PRINCE®
PIPES

PEFit® AQUA
BRINGS WATER
TO LIFE

STATE-OF-THE-ART MANUFACTURING UNITS

HYDERABAD EST. 2021

JAIPUR EST. 2019

KOLHAPUR EST. 2012

CHENNAI EST. 2012

HARIDWAR EST. 2008

DADRA EST. 2000

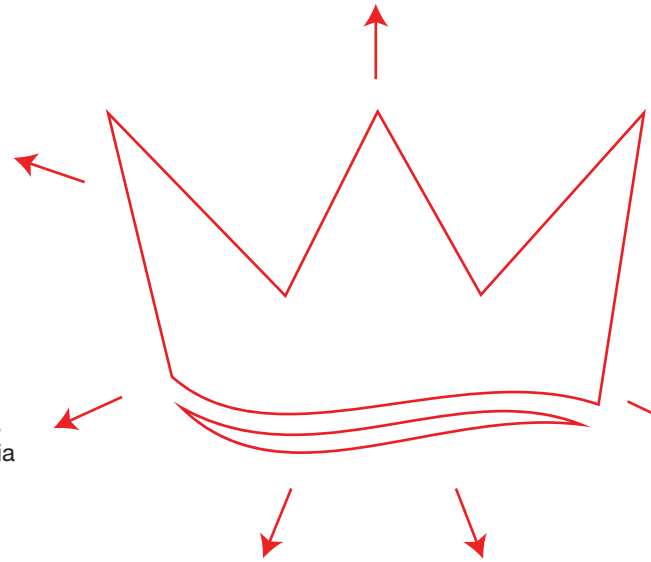
ATHAL EST. 1995

Prince Pipes provides the widest range of piping systems for all underground applications which are technologically advanced and fit for building a cleaner India. All our plants and work force are channelizing their efforts and energy towards achieving this mission making us the **ONE TRUSTED NAME** for all underground piping applications.

CONTENT

COMPANY OVERVIEW

One of **India's largest integrated piping solutions**



Amongst **top 5** processors in India

8 Patented designs backed by robust R&D

9 Depots across India

Wide range of 7,200+ SKUs

Strong legacy of more than **4 decades**

Comprehensive product portfolio **across polymers**

TECHNICAL COLLABORATION

Tooling holland
A global leader in plastic moulds manufacturing

Lubrizol
World's largest manufacturers and also the inventors of CPVC compound

FlowGuard Plus
WORLD'S NO. 1* CPVC PLUMBING SYSTEMS

Corzan
MATERIAL & PIPING SOLUTIONS

PRODUCT COLLABORATION

Ostendorf Kunststoffe

HT safe
by Gebr. Ostendorf Kunststoffe

Skolan safe
by Gebr. Ostendorf Kunststoffe

hauraton

AWARDS & CERTIFICATIONS

Green Building certification by the Indian Green Building Council (IGBC) for Chennai Plant

Green Building certification by the Indian Green Building Council (IGBC) for Jaipur Plant

Prince Pipes Wins brand of the year award at INEX 2023

TÜVRheinland CERTIFIED
ISO 9001:2015
ISO 14001:2015
ISO 45001:2018
www.tuv.com
ID 9000013955

TÜVRheinland CERTIFIED
ISO 50001:2018
www.tuv.com
ID 9108653794

Water is a valuable resource and for us at PRINCE PIPES we are committed to ensure that the water gets distributed effectively, since every drop of water counts.

With years of experience in polymer piping Industry, Prince Pipes has maintained the highest quality standards across all product categories using Zero defect manufacturing process.

A system that nurtures and embrace the glory of water by transferring every drop to the required places. We ensure zero leakage of water to prevent wastage of this valuable resource. Now Introducing **PEFit Aqua** - HDPE PIPING SYSTEMS

PEFit® AQUA

HDPE PIPING SYSTEMS

ABOUT PRINCE PEFit AQUA

Polyethylene polymer is designed to meet the most demanding operating conditions in the process of transmission of various types of liquids.

Prince **PEFit Aqua** Pipes are manufactured in our state of the art manufacturing facilities using high quality virgin raw material & are available in PE63, PE80 & PE100 HDPE material. Fittings are available in PE100 HDPE material.

Furthermore, Pipes are made as per IS4984:2016 & Fittings are made as per EN12201 using European Hi-Tech machines ensuring that the product delivered is the best in class.

PRODUCT RANGE

SIZE (MM)	MATERIAL CLASSIFICATION	WORKING PRESSURE	END CONNECTION
Pipes 20mm to 315mm	PE63, PE80, PE100	2KG/CM^2 to 20KG/CM^2 SDR41 to SDR6	Butt Welding, Electro Fusion
Fittings 63mm to 200mm	PE100	PN16 (SDR-11)	Electro Fusion

Pipe

Size: 20mm to 315mm

Length: 6 meter & 12 meter

Coil

Size: 20mm To 110mm

ADVANTAGES THAT SETS US APART

PEFit Aqua piping system offers all the major advantages of polyethylene material which results in considerably lower installation and product life cycle cost when compared with traditional piping materials;

Ease of installation and excellent weldability:

Butt welding / Electro fusion jointing process is simple and relatively fast and provides efficient installation, which ensures no leakage of fluid through out its life.

Excellent Flexibility:

The flexibility of HDPE piping systems allows it to adapt to the contour of the land as well as to directional changes.

Low friction coefficient & higher flow capacity:

Prince **PEFit Aqua** HDPE piping systems offer excellent flow characteristics and minimum pressure losses. Lower friction leads to energy saving in pumping of liquids. As per Hazen-William's flow co-efficient, the flow value is 150 for HDPE material

UV Resistance:

HDPE piping systems are UV resistance.

Recyclable:

HDPE is safe for recycling since it can be homogeneous and processed.

Light in weight:

It is lighter than Mild steel, Stainless Steel, Concrete & Cast Iron. It is easier to handle & install

Chemical and corrosion resistance*:

HDPE piping systems are corrosion resistant, do not rust, rot, or corrode.

Resistance to ground movement and loads:

HDPE has low notch sensitivity, high tear strength & excellent scratch & abrasion resistance. Its resistance to environmental stress cracking is outstanding.

Good weather resistance:

Excellent performance in aggressive climatic conditions having superior and low temperature resistance with antimicrobial properties.

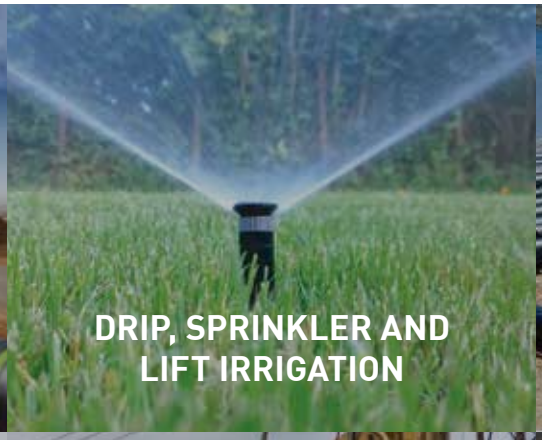
Long Life:

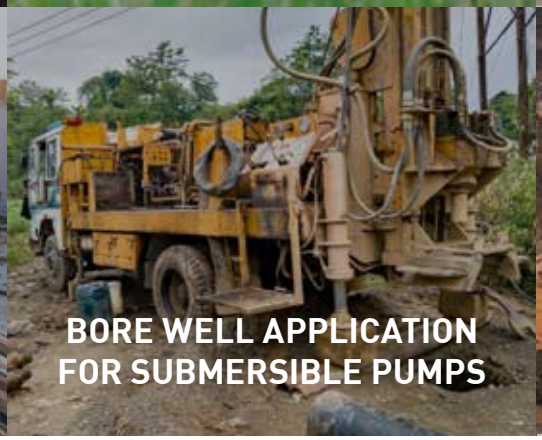
50 years expected life

*Note: The chemical resistance chart can be provided on request.

FIELDS OF APPLICATIONS

Designed especially for nation building, **PEFit Aqua** can be used for:





Rest assured, Prince **PEFit Aqua** piping system can be used in underground & above ground water piping applications.

QUALITY CONTROL & TESTING

In order to assure a high and consistent quality level, **PEFit Aqua** piping systems undergo strict quality control at its every stage of realization. PRINCE PIPES & FITTINGS LTD. has a laboratory with modern testing equipment.

- Visual appearance and dimensional check
- Longitudinal reversion
- Internal pressure creep rupture test for pipes and joints
- Carbon black content and dispersion
- Melt flow rate
- Oxidation induction time
- Overall migration
- Density
- Tensile strength test for butt fusion joint
- Elongation at break
- Slow crack growth rate

PIPE DIMENSION:

Standard dimension ratio (SDR) and corresponding wall thickness of pipes as per IS 4984:2016.

SDR	SDR 41		SDR 33		SDR 26		SDR 21		SDR 17		SDR 13.6		SDR 11		SDR 9		SDR 7.4		SDR 6	
Nominal Pressure (PN)																				
PE 63	PN 2		PN 2.5		PN 3.2		PN 4		PN 5		PN 6		PN 8		-		-		-	
PE 80	PN 2.5		PN 3.2		PN 4		PN 5		PN 6		PN 8		PN 10		PN 12.5		PN 16		PN 20	
PE 100	PN 3		PN 4		PN 5		PN 6		PN 8		PN 10		PN 12.5		PN 16		PN 20		-	
Wall Thickness (mm)																				
Nominal OD (mm)	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
20													1.9	2.2	2.3	2.6	2.7	3.1	3.4	3.8
25											1.9	2.2	2.3	2.6	2.8	3.2	3.4	3.8	4.2	4.7
32									1.9	2.2	2.4	2.7	2.9	3.3	3.6	4.1	4.4	4.9	5.4	6.0
40							1.9	2.2	2.4	2.7	3.0	3.4	3.7	4.2	4.5	5.1	5.4	6.0	6.7	7.5
50					2.0	2.3	2.4	2.7	3.0	3.4	3.7	4.2	4.6	5.2	5.6	6.3	6.8	7.6	8.4	9.3
63					2.5	2.9	3.0	3.4	3.7	4.2	4.7	5.3	5.8	6.5	7.0	7.8	8.6	9.6	10.5	11.7
75	1.9	2.2	2.3	2.6	2.9	3.3	3.6	4.1	4.5	5.1	5.6	6.3	6.9	7.7	8.4	9.3	10.2	11.3	12.5	13.9
90	2.2	2.5	2.8	3.2	3.5	4.0	4.3	4.8	5.3	5.9	6.7	7.5	8.2	9.1	10.0	11.1	12.2	13.5	15.0	16.6
110	2.7	3.1	3.4	3.8	4.3	4.8	5.9	6.6	6.5	7.3	8.1	9.0	10.0	11.1	12.3	13.6	14.9	16.5	18.4	20.3
125	3.1	3.5	3.8	4.3	4.8	5.4	6.0	6.7	7.4	8.2	9.2	10.2	11.4	12.7	13.9	15.4	16.9	18.7	20.9	23.1
140	3.5	4.0	4.3	4.8	5.4	6.0	6.7	7.5	8.3	9.2	10.3	11.4	12.8	14.2	15.6	17.3	19.0	21.0	23.4	25.8
160	3.9	4.4	4.9	5.5	6.2	6.9	7.7	8.6	9.5	10.6	11.8	13.1	14.6	16.2	17.8	19.7	21.7	24.0	26.7	29.5
180	4.4	4.9	5.5	6.2	7.0	7.8	8.6	9.6	10.6	11.8	13.3	14.7	16.4	18.1	20.0	22.1	24.4	26.9	30.0	33.1
200	4.9	5.5	6.1	6.8	7.7	8.6	9.6	10.7	11.8	13.1	14.7	16.3	18.2	20.1	22.3	24.6	27.1	29.9	33.4	36.8
225	5.5	6.2	6.9	7.7	8.7	9.7	10.8	12.0	13.3	14.7	16.6	18.4	20.5	22.7	25.0	27.6	30.5	33.7	37.5	41.4
250	6.1	6.8	7.6	8.5	9.7	10.8	12.0	13.3	14.7	16.3	18.4	20.3	22.8	25.2	27.8	30.7	33.8	37.3	41.7	46.0
280	6.9	7.7	8.5	9.5	10.8	12.0	13.4	14.8	16.5	18.3	20.6	22.8	25.5	28.2	31.2	34.4	37.9	41.8	46.7	51.5
315	7.7	8.6	9.6	10.7	12.2	13.5	15.0	16.6	18.6	20.6	23.2	25.6	28.7	31.7	35.0	38.6	42.6	47.0	52.5	57.9

ELECTROFUSION FITTINGS

PRINCE Electrofusion fittings are an integral component of high-density polyethylene (HDPE) piping system. These fittings are specifically designed for ease of assembly and to provide optimum efficiency during the welding process and offers a high-performance jointing.

Electrofusion welding is a fusion-welding process used to join HDPE pipes and fittings. It involves the use of electro fusion fitting that have built-in heating element. These fittings are equipped with resistance wire called as heating element, when energized with heat to a specific temperature the surrounding HDPE material melts. When this melted HDPE material cools down and solidifies, it forms a strong, homogeneous, and leakproof joint between pipe and fitting.

Elbow 90°	
Size (mm)	Item Code
63	IT101538
75	IT101537
90	IT101536
110	IT101535
125	IT101534
140	IT101533
160	IT101532
180	IT101531
200	IT101530

Coupler	
Size (mm)	Item Code
63	IT101547
75	IT101546
90	IT101545
110	IT101544
125	IT101543
140	IT101542
160	IT101541
180	IT101540
200	IT101539

Bend 45°	
Size (mm)	Item Code
63	IT101529
75	IT101528
90	IT101527
110	IT101526
125	IT101525
140	IT101524
160	IT101523
180	IT101522
200	IT101521

Reducer	
Size (mm)	Item Code
75 X 63	IT101519
90 X 63	IT101520
90 X 75	IT101518
110 X 63	IT101517
110 X 75	IT101516
110 X 90	IT101515
125 X 63	IT101511
125 X 75	IT101512
125 X 90	IT101513
125 X 110	IT101514
140 X 63	IT101495
140 X 75	IT101496
140 X 90	IT101508
140 X 110	IT101509
140 X 125	IT101510
160 X 63	IT101502
160 X 75	IT101503
160 X 90	IT101504
160 X 110	IT101505
160 X 125	IT101506
160 X 140	IT101507
180 X 90	IT101497
180 X 110	IT101498
180 X 125	IT101499
180 X 140	IT101500
180 X 160	IT101501
200 X 63	IT101494
200 X 75	IT101493
200 X 90	IT101492
200 X 110	IT101491
200 X 125	IT101490
200 X 140	IT101488
200 X 160	IT101489

Note: Equal Tee, Unequal Tee (with & without coupler), End Cap and Saddle will be made available as per requirement

JOINTING TECHNIQUES

PEFit Aqua piping system can be jointed with various following techniques

- Using Electrofusion fitting technique
- Butt fusion technique
- Using socket fitting Socket fusion technique
- Using compression fittings
- Using stub-end fitting and metal flange

ELECTRO FUSION JOINTING METHOD

For the installation of Electrofusion fittings following steps to be followed:

- Thoroughly clean the surface of pipe ends and electrofusion fitting internal surface with clean cloth.
- Insert the pipe ends inside the fitting till the socket end.
- Connect the supply wires of electrofusion control unit to terminals of electrofusion fittings. Electrofusion control unit controls the heating process and temperature requirements.
- Scan the bar code provided on fitting with barcode scanner which is attached to electrofusion control unit. By scanning the bar code electrofusion control unit select the necessary parameters such as voltage and time required for fusion of fitting.
- Apply control voltage to heating wires, electrofusion process starts.
- Electrofusion fitting and pipe start melting process and finally fusion of pipe and fitting complete.
- Maintain the joint holding pressure on pipe and fittings until the joint cools and solidifies.

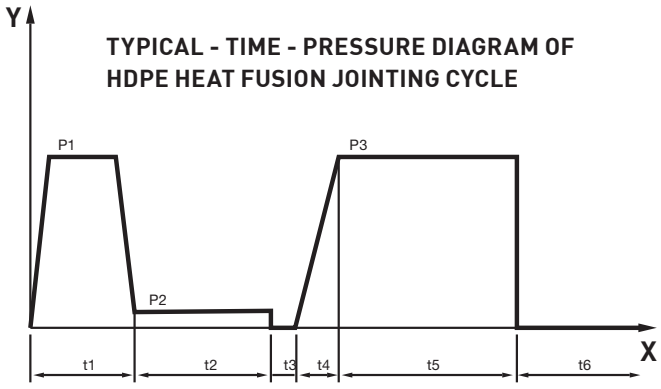
POLYETHYLENE BUTT JOINTING METHOD

- Set the fusion mirror temperature at $215^0C \pm 5^0C$.
- Test the moving clamp platform movement before clamping the pipe in butt fusion device.
- Clean the mouth of pipes and heating mirror which need to be butt fusion welded.
- Align pipes in butt fusion welding device and firmly clamp in butt fusion jointing device.
- Ensure minimal gap between cross sectional surfaces of pipe & fitting, gap between pipe and fitting shall not be more than 0.5mm.
- Face the pipe ends with motorized rotary cutter device to bring parallels of both end of pipe and fittings surface which are to be butt fusion welded.
- Position the fusion mirror on butt fusion machine, ensure pipes shall not touch with fusion mirror.
- Bring the surfaces of pipes forward so that they touch with fusion heating mirror and apply gentle pressure till the surfaces gets softened. Continue to apply pressure until formation of specified bead height around the periphery of pipes
- After completion of heating time take pipes away from heat fusion mirror. Remove the heat fusion mirror quickly and join the pipes by forwarding towards each other.
- Continue to apply pressure till the pipes are fused together. Hold the pressure till the joint get completely cool.
- Now remove the clamps and allow to cool the joint on ground.

  Note: In case of pipe and fitting jointing, the jointing procedure will be same as above.

RECOMMENDED VALUES FOR THE HEATED TOOL BUTT-WELDING OF PIPES AND FITTINGS

WALL THICKNESS (MM)	BEAD HEIGHT (MM)	HEATING TIME (SEC)	MX. CHANGE-OVER TIME (SEC)	PRESSURE BUILD-UP TIME (SEC)	MIN. COOLING TIME UNDER JOINING PRES-SURE (SEC)	COOLING TIME DURING PRES-SURE RELAX-ATION (SEC)
Up to 4.5	0.5	45	5	5	6	300
4.5 - 7	1.0	45-70	5-6	5-6	6-10	600
7-12	1.5	70-120	6-8	6-8	10-16	900
12-19	2.0	120-190	8-10	8-11	16-24	1200
19-26	2.5	190-260	10-12	11-14	24-32	1500
26-37	3.0	260-370	12-16	14-19	32-45	1800
37-50	3.5	370-500	16-20	19-25	45-60	2100
50-70	4.0	500-700	20-25	25-35	60-80	2700



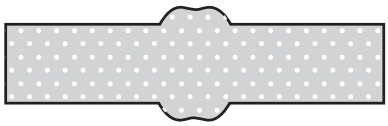
TYPICAL - TIME - PRESSURE DIAGRAM OF HDPE HEAT FUSION JOINTING CYCLE

X axis - Time
Y axis - Pressure
t1 - Initial bead formation time
t2 - Heat soaking time
t3 - Heating plate removal time
t4 - Time to achieve fusion jointing pressure
t5 - Cooling time on the machine under pressure
t6 - Cooling time out of the machine

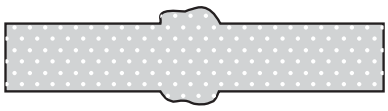
P1 - Initial bead formation pressure
P2 - Heat soaking pressure
P3 - Fusion jointing pressure

TROUBLE SHOOTING GUIDE
FOR BUTT FUSION JOINTING

SR. NO.	BUTT FUSION JOINT DESCRIPTION	POSSIBLE CAUSE
1	Excessive bead width	Overheating; Excessive joining force
2	Too deep V groove between 2 beads	Excessive joining force; Insufficient heating; Less pressure during heating
3	Flat bead top	Excessive joining force; Overheating
4	Non uniform bead formation	Misalignment; Heating tool might be worn or defective; Incomplete or improper facing
5	Uneven bead formation; one bead is larger than another bead	Misalignment; Slippage of component in clamp; Heating tool might be worn or defective; Incomplete or improper facing; Dissimilar material
6	Bead too small	Insufficient heating; Insufficient joining force
7	Bead too large	Excessive heating or heating time

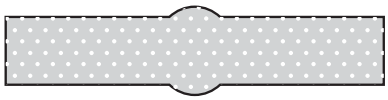


Good Butt fusion joint

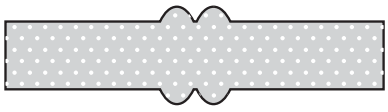


Bead too small, Insufficient heating time

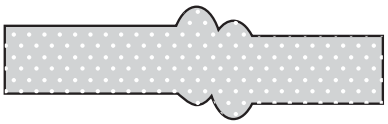
Bead spread, too much pressure



Thin bead, not enough pressure



V Groove Bead, Insufficient heating, less pressure during heating



Un even bead formation, mis-alignment, dissimilar material

TIPS ON SAFE HANDLING, STORAGE AND TRANSPORTATION

- While handling pipes at plant and at site always use personal protective equipment such as helmet, safety shoes, gloves & safety glasses to prevent injury.
- Polyethylene pipe has properties like lightweight, flexibility and good resistance to impact but they can be scored by sharp edges and can be deformed under load at high temperature and hence care has to be taken during loading/unloading, shifting and storage that they should not be dropped, dragged and impacted.
- During uncoiling and recoiling coil pipes maintain minimum coil diameter to prevent from kinking effect and ensure sharp object do not score pipe.
- While handling pipe with mechanical handling equipment use nylon sling for lifting heavy, long length and higher diameter pipe. Never use chain, wire ropes, etc. which may permanently damage pipes.
- Pipe can be stored on flat ground with timber support of at least 4” width & breadth and timber support placed at 1.5-meter interval with side support up to maximum 1.5- 2.0-meter stacking height.
- While stacking or transporting pipes keep lower SDR means thick wall thickness pipes at the bottom and higher SDR means thin wall pipes above on lower SDR pipes.
- Coiled pipes shall always be handled using nylon sling and mechanical material handling equipment.

NOTES:

PRINCE® PIPES

PRINCE PIPES AND FITTINGS LIMITED

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DISPOSAL OF WASTE & RESIDUES IN ACCORDANCE WITH LOCAL AUTHORITY REQUIREMENTS.

PEfit Catalogue/PPF/EL/Rev. No. 02/ April 2024.