NATRAJ®

PVC PIPES

Lifelines, not just pipelines

COMPLETE PIPING SOLUTION

uPVC Pipes & Fittings
SWR Pipes & Fittings
Solvent Cement

JAS-ANZ MAX

An 9001 : 2008 Company

A product of
PRABHU POLY PIPES LTD.




IS-12818:2010	IS-4985:2000	IS-10124:92	IS-14182:94
CM/L-5798706	CM/L-5366370	CM/L-5366572	CM/L-5558117

Drawing upon our rich & unique experience in manufacturing of uPVC Pipes, we started marketing our pipes under our brand name NATRAJ PIPES . From modest beginning in 2006 when the unit of uPVC Pipes was set up, we have grown from strength to strength over the years. We have been expanding and diversifying rapidly and today we have been recognised as one of the leading companies in PVC Pipe manufacturing business under our brand name NATRAJ PIPES.

OUR VALUES

At Prabhu Poly Pipes, our prime focus is on customer satisfaction which we believe can be achieved following our three core values.

COMMITMENT

We have a strong commitment for the market we operate in. We are committed to meet our customers needs and expectations by offering a wide range of products and continually improvising our product quality to bring cost effective products without compromising the performance.

SPEED

With use of modern day technology and IT enabled infrastructure we believe in having the shortest possible lead time for customers. With constantantly extending market reach to customers we believe in timely deliveries as per schedule. We understand that timely supply is the essence of any contract and this is always foremost in our mind.

INTEGRITY

We believe in no compromise in product quality and strict quality control norms are being followed by us for the purpose. Integrity in all respects towards our customers and employees is one of the key values which have enabled us to grow in such a short span of time.

Certifications:

IS-12818:2010	IS-4985:2000	IS-10124:92	IS-14182:94	
CM/L-5798706	CM/L-5366370	CM/L-5366572	CM/L-5558117	An 9001 : 2008 Company
uPVC pipes for Borewell	uPVC pipes for Potable Water Supplies	uPVC Fittings	Solvent Cement for Joining uPVC pipes	

INFRASTRUCTURE

Located in Sankrail Industrial Park, Howrah, West Bengal, India in a sprawling campus we have over 60000 sq.ft. of cover shed housing extrusion plants and other allied state of art machinery. We have a separate raw material godown and a shed for storing finished goods.

A well-structured framework combined with latest technology has helped us to arrive at a zero defect manufacturing process. We operate latest state of the art twin screw Extruders with GERMAN technology for manufacturing uPVC Pipes.These machines come with their own set of benefits as mentioned below which keep us on the cutting edge:

- High quality plasticizing capacity, due to specially designed screw barrel, ensuring homogeneity of material.
- Higher operating speeds increase production capacity.
- Precisely controlled processing parameters ensuring consistent quality output.
- Provided with power saving measures.

Following the principle of Zero Defects we have automated most of the inline processes and have deployed CNC machines for threading of uPVC pipes. This has enabled us to minimize threading defects in our pipes.

We have a prestigious client list ranging from the leading construction companies of India like L&T ECC Division, Simplex Infrastructure Ltd, Bhilai Engineering Company, Border Security Force, Indian Railways and Public Health & Engineering Department, Govt. of West Bengal, Water Resources Dept, Govt. Of West Bengal, P.W.D to name a few.

We are currently manufacturing uPVC pipes from $^{1}/_{2}$ inch (15 mm) to 12 inch (330 mm) diameter following various Indian and International Standards namely IS-4985, IS-12818, IS 14182, ASTM and DIN standards as well as of specific customer specification. Our latest addition in our product range has been a complete range of PVC Fittings and Column Pipes.

We have established ourself as a major player in eastern India with a wide network of distributors and dealers. The major factor behind our success in a short span of time is our market driven approach and uncompromising attitude with respect to quality. We have well defined and stringent quality assurance systems where in all employees from top to bottom are responsible for quality & services.

Our constant endeavour to follow strict quality controls have enabled us to get certified by Bureau of Indian standards (BIS) for ISI marking for four of our products under IS 12818 (uPVC pipes for Borewell), IS 4985 (uPVC pipes for Potable water supplies), IS 10124 (for uPVc fittings), IS 14182 (Solvent Cement for Joining uPVC pipes). We have also been certified as ISO 9001:2008 company for following stringent Management controls

GENERAL PROPERTIES OF uPVC PIPE

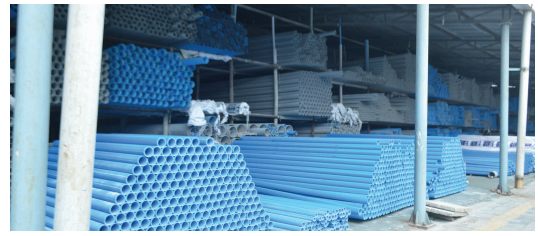
The properties listed in Tables - 1 , 2 and 3 are characteristic of the material and are derived from large numbers of test samples. uPVC pipes and fittings will not adversely affect other materials in contact or in close proximity to them, underground or in open space.

TABLE - 1: Mechanical properties of uPVC at 20°C	
Density	1430- 1460 kg/m3
Minimum ultimate Iensllestrenqth	45 MPa
Compressive strength	66 MPa
Shear strength	39 MPa
Tensile (Youngs) modulus	2750 MPa (at high loads)
Hardness (Shore)	85 (ASTM D2240)
Hardness (Brinnell) at 23°C	12 - 15
Impact (Charpy) - 20°C	20 KJ/m^2 (250 (u)m notch radius)
Elongation at break	50 - 80%
Poissons ratio	0.35 - 0.40

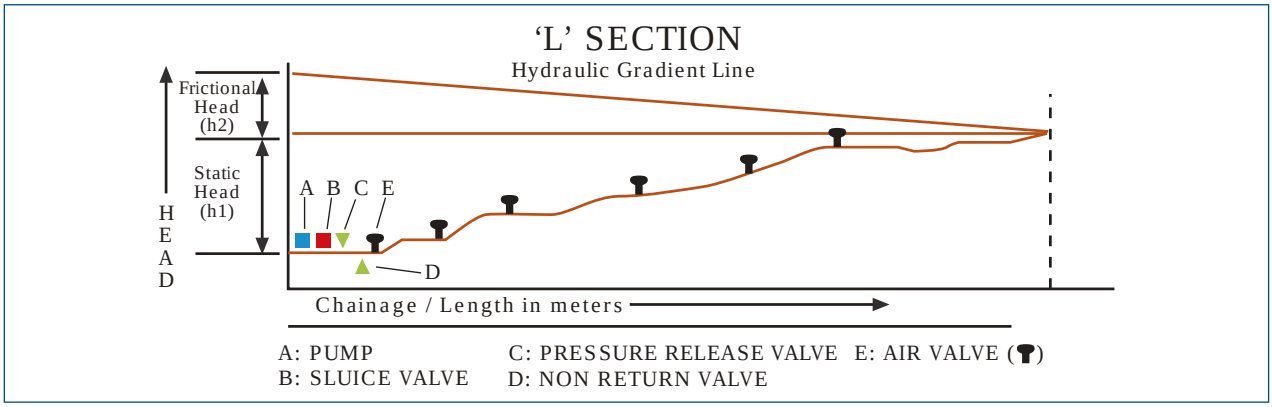
TABLE - 2: Thermal properties	
Max continuous service temp	60°C
Specific heat	1047 J / kg / °C
Coefficient of linear expansion	7 x 10^{-5} / °C
Thermal conductivity	0.13 - 0.15 W / m / °C
Flame resistance	Self-extinguishing uPVC does not support combustion when the source of ignition is removed. At the fabrication temperature, it can be shaped by deformation.
Primary softening point	Not less than 80°C (AS 1462)

TABLE - 3: Electrical properties	
Electrical properties	12 - 38 kV / mm
Dielectric strength	3.0 - 3.2 @ 106 Hz
Dielectric constant	0.02 @ 106 Hz
Resistance to Power factor	1013-1014 Ohm
Surface resistivity	2000 Volts / mm

uPVC is a non-conductor and cannot be used as earthing for electrical equipment.



DESIGN ASPECTS OF A PVC PIPELINE



'L'Section

Hydraulic Gradient Line

TOTAL HEAD = Frictional Head [h2] + Static Head [h1] + Losses in Valves

Change / Length in meters

A: PUMP
B : SLUICE VALVE
C: PRESSURE RELEASE VALVE
D: NON RETURN VALVE
E : AIR VALVE (T)

Basic Parameters Required

Discharge Required (Q) (lps) This is the amount of water required for irrigating the fields & can be obtained by planning the crop pattern & frequency of irrigation.

Length of the Pipeline (L) (meters) This is the total length of the pipe required from the source of water to the discharge point as shown in the "L" section.

Static Head (h1) (meter) This is the level difference between the lowest & the highest level of the pipeline as shown in the "L:' section.

Selection of Pipe Diameter

For an optimum design, the velocity of the fluid passing through the pipe is taken as 1m/sec, Using the Flow chart available in Product Catalogue, select the pipe size at an intersection of velocity = 1m/sec & discharge Q in LPS. For this pipe size also check the corresponding frictional losses (h2) from the flow chart. Alternatively the frictional losses can also be calculated by the Hazen Wiliams formula i.e.

$V = 4.567 \times 10^{-3} \times C \times 0.63D \times 0.54S$

V - Velocity of the fluid flowing through the pipe.
C - Hazen Williams coefficient for PVC = 150
D - Internal Diameter of the pipe.
S - Hydraulic Gradient.

Selection of Pressure Class

For selection of pressure class of Pipeline, total head acting on the pipe at that particular point needs to be worked out as under:

Total Head (H) = h1 + h2 + 10% of (h1 + h2).

10% of (h1+h2) is taken for losses in valves & fittings Please note that the frictional losses calculated are in meters / km. & for total head this needs to be multiplied by the corresponding length.

On working out the total head, Pipe Pressure Class can be selected as below:

Total Head (meters)	Pressure Class (Kg/cm²)
80-100	10
60-80	8
40-60	6
25-40	4
00-25	2.5

The principle, which is generally used, is that 1kg/cm² is equal to 10 meters of water column.

*Note: It is recommended to use the services of a Design Engineer for designing pipeline.

Pump Selection

Pump can be selected by using the formula

HP of pump = Q x H / 75 x (n)

where (n) = efficiency of the pump i.e. 65%

On getting the Pump HP Select the closest available model based on the manufacturers specification. It is highly recommended to once again check the pressure class of the pipe by backward calculation upon selecting the pump.

NATRAJ PVC PIPES

IS-12818:2010

CM/L-5798706

uPVC CASING PIPES & SCREEN (FILTER) PIPES

AS PER IS 12818:2010

Casing pipes for Borewells/Tubewells:

These pipes are manufactured as per IS 12818:2010 for the purpose of construction of the tubewells and borewells which is then used for lowering the Pumps inside it for drawing water from the underground waterbed. These Borewells or Tubewells are one of the major sources of potable ground water in India specially for the rural areas.

In a typical Borewell system Screens Pipes are positioned at the water bearing levels usually at the bottom to filter sand particles from water followed by casing pipes on top. In general cases same size of strainer and casing pipes is used for the entire system. However in specific cases to accommodate the pump set and to get higher yield at the upper levels higher size of casing pipes is also used which is attached to lower system using reducers.

uPVC Pipes being more resilient, non-corrosive and economical has successfully and effectively replaced the conventional metal piping materials.

Range:

We manufacture these uPVC pipes as per IS 12818 and DIN 4925 of following sizes:

Casing pipes:

Sl No.	Nominal Size	Type	Suitable for Depth
1	DN 6 Inch (150 mm) to 12 Inch (300 mm)	Shallow Well Casings (CS) Pipes	For depths not exceeding 80 mtrs
2	DN 1$^{1/2}$ Inch (40 mm) to 12 Inch (300 mm)	Medium Well Casings (CM) Pipes	For depths beyond 80 mtrs and upto 250 mtrs
3	DN 4 Inch (100 mm) to 12 Inch (300 mm)	Deep well Casing (CD) Pipes	for depths beyond 250 mtrs and upto 400 mtrs

Screen pipes:

Sl No.	Nominal Size	Type
1	1$^{1/2}$ Inch (40 mm) to 8 Inch (200 mm)	Ribbed Medium Screen (RMS)
2	4 Inch (100 mm) to 8 Inch (200mm)	Ribbed Deep Screen (RDS)

Application:

Borewells and tubewells

Features and Benefits:

Economical & easy handling:

Natraj uPVC Pipes cost less than the other alternates. Cost of transportation, handling and installation is lesser, being lighter in weight.

Non Conductive:

Offers excellent life avoiding Electro Chemical reactions, which generally lead to encrustation of pipes.

Quality Water:

Natraj uPVC Pipes doesn't impart any colour, odour or taste to the water which flows through it.

Complement the well casing system:

The Natraj uPVC screen pipes facilitate optimum performance & safety by keeping the gravel pack & other foreign substances out of the well.

Supplement better yields:

Natraj uPVC screen pipes(Plain & Ribbed) have horizontal slots which enable laminar flow in to the well ensuring higher permiablity & reducing well entrance losses, thus saving pumping energy and higher yields.

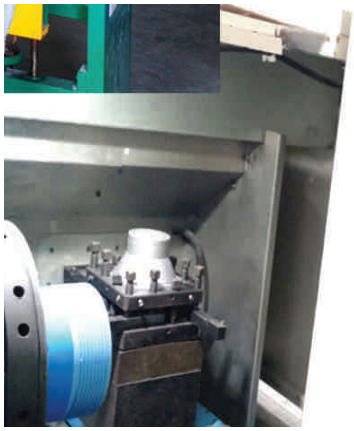
Specifications:

NATRAJ uPVC CASING PIPES AS PER IS 12818 : 2010

Nominal Outside Diameter	Mean Outside Diameter		"Outer Diameter of Pipe at any point"		Mean Outer Diameter over connection	Wall thickness	
Inch (mm)	Min (mm)	Max (mm)	Min (mm)	Max (mm)	Max (mm)	Min (mm)	Max (mm)
Type – Casing Medium (CM)							
1 1/2" (40)	48	48.2	47.9	48.3	52	3.5	4
2" (50)	60	60.2	59.9	60.3	65	4	4.6
3" (80)	88	88.3	87.9	88.4	94	4	4.6
4" (100)	113	113.3	112.9	113.4	120	5	5.7
5" (125)	140	140.4	139.9	140.5	150	6.5	7.3
6" (150)	165	165.4	164.6	165.6	178	7.5	8.5
7" (175)	200	200.5	199.6	200.6	215	8.8	9.8
8" (200)	225	225.5	224.5	225.8	243	10	11.2
10" (250)	280	280.5	279.4	280.8	298	12.5	14
12" (300)	330	330.6	329.3	331	352	14.5	16.2
Type – Casing Shallow (CS)							
6" (150)	165	165.4	164.8	165.6	174	5.7	6.5
7" (175)	200	200.5	199.6	200.6	211	7	7.8
8" (200)	225	225.5	224.5	225.8	238	7.6	8.8
10" (250)	280	280.5	279.4	280.8	292	9.6	11
12" (300)	330	330.6	329.3	331	346	11.2	13.3
Type – Casing Deep (CD)							
4" (100)	113	113.3	112.8	113.4	125	7	7.9
5" (125)	140	140.4	139.7	140.5	152	8	9
6" (150)	165	165.4	164.6	165.6	180	9.5	10.7
7" (175)	200	200.5	199.6	200.6	217	11.8	13.6
8" (200)	225	225.5	224.5	225.8	247	13	14.8
9" (250)	280	280.5	279.4	280.8	304	16	17.6
12" (300)	330	330.6	329.3	331	359	19	21

NATRAJ uPVC SCREEN PIPES AS PER IS 12818 : 2010

Nominal Outside Diameter	Mean Outside Diameter		"Outer Diameter of Pipe at any point"		Mean Outer Diameter over connection	Wall thickness	
Inch (mm)	Min (mm)	Max (mm)	Min (mm)	Max (mm)	Max (mm)	Min (mm)	Max (mm)
Type – Ribbed Medium Screen (RMS)							
1 1/2" (40)	52	52.2	51.9	52.3	56	3.5	4
2" (50)	64	64.2	63.9	64.3	69	4	4.6
3" (80)	92	92.3	91.8	92.4	98	4	4.6
4" (100)	117	117.3	116.8	117.4	124	5	5.7
5" (125)	144	144.4	143.7	144.5	154	6.5	7.3
6" (150)	169	169.4	168.6	169.6	182	7.5	8.5
8" (200)	229	229.5	228.5	229.8	247	10	11.2
Type – Ribbed Deep Screen (RDS)							
4" (100)	117	117.3	116.8	117.4	129	7	7.9
5" (125)	144	144.4	143.7	144.5	156	8	9
6" (150)	169	169.4	168.6	169.6	184	9.5	10.7
8" (200)	229	229.5	228.5	229.8	251	13	14.8
Type – Plain Medium Screen							
8" (200)	225	225.5	224.5	225.8	243	10	11.2
10" (250)	280	280.5	279.4	280.8	298	12.5	14
12" (300)	330	330.6	329.3	331	352	14.5	16.2
Type – Plain Deep Screen (PDS)							
8" (200)	225	225.5	224.5	225.8	247	13	14.8
10" (250)	280	280.5	279.4	280.8	304	16	17.6
12" (300)	330	330.6	329.3	331	359	19	21



uPVC PIPE AS PER ASTM D 1785

NATRAJ uPVC Pipes are manufactured using the highest grade quality resin which ensures the fulfillment of the basic need for clean and hygienic water. These pipes are manufactured as per ASTM D 1785 standard in Schedule 40, Schedule 80 & Schedule 120 pressure class. These pipes are manufactured with two different jointing methods:

Solvent Cement Joints:

Natraj uPVC Plumbing Pipes are also available with Solvent Cement type of jointing for plain ended pipes. Proper importance is to be given for selection of Solvent cement for this type of jointing. Natraj super grip solvent cement is best used for this process.

Threaded Joints:

Natraj uPVC Pipes are commonly available with CNC made threaded joints as per IS 554. It is fully compatible for jointing with GI pipes and fittings as per IS-1239 (Part1).

Range:

Pipes are available in Nominal bore of ½ Inch (15mm) to 12 Inch (330mm) in three viz Schedule 40, Schedule 80 & Schedule 120.

Sl No.	Type	Availablity
1	Schedule 40, Schedule 80 & Schedule 120 - ½ Inch (15mm) to 2 Inch (50mm)	Both threaded and solvent cement jojnting pipes are available
2	Schedule 40, Schedule 80 & Schedule 120 - 3 Inch (80mm) to 12 Inch (330mm)	Only threaded jointing system is available

Application:

- Building Plumbing
- Water Distributor Mains
- Swimming Pool
- Salt Water Lines
- Pipes for Hand Pumps
- Dye Houses, Plating Industry
- Sugar, Paper & Breweries
- Coal Washing & Ash Handling
- Aggressive / Corrosive Fluid Transportation etc

Features and Benefits:

Economical & Easy handling:

Natraj uPVC Pipes Cost Less than the other alternates like GI pipes. Cost of Transportation, Handling and Installation is also lower.

Excellent Chemical Resistance:

Non reactive with acidic and alkali substances in water. Non corrosive, Ensures longer life cycle than GI pipes.

Non Conductive:

Offers excellent life avoiding Electro Chemical reactions, which generally lead to encrustation of pipes.

Quality Water:

Natraj uPVC doesn't impart any colour, odour or taste to the water which flows through it.

Leak proof joints:

Natraj uPVC plumbing system offers a leak proof distribution system for water as well as a numerous number of chemicals like strong minerals and acids.

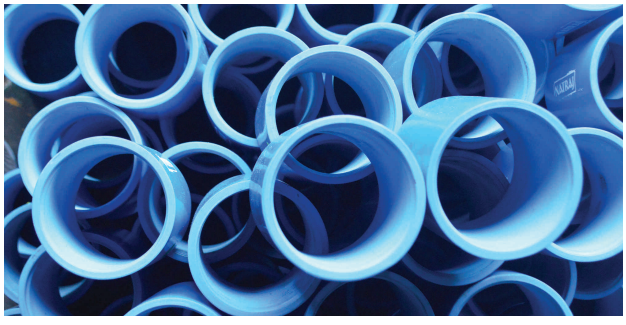
Specifications:

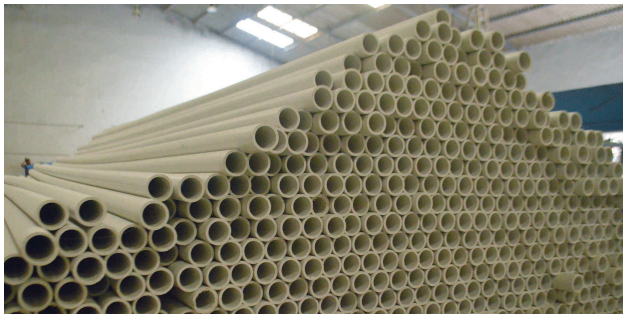
NATRAJ uPVC PIPE AS PER ASTM D 1785 threaded as per IS 554 and to match with G.I Pipes as per IS 1239 (Part I)

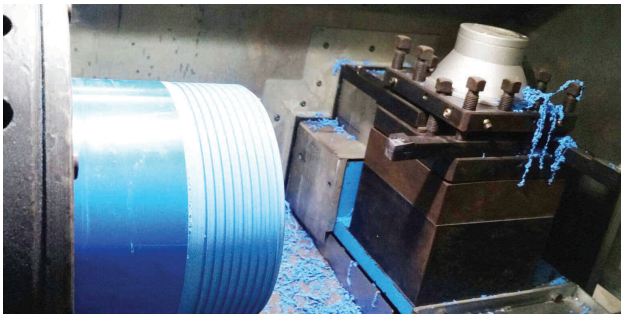
Nominal Sizes in 'inches'	Mean outside diameter in mm		Schedule 40			Schedule 80			Schedule 120		
			Working pressure in Kg/cm^2	Wall thickness in mm		Working pressure in Kg/cm^2	Wall thickness in mm		Working pressure in Kg/cm^2	Wall thickness in mm	
	Min	Max		Min	Max		Min	Max		Min	Max
1/2	21.2	21.4	21.2	2.8	3.3	29.3	3.7	4.2	35	4.3	4.9
3/4	26.6	26.8	16.6	2.9	3.4	23.8	3.9	4.4	27	4.3	4.9
1	33.3	33.5	15.5	3.4	3.9	21.7	4.6	5.1	25	5.1	5.7
1 1/4	42	42.3	12.8	3.6	4.1	18	4.9	5.4	21	5.5	6.1
1 1/2	48.1	48.4	11.4	3.7	4.2	16.2	5.1	5.7	19	5.7	6.4
2	60.2	60.5	10.4	3.9	4.4	14	5.5	6.2	16.2	6.4	7.1
2 1/2	72.8	73.2	9.7	5.2	5.8	15	7	7.9	16.2	7.6	8.5
3	88.7	89.1	9	5.5	6.2	13	7.6	8.5	15	8.9	10
4	114.1	114.5	7.6	6	6.7	11	8.6	9.6	15	11.1	12.4
5	141.1	141.6	6.6	6.6	7.3	10	9.5	10.7	14	12.7	14.2
6	168	168.6	6.2	7.1	8	9.7	11	12.3	13	14.3	16
8	218.7	219.5	5.5	8.2	9.2	8.6	12.7	14.2	13	18.2	20.4
10	272.7	273.4	4.9	9.3	10.4	8	15.1	16.9	13	21.4	24
12	323.5	324.2	4.5	10.3	11.6	8	17.5	20.5	12	25.4	28.5

Note:

1. For Push type joints i.e. Solvent Cement type jointing the working pressure mentioned above should be doubled.
2. The above mentioned working pressure is calculated at working temperature of 70° F. To obtain working pressure for higher temperature the respective working temperature should be multiplied with corresponding correction factor.







NATRAJ PVC PIPES

IS-4985:2000

CM/L-5366370

uPVC PRESSURE PIPE AS PER IS 4985 : 2000

uPVC Pipes for Potable Water Supplies and Agricultural Irrigation systems

Natraj Rigid uPVC Pipes are made of highest grade quality resin which ensures the fulfillment of the basic need for clean and hygienic water. Produced as per IS 4985:2000, ISO 4422, DIN 8062 can be used for multiple purposes for carrying water to waste liquids. It comes in two variants:

Plain Pipe:

Plain end pipes are supplied with one coupler for Solvent Cement Joining as per lay & joining standards.

Socketed Pipes:

Self socketed pipes have one end self socketed and other end plain. It joins with the help of Solvent Cement.

Range:

Natraj Rigid uPVC pipes conforms to IS 4985 : 2000 as per application requirement. Further they are also manufactured as per ISO 4422, DIN 8062 standards as required.

Sl No.	Minimum Size	Maximum Size	Rating
1	40 mm	315 mm	Class 1 (0.25 mpa or 2.5 k/cm^2)
2	40 mm	315 mm	Class 2 (0.40 mpa or 4.00 k/cm^2)
3	40 mm	315 mm	Class 3 (0.60 mpa or 6.00 k/cm^2)
4	40 mm	315 mm	Class 4 (0.80 mpa or 8.00 k/cm^2)
5	40 mm	315 mm	Class 5 (1.00 mpa or 10.00 k/cm^2)

Application:

NATRAJ Rigid uPVC Plain / Socketed pipes are used for various applications, some of its agricultural and allied applications are:

- Irrigation Scheme (major/minor)
- Tubewell
- Bio Gas Plant
- Rainwater
- Drinking water supply lines
- Main line for sprinklers / drip irrigation
- Underground or open sewerage pipeline
- Telecommunication cable ducting
- Waste Sludge line in industries

Features and Benefits:

Economical & Easy handling

Natraj uPVC Pressure Pipes cost less than the other alternates like AC pipes or AI pipes. Cost of Transportation, Handling and Installation is also lower.

Excellent chemical resistance

Non reactive with acidic & alkali substances in water ideal for drain water discharge as well as a numerous number of chemicals like strong minerals acids that could be therein. Non corrosive, Ensures longer life cycle.

Non Conductive

Natraj uPVC Pressure Pipes offer excellent life avoiding Electro Chemical reactions, which generally lead to encrustation of pipes.

Better flow for optimum yields

Natraj uPVC Pressure Pipes have a smoother (inner) surface as compare to the alternate products maintaining smooth flow of water.

Leak proof joints

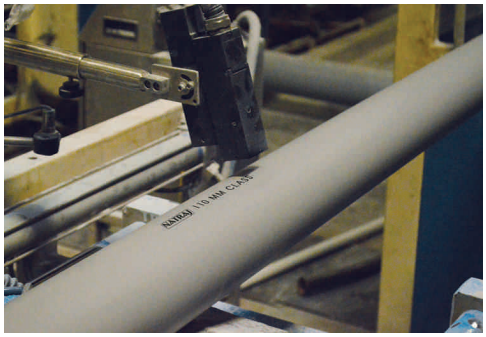
Natraj uPVC Pressure Pipes with Self Fit (Solvent Cement based) jointing system ensures leak proof jointing for optimum results.

Natraj uPVC Pressure Pipes with Elastomeric (Ring Fit) jointing provide for special rubber rings at the joints which offers quick & easy installation & leak proof joints.

Specifications:

NATRAJ uPVC PRESSURE PIPES AS PER IS 4985 : 2000

Nominal Diameter	Mean Outside Diameter		Wall Thickness of Pipes for Pressure Ratings of											
			"CLASS 1 (2.5 kg / cm2)"		"CLASS 2 (4.0 kg / cm2)"		"CLASS 3 (6.0 kg / cm2)"		"CLASS 4 (8.0 kg/cm2)"		"CLASS 5 (10.0 kg / cm2)"		"CLASS 6 (12.5 kg / cm2)"	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
20	20	20.3									1.1	1.5	1.4	1.8
25	25	25.3							1.2	1.6	1.4	1.8	1.7	2.1
32	32	32.3							1.5	1.9	1.8	2.2	2.2	2.7
40	40	40.3					1.4	1.8	1.8	2.2	2.2	2.7	2.8	3.3
50	50	50.3					1.7	2.1	2.3	2.8	2.8	3.3	3.4	4
63	63	63.3			1.5	1.9	2.2	2.7	2.8	3.3	3.5	4.1	4.3	5
75	75	75.3			1.8	2.2	2.6	3.1	3.4	4	4.2	4.9	5.1	5.9
90	90	90.3	1.3	1.7	2.1	2.6	3.1	3.7	4	4.6	5	5.7	6.1	7.1
110	110	110.4	1.6	2	2.5	3	3.7	4.3	4.9	5.6	6.1	7.1	7.5	8.7
125	125	125.4	1.8	2.2	2.9	3.4	4.3	5	5.6	6.4	6.9	8	8.5	9.8
140	140	140.5	2	2.4	3.2	3.8	4.8	5.5	6.3	7.3	7.7	8.9	9.5	11
160	160	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
180	180	180.6	2.6	3.1	4.2	4.9	6.1	7.1	8	9.2	9.9	11.4	12.2	14.1
200	200	200.6	2.9	3.4	4.6	5.3	6.8	7.9	8.9	10.3	11	12.7	13.6	15.7
225	225	225.7	3.3	3.9	5.2	6	7.6	8.8	10	11.5	12.4	14.3	15.3	17.6
250	250	250.8	3.6	4.2	5.7	6.5	8.5	9.8	11.2	12.9	13.8	15.9	17	19.6
280	280	280.9	4.1	4.8	6.4	7.4	9.5	11	12.5	14.4	15.4	17.8	19	21.9
315	315	316	4.6	5.3	7.2	8.3	10.7	12.4	14	16.1	17.3	19.9	21.4	24.7



uPVC HIGH TENSILE COLUMN PIPE

NATRAJ uPVC column pipes are used In borewell systems to lower the pumpsets in the casing pipe to raise water. Natraj uPVC column pipes are manufactured to sustain high tensile loads subjected on it by the weight of the Submersible Pumpset and vibration generated by it while running. These pipes have heavy duty square threads along with a separate socket attached to one end of the pipe. To ensure leak proof joints high quality EPDM rubber rings are provided on both ends of the pipe.

Range:

NATRAJ Submersible Column Pipes is available in sizes from 1 Inch (25mm) to 4 Inch (100 mm) ID & in standard 3 metre lengths. They are categorized under three categories SILVER (upto 100 ft), GOLD (100 ft to 200 ft), Diamond (200 ft to 350 ft) depending upon their depth of lowering.

Thread Profile:

Specially designed Square threaded of Natraj Pipes can bear maximum load in a bore well environment.These pipes can be assembled and dismantled very easily and quiclky.

Leak Proof Joints:

Best Quality EPDM 'O' Rings are used for leak proof joints. These rubber rings also act as jerk absorbers when the pump is switched on or off.

Application:

- Water transportation in Borewells / Tubewells.
- Hanging of submersible pumps in Borewells / Tubewells.

Features and Benefits:

Economical & Easy handling

Natraj uPVC Pressure Pipes cost less than the other alternates. Cost of Transportation, Handling and Installation is lower.

Excellent chemical resistance

Non reactive with acidic & alkali substances in water Non corrosive, ensures longer life cycle.

Non conductive

Offers excellent life avoiding electro chemical reactions, which generally lead to encrustation of pipes.

Quality water

Upvc pipes does not impart any colour, adour or taste in the eater which flows through it.

Low frictional losses

Smoother (inner) surface as compared to the alternate products keeping the frictional losses to the minimal.

Leak proof joints

Special rubber seal are provided along with the threads to ensure leak proof joints at high pressure ensuring smooth & optimum functioning of the system.

Specifications:

NATRAJ uPVC HIGH TENSILE COLUMN PIPES

Nominal Size	Outer Diameter	Silver Type			Gold Type			Diamond Type		
		Light Grade			Medium Grade			Heavy Grade		
		Hydrostatic Pressure	Max Depth	Max Load	Hydrostatic Pressure	Max Depth	Max Load	Hydrostatic Pressure	Max Depth	Max Load
inch	mm	kg/cm ^ 2	ft	kg	kg/cm ^ 2	ft	kg	kg/cm ^ 2	ft	kg
1"	33.4	20	100	850	25	200	1100	30	350	1200
1-1/4"	42.16	15	100	1100	20	200	1500	25	350	1700
1-1/2"	48.26	15	100	1300	20	200	1800	25	350	2000
2"	60.32	14	100	1800	16	200	2500	20	350	2800
3"	88.3	12	100	3800	14	200	5000	17	350	5900
4"	113.3	10	100	5300	12	200	7500	15	350	9400

SWR PIPE

NATRAJ Soil, Waste & Rain Water (S.W.R.) uPVC Drainage Systems are the ideal solution for drainage & sewerage applications, owing to its superior properties compared to conventional drainage systems.

Range:

The system is available in a wide range with diameters 75 MM, 110 MM AND 160 MM & conforming to IS-13592 & international specifications.

Application:

SWR uPVC Drainage Systems is a set of pipes and fittings used in excreta lines of Residential and Commercial complexes. They are generally used for:

Soil / Waste:

Lines are connected to various excreta generation points such as lavatories (Basins, commodes etc.) and kitchens (sinks etc.) for smooth transportation of soluble and in soluble waste along with water to main drain lines.

Rain:

Lines connected to gulleys, gutters on roof tops for drainage of excess rain water.

- Chemical Resistance :

  Unaffected by a wide range of chemicals & safe from attacks by galvanic or electrolytic action.

- Non-Flammable :

  Self-extinguishing as it does not support combustion.

- Corrosion Resistant :

  Constant contact with water does not deteriorate the material.

- Rodent Repellent :

  Special treatment at compounding stage ensures that the product is immuned to rodent attacks.

Specifications:

NATRAJ SWR PIPES

Description		Type A	Type B
Single Socket	3 Mtrs. Length	75, 110 & 160 mm	75, 110 & 160 mm
Double Socketed	3 Mtrs. Length	75, 110 & 160 mm	75, 110 & 160 mm
Single Socket	2 Mtrs. Length	75, 110 & 160 mm	75, 110 & 160 mm
Double Socketed	2 Mtrs. Length	75, 110 & 160 mm	75, 110 & 160 mm
Double Socketed	1 Mtr. Length	75, 110 & 160 mm	75, 110 & 160 mm
Rubber Ring	-	75, 110 & 160 mm	75, 110 & 160 mm

Features and Benefits:

Lightweight :

Convenient and cost effective as transportation & handling is easy.

Flexibility in usage :

Possible due to option of joining either by rubber ring or with solvent cement.

High Flow Rate:

Excellent flow properties that remains constant throughout its life, possible due to the internal smooth surface.

Weather Resistant:

Excellent outdoor weathering performance due to specially blended UV stabilised compound.

Aesthetic Superiority:

Far superior when compared to conventional CI and AC systems.

Performance:

Trouble-free functioning saves on inspection & maintenance costs. A combination of lightness, flexibility & use of pre-fabrication results in substantial savings in time and money.

High Impact Strength:

Not prone to mechanical damages due to handling and transportation.

uPVC SWR RANGE OF FITTINGS

Plain Tee (Double)

Door Tee (Double)

Door Tee (Single)

Door 'Y'

Plain Tee

Bend 45^0

Plain Bend 87.5^0

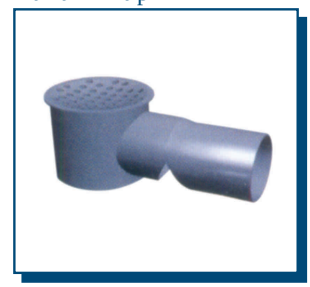
Door Bend 87.5^0

Plain 'Y'

Coupler

Cleansing Pipe

Nahani Trap

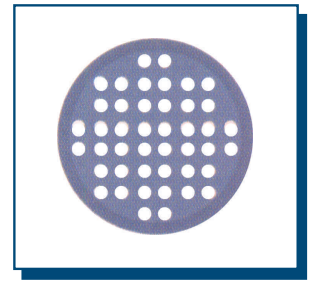


Q - Trap

P - Trap

S - Trap

4" Round Jali



Vent Cowl

Pipe Clip

uPVC FITTINGS

Union

SIZE
1/2”
3/4”
1”
1¼”
1½”
2”

FTA (Plastic)

SIZE
1/2”
3/4”
1”
1¼”
1½”
2”

MTA (Plastic)

SIZE
1/2”
3/4”
1”
1¼”
1½”
2”

Tank Connector

SIZE
1/2”
3/4”
1”
1¼”
1½”
2”

Coupler

SIZE
1/2”
3/4”
1”
1¼”
1½”
2”

Elbow 90^0

SIZE
1/2”
3/4”
1”
1¼”
1½”
2”
3/4” X 1/2”
1” X 3/4”
1¼” X 3/4”

Reducing Elbow

SIZE
3/4” X 1/2”
1” X 1/2”
1” X 3/4”

Reducing Tee

SIZE
3/4” X 1/2”
1” X 3/4”
1” X 1/2”
1¼” X 1”
1½” X 1”
1½” X 1¼”
2” X 1”
2” X 1½”

Ball Valve

SIZE
1/2”
3/4”
1”
1¼”
1½”
2”

Reducing Bush

SIZE
3/4” X 1/2”
1” X 1/2”
1” X 3/4”
1¼” X 1”
1½” X 1”
1½”X 1¼”
2” X 1”
2” X 1¼”
2” X 1½”

Reducer

SIZE
3/4” X 1/2”
1” X 1/2”
1” X 3/4”
1¼” X 1”
1½” X 1”
1½”X 1¼”
2” X 1”
2” X 1¼”
2” X 1½”

Bypass Bend

SIZE
1/2”
3/4”
1”
1¼”
1½”
2”

MTA (Brass)

SIZE
1/2”
3/4”
1”
1¼”
1½”
1” X 3/4”
2”
3/4” X 1/2”
1” X 1/2”

FTA (Brass)

SIZE
1/2”
3/4”
1”
1¼”
1½”
1” X 3/4”
2”
3/4” X 1/2”
1” X 1/2”

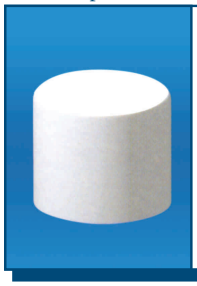
Female Threaded Tee (Brass)

SIZE
1/2”
3/4”
3/4” X 1/2”
1” X 1/2”

Female Threaded Elbow(Brass)

SIZE
1/2”
3/4”
3/4” X 1/2”
1” X 1/2”

End Cap



SIZE
1/2”
3/4”
1”
1¼”
1½”
2”

Equal Tee

SIZE
1/2”
3/4”
1”
1¼”
1½”
2”

Pipe Clip

SIZE
1/2”
3/4”
1”
1¼”
1½”
2”

Solvent Cement (Heavy Duty)

SIZE
32 OZ/946 ML TNS
16 OZ/473 ML TNS
08 OZ/237 ML TNS
04 OZ/118 ML TNS

IS-14182:94

CM/L-5558117

SOLVENT CEMENT AS PER IS 14182:1994

Used for jointing uPVC pipes and Fittings

We hold expertise in providing a high grade manufacturing of uPVC Solvent Cement, and hold BIS certification mark for production of LIGHT duty, Medium Duty and Heavy duty Solvent Cement as per IS 14182:1994.

At our sound infrastructure, we process the offered solvent cement using high quality ingredients while keeping in mind the requirements of customers.

Detailing

- Solvent cementing is a method of permanently jointing plastic pipes and fittings using solvent cement.
- It is an easy, inexpensive and rapid method of jointing uPVC Pipes and fittings.
- It produces strong, leak proof joints when done properly

Features and Benefits:

- Easy to mix
- Quick healing
- High strength

How it works?

- The solvent constituents penetrate, soften and swell the mating plastic surfaces and cause the plastic pipe to soften and swell.
- Swelling continues until the gaps between the pipe and fitting walls are closed and consequently the pipe and fitting cure and fuse into a tight weld.
- As the solvents evaporate, the pipe and fitting cure into a single piece of plastic.
- These types of joints are permanent in nature and strong in tension and commonly used for service pipes of water mains and PVC, uPVC plumbing works.

Standard Technical Information on Solvent Cement:

Note: The above mentioned performance of solvent cements is under lab conditions. There may be variance under field conditions based on weather, temperature, individual handling & pipe characteristics.

- Average initial SET – under lab condition. Field conditions & timings may vary.
- Initial set is necessary time to allow before the joint can be carefully handled.
- Allow 50% extra time during damp or humid weather.

Temperature	1/2" - 1 1/4"	1 1/2" - 2"	2 1/2" - 8"	10" - 15"	15"+
Below 5°C	10 min	15 min	12 hrs	24 hrs	48 hrs
5°C - 16°C	5 min	10 min	2 hrs	8 hrs	16 hrs
16°C & above	2 min	5 min	30 min	2 hrs	4 hrs

Joint cure schedule for testing at 15 KG pressure,7 Kg for 10” and above

- Joint cure time is necessary time to allow before the joint can be pressurized.
- Allow 50% extra time during damp or humid weather
- Allow 2-3 times extra time for industrial applications

Temperature	1/2" - 1 1/4"	1 1/2" - 2"	2 1/2" - 8"	10" - 15"	15"+
Below 5°C	48 hrs	96 hrs	8 days	8 days	14 days
5°C - 16°C	12 hrs	24 hrs	48 hrs	96 hrs	6 days
16°C & above	6 hrs	12 hrs	24 hrs	48 hrs	72 hrs

Average no of joints per liter of solvent cement

This is as per lab tests Field conditions may vary

Pipe Dia inch	No of joints
1/2"	500
3/4"	450
1"	350
1 1/2"	250
2"	150
3"	80

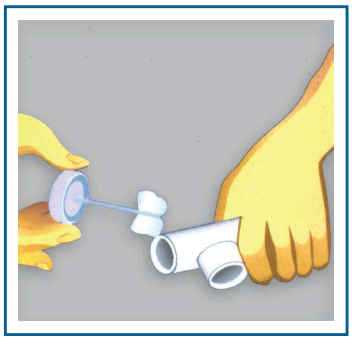
Pipe Dia inch	No of joints
4"	50
6"	40
8"	30
10"	10
12"	5

SOLVENT WELD JOINING INSTRUCTIONS

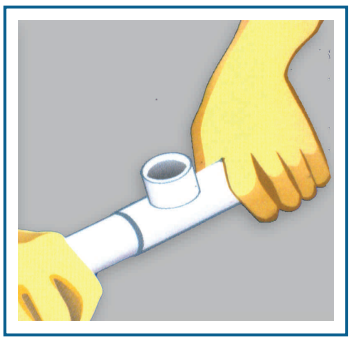
1 CUTTING

2 DEBURRING

3 ROUGHENING



4 SOLVENT CEMENTING



5 JOINTING

Installation Method

Above ground / on the walls Mark layout line on the wall and fix the pipeline accordingly. Support the pipeline at proper intervals using pipe clips.

Under the ground provide a trench of 600 mm to 1000mm depth and 400 mm width. Lay the pipeline and avoid stones in direct contact with pipeline. Refill the trench after checking for leakages. For crossing through open drain, encase the pipeline in bigger sized pipe.

NATRAJ
PVC PIPES

COLUMN PIPE JOINING INSTRUCTIONS

1

Join the Metal connector with Submersible pump with the help of chain wrench.

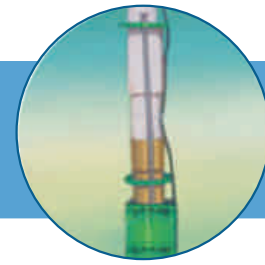
Before joining the pipes, ensure to clean the threads of with clean water.

2

3

Before joining the pipes ensure that the Pump Guard is installed Properly.

Before opening or joining the pipe / adopter ensure to hold the coupler by hand.



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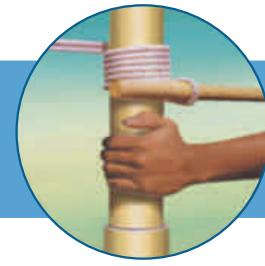
5

Tighten pipe till half rubber ring is seen with hand last jerk with rope it required.

At the time of lowering pipes place the clamp below the coupler Clamp the top adopter with the last pipe.



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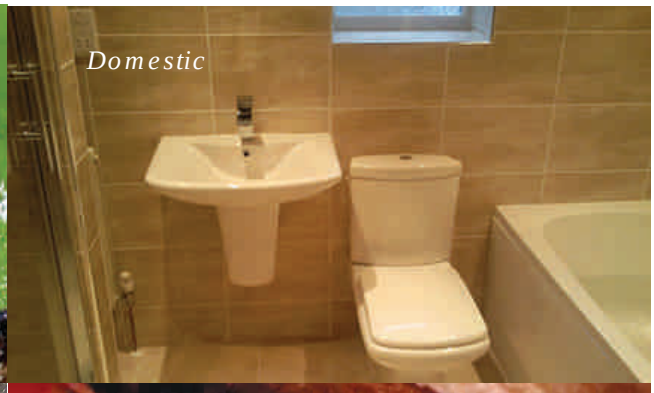


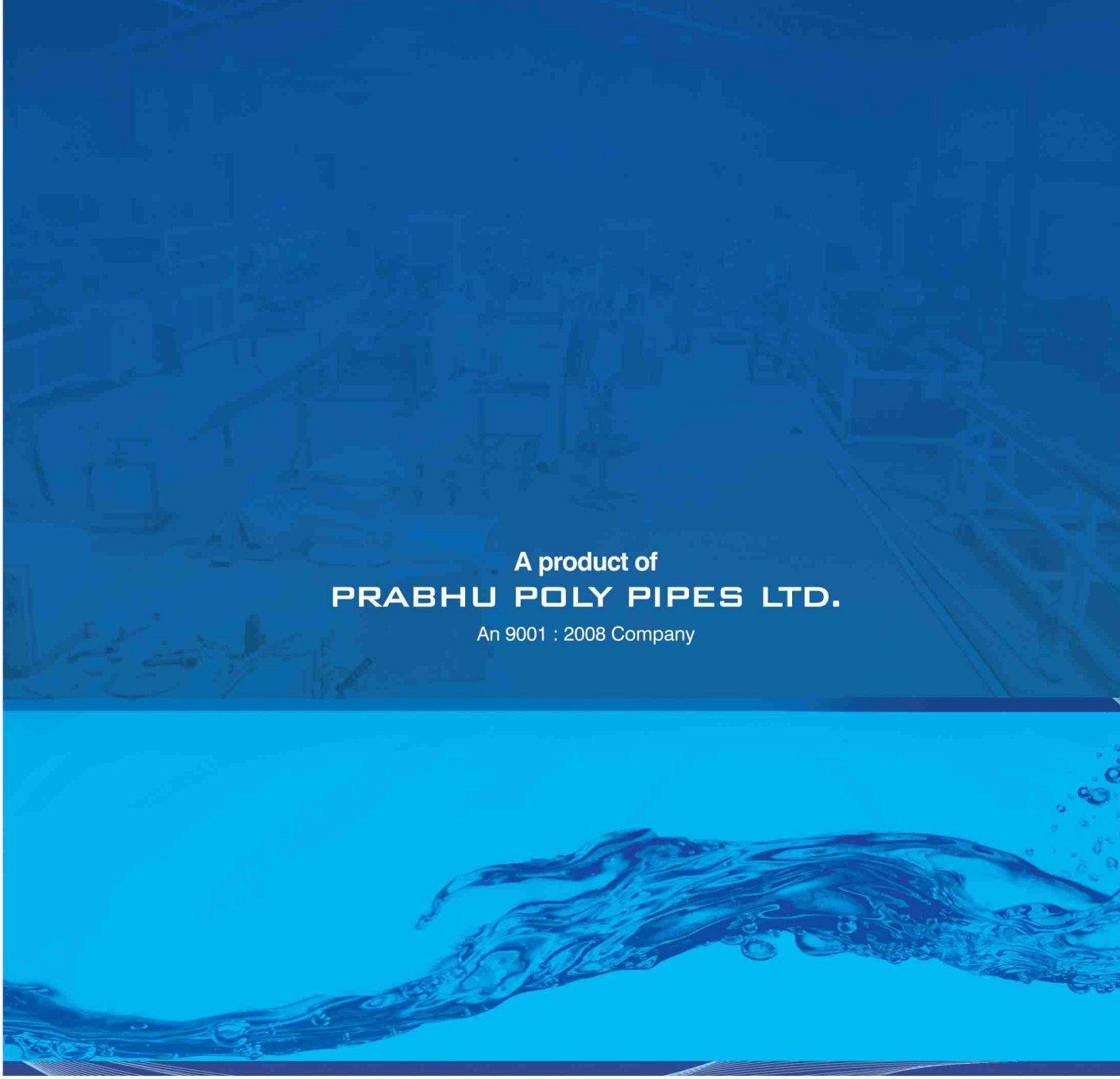
NATRAJ
PVC PIPES

NATRAJ PVC Pipes produced under various categories can be used for various applications and uses. Due to the vast product rage we have been established as the most reputed brand in the market today.

OUR ESTEEMED CLIENTS

We have a prestigious client list ranging from the leading construction companies of India like L&T ECC Division, Simplex Infrastructure Ltd, Bhilai Engineering Company, Border Security Force, Indian Railways and Government organization Public Health & Engineering Department, West Bengal, Water Resources Dept, Govt. Of West Bengal, P.W.D Govt. Of West Bengal to name a few.

L&T Construction Buildings & Factories
Simplex Infrastructures Limited
Tantia Constructions Limited
BEC Bhilai Engineering Corporation Limited 1960-2010
Indian Railways Lifeline to the nation...
PHED Public Health Engineering Department
WRDD Water Resources Development Department
TATA STEEL
NCC
PWD Public Works Department Government of West Bengal
RAMKY Towards sustainable growth
IVRCL Infrastructures & Projects Ltd.
Lloyd Insulations



A product of

PRABHU POLY PIPES LTD.

An 9001 : 2008 Company

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