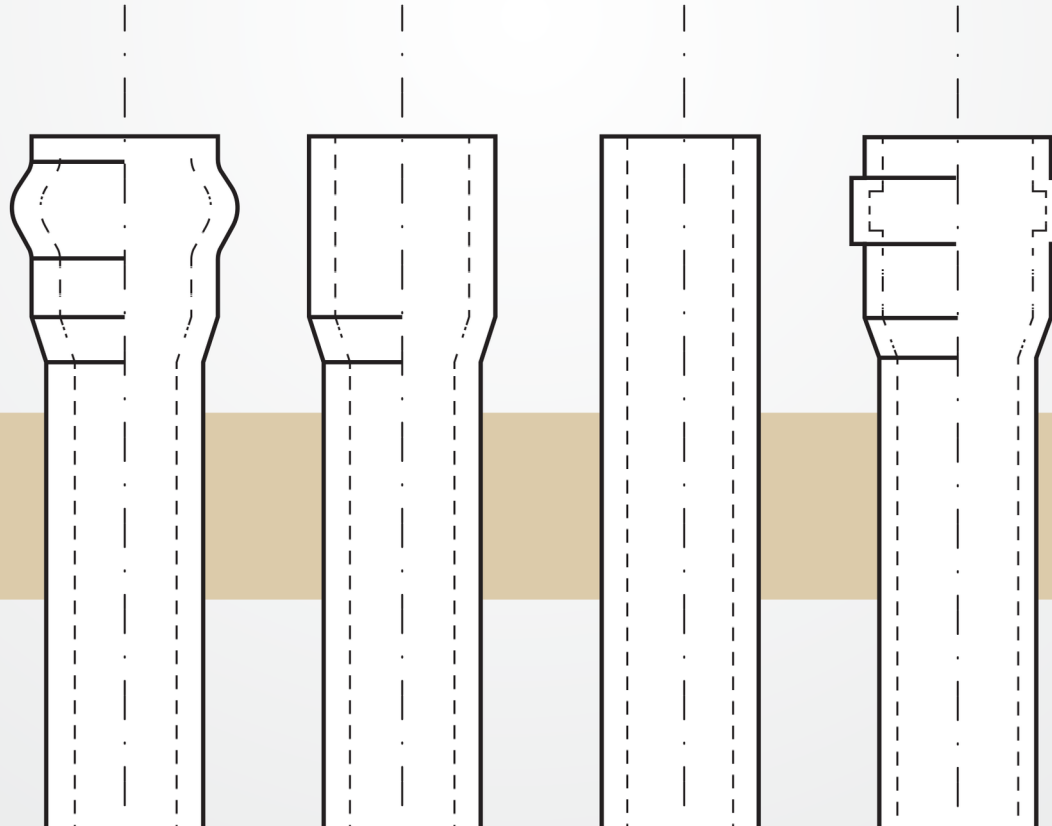


U-PVC PIPE

INTERNATIONAL TECHNICAL SPECIFICATIONS





المواصفات الفنية الدولية لالانابيب (يو بي في سي)



INTERNATIONAL ORGANIZATION
FOR STANDARDIZATION



Al-Watania Plastics also produces PVC pipes according
to the following Saudi specifications:

تنتج بلاستيك الوطنية أنابيب أنابيب اليو بي في سي
وفق المواصفات السعودية التالية :

Standard No.	SASO-ISO - 1452	رقم المواصفة
Reference No.	ISO 1452	مرجع المواصفة
Issue Year	2009	سنة الاصدار
Adoption Year	2014	سنة الاعتماد
Numeric Coding	922 - 1452	الترميز الرقمي

Table 1 - Nominal outside diameters and tolerances

Dimensions in millimetres			
Nominal outside diameter	Tolerance for mean outside diameter, d_{ema}	Tolerance for out-of-roundness ^b	
d_n	x	S 20 to S 16 ^c	S 12,5 to S 5 ^d
12	0,2	—	0,5
16	0,2	—	0,5
20	0,2	—	0,5
25	0,2	—	0,5
32	0,2	—	0,5
40	0,2	1,4	0,5
50	0,2	1,4	0,6
63	0,3	1,5	0,8
75	0,3	1,6	0,9
90	0,3	1,8	1,1
110	0,4	2,2	1,4
125	0,4	2,5	1,5
140	0,5	2,8	1,7
160	0,5	3,2	2,0
180	0,6	3,6	2,2
200	0,6	4,0	2,4
225	0,7	4,5	2,7
250	0,8	5,0	3,0
280	0,9	6,8	3,4

Dimensions in millimetres			
Nominal outside diameter	Tolerance for mean outside diameter, d_{ema}	Tolerance for out-of-roundness ^b	
d_n	x	S 20 to S 16 ^c	S 12,5 to S 5 ^d
315	1,0	7,6	3,8
355	1,1	8,6	4,3
400	1,2	9,6	4,8
450	1,4	10,8	5,4
500	1,5	12,0	6,0
560	1,7	13,5	6,8
630	1,9	15,2	7,6
710	2,0	17,1	8,6
800	2,0	19,2	9,6
900	2,0	21,6	--
1 000	2,0	24,0	--

^a(The tolerance conforms to grade D of ISO 11922 - 1 [3] for $d_n \leq 50$ and to grade C for $d_n > 50$. The tolerance is expressed

in the form $+x$ 0mm, where x is the value of the tolerance.

^b(The tolerance is expressed as the difference between the largest and the smallest outside diameter in a cross-section of the pipe)i.e. d_e , max - d_e , min(.

^c(For $d_n \leq 250$, the tolerance conforms to grade N of ISO 11922 - 1 [3]. For $d_n > 250$, the tolerance conforms to grade M of ISO 11922 - 1 [3]. The requirement for out-of-roundness is only applicable prior to storage.

Table 2 - Nominal)minimum(wall thicknesses

Nominal outside diameter, d_n	Nominal pressure PN based on design coefficient $C = 2,0$						
	PN 6	PN 8	PN 10	PN 12.5	PN 16	PN 20	PN 25
110	2,7	3,4	4,2	5,3	6,6	8,1	10,0
125	3,1	3,9	4,8	6,0	7,4	9,2	11,4
140	3,5	4,3	5,4	6,7	8,3	10,3	12,7
160	4,0	4,9	6,2	7,7	9,5	11,8	14,6
180	4,4	5,5	6,9	8,6	10,7	13,3	16,4
200	4,9	6,2	7,7	9,6	11,9	14,7	18,2
225	5,5	6,9	8,6	10,8	13,4	16,6	—
250	6,2	7,7	9,6	11,9	14,8	18,4	—
280	6,9	8,6	10,7	13,4	16,6	20,6	—
315	7,7	9,7	12,1	15,0	18,7	23,2	—
355	8,7	10,9	13,6	16,9	21,1	26,1	—
400	9,8	12,3	15,3	19,1	23,7	29,4	—
450	11,0	13,8	17,2	21,5	26,7	33,1	—
500	12,3	15,3	19,1	23,9	29,7	36,8	—
560	13,7	17,2	21,4	26,7	—	—	—
630	15,4	19,3	24,1	30,0	—	—	—
710	17,4	21,8	27,2	—	—	—	—
800	19,6	24,5	30,6	—	—	—	—
900	22,0	27,6	—	—	—	—	—
1000	24,5	30,6	—	—	—	—	—

Nominal outside diameter, d_n	Pipe series S						
	Nominal)minimum(wall thickness						
	S 20)SDR 41(	S 16)SDR 33(	S 12,5)SDR 26(	S 10)SDR 21(	S 8)SDR 17(	S 6,3)SDR 13,6(	S 5)SDR 11(
	Nominal pressure PN based on design coefficient $C = 2,5$						
		PN 6	PN 8	PN 10	PN 12.5	PN 16	PN 20
1		—	—	—	—	—	1,5
2		—	—	—	—	—	1,5
1		—	—	—	—	1,5	1,9
6		—	—	—	1,5	1,9	2,3
2		—	1,5	1,6	1,9	2,4	2,9
0		1,5	1,6	1,9	2,4	3,0	3,7
2		1,6	2,0	2,4	3,0	3,7	4,6
5		2,0	2,5	3,0	3,8	4,7	5,8
3		2,3	2,9	3,6	4,5	5,6	6,8
2		2,8	3,5	4,3	5,4	6,7	8,2

a To apply a design coefficient of 2,5)instead of 2,0(for pipes with nominal diameters above 90 mm, the next higher pressure rating, PN, shall be chosen.

NOTE 1 The nominal wall thicknesses conform to ISO 4065[4].

NOTE 2 The PN 6 values for S 20 and S 16 are calculated with the preferred number 6,3.



Table 3 – Tolerance on wall thicknesses at any point

Dimensions in millimetres					
Nominal)minimum(wall thickness - e _n		Tolerance for wall thickness x	Nominal)minimum(wall thickness e		Tolerance for wall thickness x
>	≤		>	≤	
1,0	2,0	0,	21,0	22,0	2,
2,0	3,0	4	22,0	23,0	4
3,0	4,0	0,	23,0	24,0	2,
4,0	5,0	5	24,0	25,0	5
5,0	6,0	0,	25,0	26,0	2,
6,0	7,0	6	26,0	27,0	6
7,0	8,0	0,	27,0	28,0	2,
8,0	9,0	7	28,0	29,0	7
9,0	10,0	0,	29,0	30,0	2,
10,0	11,0	8	30,0	31,0	8
11,0	12,0	0,	31,0	32,0	2,
12,0	13,0	9	32,0	33,0	9
13,0	14,0	1,	33,0	34,0	3,
14,0	15,0	0	34,0	35,0	0
15,0	16,0	1,	35,0	36,0	3,
16,0	17,0	1	36,0	37,0	1
17,0	18,0	1,	37,0	38,0	3,
18,0	19,0	2			2
19,0	20,0	1,			3,
20,0	21,0	3			3

NOTE 1 The tolerance applies to the nominal)minimum(wall thickness and is expressed in the form 0 + x mm, where x is the value of tolerance for the mean wall thickness, em.

NOTE 2 The tolerance for wall thickness, e, at any point, conforms to grade W of ISO 119223 [1-].

6.5 Length of pipe

The nominal pipe length, l, shall be a minimum length which does not include the depth of the socketed portions, as shown in Figure 1.

NOTE

The preferred nominal length of pipe is 6 m. Other lengths are subject to agreement between the manufacturer and the purchaser.



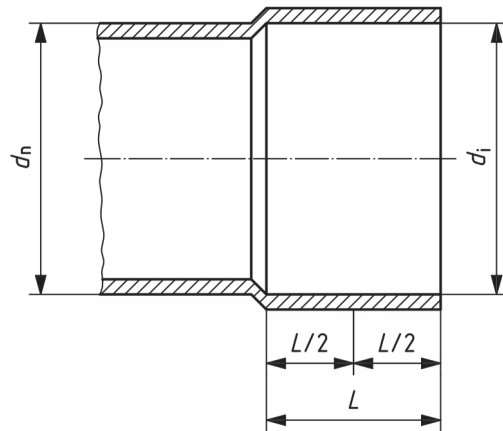


Figure 2 — Socket for solvent cementing

The nominal inside diameter of a socket shall be equal to the nominal outside diameter, d_n , of the pipe.

The maximum included internal angle of the socketed portion shall not exceed 0.30° ($>30^\circ$ min).

The requirements for mean inside diameters, d_{im} , of sockets shall apply at the midpoint of the socket length.

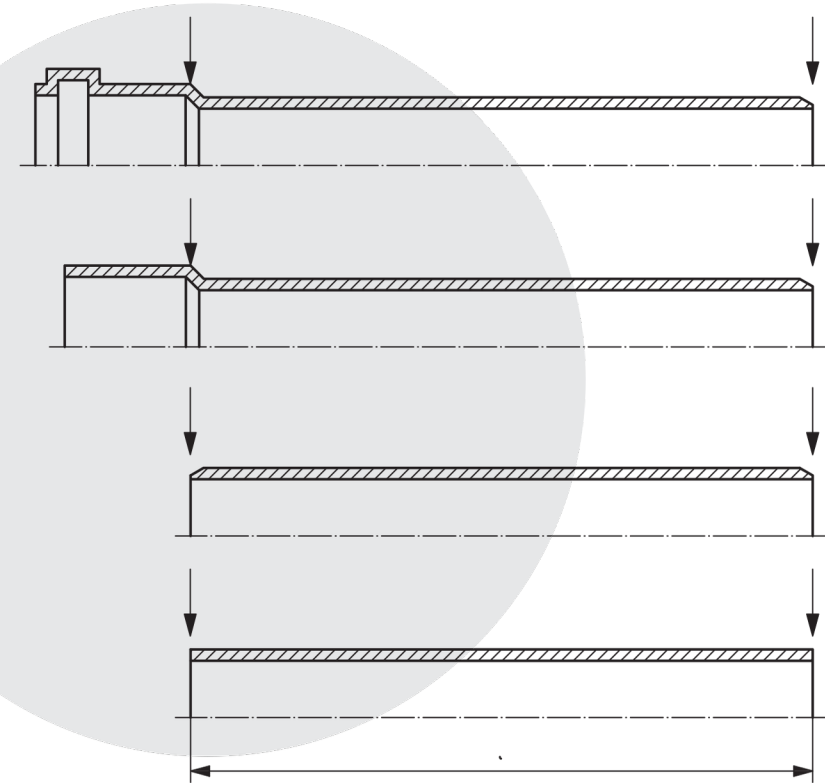


Figure 1 — Points of measurement for nominal pipe lengths

6.6 Pipes with sockets

6.6.1 Sockets for solvent cementing

The dimensions of sockets for solvent cementing are given in Figure 2. They shall conform to Table 4.

Table 4 – Dimensions of sockets for solvent cementing

Dimensions in millimetres				
Nominal inside diameter of socket	Mean inside diameter of socket		Maximum out-of roundness for di	Minimum socket length
dn	dim, min	dim, max	a	Lminb
12	12,1	12,3	0,25	12,0
16	16,1	16,3	0,25	14,0
20	20,1	20,3	0,25	16,0
25	25,1	25,3	0,25	18,5
32	32,1	32,3	0,25	22,0
40	40,1	40,3	0,25	26,0
50	50,1	50,3	0,3	31,0
63	63,1	63,3	0,4	37,5
75	75,1	75,3	0,5	43,5
90	90,1	90,3	0,6	51,0
110	110,1	110,4	0,7	61,0
125	125,1	125,4	0,8	68,5
140	140,2	140,5	0,9	76,0
160	160,2	160,5	1,0	86,0
180	180,2	180,6	1,1	96,0
200	200,2	200,6	1,2	106,0
225	225,3	225,7	1,4	118,5
250	250,3	250,8	1,5	131,0
280	280,3	280,9	1,7	146,0
315	315,4	316,0	1,9	163,5
355	355,4	356,1	2,0	183,5
400	400,4	401,2	2,0	206,0

- a The out-of-roundness tolerances are rounded values of 0,25 grade M to ISO 11922 - 1[3].
- b The minimum socket lengths are equal to $0,5dn + 6 \text{ mm}$ (or 12 mm if $0,5dn + 6 \text{ mm} \leq 12 \text{ mm}$).

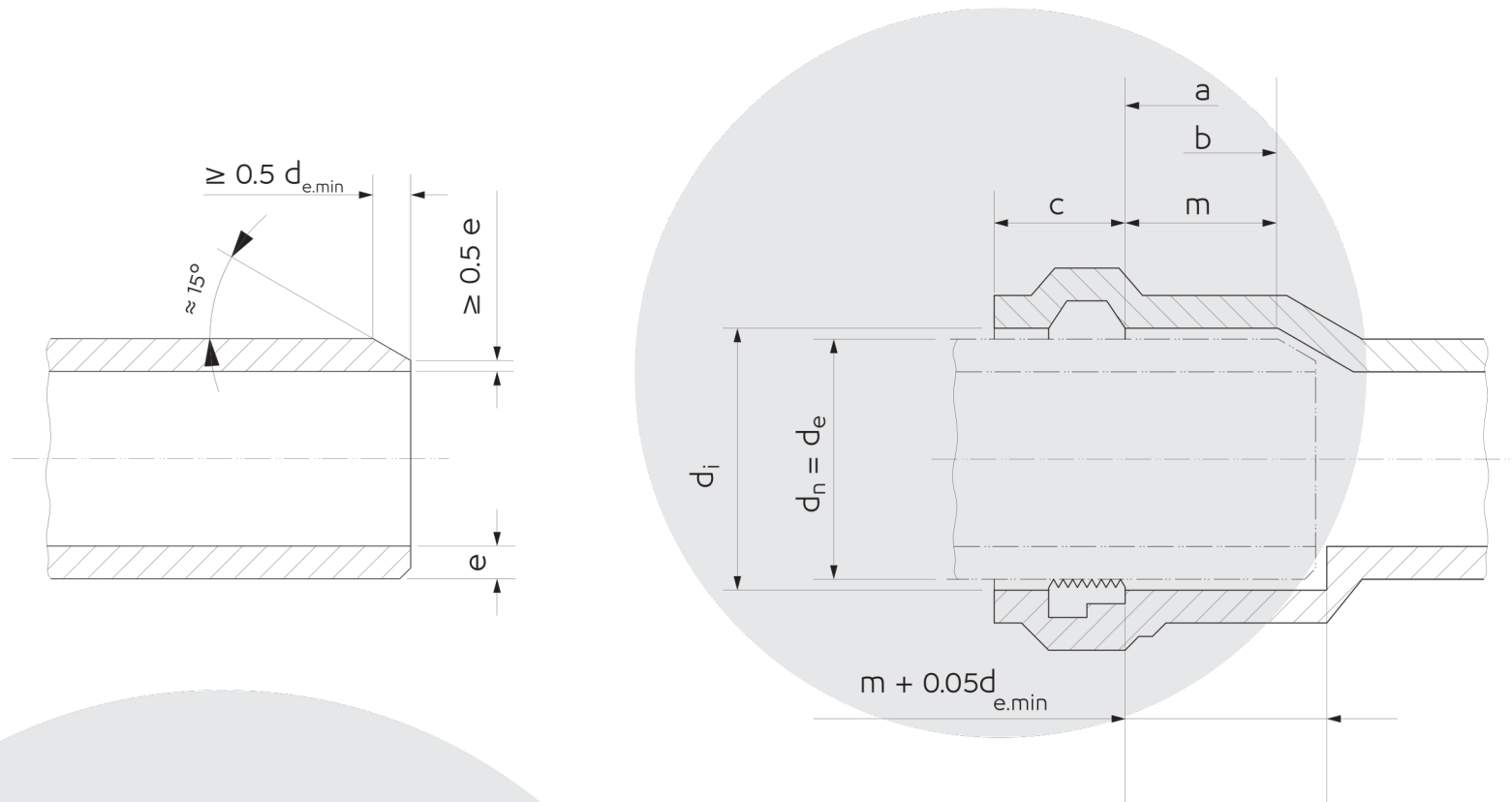
6.6.2 Sockets for elastomeric ring seal type joints

The minimum depth of engagement, m_{min} , of single sockets with elastomeric ring seal joints (see Figure 3) is based on pipe lengths up to 12 m and shall conform to Table 5.

The wall thickness of the sockets at any point, except the sealing ring groove, shall not be less than the minimum wall thickness of the connecting pipe. The wall thickness of the sealing ring groove shall not be less than 0,8 times the minimum wall thickness of the connecting pipe.

The requirements for mean inside diameters, dim , of sockets shall apply at the midpoint of the depth of engagement, m .





Key

- a Start of sealing area.
- b End of cylindrical part of socket and pipe.

Figure 3 — Socket and spigot end for pipes with elastomeric sealing

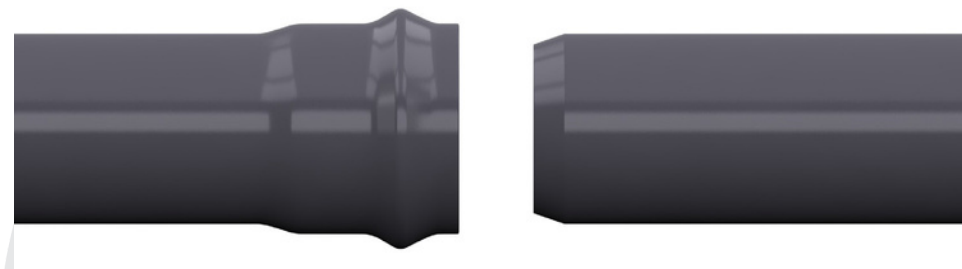
Figure 3 shows the engagement if the spigot end is pushed to the socket bottom.

NOTE For assembly instructions, see ISO/TR 4191[1].

Table 5 – Dimensions of sockets for elastomeric ring seal joints

Nominal inside diameter of Socket	Minimum mean inside diameter of Socket	Maximum permissible out-of-roundness for <i>dib</i>		Minimum depth of engagement	Length of socket Entrance and Sealing Area	Nominal inside diameter of Socket	Minimum mean inside diameter of Socket	Maximum permissible out-of-roundness for <i>dib</i>		Minimum depth of engagement	Length of socket Entrance and Sealing Area
d_n	$dim, \min a$	S 20 to S 16	S 12,5 to S 5	m_{minc}	C^d	d_n	$dim, \min a$	S 20 to S 16	S 12,5 to S 5	m_{minc}	C^d
20	20,3	—	0,3	55	27	250	250,9	3,8	2,3	81	62
25	25,3	—	0,3	55	27	280	281,0	5,1	2,6	85	67
32	32,3	0,6	0,3	55	27	315	316,1	5,7	2,9	88	72
40	40,3	0,8	0,4	55	28	355	356,2	6,5	3,3	90	79
50	50,3	0,9	0,5	56	30	400	401,3	7,2	3,6	92	86
63	63,4	1,2	0,6	58	32	450	451,5	8,1	4,1	95	94
75	75,4	1,2	0,7	60	34	500	501,6	9,0	4,5	97	102
90	90,4	1,4	0,9	61	36	560	561,8	10,2	5,1	101	112
110	110,5	1,7	1,1	64	40	630	632,0	11,4	5,7	105	123
125	125,5	1,9	1,2	66	42	710	712,3	12,9	6,5	109	136
140	140,6	2,1	1,3	68	44						
160	160,6	2,4	1,5	71	48						
180	180,7	2,7	1,7	73	51						
200	200,7	3,0	1,8	75	54						
225	225,8	3,4	2,1	78	58						

Dimensions in millimetres





AL-RAJHI UPVC PRESSURE PIPES



UPVC pipes according to (SASO 14, DIN 8062, DIN 19532, ISO 161)

Class		Class 1		Class 2		Class 3		Class 4		Class 5	
Nominal Pressure in Bars		2 BAR		4 BAR		6 BAR		10 BAR		16 BAR	
Nom-OD mm	Tolerance on Nom-OD mm	Nom-thick of wall mm	Nom-wt. kg/m	Nom-thick of wall mm	Nom-wt. kg/m	Nom-thick of wall mm	Nom-wt. kg/m	Nom-thick wall mm	Nom-wt. kg/m	Nom-thick of wall mm	Nom-wt. kg/m
20	+0.2									1.5	0.137
25	+0.2							1.5	0.174	1.9	0.212
32	+0.2							1.8	0.264	2.4	0.342
40	+0.2					1.8	0.334	1.9	0.350	3.0	0.525
50	+0.2					1.8	0.422	2.4	0.552	3.7	0.809
63	+0.2					1.9	0.562	3.0	0.854	4.7	1.29
75	+0.3			1.8	0.642	2.2	0.782	3.6	1.22	5.6	1.82
90	+0.3			1.8	0.774	2.7	1.13	4.3	1.75	6.7	2.61
110	+0.3	1.8	0.950	2.2	1.16	3.2	1.64	5.3	2.61	8.2	3.90
125	+0.3	1.8	1.08	2.5	1.48	3.7	2.13	6.0	3.64	9.3	5.01
140	+0.4	1.8	1.21	2.8	1.84	4.1	2.65	6.7	4.18	10.4	6.27
160	+0.4	1.8	1.39	3.2	2.41	4.7	3.44	7.7	5.47	11.9	8.17
180	+0.4	1.8	1.57	3.6	3.02	5.3	4.37	8.6	6.88	13.4	10.4
200	+0.4	1.8	1.74	4.0	3.70	5.9	5.37	9.6	8.51	14.9	12.8
225	+0.5	1.8	1.96	4.5	4.70	6.6	6.76	10.8	10.8	16.7	16.1
250	+0.5	2.0	2.40	4.9	5.65	7.3	8.31	11.9	13.2	18.6	19.9
280	+0.6	2.3	3.11	5.5	7.11	8.2	10.4	13.4	16.6	20.8	24.9
315	+0.6	2.5	3.78	6.2	9.02	9.2	13.2	15.0	20.9	23.4	31.5
355	+0.7	2.9	4.88	7.0	11.4	10.4	16.7	16.9	26.5	26.3	39.9
400	+0.7	3.2	6.10	7.9	14.5	11.7	21.1	19.1	33.7	29.7	50.8
450	+0.8	3.6	7.65	8.9	18.3	13.2	26.8	21.5	42.7	33.1	
500	+0.9	4.0	9.38	9.8	22.4	14.6	32.9	23.9	52.6	36.8	
560	+1.0	4.2	11.8	11.0	28.1	16.4	41.4	26.7	65.8		
630	+1.1	2.5	14.7	12.4	35.7	18.4	52.2	30.0	83.2		
710	+1.2	5.7	18.9	14.0	45.3	20.7	66.1				
800	+1.3	6.4	23.9	15.7	57.2	23.3	83.9				

Length : 6 meters (Other lengths are available on request.)

Colour : Grey.

Socket Type Rubber joint (R/J) type supplied from sizes 63mm up to 800mm.
Solvent Cement (SC/J) type supplied from sizes 20mm up to 800mm.

Country
Standard


UPVC Pipes According to ASTM D - 1785, Schedule 40 & Schedule 80

Nominal Size Inch.	O.D. (mm)		Schedule 40				Schedule 80			
	min	max	Wall Thickness (mm)		Nominal Weight (kg/m)	PSI	Wall Thickness (mm)		Nominal Weight (kg/m)	PSI
			min	max			min	max		
1/2	21.24	21.44	2.77	3.28	0.24	600	3.73	4.24	0.3	850
3/4	26.57	26.77	2.87	3.38	0.33	480	3.91	4.42	0.43	690
1	33.27	33.53	3.38	3.89	0.48	450	4.55	5.08	0.61	630
1 1/4	42.03	42.29	3.56	4.07	0.65	370	4.85	5.44	0.87	520
1 1/2	48.11	48.41	3.68	4.19	0.77	330	5.08	5.69	1.03	470
2	60.17	60.47	3.91	4.42	1.04	280	5.54	6.2	1.43	400
2 1/2	72.84	73.2	5.16	5.77	1.57	300	7.01	7.85	2.2	420
3	88.7	89.1	5.49	6.15	2.14	260	7.62	8.53	2.91	370
4	114.1	114.5	6.02	6.73	3.05	220	8.56	9.58	4.26	320
5	141.05	141.55	6.22	7.347	4.18	190	9.52	10.67	6.42	290
6	168	168.56	7.11	7.98	5.37	180	10.97	12.29	8.13	280
8	218.7	219.46	8.18	9.17	8.11	160	12.7	14.22	12.4	250

Length : 6 meters (Other lengths are available on request.)

Colour : Schedule 40- White, Schedule 80 - Grey

Socket Type : Plain, solvent cement (SC/J)

Country Standard 

UPVC Pressure-rated Pipes According to ASTM D 2241

Nominal Size Inch.	O.D. (mm)		Wall Thickness (mm)											
	min	max	Standard Diameter Ratio (SDR)											
			41		32.5		26		21		17		13.5	
			W.P: 6.9 Bar	W.P: 8.6 Bar	W.P: 11 Bar	W.P: 13.8 Bar	W.P: 17.2 Bar	W.P: 21.7 Bar	min	max	min	max	min	max
1/2	21.24	21.44											1.57	2.08
3/4	26.57	26.77							1.52	2.03	1.57	2.08	1.98	2.49
1	33.27	33.53							1.52	2.03	1.60	2.11	1.96	2.46
1 1/4	42.03	42.29											2.46	2.97
1 1/2	48.11	48.41											3.12	3.63
2	60.17	60.47											3.58	4.09
3	88.70	89.10	2.16	2.67	2.74	3.25	3.43	3.94	4.24	4.75	5.23	5.87	6.58	7.37
4	114.07	114.53	2.80	3.30	3.51	4.01	4.39	4.90	5.44	6.10	6.73	7.54	8.46	9.47
6	168.00	168.56	4.11	4.62	5.18	5.79	6.48	7.26	8.03	9.00	9.91	11.10	12.47	13.97
8	218.70	219.46	5.33	5.97	6.73	7.54	8.43	9.45	10.41	11.66	12.90	14.45		

Note: The maximum pressure rating given above is based on water at 73 °F/23 °C and for unthreaded pipes.

Length : 6 meters (Other lengths are available on request.)

Colour : White

Socket Type : Plain, solvent cement (SC/J).

Country Standard 

UPVC Pipes According to BS 3505 / 3506

Applications: Water supply, irrigation systems, industrial use.

Nominal Size Inch.	O.D. (mm)		Wall Thickness (mm)													
	min	max	Class B		Class C		Class D		Class E		Class O		Class 6		Class 7	
			min	max	min	max	min	max	min	max	min	max	min	max	min	max
3/8	17.0	17.3							1.5	1.9			2.3	2.8	3.2	3.8
1/2	21.2	21.5							1.7	2.1			2.8	3.3	3.7	4.3
3/4	26.6	26.9							1.9	2.5			2.9	3.4	3.9	4.5
1	33.4	33.7							2.2	2.7			3.4	4.0	4.5	5.2
1 1/4	42.1	42.4					2.2	2.7	2.7	3.2			3.6	4.2	4.8	5.5
1 1/2	48.1	48.4					2.5	3.0	3.1	3.7	1.8	2.2	3.7	4.3	5.1	5.9
2	60.2	60.5			2.5	3.0	3.1	3.7	3.9	4.5	1.8	2.2			5.5	6.3
2 1/2	75.0	75.3			3.0	3.5	3.9	4.5	4.8	5.5	1.8	2.2				
3	88.7	89.1	2.9	3.4	3.5	4.1	4.6	5.3	5.7	6.6	1.8	2.2				
4	114.1	114.5	3.4	4.0	4.5	5.2	6.0	6.9	7.3	8.4	2.3	2.8				
5	140.0	140.4	3.8	4.4	5.5	6.4	7.3	8.4	9.0	10.4	2.6	3.1				
6	168.0	168.5	4.5	5.2	6.6	7.6	8.8	10.2	10.8	12.5	3.1	3.7				
8	218.8	219.4	5.3	6.1	7.8	9.0	10.3	11.9	12.6	14.5	3.1	3.7				

Note: Classes B,C,D and E are to BS 3505/3506. Classes O, 6 and 7 are to BS 3506 / 1969. Classes 6 and 7 equivalent to ASTM D-1785, SCH 40 and SCH 80 respectively.

Length : 6 meters (Other lengths are available on request.)
 Colour : Dark Grey except class O which is grey.
 Socket Type: Plain, solvent cement (SC/J)

Country Standard 

Pressure ratings for working pressure at 20 °C

Class

B 6.0 bar
C 9.0 bar
D 12.0 bar
E 15.0 bar

For higher working temperatures, the pressure rating should be reduced.