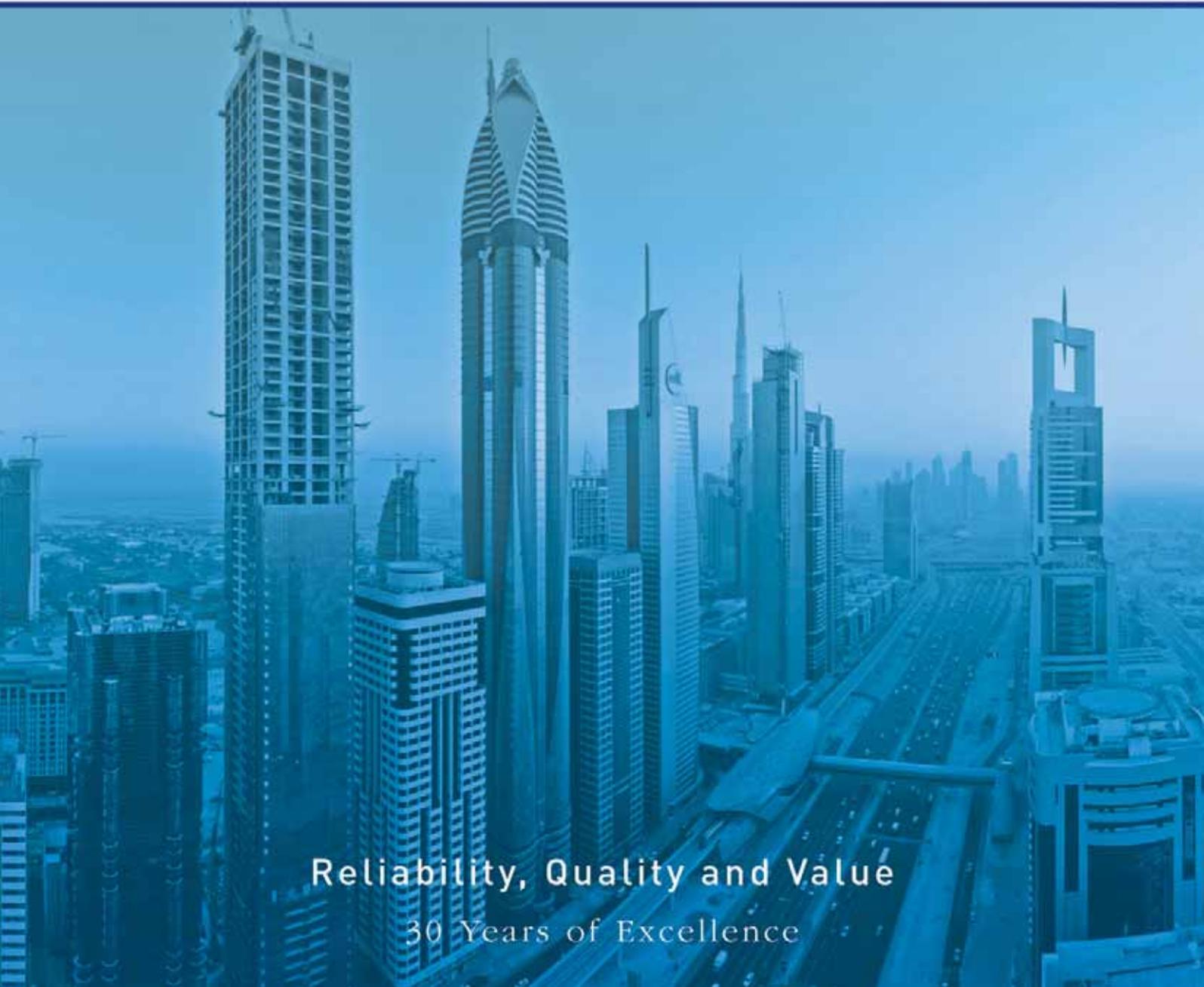




MODERN PLASTIC INDUSTRY L.L.C.



UPVC SOIL & DRAINAGE PIPES & FITTINGS



Reliability, Quality and Value
30 Years of Excellence

P R O F I L E

INTRODUCTION

Modern plastic industry is a part of AL SHIRAWI GROUP OF COMPANIES which is one of the largest and most diversified business conglomerates in the Arabian Gulf. From its inception in 1971 as a trading and contracting company, the Group has broadened its scope to encompass a cross section of products, services and industries ranging from printing, heavy fabrication, engineering, electromechanical, electronics, trucks and logistics.

Established in 1987, Modern Plastic industry (MPI) has pioneered the manufacturing of UPVC pressure pipe fittings in the UAE. Today Modern Plastic has a wide range of SWR drainage, high pressure UPVC, CPVC, PP Compression Fittings and pipes.



MPI products have been used extensively in the irrigation, construction, plumbing and landscaping industry and are playing a significant role in the development of the Gulf region and Middle East.

Subsequently the company started manufacturing Drainage systems under the "FLOWTECH" brand.

STATE-OF-THE-ART FACILITY

MPI UPVC Drainage systems are manufactured in a state-of-the-art facility at Dubai Investment Park with Precision moulds for fittings and high quality State-of-the-art Microprocessor based Injection Moulding Machines and High Quality Extrusion Machines for pipes.

Technology is the backbone of ongoing development and the right design selection headed by a team of experienced and well-trained professionals complements the development process.

MPI has established an in-house tool room with the latest CNC machines and EDM machines, which are used to manufacture moulds as per the needs of market.

QUALITY CONTROL

As the UPVC Drainage systems are specially designed to meet the harsh climate conditions of the Gulf region, MPI places emphasis on Quality, Reliability and the Economy. Strict in-house Quality control is backed by testing through independent laboratories of international repute to certify the quality of pipes and fittings.

MPI places great emphasis on customer satisfaction through quality products. The company's operational excellence is evident through its established Quality Management System, which complies with the ISO 9001-2008 standard, certified by British Standard Institute (BSI) UK. Also the company's products have been awarded the prestigious Kitemark certification of BSI, UK.



A COMPLETE SOLUTION

With the growing demand to create to cater to the construction industry MPI has a complete range of UPVC Drainage Pipes and Fittings from 36mm to 400mm conforming to the British Standards BS EN 1401. MPI products are manufactured par excellence to the international standards and ensure a complete solution of "Piping System" for plumbing applications.

Modern Plastic is one of the largest companies in the Middle East to manufacture a wide range of UPVC H.P. Water supply & Drainage pipes and Fittings certified by UK BSI Kitemark standards.

GLOBAL PRESENCE

MPI has been the leader in the Gulf market mainly because it can offer the widest range of UPVC Drainage Pipes and Fittings which are specially designed to meet the harsh climatic conditions with more emphasis of Quality, Reliability and Economy.

MPI is managed by a team of experienced and well trained professionals, and markets its range of products in the AGCC region, the Middle East, Africa, Europe, CIS Country and the Asian subcontinent.





Flowtech UPVC Drainage Systems offer a comprehensive range of pipes and fittings for waste, soil and Drainage applications to cater to the growing needs of the building construction industry.

STANDARDS

Flowtech UPVC pipes and fittings are manufactured as per the following standards.

- Above ground : BS EN 1329-1 : 2000
This standard supercedes BS 4514 : 1993 and BS 5255 : 1989
- Below Ground : BS EN 1401-1 : 2009
This standard supercedes BS 4660 : 1989 and BS 5481 : 1977

KITE-MARK

Flowtech UPVC Drainage Fittings are available with the prestigious Kite mark license which is awarded by the British Standards Institute(BSI).

RANGE

Flowtech UPVC Pipes and Fittings are available in sizes from 36mm to 400mm.

ADVANTAGES OF FLOWTECH UPVC DRAINAGE SYSTEMS

- | | |
|-----------------------|---|
| Light weight | : Hence transport and handing is simple and convenient. |
| Chemical Resistance | : Excellent chemical resistance of UPVC to acids, alkalies, and oxidizing and reducing agents makes it suitable for all applications. |
| High Flow rate | : The smooth internal bore gives excellent flow properties which remain constant throughout the service life of the system. |
| Non-Flammable | : UPVC does not support combustion and is self-extinguishing. |
| Non- Conductive | : UPVC is a non-conductor and hence not attacked by galvanic or electrolytic action. |
| Weather Resistance | : Specially blended UV stabilized compound offers an excellent outdoor weathering performance. High durability. |
| Easy Installation | : Tough, impact-resistant and easy to install. |
| Corrosion Resistance | : UPVC is non-corrosive and hence constant contact with water does not deteriorate the material. |
| Aesthetic Superiority | : UPVC is aesthetically far superior to conventional systems. |



INSTALLATION PROCEDURES

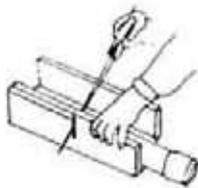
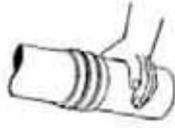
- During installation, the pipeline should be adequately supported by providing pipe support brackets as per support distances shown in the chart.

MAXIMUM SUPPORT DISTANCES (BS 5572 : 1994)

	Soil	Waste	Overflow
Horizontal	1.00m	0.75m	0.75m
Vertical	2.00m	1.50m	1.50m

- PVC pipelines expand or contract with change in temperature. This thermal expansion and contraction should be allowed for in the design.
- In case of a change in direction of the pipeline, an adequate support should be provided.

SOLVENT CEMENT JOINTING

01 	Cut the spigot end of the pipe square	02 	All burrs from the internal and external surfaces should be removed.	03 	The spigot should be marked with a pencil line at a distance equivalent to the socket depth. Clean the surface with in the marked area.
04 	Apply uniform coat of solvent cement on the external surface of the pipe and a lighter coat on the internal surface of the fitting.	05 	Insert the pipe end in to the socket of the pipe/ fitting and push it in upto the mark.	06 	Remove the excess solvent cement and hold the joint firmly in position for 30 seconds to dry.

RUBBER RING JOINTING

01 	Cut pipe square.	02 	Chamfer the end of the pipe. Remove all burrs, dust and dirt.	03 	Apply lubricant on the external surface of the chamfered end of the pipe and on the rubber gasket.
04 	Check that the ring seal is in position in the housing.	05 	Push the pipe fully in to the socket and mark the pipe depth in the socket with marker.	06 	Withdraw the pipe until the mark is 12mm away from the socket before fixing. This gap between the pipe end and the socket register is very essential for thermal expansion/contraction.

Note: For proper design, architects' approved drawing for sanitary systems shall form the basis. All relevant code of practice/ building regulations must be strictly followed.



FLOWTECH DRAINAGE PIPES

Flowtech Drainage Systems offer a complete range of pipes and fittings for waste, Soil and Drainage applications to cater to the growing needs of the building construction industry.

STANDARDS

Flowtech UPVC Pipes and fittings are manufactured as per the following standards:

- Above Ground : BS EN 1329-1 : 2000
This standard supercedes BS 4514 : 1993 and BS 5255 : 1989.
- Below Ground : BS EN 1401-1 : 2009
This standard supercedes BS 4660 : 1989 and BS 5481 : 1977



RAW MATERIAL

The raw material used is 100% UPVC virgin material, with necessary additives/chemicals needed to facilitate the manufacturing process.

APPEARANCE

The internal and external surface of the pipes are smooth, clean and free from surface defects.

COLOUR

The pipes are coloured throughout the wall as follows:

- Above Ground : BS EN 1329-1 : Grey
- Below Ground : BS EN 1401-1 : Orange Brown / Terra Cotta.

EFFECTIVE LENGTH

All Pipes are manufactured in 4m and 6/5.8m lengths.

SOCKETS

The pipes are supplied as follows:

- 36mm, 43mm & 56mm pipes are supplied with plain ends.
- 82mm, 110mm, 160mm, 200mm, 250mm, 315mm & 400mm pipes are supplied with solvent cement socket or rubber ring socket.



GENERAL PHYSICAL PROPERTIES OF UPVC

Sr.	Characteristics	value
1	Specific Gravity	1.41
2	Thermal Conductivity	160 W/m ^{°c}
3	Specific Heat	1040 J/Kg/°c
4	Flammability	UPVC is self-extinguishing and will not support combustion.
5	Tensile Strength	>45 MN/Sq cm at 20°c
6	Vicat Softening Temperature	Min 79°c
7	Poissons Ratio	1:3



Sr.	Characteristics	Requirement	Testing Method
1	Impact Resistance (Round the clock method)	TIR<10% AT 0°C	EN 744
2	Vicat Softening Temperature (VST)	>79°C	EN 727
3	Longitudinal Reversion	<5% at 150°C	EN 743 (Method B; Air)
4	Resistance to DCM Acid	No attack any part of surface of pipe at 15°C	EN 580
5	Water Tightness of Rubber Ringing Joint	No leakage at 0.5 bar	EN 1277
6	Elevated Temperature Cycling (ETC)	No leakage	EN 1055
7	Long Term performance of TPE seals	90 days>1.3 bar 100 years>0.6 bar	prEN 1989
8	Resistance to internal pressure	No failure during the test period of 1000 hrs at 60°C, 10Mpa	EN 921



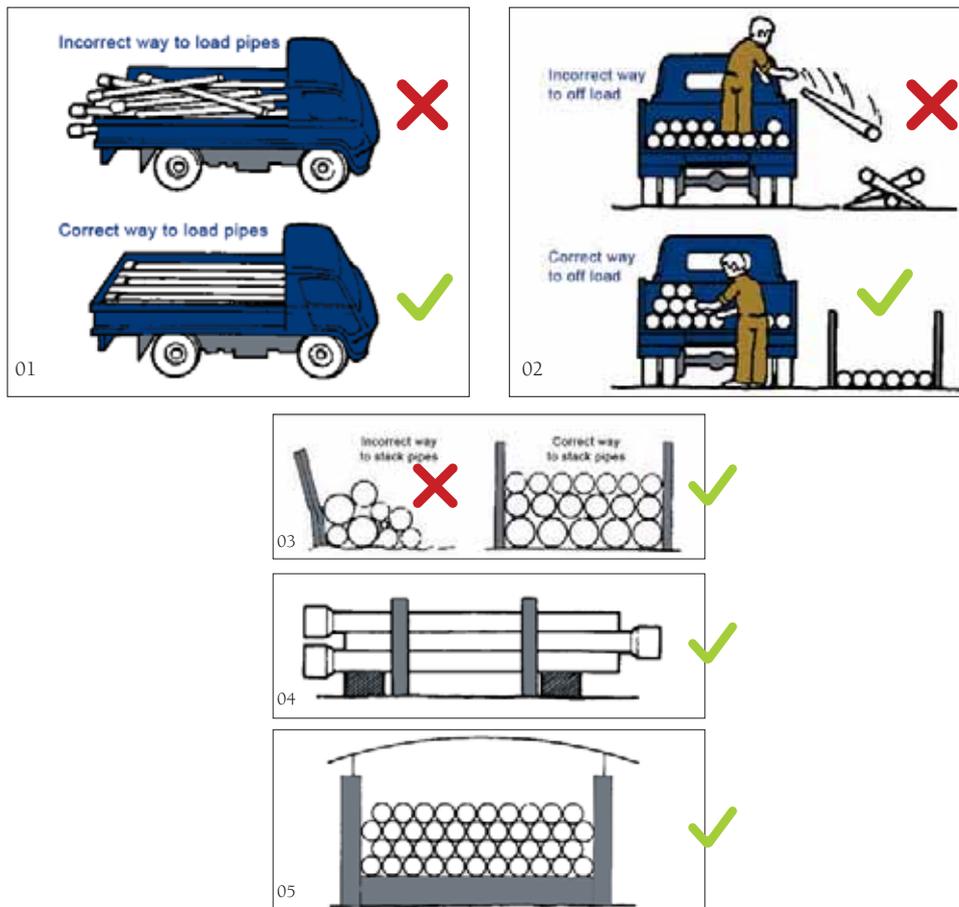
CHEMICAL RESISTANCE

Flowtech UPVC Drainage Systems are suitable to be used with a number of acids, alkalies, salts and water-miscible solvents.

Flowtech UPVC Drainage Systems are not resistant to aromatic and chlorinated hydrocarbons.

More detailed and specific information is available in the British Standard BS 5955-7:1983 Formerly CP 312-3:1973.

ON SITE STORAGE AND HANDLING



STORAGE

- The pipes should be kept on a flat surface or on level ground free from stones and sharp objects. Refer (3)
- The maximum stack should be 7 layers high under normal conditions or 1.5 mtr high & 3.0 mtr wide and 6 layers high in hot conditions. Refer (5)
- Ideally a stack should contain pipes of the same Diameter. If this is not possible nesting of the smaller pipes inside the larger pipes may be done. The larger diameter pipes should always be kept at the bottom of the stack. Refer(3)
- Direct exposure to sunlight(UV rays) can affect the pipes and fittings, causing decolouration and deterioration in the seal rings.
- It is recommended that the pipes should not be exposed to direct sunlight, it should be covered by opaque tarps sheets. Refer(5)
- While storing socketed pipes, it is recommended that alternate layers should have sockets in the opposite direction. Refer(4)



HANDLING

- Reasonable care should be taken while handling of pipes, during unloading from vehicle, pipes should not be dropped / mishandled from the vehicle. Refer (1)
- Pipes should never be dragged along hard surfaces. In case of mechanical lifting, avoid using metal chains and hooks to come in direct contact with the pipes. It is recommended to provide protected slings and padded supports. Refer (2)

TRANSPORTATION

- General UPVC pipes are supplied in prepacked bundles of standard quantity.
- In case loose pipes being transported, the larger diameter and heavier pipes should be placed at the bottom of the load and
- smaller diameter pipes on top. Refer (5)
- The pipes should be loaded in such a way that the overhang should be less than a meter. Refer (1)





ABOVE GROUND UPVC SOIL & WASTE PIPES BS EN 1329-1 (SUPERCEDES BS 5255 & BS 4514)

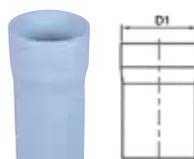
Flowtech UPVC SOIL & WASTE Pipes are manufactured as per the following dimensions:

ABOVE GROUND SOIL & WASTE PIPES: BS EN1329 - 1:2000

Item Code	Nominal Size DN/OD	Standard	Joints	Type	Mean Outside Dia(D1)		Wall Thickness	
					min	max	min	max
FDPL1.25X4	36 mm	BS 5255	P/E	B (without KM)	36.2	36.5	1.8	2.2
FDPL1.25X3.0X4	36 mm	BS EN 1329-1	P/E	B	36.2	36.5	3.0	3.5
FDPL1.5X4	43 mm	BS 5255	P/E	B (without KM)	42.8	43.1	1.9	2.3
FDPL1.5X3.0X4	43 mm	BS EN 1329-1	P/E	B	42.8	43.1	3.0	3.5
FDPL2X4	56 mm	BS 5255	P/E	B (without KM)	55.8	56.1	2.0	2.4
FDPL2X3.0X4	56 mm	BS EN 1329-1	P/E	B	55.8	56.1	3.0	3.5
FDPL3X5.8	82 mm	BS EN 1329-1	P/E	B	82	82.3	3.0	3.5
FDSL3X5.8	82 mm	BS EN 1329-1	S/S	B	82	82.3	3.0	3.5
FDRL3X5.8	82 mm	BS EN 1329-1	R/R	B	82	82.3	3.0	3.5
FDPL4X5.8	110 mm	BS EN 1329-1	P/E	B	110	110.3	3.2	3.8
FDSL4X5.8	110 mm	BS EN 1329-1	S/S	B	110	110.3	3.2	3.8
FDRL4X5.8	110 mm	BS EN 1329-1	R/R	B	110	110.3	3.2	3.8
FDPL6X5.8B	160 mm	BS EN 1329-1	P/E	B	160	160.4	3.2	3.8
FDSL6X5.8B	160 mm	BS EN 1329-1	S/S	B	160	160.4	3.2	3.8
FDRL6X5.8	160 mm	BS EN 1329-1	R/R	B	160	160.4	3.2	3.8
FDPL6X5.8BD	160 mm	BS EN 1329-1	P/E	BD	160	160.4	4.0	4.6
FDSL6X5.8BD	160 mm	BS EN 1329-1	S/S	BD	160	160.4	4.0	4.6
FDRL6X4X5.8BD	160 mm	BS EN 1329-1	R/R	BD	160	160.4	4.0	4.6
FDPL8X5.8B	200 mm	BS EN 1329-1	P/E	B	200	200.5	3.9	4.5
FDSL8X5.8B	200 mm	BS EN 1329-1	S/S	B	200	200.5	3.9	4.5
FDRL8X5.8	200 mm	BS EN 1329-1	R/R	B	200	200.5	3.9	4.5
FDPL8X5.8BD	200 mm	BS EN 1329-1	P/E	BD	200	200.5	4.9	5.6
FDSL8X5.8BD	200 mm	BS EN 1329-1	S/S	BD	200	200.5	4.9	5.6
FDRL8X4.9X5.8BD	200 mm	BS EN 1329-1	R/R	BD	200	200.5	4.9	5.6
FDPL10X5.8B	250 mm	BS EN 1329-1	P/E	B	250	250.5	4.9	5.6
FDSL10X5.8B	250 mm	BS EN 1329-1	S/S	B	250	250.5	4.9	5.6
FDRL10X5.8B	250 mm	BS EN 1329-1	R/R	B	250	250.5	4.9	5.6
FDPL10X5.8BD	250 mm	BS EN 1329-1	P/E	BD	250	250.5	6.2	7.1
FDSL10X5.8BD	250 mm	BS EN 1329-1	S/S	BD	250	250.5	6.2	7.1
FDRL10X5.8BD	250 mm	BS EN 1329-1	R/R	BD	250	250.5	6.2	7.1
FDPL12X5.8SN4	315 mm	BS EN 1329-1	P/E	B	315	315.6	6.2	7.1
FDRL12X5.8SN4	315 mm	BS EN 1329-1	R/R	B	315	315.6	6.2	7.1



P/E = PLAIN END



S/S = SOLVENT SOCKET



R/R = RUBBER RING



BELOW GROUND UPVC DRAINAGE PIPES BS EN 1401-1 (SUPERCEDES BS4660 & BS5481)

BELOW GROUND DRAINAGE/SEWERAGE PIPES: BS EN1401 - 1:2009

Item Code	Nominal Size DN/OD	Standard	Joints	Type	Mean Outside Dia(D1)		Wall Thickness	
					min	max	min	max
FDRT3x5.8	82 mm	BS EN 1329-1	R/R	SN4	82	82.3	3.0	3.5
FDRT4X5.8	110 mm	BS EN 1401-1	R/R	SN4	110	110.3	3.2	3.8
FDRT4X3.2X5.8SN8	110 mm	BS EN 1401-1	R/R	SN8	110	110.3	3.2	3.8
FDRT6X5.8SN4	160 mm	BS EN 1401-1	R/R	SN4	160	160.4	4.0	4.6
FDRT6X4.7X5.8SN8	160 mm	BS EN 1401-1	R/R	SN8	160	160.4	4.7	5.4
FDRT8X5.8SN4	200 mm	BS EN 1401-1	R/R	SN4	200	200.5	4.9	5.6
FDRT8X5.9X5.8SN8	200 mm	BS EN 1401-1	R/R	SN8	200	200.5	5.9	6.7
FDRT10X5.8SN4	250 mm	BS EN 1401-1	R/R	SN4	250	250.5	6.2	7.1
FDRT10X5.8SN8	250 mm	BS EN 1401-1	R/R	SN8	250	250.5	7.3	8.3
FDPT12X5.8SN4	315 mm	BS EN 1401-1	P/E	SN4	315	315.6	7.7	8.7
FDRT12X5.8SN4	315 mm	BS EN 1401-1	R/R	SN4	315	315.6	7.7	8.7
FDRT12X5.8SN8	315 mm	BS EN 1401-1	R/R	SN8	315	315.6	9.2	10.4
FDPT16X6SN4	400 mm	BS EN 1401-1	P/E	SN4	400	400.7	9.8	11.0
FDRT16X5.8SN4	400 mm	BS EN 1401-1	R/R	SN4	400	400.7	9.8	11.0
FDRT16X5.8SN8	400 mm	BS EN 1401-1	R/R	SN8	400	400.7	11.7	13.1



P/E = PLAIN END



S/ S= SOLVENT SOCKET



R/R = RUBBER RING



FLOWTECH ABOVE GROUND UPVC SOIL & WASTE FITTINGS

Flowtech Above Ground UPVC Soil&Waste Fittings are available in two options: Push Fit joints and solvent Cement Joints

The fittings are available in Light Grey Colour matching the colour of the pipes. The fittings are manufactured as per UK BSI Kite-mark standards.

PUSH FIT FITTINGS

In the Push Fit Joints, the plain end of the pipes or spigot of the fittings can be joined to the push fit fittings using a suitable lubricant.

The Push Fit Joints have a unique sealing system using a retaining ring which includes a rubber ring made of EPDM rubber which offers reliable leak proof joints. This rubber ring takes care of thermal expansion and contraction in the drainage systems. The Push Fit Fittings are easy to install and also easy to dismantle in case any adjustments are required to the system while it helps in easy maintenance during service life.

SOLVENT JOINTS

These fittings are for solvent cement jointing. The plain end of the pipes or spigot end of the fittings can be easily joined with socket end of the fittings by cleaning and applying a suitable solvent cement coat. The strong solvent welded bonds ensure an excellent cleaning and chemical bonding, to withstand the internal pressure in the system.

1 1/4"(36mm), 1 1/2"(43mm)&2"(56mm) pipes and fittings are also available in mUPVC material.

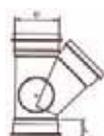
MECHANICAL AND PHYSICAL PROPERTIES

Flowtech UPVC Soil & Waste Fittings are manufactured as per following:

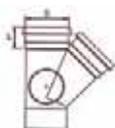
Sr	Characteristics	Requirement	Testing Method
1	Effects of Heating	Depth of crack/de-lamination, blisters<50% wall thickness around injection point	EN 763(Method A)
2	Vicat Softening Temperature(VST)	>79°C	EN 727
3	Water Tightness	No leakage	EN 1053
4	Air Tightness	No leakage	EN 1054
5	Elevated Temperature Cycling(ETC)	No leakage	EN 1055
6	Resistance to internal Pressure	No failure during the test period of 1000 hrs at 60°C, 6.3 MPa	EN 921



ABOVE GROUND UPVC SOIL & WASTE FITTING BS EN 1329-1 (SUPERCEDES BS 5255 & BS 4514)



"Y" 45° Female / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3Y12S	82mm	82	-	26
FLN4Y12S	110mm	110	-	40
FLN6Y12S	160mm	160	-	60
FLN8Y12S	200mm	200	-	61



"Y" 45° Male / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3Y11S	82mm	82	82	26
FLN4Y11S	110mm	110	110	40
FLN6Y11S	160mm	160	160	60
FLN8Y11S	200mm	200	200	61



"Y" 45° Female / Female Access Opening		Rubber Ring		
Code	Size	D	DI	L
FLN3YA12S	82mm	82	-	26
FLN4YA12S	110mm	110	-	40



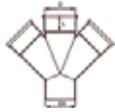
"Y" 45° Male / Female Access Opening		Rubber Ring		
Code	Size	D	DI	L
FLN3YA11S	82mm	82	82	26
FLN4YA11S	110mm	110	110	40



DOUBLE "Y" 45° Female / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3DY12S	82mm	82	-	26
FLN4DY12S	110mm	110	-	40



ABOVE GROUND UPVC SOIL & WASTE FITTINGS BS EN 1329-1 (SUPERCEDES BS 5255 & BS 4514)



DOUBLE "Y" 45° Male / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3DY11S	82mm	82	82	26
FLN4DY11S	110mm	110	110	40

TEE 87.5° Female / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3T12S	82mm	82	-	26
FLN4T12S	110mm	110	-	40
FLN6T12S	160mm	160	-	60
FLN8T12S	200mm	200	-	61

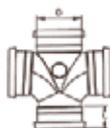
TEE 87.5° Male / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3T11S	82mm	82	82	26
FLN4T11S	110mm	110	110	40
FLN6T11S	160mm	160	160	60
FLN8T11S	200mm	200	200	61

TEE 87.5° Female / Female Access Opening		Rubber Ring		
Code	Size	D	DI	L
FLN3TA12S	82mm	82	-	26
FLN4TA12S	110mm	110	-	40

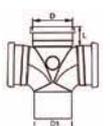
TEE 87.5° Male / Female Access Opening		Rubber Ring		
Code	Size	D	DI	L
FLN3TA11S	82mm	82	82	26
FLN4TA11S	110mm	110	110	40



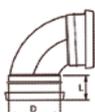
ABOVE GROUND UPVC SOIL & WASTE FITTINGS BS EN 1329-1 (SUPERCEDES BS 5255 & BS 4514)



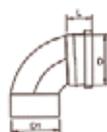
DOUBLE TEE 87.5° Female / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3DT12S	82mm	82	-	26
FLN4DT12S	110mm	110	-	40



DOUBLE TEE 87.5° Male / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3DT11S	82mm	82	82	26
FLN4DT11S	110mm	110	110	40



BEND 87.5° Female / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3B12S	82mm	82	-	26
FLN4B12S	110mm	110	-	40
FLN6B12S	160mm	160	-	60
FLN8B12S	200mm	200	-	61



BEND 87.5° Male / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3B11S	82mm	82	82	26
FLN4B11S	110mm	110	110	40
FLN6B11S	160mm	160	160	60
FLN8B11S	200mm	200	200	61



BEND 87.5° Female / Female Access Opening		Rubber Ring		
Code	Size	D	DI	L
FLN3BA12S	82mm	82	-	26
FLN4BA12S	110mm	110	-	40



ABOVE GROUND UPVC SOIL & WASTE FITTINGS BS EN 1329-1 (SUPERCEDES BS 5255 & BS 4514)



BEND 87.5° Male / Female Access Opening		Rubber Ring		
Code	Size	D	DI	L
FLN3BA11S	82mm	82	82	26
FLN4BA11S	110mm	110	110	40



BEND 45° Female / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3B4512S	82mm	82	-	26
FLN4B4512S	110mm	110	-	40
FLN6B4512S	160mm	160	-	60
FLN8B4512S	200mm	200	-	61



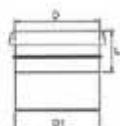
BEND 45° Male / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3B4511S	82mm	82	82	26
FLN4B4511S	110mm	110	110	40
FLN6B4511S	160mm	160	160	60
FLN8B4511S	200mm	200	200	61



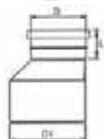
COUPLER DOUBLE SOCKET		Rubber Ring		
Code	Size	D	DI	L
FLN3C12S	82mm	82	-	26
FLN4C12S	110mm	110	-	40
FLN6C12S	160mm	160	-	60
FLN8C12S	200mm	200	-	61



ABOVE GROUND UPVC SOIL & WASTE FITTINGS BS EN 1329-1 (SUPERCEDES BS 5255 & BS 4514)



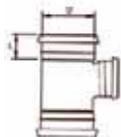
COUPLER SINGLE SOCKET		Rubber Ring		
Code	Size	D	DI	L
FLN3SRC11S	82mm	82	-	26
FLN4SRC11S	110mm	110	-	40
FLN6SRC11S	160mm	160	-	60
FLN8SRC11S	200mm	200	-	61



LEVEL INVERTER TAPER		Rubber Ring		
Code	Size	D	DI	L
FL3X2LI11S	82X56mm	82	56	43
FL4X2LI11S	110X56mm	110	56	43
FLN4X3LI12S	110X82mm	110	82	48
FLN6X4LI12S	160X110mm	160	110	58
FLN8X6LI11S	200X160mm	200	160	60



REDUCER Y Female / Female		Rubber Ring		
Code	Size	D	DI	L
FLN4X3RY12S	110X82mm	110	-	43
FLN6X4RY12S	160X110mm	160	-	60



REDUCER TEE Female / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3X2RT12S	82X56mm	82	-	43
FLN4X2RT12S	110X56mm	110	-	48
FLN4X3RT12S	110X82mm	110	-	48
FLN6X4RT12S	160X110mm	160	-	58



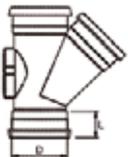
ABOVE GROUND UPVC SOIL & WASTE FITTINGS BS EN 1329-1 (SUPERCEDES BS 5255 & BS 4514)



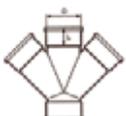
ACCESS PIPE Female / Female		Rubber Ring		
Code	Size	D	DI	L
FLN3AP12S	82mm	82	-	26
FLN4AP12S	110mm	110	-	40
FLN6AP12S	160mm	160	-	42



"Y" 45° Female / Female		Solvent		
Code	Size	D	DI	L
FL1.25Y14	36mm	36	-	18
FL1.5Y14	43mm	43	-	26
FL2Y14	56mm	56	-	28.5
FL3Y14	82mm	82	-	48.5
FL4Y14	110mm	110	-	51
FL6Y14	160mm	160	-	60
FL8Y14	200mm	200	-	61



"Y" 45° Female / Female Access Opening		Solvent		
Code	Size	D	DI	L
FL3YA14S	82mm	82	-	48.5
FL4YA14S	110mm	110	-	51



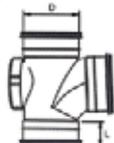
DOUBLE "Y" 45° Female / Female		Solvent		
Code	Size	D	DI	L
FL3DY14	82mm	82	-	48.5
FL4DY14	110mm	110	-	51



ABOVE GROUND UPVC SOIL & WASTE FITTINGS BS EN 1329-1 (SUPERCEDES BS 5255 & BS 4514)



TEE 87.5° Female / Female		Solvent		
Code	Size	D	DI	L
FL1.25T14	36mm	36	-	18
FL1.5T14	43mm	43	-	27
FL2T14	56mm	56	-	30.5
FL3T14	82mm	82	-	48.5
FL4T14	110mm	110	-	51
FL6T14	160mm	160	-	60
FL8T14	200mm	200	-	61



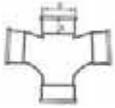
TEE 87.5° Female / Female Access Opening		Solvent		
Code	Size	D	DI	L
FL3TA14S	82mm	82	-	48.5
FL4 TA14S	110mm	110	-	51



BEND 87.5° Female / Female		Solvent		
Code	Size	D	DI	L
FL1.25B14	36mm	36	-	25
FL1.5B14	43mm	43	-	27
FL2B14	56mm	56	-	30.5
FL3B14	82mm	82	-	48.5
FL4B14	110mm	110	-	51
FL6B14	160mm	160	-	60
FL8B14	200mm	200	-	61



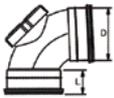
ABOVE GROUND UPVC SOIL & WASTE FITTINGS BS EN 1329-1 (SUPERCEDES BS 5255 & BS 4514)



Double TEE 87.5° Female / Female		Solvent		
Code	Size	D	DI	L
FL3DT14	82mm	82	-	48.5
FL4DT14	110mm	110	-	51



BEND 45° Female / Female		Solvent		
Code	Size	D	DI	L
FL1.25B4514	36mm	36	-	18
FL1.5B4514	43mm	43	-	26
FL2B4514	56mm	56	-	30.5
FL3B4514	82mm	82	-	48.5
FLB45144	110mm	110	-	51
FL6B4514	160mm	160	-	60
FL8B4514	200mm	200	-	61



BEND 87.5° Female / Female Access Opening		Solvent		
Code	Size	D	DI	L
FL3BA14S	82mm	82	-	48.5
FL4BA14S	110mm	110	-	51



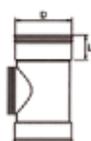
COUPLER / SOCKET		Solvent		
Code	Size	D	DI	L
FL1.25C14	36mm	36	-	18
FL1.5C14	43mm	43	-	27
FL2C14	56mm	56	-	30.5
FL3C14	82mm	82	-	48.5
FL4C14	110mm	110	-	51
FL6C14	160mm	160	-	60
FL8C14	200mm	200	-	61



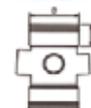
ABOVE GROUND UPVC SOIL & WASTE FITTINGS BS EN 1329-1 (SUPERCEDES BS 5255 & BS 4514)



ACCESS PLUG & CAP		Solvent		
Code	Size	D	DI	L
FL1.25AGS	36mm	-	36.2	-
FL1.5AGS	43mm	-	43	-
FL2AGS	56mm	-	56	-
FL3AGS	82mm	-	82	-
FL4AGS	110mm	-	110	-
FL6AGS	160mm	-	160	-
FL8AGS	200mm	-	200	-



ACCESS PIPE Female / Female		Solvent		
Code	Size	D	DI	L
FL3AP14S	82mm	82	-	43
FL4AP14S	110mm	110	-	48
FL6AP14S	160mm	160	-	58



BOSS PIPE Female / Female		Solvent		
Code	Size	D	DI	L
FL4P14	110mm	110	-	51



VENT COWL		Solvent		
Code	Size	D	DI	L
FL2VC	56mm	56	-	-
FL3VC	82mm	82	-	-
FL4VC	110mm	110	-	-
FL6VC	160mm	160	-	-



ABOVE GROUND UPVC SOIL & WASTE FITTINGS BS EN 1329-1 (SUPERCEDES BS 5255 & BS 4514)



REDUCER BUSH		Solvent		
Code	Size	D	DI	L
FL1.5X1.25RB	43X36mm	43	36	26
FL2X1.5RB	56X43mm	56	43	27
FL3X2RB	82X56mm	82	56	43
FL4X2RB	110X56mm	110	56	48
FL4X3RB	110X82mm	110	82	48
FL6X4RB	160X110mm	160	110	58



REDUCER TEE Female / Female		Solvent		
Code	Size	D	DI	L
FL4X3RT14	110X82mm	110	-	48
FL6X4RT14	160X110mm	160	-	58



REDUCER "Y" Female / Female		Solvent		
Code	Size	D	DI	L
FL4X3RY14	110X82mm	110	-	43
FL6X4RY14	160X110mm	160	-	60



PATCH BOSS ADAPTOR		Solvent		
Code	Size	D	DI	L
FL4X2CO14S	110X56mm	110	56	48
FL6X2CO14S	160X56mm	160	56	58



ABOVE GROUND UPVC SOIL & WASTE FITTINGS BS EN 1329-1 (SUPERCEDES BS 5255 & BS 4514)



FEMALE / FEMALE THREAD BEND 90°		Solvent		
Code	Size	D	DI	L
FL1.5B9014	43X1 1/2" BSP	43	1 1/2" BSP	27



FLOOR TRAP		Solvent			
Code	Size	D	D1	L	Seal
FL4X3X2FT70S	110X82X56mm	110	82/56	182	70
FL4X3X1.50FT70S	110X82X43mm	110	82/43	182	70
FL110X82X56FT50S	110X82X56mm	110	82/56	135	50
FL110X82X43FT50S	110X82X43mm	110	82/43	135	50



FEMALE THREAD SOCKET		Solvent		
Code	Size	D	DI	L
FL1.5FSO14	43X1 1/2" BSP	43	1 1/2" BSP	27



END CAP		Solvent		
Code	Size	D	DI	L
FL1.25EC	36mm	36	-	18
FL1.5EC	43mm	43	-	25
FL2EC	56mm	56	-	27
FL3EC	82mm	82	-	43
FL4EC	110mm	110	-	48
FL6EC	160mm	160	-	58
FL8EC	200mm	200	-	60



AC CONVERTER / ADAPTOR		Solvent		
Code	Size	D	DI	L
FL43x1RB	43mmX1" HP class E	43	33.5	21
FL56X1RB	56mmx1" HP class E	56	33.5	21



BELOW GROUND UPVC DRAINAGE PIPES BS EN 1401-1 (SUPERCEDES BS 4660 & BS 5481)



Y" 45° Female / Female		Rubber Ring		
Code	Size	D	DI	L
FRN3Y22S	82mm	82	-	25
FRN4Y22S	110mm	110	-	40
FRN6Y22S	160mm	160	-	60
FRN8Y22S	200mm	200	-	61



"Y" 45° Male / Female		Rubber Ring		
Code	Size	D	DI	L
FRN3Y21S	82mm	82	-	25
FRN4Y21S	110mm	110	-	40
FRN6Y21S	160mm	160	-	60
FRN8Y21S	200mm	200	-	61



DOUBLE Y" 45° Female / Female		Rubber Ring		
Code	Size	D	DI	L
FRN3DY22S	82mm	82	-	26
FRN4DY22S	110mm	110	-	40



DOUBLE Y" 45° Male / Female		Rubber Ring		
Code	Size	D	DI	L
FRN3DY21S	82mm	82	-	26
FRN4DY21S	110mm	110	-	40



TEE 87.5° Female / Female		Rubber Ring		
Code	Size	D	DI	L
FRN3T22S	82mm	82	-	26
FRN4T22S	110mm	110	-	40
FRN6T22S	160mm	160	-	60
FRN8T22S	200mm	200	-	61



BELOW GROUND UPVC DRAINAGE PIPES BS EN 1401-1 (SUPERCEDES BS 4660 & BS 5481)



TEE 87.5° Male / Female		Rubber Ring		
Code	Size	D	DI	L
FRN3T21S	82mm	82	-	26
FRN4T21S	110mm	110	-	40
FRN6T21S	160mm	160	-	60
FRN8T21S	200mm	200	-	61



P-TRAP BASE		Solvent		
Code	Size	D	DI	L
FR4PT13	110mm	110	110	48



DOUBLE TEE 87.5° Female / Female		Rubber Ring		
Code	Size	D	DI	L
FRN3DT22S	82mm	110	110	40
FRN4DT22S	110mm	110	110	40



DOUBLE TEE 87.5° Male / Female		Rubber Ring		
Code	Size	D	DI	L
FRN3DT21S	82mm	110	110	40
FRN4DT21S	110mm	110	110	40



BEND 87.5° Female / Female		Rubber Ring		
Code	Size	D	DI	L
FRN3B22S	82mm	82	-	26
FRN4B22S	110mm	110	-	40
FRN6B22S	160mm	160	-	60
FRN8B22S	200mm	200	-	61





BELOW GROUND UPVC DRAINAGE PIPES BS EN 1401-1 (SUPERCEDES BS 4660 & BS 5481)



BEND 87.5° Male / Female		Rubber Ring		
Code	Size	D	DI	L
FRN3B21S	82mm	82	-	26
FRN4B21S	110mm	110	-	40
FRN6B21S	160mm	160	-	60
FRN8B21S	200mm	200	-	61



BEND 45° Female / Female		Rubber Ring		
Code	Size	D	DI	L
FRN3B4522S	82mm	82	-	26
FRN4B4522S	110mm	110	-	40
FRN6B4522S	160mm	160	-	60
FRN8B4522S	200mm	200	-	61



BEND 45° Male / Female		Rubber Ring		
Code	Size	D	DI	L
FRN3B4521S	82mm	82	-	26
FRN4B4521S	110mm	110	-	40
FRN6B4521S	160mm	160	-	60
FRN8B4521S	200mm	200	-	61



COUPLER / DOUBLE SOCKET		Rubber Ring		
Code	Size	D	DI	L
FRN3C22S	82mm	82	-	26
FRN4C22S	110mm	110	-	40
FRN6C22S	160mm	160	-	60
FRN8C22S	200mm	200	-	61



BELOW GROUND UPVC DRAINAGE PIPES BS EN 1401-1 (SUPERCEDES BS 4660 & BS 5481)



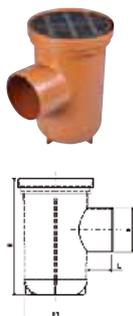
P-TRAP		Rubber Ring		
Code	Size	D	DI	L
FRN4PTR22S	110mm	110	110	85



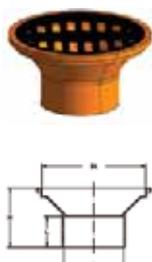
REDUCER Y Female / Female		Rubber Ring		
Code	Size	D	DI	L
FRN4X3RY22S	110X82mm	110	110	85
FRN6X4RY22S	160X110mm	200	-	60



160 X110 DIA BOTTLE GULLY TRAP WITH OPTIONAL BAC K INLETS & CIRCULAR GRID			Rubber Ring		
Code	D	D1	D2	H	L
FRN6X4GTRS	110	50	160	268	51



160 X110 DIA BOTTLE GULLY TRAP, ROUND BOTTOM & CIRCULAR GRID					
Code	D	D1	D2	H	L
FR6X4BGS	110	160	160	290	61.5



110 DIA ROUND HOPPER WITH GRID			
D	D1	H	L
110	190	110	45



DRAINAGE DESIGN PRINCIPLES

The European Standard EN 12056-2 has the status of a British Standard Gravity drainage systems inside buildings.

The BS EN 12056 is made up of the following 5 parts

- Part 1: General and performance requirement
- Part 2: Sanitary pipework ,layout and calculation
- Part 3: Roof drainage, layout and calculation
- Part 4: Wastewater lifting plants,layout ad calculation
- Part 5: Installation and testing instructions for operation,maintenance and use

Part 2 gives guidance on the minimum design requirement for internal building sanitary drainage system. The Standard highlights four types of drainage system:

1. Single stack system with partly filled branch discharge pipes
 - Sanitary appliances connected to partly filled branch discharge pipes are designed with a filling degree of 0.5 (50 %) and are connected to a single discharge stack
2. Single discharge stack with small bore discharge branch pipes
 - Sanitary appliances are connected to small discharge pipes. The small bore discharge pipes are designed with a filling degree of 0.7 (70 %) and are connected to a single discharge stack
3. Single stack system with full bore branch discharge pipes
 - Sanitary appliances are connected to full bore discharge pipes. The full bore branch discharge pipes are designed with a filling degree of 1.0 (100 %) and each branch discharge pipe is separately connected to a single discharge stack
4. Separate discharge stack system
 - Drainage system type 1,2 and 3 may also be divided into black water stack serving WCs and Urinals, and a Grey water stack serving other appliances Double Stack - 110 mm Soil pipe & 110 mm Waste pipe
 - Three Pipe System - 110 mm soil pipe / 110 mm vent pipe / 110 mm waste water
5. For Buildings less than 20 stories height,Appliances located on Ground Floor shall NOT be connected to vertical stack discharging at GR Level
6. For Buildings greater than 20 stories height,Appliances located on Ground Floor and 1st Floor, shall NOT be connected to vertical stack discharging at GR Level
7. For all bends that are at base of stack, provide a 45 or 90 Degree Long Radius type Bends.

DRAINAGE PIPE'S STRUCTURAL DESIGN

The structural performance of u PVC pipes is assessed as the ability of the pipe to resist deformation under soil and traffic loads. The accepted long- term limit for deformation is 6 % of the vertical diameter,and is determined for the particular pipe according to its loading installation conditions.

DRAINAGE PIPE'S FLEXIBILITY

The PVC pipes themselves are flexible. However ,where part of the pipe is embedded in concrete (e.g. at a manhole) an additional flexibility should be provided by the use of two R/R Sockets with 600 mm long rocker pipe piece in between ,placed very close to the concrete face,which will help offset the ground settlements around the civil structure in future.

The drainage pipes with R/R push fit joints , themselves will stand cold bending to a radius of 250 X pipes Dia, as each R/R pipe joint can absorb 2 ½ Degree linear angular deflection in the line.



VENTILATION SYSTEM

All drainage pipework system are full of air until an appliance is discharged ;once this occurs ,the air within the pipework fluctuates. These pressure fluctuations,if not balanced ,can adversely affect the water trap seals;therefore ,to limit pressure fluctuations,vent piping is traditionally employed. Vent pipes from manholes and vertical stacks shall be extended 2 meters above the roof & the end of which shall be fitted with vent cowls.

GENERAL GUIDELINE FOR THE SIZING OF VENTILATING PIPES AND STACK.

Size of branch discharge pipe or discharge stack dia "D"	Size of branch ventilating pipe of stack
Smaller than 75 mm Dia	2/3 D (25 mm min)
Dia of 75 mm and above	½ D

DESIGN RECOMMENDATIONS FOR SINGLE STACK PLUMBING

	Bath	Wash basin	Sink	W.C.
Trap	P	P	P	S or P
Depth of Seal	Minimum 75mm (3")	Minimum 75mm (3")	Minimum 75mm (3")	Minimum 50 mm (2")
Height of Appliance	0.622m (2'01/2")	0.787m (2'7")	0.900m (3'0")	0.406m (16")
Height of Trap Outlet Angle of Outlet	140mm (5") (21/2°)	521mm (1'81/2") (21/2°)	546mm (1'91/2") (21/2°)	190mm (71/2")
Pipe Min. size	40mm (1 1/2")	32mm (1 1/4")	40mm (1 1/2")	75mm (3") & 102mm (4")
Maximum Length	3m	1.7m	3m	6m
Recommended Fall	Between 1° and 5°	Between 1° and 5°	Between 1° and 5°	Minimum 1°
Connection to Main Stack	No connection within area 200mm (8") below the intersection of the centre lines of branch		Preferably via Boss Pipe with expansion joint	Branch should have a swept entry
Notes	Flat bottom tends to trickle fill Trap	With the exception of heights this data can be used for bidet	Flat bottom tends to trickle fill Trap	75mm usual (3") syphonic

DISCHARGE UNIT VALUES AND FLOW RATES FOR COMMON APPLIANCES

Type of appliance	Frequency of use, min	Discharge units
WC (9 litres)	20	7
	10	14
	5	28
Wash basin	20	1
	10	3
	5	6
Spray tap basin*	- Add 0.06 litre/s per tap	
Bath	75 (domestic)	7
	30 (commercial and congested)	18
Shower	- Add 0.06 litre/s per tap	
Washing Mashine (automatic)	250	4
Sink	20	6
	10	14
	5	27
Urinal (per person) One group consisting of one WC, one bath, one or two basins and one sink	+20 (commercial and congested)	0.3 14



* Some proportion of the total may be assumed to be insimultaneous operation if considered appropriatet
Frequency of flushing of automatic flushing cistern.

NOTE: Unless otherwise stated, the frequencies given above represent the following:

- 20min corresponds to peak domestic use,
- 10 min corresponds to peak commercial use,
- 5 min corresponds to congested use in public toilets, schools, etc.

MAXIMUM CAPACITY AND NUMBER OF DISCHARGE UNITS FOR VERTICAL STACKS

Size, mm	Approximate capacity of stack, l/s	Approximate number of discharge units
50	1.2	10*
65	2.1	60*
75	3.4	200t
90	5.3	350
100	7.2	750
125	13.3	2500
150	22.7	5500

* No WCs. t Not more than one siphonic WC with a 75mm outlet

NOTE: Ventilating stacks may be required and sizes are shown on page 29.

MAXIMUM NUMBER OF DISCHARGE UNITS ALLOWED ON BRANCH DISCHARGE PIPES

Size, mm	Gradient 1/2° (9mm/m)	11/4° (22mm/m)	11/4° (45mm/m)
32	-	1	1
40	-	2	8
50	-	10	26
65	-	35	95
75	-	100	230
90	120	230	460
100	230	430	1050
125	780	1500	3000
150	2000	3500	7500

RODDING EYES / ACCESS POINTS

It is essential that adequate provision is made for the testing and maintenance of the above-ground drainage system. Suitable accessibility via access covers, plugs and caps should be provided to enable all traps, discharge pipes and stack to be tested, cleaned and cleared of any obstructions as and when necessary.

Access points must be air and water tight, quick and easy to remove & fully accessible to facilitate cleaning.

RODDING EYES / ACCESS POINTS SHOULD BE LOCATED:

- Access points should be carefully sited to allow the service entry for cleaning and testing
- At the base of all soil and waste stacks above the spill-over level of the highest connection on a branch run, typically 1200 mm above finished floor level
- At every change of direction, on vertical stacks and horizontal pipe runs
- At regular intervals on long horizontal runs typically
 - at 15m interval on pipework up to 110 mm
 - at 24 m intervals on pipework 160 mm and above
- where more than 1 WC is connected to a branch
- All vertical stack shall be provided with Rodding Eye at junction on every floor
- The size of the Rodding points within a building should generally be the same size as the pipework, up to 160 mm & for larger pipework 160 mm Rodding point should be adequate.



AIR TEST

- The length of drain or sewer to be tested including any connections should be effectively plugged.
- Air is then pumped into the test length by suitable means (e.g. hand pump) until pressure of 100 mm of water is indicated on the manometer connected to the system.
- A suitable time should be allowed for stabilization of air temperature.
- The air pressure should not fall below 75 mm of water during a period of five minutes, without further pumping

WATER TEST

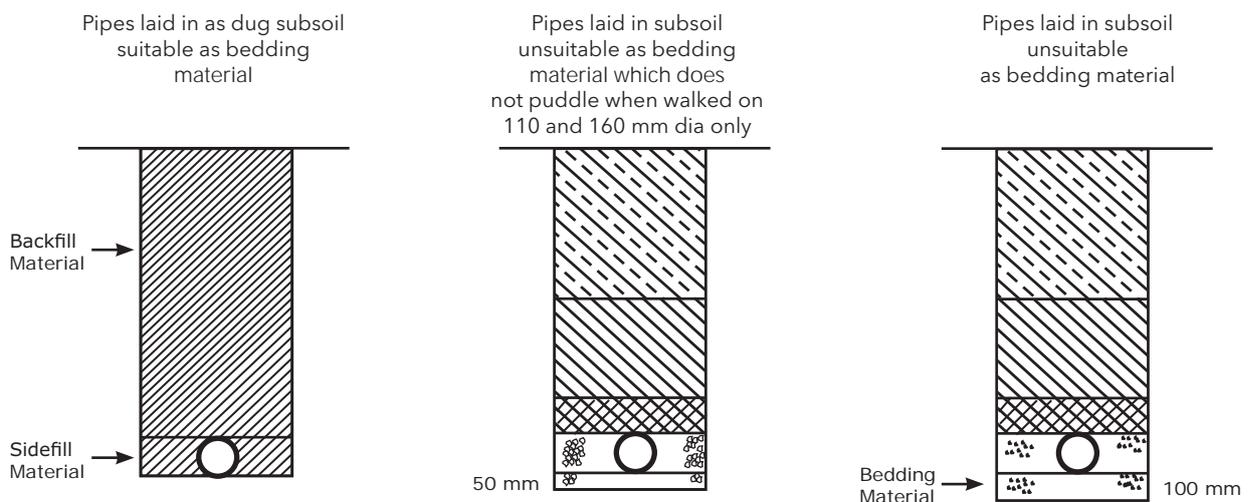
- Suitable strutted testing plugs are inserted at the lower end of the drain or sewer and at the head of any connections.
- A suitable bend together with a vertical length of pipe is fitted at the head of the sewer or drain to provide the necessary test head. The system is then filled with water
- A test pressure of 1.5 m head above the crown of the pipe is applied at the higher end of the drain or sewer ensuring that the resultant head at the lower end does not exceed 4 m. Where gradient are steep, it may be necessary to test in sections to avoid exceeding this figure.
- The sewer or drain under test should be left filled with water for 1-2 hours.
- The loss of water over a period of 30 minutes should be measured, by adding known quantities of water every 10 minutes to maintain the original level in the stand pipe. The loss of water should not exceed the equivalent 1 litre / hour / linear meter / meter of nominal diameter. The source of any leakage should be visible and the defective part of the work should be removed and made good.
- During the water test, strutting precautions should be taken to prevent any movement of the drain or sewer.

DRAINAGE PIPES INSTALLATIONS BELOW GROUND TRENCH PREPARATION

The trench should not be excavated too far in advance of pipe laying and should be back filled as soon as possible.

Trench width should be as narrow as practicable but not less than the pipe OD+300 mm to enable proper compaction of sidefill. Trench sides should be correctly supported.

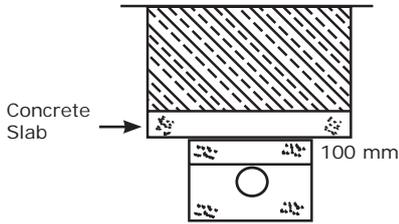
Pipes laid at depths greater than 900 mm cover in roads, 600 mm in fields



Suitable material - granular material in accordance with BS5955 Part 6 : 1980 Appendix A maximum particle size - 10 mm (110 dia), 14 mm (160 dia), 20 mm (200 dia +)



Pipes laid at depths less than 900 mm cover in roads,600 mm in fields



Note: Concrete surround,pipes may be protected at shallow depths using a 150 mm thick concrete surround with allowance for flexibility at pipe joints using compressible boards which should be equal in size to the concrete cross section

- As dug back fill / side-fill maximum particle size 10 mm (110 dia) 14 mm (160 mm) 20 mm (200 mm dia and over)
- 10 mm single - sized aggregate (complying with BS 882)
- NB - Where back fill above pipe contains stones greater than 40 mm or cover to pipe exceeds 2m in poor ground extend the bedding material to 100 mm above the pipe crown
- 300 mm back fill free from stones greater than 40 mm(unless granular material extends 100 mm above pipe - see above)
- As dug back fill

Granular material in accordance with BS5955 part 6 1980 : table 2	
Pipe dia (mm)	Material (complying with BS 882) mm
110	10 , single sized
160	10, 14 single sized, 14-5 graded
200	10, 14, 20 single sized, 14 -5, 20-5 graded

RECOMMENDED CONSTRUCTION AND BEDDING

The following recommendations should be adopted when laying in the situations listed

LOCATION	DEPTH TO CROWN OF PIPE	BEDDING MATERIAL	BEDDING DETAILS
Fields Gardens (elsewhere than under roads)	0.6 meters to 6.0 meters	Excavated material with C.F. Value not greater than 0.3 or Imported granular material	As Fig 1. Fig 2 ,or Fig 3
Fields Gardens (elsewhere than under roads)	Less than 0.6 meters	Construction as detailed in Fig.4	Fig.4
Under Roads	Less than 0.9 meters (below final surface)	Construction as detailed in Fig.4	Fig.4
Under Roads	0.9 meters to 1.2 meters (below final surface)	Excavated material with C.F. Value not greater than 0.15 or Imported granular materia	As Fig 1. Fig 2 ,or Fig 3
Under Roads	1.2 meters to 6.0 meters (below final surface)	Excavated material with C.F. Value not greater than 0.3 or Imported granular material	As Fig 1. Fig 2 ,or Fig 3



These requirements apply to trenches in stable soils. In less stable soils, i.e. soft clays, silts or fine sands, it may be desirable to double the thickness of granular bedding and surround given in Figures 1 to 3 and extra care should be taken in compaction.

AVERAGE QUANTITIES OF SOLVENT CEMENT, CLEANER AND LUBRICANT REQUIRED FOR U PVC PIPE JOINTS USING 500 ML CONTAINERS

SOLVENT CEMENT		SOLVENT CLEANER		LUBRICANT	
SIZE OF PIPE	QTY (500 ML)	SIZE OF PIPE	QTY (500 ML)	SIZE OF PIPE	QTY (500 ML)
1 1/4" / 36 mm	86	1 1/4" / 36 mm	57.35	1 1/4" / 36 mm	0
1 1/2" / 43 mm	62	1 1/2" / 43 mm	41.35	1 1/2" / 43 mm	0
2" / 56 mm	38	2" / 56 mm	25.35	2" / 56 mm	0
2 1/2" / 75 mm	24	2 1/2" / 75 mm	16	2 1/2" / 75 mm	0
3" / 82 mm	17	3" / 82 mm	11.35	3" / 82 mm	44
4" / 110 mm	10	4" / 110 mm	6.7	4" / 110 mm	39
6" / 160 mm	4.5	6" / 160 mm	3	6" / 160 mm	22
8" / 200 mm	2.6	8" / 200 mm	1.75	8" / 200 mm	16
10" / 250 mm	1.7	10" / 250 mm	1.15	10" / 250 mm	11
12" / 315 mm	1.2	12" / 315 mm	0.8	12" / 315 mm	9
16" / 400 mm	0.7	16" / 400 mm	0.5	16" / 400 mm	6

TYPICAL APPLIANCES OUTLET SIZES

WC	- 110 mm / 4 "
W H Basin	- 36 mm / 1 1/4"
Kitchen Sink	- 43 mm / 1 1/2"
Floor Drain	- 82 mm / 3"
Bath Tub / Shower	- 42 mm / 1 1/2"
Washing Machine	- 43 mm / 1 1/2"
Balcony Drain	- 56 mm / 2"

STACK SIZES SHALL BE AS FOLLOWS UPTO (G+7) STORY BLDGS

Soil Pipes	- 110 mm
Waste Pipes	- 110 mm
Vent Pipes	- 82 mm
Rain Water Pipes	- 110 mm
Balcony Drain Pipes	- 56 mm
A/C Drain Pipes	- 36 mm



STACK SIZES SHALL BE AS FOLLOWS ABOVE (G+7) STORY BLDGS

Soil Pipes	- 160 mm
Waste Pipes	- 160 mm
Vent Pipes	- 110 mm
Rain Water Pipes	- 110 mm
Balcony Drain Pipes	- 56 mm
A/C Drain Pipes	- 36 mm
Balcony Drain	- 56 mm / 2"

RAIN WATER DRAINAGE

The drainage of Roofs & Paved areas shall be according to BS 6367

Rain water pipes are not to be connected to sewer lines, they shall free discharge above ground

All O.T.S. S (4x4 M & less) should have floor traps for rainwater connected to the nearest Gully traps or Waste stack.

Other O.T.S. S shall have RW drain for rain water which is free discharge to outside

For all air well, Access doors should be provided at the lower level of well

TRAPS

Traps should be designed to ensure that

- deposits do not accumulate
- they are fully accessible, and capable of being removed / dismantled
- they are attached immediately beneath its outlet, or as close as possible
- there is no reduction in cross - sectional area
- they are self cleansing
- there is no more than one-trap on the discharge pipe work from any pipework

MINIMUM DEPTH OF TRAP SEALS

- 75 mm - WHB, SINK, BIDETS , FLOOR GULLY, URINAL, WM, DW
- 50 mm - SHOWER, BATH, WC.

THERMAL EXPANSION / MOVEMENT

All pipework materials will expand and contract with changes in temperature, both from atmospheric ambient temperature and from the temperature of the waste discharge through the pipework.

- It is necessary to Calculate the theoretical thermal movement distances to allow the pipework system to be designed to accommodate expansion, and Determine where the expansion joints are required and anchor these location to the structure. The remaining pipework must be adequately supported and allowed to move freely.

CHANGE IN PIPE LENGTH CAN BE CALCULATED FROM THE FOLLOWING FORMULA

$$\Delta L = a \times L \times \Delta T$$

Where

ΔL = Change in length (mm)

a = Coefficient of linear expansion = 0.08 mm/M/Deg.C

ΔT = Change in temperature (Deg.C)

L = Total Pipe length in Meters



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