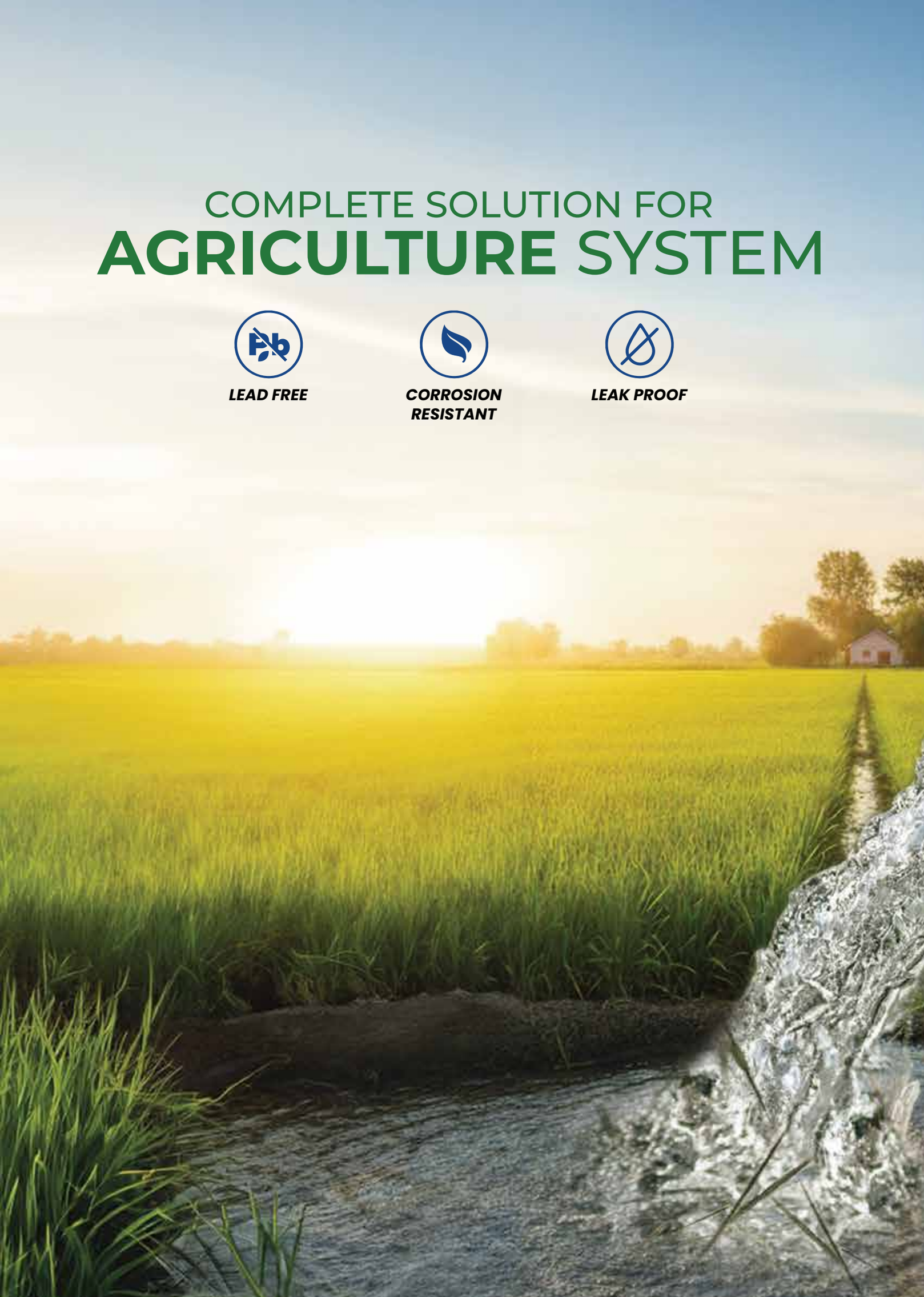
MARKED PIPES & FITTINGS

SKIPPER PIPES

INDIA'S SAFEST PIPES

PROGRESS IN THE PIPELINE

Precision in Every Joint, Excellence in Every Flow


COMPLETE SOLUTION FOR
AGRICULTURE SYSTEM
Pb
LEAD FREE
CORROSION RESISTANT
LEAK PROOF

SKIPPER
PIPES

ABOUT UPVC

uPVC stands for Unplasticized Polyvinyl Chloride, a rigid, durable, long lasting and low-maintenance material widely use.

uPVC pipes have several benefits as below

Durability: Resistant to rust, rot, and wear, ensuring a long lifespan.

Low Maintenance: Smooth surface reduces bacterial growth and contamination.

Flexibility: Can withstand extreme movement and bending, making them suitable for earthquake-prone areas.

Versatility: Commonly used for:

- Cold water applications
- Plumbing
- Water supply
- Underground drainage
- Sewage lines

These properties make uPVC pipes a popular choice for various applications.

PHYSICAL PROPERTIES

Density [g/cm^3]	1.3 - 1.45
Thermal conductivity [w/(m.k)]	0.14 - 0.28
Yield strength [MPa]	31 - 60
Young's modulus [psi]	4,90,000
Flexural strength (yield) [psi]	10,500
Compression strength [psi]	9500
Coefficient of thermal expansion (linear) [mm(mm ^oC)]	5 x 10^{-5}
Vicat B [°C]	>83°C
Resistivity[Ωm]	1016
Surface resistivity [Ω]	10^{13} - 10^{14}

FIRE RESISTANT

Skipper uPVC pipes have

Fire-Resistant Properties: Self-extinguishing and don't support combustion

High Limiting Oxygen Index (LOI): Requires 45% oxygen to burn, making it difficult to ignite.

Safe for Buildings: Ideally suited for use in buildings and houses due to its fire-resistant properties.

This makes uPVC pipes & fittings a reliable choice for various applications.

Material	Limit Oxygen Index
Cotton	16 - 17
Polypropylene (PP)	18
Polyethylene (PE)	18
Wood	20
Atmospheric content of OXYGEN	21
uPVC	45
CPVC	60

FEATURES

Skipper is a trusted brand for plumbing solutions, offering several benefits & following are the Key Features:

Lead-Free: Skipper u-PVC leadfree Pipes and fittings made from a special lead-free compound, ensuring safe drinking water.

Antimicrobial Protection: Skipper Upvc leadfree Pipes and fittings advanced silver ion technology inhibits microbial growth, providing cleaner and safer water flow.

UV Resistance: Skipper Upvc leadfree Pipes and fittings Resistant to ultraviolet degradation, ensuring long-term durability.

Fire Safety: Skipper Upvc leadfree Pipes and fittings Self-extinguishing and doesn't support combustion, with a highLimiting Oxygen Index (LOI) of 45.

Safe for Drinking Water: Skipper Upvc leadfree Pipes and fittings Free from toxins, Odors, and tastes, making it ideal for potable water applications.

Easy Installation: Skipper Upvc leadfree Pipes and fittings Features a self-alignment system, ensuring precise fitting alignment and 100% leak-proof joints.

Cost-Effective: Skipper Upvc leadfree Pipes and fittings Lightweight, reducing material and installation costs.

Maintenance Free: Skipper Upvc leadfree Pipes and fittings are not rust, pit, scale, promote build-up on the system interior Trouble-free service can be expected from these pipe & fittings.

Strong and Durable: Skipper Upvc leadfree Pipes and fittings are highly resilient, tough and durable products have high tensile and high-impact.Strong and resistant to chemical attack, corrosion, and weathering strength. It can withstand High pressure for long periods.

Excellent Chemical Resistance: Skipper Upvc leadfree Pipes and fittings are inert to attack by a wide variety of strong acids, alkalis, salt solutions, alcohols and many other chemicals. They do not react with materials carried, nor act as a catalyst.

Low thermal conductivity: Skipper Upvc leadfree pipes and fittings have a much lower thermal conductivity factor than metal pipes. This ensures that fluids maintain a constant temperature.

Toxicity, Odours, Tastes: Skipper Upvc lead free pipes and fittings are non-toxic, odourless and tasteless.

PROPERTIES OF SKIPPER AGRI PIPE

General

Physical properties of uPVC pipe	Value	Test Method
Cell classification	**12454**	**ASTMD1784**
Maximum service temperature	140°F/60°C	-
Colour	White	-
Water Absorption % increase 24 hrs @ 25°C	0.05	ASTM D570
Rockwell hardness	110-120	ASTM D785
Poisson's Ratio @ 73°F	0.41	-
Hazen Williams factor	C=150	-

Mechanical

Physical properties of uPVC pipe	Value	Test Method
Specific gravity	**1.45 / 1.47**	**ASTM D792**
Tensile strength, psi @ 73°F	7,450	ASTM D638
Modulus of elasticity, psi @ 73°F (tensile modulus)	4,20,000	ASTM D638
Flexural strength, psi @ 73°F	14,450	ASTM D790
Compressive strength, psi @ 73°F	9,600	ASTM D695
Izod impact, ft-lb./in @ 73°F	0.75	ASTM D256

Thermal

Physical properties of uPVC pipe	Value	Test Method
Coefficient of linear expansion (in/in/°F)	**2.9×10^{-5}**	**ASTM D696**
Coefficient of thermal conductivity (BTU/hr/ft^2/°F/in)	1.02	ASTM C177
Heat deflection temperature °F @ 264 psi	170	ASTM D648
Specific heat, Cal/g/°C	0.25	ASTM D2766

Electrical

Physical properties of uPVC pipe	Value	Test Method
Dielectric strength, V/mil	**1,413**	**ASTM D149**
Dielectric Constant, 60Hz, 30°F	3.7	ASTM D150
Volume resistivity, W/cm @ 95°C, ohms/cm	1.2×10^{12}	ASTM D257

Flammability

Physical properties of uPVC pipe	Value	Test Method
Flammability rating	**V-0**	**UL94**
Flammability index	<10	
Flame spread	0-25	ULC S102.2
Flash ignition temperature	730°F	ASTM D1929
Average time of burning (sec.)	<5	ASTM D635
Average extent of burning	<10(mm)	ASTM D635
Burning rate (in/min)	Self Extinguishing	ASTM D635
Softening starts (approx)	250°F/121°C	-
Material becomes viscous	350°F/176°C	-
Material carbonizes	425°F/218°C	-
Smoke generation	80-225	ULC S102.2

Pipes: 20 to 315 mm - Fittings: 32 to 200 mm

Pipes				Fittings		
Size (mm)	**Working Pressure (Kg/cm^2)**	**Standard**	**End Connection**	**Size (mm)**	**Working Pressure (Kg/cm^2)**	**Standard**
20 to 315	2.5, 4, 6, 8, & 10.0	IS 4985:2001	Solvent Joint	32 to 200	4, 6 & 10	IS 7834 (part-1): 1987

FEATURES AND BENEFITS

- Light weight, easy to transport, store, handle and install.
- Smooth bore ensures higher flow compared to G.I pipes and fittings of the same size. Saves operational cost
- Solvent cement joint for quick installation.
- Corrosion resistance,
- UPVC is rustproof material therefore bore diameter remains constant, ensuring constant flow over a lifetime.
- Long working life (if operated under normal/ recommended working conditions)
- Cost effective
- Added value for your money
- Excellent Resistance to Chemical
- Excellent self Clinging Velocity
- Superior Mechanical Strength

Dimensions of Skipper Agri Pipes

Dimensions as per IS 4985 - Class 3 (6Kgf/cm2)

Size	Wall Thickness			
	Minimum (mm)	Maximum (mm)	Minimum (mm)	Maximum (mm)
40	40	40.30	1.40	1.80
50	50	50.30	1.70	2.10
63	63	63.30	2.20	2.70
75	75	75.30	2.60	3.10
90	90	90.30	3.10	3.70
110	110	110.40	3.70	4.30
125	125	125.40	4.30	5.00
140	140	140.50	4.80	5.50
160	160	160.50	5.40	6.20
180	180	180.60	6.10	7.10
200	200	200.60	6.80	7.90
225	225	225.70	7.60	8.80
250	250	250.80	8.50	9.80
315	315	316.00	10.70	12.40

Dimensions of Skipper Agri Pipes

Nominal Outside Diameter (Nominal Size)	Mean Outside Diameter		Wall Thickness												Mean Socket Internal Diameter of Mid Point of Socket Length	
			Class 1 0.25 MPa 2.5 Kg/cm^2		Class 2 0.40 MPa 4.0 Kg/cm^2		Class 3 0.60 MPa 6.0 Kg/cm^2		Class 4 0.80 MPa 8.0 Kg/cm^2		Class 5 1.00 MPa 10.0 Kg/cm^2		Class 6 1.25 MPa 12.5 Kg/cm^2			
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
20	20.0	20.3	-	-	-	-	-	-	-	-	1.1	1.5	1.4	1.8	20.1	20.3
25	25.0	25.0	-	-	-	-	-	-	1.2	1.6	1.4	1.8	1.7	2.1	25.1	25.3
32	32.0	32.3	-	-	-	-	-	-	1.5	1.9	1.8	2.2	2.2	2.7	32.1	32.3
40	40.0	40.3	-	-	-	-	1.4	1.8	1.8	2.2	2.2	2.7	2.8	3.3	40.1	40.3
50	50.0	50.3	-	-	-	-	1.7	2.1	2.3	2.8	2.8	3.3	3.4	4.0	50.1	50.3
63	63.0	63.3	-	-	1.5	1.9	2.2	2.7	2.8	3.3	3.5	4.1	4.3	5.0	63.1	63.3
75	75.0	75.3	-	-	1.8	2.2	2.6	3.1	3.4	4.0	4.2	4.9	5.1	5.9	75.1	75.3
90	90.0	90.3	1.3	1.7	2.1	2.6	3.1	3.7	4.0	4.6	5.0	5.7	6.1	7.1	90.1	90.3
110	110.0	110.4	1.6	2.0	2.5	3.0	3.7	4.3	4.9	5.6	6.1	7.1	7.5	8.7	110.1	110.4
125	125.0	125.4	1.8	2.2	2.9	3.4	4.3	5.0	5.6	6.4	6.9	8.0	8.5	9.8	125.1	125.4
140	140.0	140.5	2.0	2.4	3.2	3.8	4.8	5.5	6.3	7.3	7.7	8.9	9.5	11.0	140.2	140.5
160	160.0	160.5	2.3	2.8	3.7	4.3	5.4	6.2	7.2	8.3	8.8	10.2	10.9	12.6	160.2	160.5
180	180.0	180.6	2.6	3.1	4.2	4.9	6.1	7.1	8.0	9.2	9.9	11.4	12.2	14.1	180.2	180.5
200	200.0	200.6	2.9	3.4	4.6	5.3	6.8	7.9	8.9	10.3	11.0	12.7	13.6	15.7	200.3	200.6
225	225.0	225.7	3.3	3.9	5.2	6.0	7.6	8.8	10.0	11.5	12.4	14.3	15.3	17.6	225.3	225.7
250	250.0	250.8	3.6	4.2	5.7	6.5	8.5	9.8	11.2	12.9	13.8	15.9	17.0	19.6	250.4	250.8
280	280.0	280.9	4.1	4.8	6.4	7.4	9.5	11.0	12.5	14.4	15.4	17.8	19.0	21.9	280.4	280.9
315	315.0	316.0	4.6	5.3	7.2	8.3	10.7	12.4	14.0	16.1	17.3	19.9	21.4	24.7	315.4	316.0

QUALITY CONTROL PROCEDURES AT SKIPPER

The pipes and fittings manufactured at Skipper, follow a stringent quality control process before being rolled out to the market, in order to supply a defect free system to its users.

The various quality control checks regularly being done at Skipper follow the highest specifications of BIS (India) as given below.

PIPES

DROP IMPACT TEST

Specified weights dropped onto pipe at 0°C. No cracks or failures are expected to be seen after testing.

HEAT REVERSION TEST

The percentage of change in length when heated in an oven and left to cool. It measures the residual stresses left in pipe from production process.

VICAT SOFTENING TEMPERATURE

The VST of the specimen shall not be less than 80°C.

SULPHATED ASH CONTENT

The ash content in the pipe shall not exceed 11 percent.

OPACITY

To measure the percentage of light flux passing through the wall and to ensure it is below 0.2%.

HYDROSTATIC PRESSURE TEST

System is to sustain upto 1 hour a pressure of 4.2 times working pressure without leakage.

EFFECT ON WATER TEST

The pipes shall not have any detrimental effect on the composition

of water flowing through them.

DENSITY

Density of pipes and fittings is to be determined mass per unit volume.

FITTINGS

STRESS RELIEF TEST: To determine the level of internal stress & weld line splitting by heating the fitting in an aircirculated oven @ 150°C. There should not be any blisters, weld line splitting or any cracking.

PIPES AND FITTINGS

VISUAL APPEARANCE

To ensure that all pipes and fittings are uniform in colour and free from visual effects such as black dots, scratches, burn marks, etc.

DIMENSIONS

To ensure that all pipes and fittings conform to the appropriate standards particularly wall thickness, socket diameters and socket depth.

HANDLING AND STORAGE

HANDLING OF PIPES

When receiving pipes, it's essential to inspect them for potential damage. Here are some key points to consider.

TRANSPORT DAMAGE: Check for signs of damage caused by shifting loads or improper handling during transportation.

VISUAL INSPECTION: Examine the pipe ends for cracks, dents, or other forms of damage.

HANDLING PRECAUTIONS: Avoid throwing, dropping, dragging, or pushing pipes, as this can cause damage.

PROTECTION FROM SHARP OBJECTS: Keep pipes away from sharp objects to prevent scratches or damage.

STORAGE OF PIPES

Proper storage is crucial for maintaining pipe quality. Key storage guidelines include:

INDOOR STORAGE: Preferably store pipes indoors to protect them from environmental factors.

UV PROTECTION: If outdoor storage is necessary, cover bundles to prevent sunlight exposure and UV damage.-

STACKING HEIGHT: Limit stacking height to 7 feet to prevent damage and instability.

STACKING TECHNIQUE: Alternatively, pipes can also be stacked with adjacent layers lying at right angles to each other to ensure stability and prevent damage.

LEVEL GROUND: Store pipes on level ground, free from sharp objects.

PIPE PLACEMENT: Store heavier pipes below lighter ones when stacking different classes together.

DRY SURFACE: Ensure the storage surface is dry to prevent damage or degradation.

EASY AND 100% LEAKPROOF INSTALLATION

Step 1: Cutting
Measure the pipe length accurately and make a visible marking using a felt tip pen. Ensure that the pipe and fittings are size compatible. You can easily cut with a plywood cutting saw/ ratchet cutter or a wheel cutter. Cutting the pipe as squarely as possible (at 90°) provides optimal bonding area within a joint. Inspect pipe ends thoroughly prior to making a joint. If a crack or splintering is noticed cut-off a minimum of 25 mm beyond the visible crack before proceeding.

Step 2: Deburring/Beveling
Burrs in and on pipe end can obstruct flow/proper contact between the pipe and socket of the fitting during assembly and should be removed from both in and outside of the pipe. A 15 mm dia half round file/a pen knife or a deburring tool are suitable for this purpose. A slight bevel on the end of the pipe will ease entry of the pipe into the socket of the fitting socket.

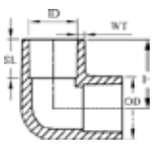
Step 3: Fitting Preparation
Using a clean dry rag, wipe the dirt and moisture from the fitting sockets and pipe end. Dry fit the pipe to ensure total entry into the bottom of the fittings socket and make a visible marking using a felt tip pen.

Step 4: One Step Solvent Cement Procedure
Use only Skipper uPVC Solvent Cement conforming to ASTM D-2564 / IS 14182 to ensure a perfect solvent weld joint. When making a joint, apply an even coat of solvent Cement at the end of the pipe and also inside the fitting socket. Do not use thick-ened or lumpy solvent Cement. It should have a flow consistency like that of syrup or paint.

Step 5: Assembly
Immediately insert the pipe into the fitting socket, rotate the pipe 1/4 to 1/2 turn while inserting. This motion ensures an even distribution of solvent Cement within the joint. Hold the assembly for 3 seconds to allow the joint to setup and avoid push-out.
A bead of One-Step solvent Cement must be formed around the entire socket fitting entrance. With a clean, dry cloth remove the excess solvent Cement from the surface of the pipe and fitting.

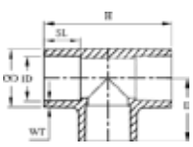
FITTINGS - DIMENSIONS

ELBOW 90°



SIZE(INCH)	ID	SL	WT
40	40.10 - 40.30	26.00	3.00
50	50.10 - 50.30	31.50	3.00
63	63.10 - 63.30	38.00	3.00
75	75.10 - 75.30	44.50	3.10
90	90.10 - 90.30	51.50	3.10
110	110.10 - 110.40	61.50	4.00
140	140.20-140.50	76.00	4.20
160	160.20-160.50	86.00	4.50

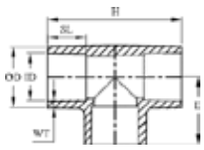
TEE



SIZE(INCH)	ID	SL	WT
40	40.10 / 40.30	26.00	3.00
50	50.10 / 50.30	31.50	3.00
63	63.10 / 63.30	38.00	3.00
75	75.10 / 75.30	44.50	3.10
90	90.10 / 90.30	51.50	3.10
110	110.10 / 110.40	61.30	4.00
140	140.20-140.50	76.00	4.30
160	160.20-160.50	86.00	4.50

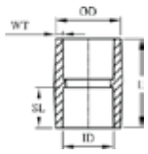
FITTINGS - DIMENSIONS

REDUCER TEE



SIZE(INCH)	ID-1	SL-1	ID-2	SL-2	WT
90 X 63	90.10 - 90.30	51.50	63.10 - 63.30	38.00	3.00
90 X 75	90.10 - 90.30	51.50	75.10 - 75.30	44.50	3.00
110 X 63	10.10 - 110.40	61.50	63.10 - 63.30	38.00	4.00
110 X75	110.10 - 110.40	61.50	75.10 - 75.30	44.50	4.00
110 X 90	110.10 - 110.40	61.50	90.10 - 90.30	51.50	4.00
160 X 110	160.20-160.50	86.00	110.10 - 110.40	61.50	4.50

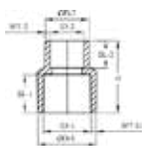
COUPLER



SIZE(INCH)	ID	SL	WT
40	40.10 -40.30	26.00	3.00
50	50.10 -50.30	31.50	3.00
63	63.10 - 63.30	38.00	3.00
75	75.10 - 75.30	44.00	3.00
90	90.10 - 90.30	51.20	3.50
110	110.10 - 110.40	61.30	4.00
140	140.20-140.50	76.00	4.20
160	160.20-160.50	86.00	4.50

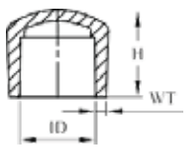
FITTINGS - DIMENSIONS

REDUCER COUPLER



SIZE(INCH)	ID-1	SL-1	WT-1	ID-2	SL-2	WT-2
90x63	90.10 - 90.30	51.00	3.00	63.10-63.30	37.50	3.00
90x75	90.10 - 90.30	51.00	3.00	75.10-75.30	43.50	3.00
110x63	110.10 - 110.40	61.00	4.00	63.10-63.30	37.50	3.00
110x75	110.10 - 110.40	61.00	4.00	75.10-75.30	43.50	3.00
110x90	110.10 - 110.40	61.00	4.00	90.10 - 90.30	51.00	3.00
160x110	160.20-160.50	87.00	4.50	110.10 - 110.40	61.00	4.00

END CAP

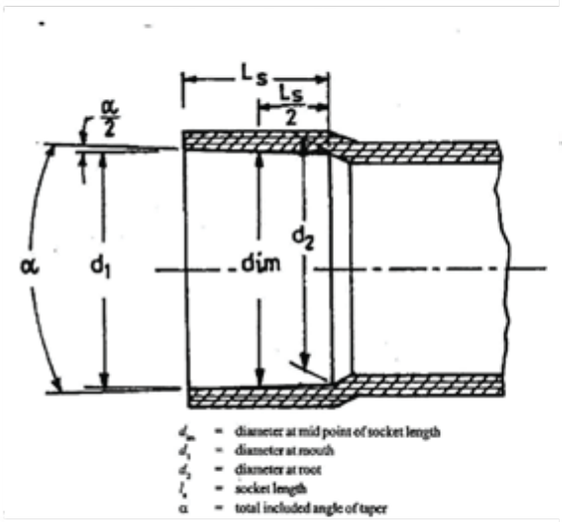


SIZE(INCH)	ID	SL	WT
40	40.10 - 40.30	26.20	3.20
50	50.10 - 50.30	31.70	3.20
63	63.10 - 63.30	38.00	3.20
75	75.10 - 75.30	44.00	3.20
90	90.10 - 90.30	51.00	3.20
110	110.10 - 110.40	61.00	4.00
140	140.20-140.50	76.00	4.20
160	160.20-160.50	86.00	4.50

SS CLAMP

SIZE(INCH)
25
32

SOCKET - DIMENSIONS



d_m = diameter at mid point of socket length
d_1 = diameter at mouth
d_2 = diameter at root
l_s = socket length
α = total included angle of taper

Nominal Size DN	Socket Length L_s	Mean Socket Internal Diameter at Mid-Point of Socket Length, d_m	
	Min	Min	Max
(1)	(2)	(3)	(4)
20	16.0	20.1	20.3
25	19.0	25.1	25.3
32	22.0	32.1	32.3
40	26.0	40.1	40.3
50	31.0	50.1	50.3
63	37.5	63.1	63.3
75	43.5	75.1	75.3
90	51.0	90.1	90.3
110	61.0	110.1	110.4
125	68.5	125.1	125.4
140	76.0	140.2	140.5
160	86.0	160.2	160.5
180	96.0	180.2	180.5
200	106.0	200.3	200.6
225	118.5	225.3	225.7
250	131.0	250.4	250.8
280	146.0	280.4	280.9
315	163.5	315.4	316.0
355	183.5	355.4	356.0
400	206.0	400.4	401.0
450	231.0	450.4	451.0
500	256.0	500.4	501.0
560	286.0	560.4	561.0
630	321.0	630.4	631.0

NOTE — For nominal sizes 20 mm to 225 mm, the dimensions are based on IS 727-1985 (E).

DO'S AND DONT'S

DO'S

- Use pipes and fittings from the same manufacturer for compatibility and warranty.
- Cut pipes squarely (perpendicular) and deburr edges for a smooth, secure fit.
- Clean pipes and fittings before assembly to remove dirt and debris.
- Dry-fit pipes and fittings before gluing to ensure proper alignment.
- Use only solvent cement specifically designed for uPVC for joining; apply to both pipe and fitting, then give a quarter turn when inserting.
- Allow recommended curing time for solvent cement before pressure testing or use.
- Provide proper support and alignment to avoid stress on joints.
- Conduct hydraulic pressure testing after installation to check for leaks.
- Insulate pipes exposed to sunlight or extreme temperatures.
- Regularly inspect and maintain the system for leaks or damage.

DONT'S

- Do not overtighten threaded joints; finger-tighten plus one or two turns only to prevent cracking.
- Do not use PTFE (Teflon) tape or sealant paste meant for metal pipes on uPVC threads; use only sealants approved for plastic.
- Do not use metal hooks, nails, or sharp-edged straps to support pipes.
- Do not expose uPVC pipes to open flame or use them for pneumatic (air/gas) applications.
- Do not use petroleum-based or solvent-based sealants, adhesives, or lubricants not intended for uPVC.
- Do not drop pipes from heights or walk on them to avoid cracks or deformation.
- Do not thread uPVC pipes unless specifically designed for threading.
- Do not use plastic threaded fittings for hot water above 60°C.
- Do not rush pressure testing; always wait for the full curing time.

Complete range of Polymer Piping System & Bath Fittings

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