

**MAX M PE PIPES**  
Strength. Performance. Durability



**Build to last. Build to perform.**



**TIME TECHNOPLAST LTD.**  
Leading through Innovations and Technology

**Time Technoplast Limited (TTL)**, is one of India's leading plastic processing companies and has pioneered innovative products driven with latest world-class technology. Headquartered in Mumbai, TTL has established the largest manufacturing capacity in the country with 22 state-of-the-art production facilities at strategic locations across the country. The company's interest covers Rigid Industrial Packaging, Automotive Components, PET Sheets, Lifestyle, Infrastructure and Health Care products. The latest addition to the company's existing range is Polyethylene pipe branded as **maxM PE Pipe**.

### PE (Polyethylene) Pipe.

Even in heavy-loaded areas, where only the strongest – Galvanized iron, Ductile iron, Cement Pipe survive, Plastic in the form of HDPE has scored beyond doubt as an ideal substitute. HDPE is today, the internationally preferred piping material across an unbelievable range of applications (where strength & long life are key requirements). HDPE is also capable of handling even semi-solid and gaseous effluents and displays unmatched resistance to corrosive chemicals. In other words where metal, cement and other forms of plastics fail to perform, HDPE pipes excel.



State-of-the-art HDPE Pipe plant at Silvassa



Ultra modern manufacturing unit

**PE Pipes** are one of the two largest thermoplastic pipelines available and by far the most versatile. Polyethylene is a wax like thermoplastic with a density varying from a range of 934 Kg/m<sup>3</sup> to 960 Kg/m<sup>3</sup> which is less than that of water. The only two additives that are added to polyethylene are Carbon black with a limit of 2–3% to add some reinforcing effect to increase its weathering properties and some Anti-Oxidant to a limit of 0.3%. We mostly use black pre-compounded PE material. HDPE having comparatively high molecular weight is high in abrasion resistance and impact strength. It is also very good in stress cracking resistance and has low creep rupture properties. It is excellent in insulation properties over a wide range of frequencies and good chemical properties.

### Raw Material

**maxM PE Pipes** are manufactured from virgin raw material. The wide varieties of materials such as PE-63, PE-80 and PE-100 have varied MRS (Minimum Required Strength) values. Both excellent weathering ability and resistance to UV light can be obtained by utilizing the correct material configuration available in the market.

### Applications

The company is equipped with most modern automatic extrusion lines for making pipes ranging from **20 mm OD to 1400 mm OD** of pressure range PN 2.5 to PN 16.

**maxM PE Pipes** can act as an ideal substitute for Galvanised iron, Cast iron and other material pipes – appropriate for varied applications such as Potable Water Services or Distribution lines, Sewerage & Drainage, Electrical Ducting, Natural Gas distribution, Irrigation, Waste Disposal, Industrial & Mining applications, Offshore pipeline installations under different climatic conditions as also or transportation of major aggressive chemicals.

### Fabricated Fittings

TTL also fabricates PE fittings to suit specific applications, thus providing a complete solution to all customer requirements. Accessories like bends, tees, flanges, slint ends, reducers & end caps are available, as required, both fabricated & moulded.

### Quality and Testing Facilities:

**maxM PE Pipes** are made with quality assurance system and strict adherence to IS : 4984, IS : 14333, IS : 14151, ISO : 4427, ASTM - D 2239, D 2447, D 3035, F 714, AS AE - 435, AS - 2698.1, BS - 6437, DIN 8074/5 design and testing code to match the quality of our products and services.



Quality Control & Testing Laboratory



## FEATURES AND BENEFITS OF **maxMPE** PIPES

- Very low frictional resistance to fluid flow and thus saves energy cost for pumping.
- "C" factor of **maxMPE** Pipe is 150 (Highest "C" value of 150 is recommended in William Hazen Formula).
- UV resistant. Low wear and tear and fully abrasion resistant. Remains free from incrustation throughout the life span giving better flow always.
- Suitable to withstand high fluid flow and external soil pressure. Chemically inert and hence resistant to most chemicals and hostile corrosive soils.
- Excellent impact resistance, withstands water hammer shocks and transverse loads due to thermal stresses.
- Bending radius is 25 times the pipe diameter. Excellent elastic properties ensure absorption of soil movements, stresses and Hydraulic pressure.
- PE pipes are easier to handle & install compared to heavier metallic or concrete pipes. PE is about one-eighth, the density of steel and thus does not require the use of heavy lifting equipment for installation.
- Light weight facilitates easy handling and instant fixing. Joints obtained by Butt welding are homogenous and 100% leak proof. Offers life of minimum 50 years.
- Available in single coil in lengths as required particularly the smaller diameter pipes. No additional joints, sockets, etc are required.
- Ease of use with relining techniques avoiding opening of trenches, Outstanding ability to withstand Rapid Crack Propagation (RCP).
- Full joint traceability, ideal for renovation work through pipe bursting techniques, No requirements for protective coatings.



Comparison of PE PIPING SYSTEM versus CONVENTIONAL PIPES such as DUCTILE IRON, CONCRETE, CLAY etc		
	Conventional	PE
Joint traceability?	X	✓
Low maintenance costs?	X	✓
Corrosion resistant?	X	✓
Flexible pipe, less liable to stress fractures?	X	✓
Operational system during branch additional?	X	✓
Reduce labour requirement in pipe lifting and installation due to weight differential	X	✓
Reduce labour skills in jointing operations	X	✓
Extra protection required?	✓	X
Lower energy requirement to overcome pipe friction?	X	✓
Reduced joint stress due to pipe flexibility?	X	✓
Liable to layer separation?	✓	X
Potential joint leakage?	✓	X

### Design life of Polyethylene Pipes

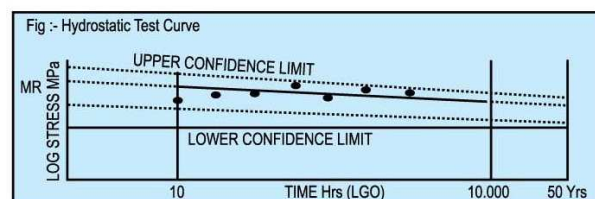
The burst pressure of PE pipes is time dependent and therefore it is necessary to define the strength of the material at a reference life time.

The time normally chosen for this reference value is 50 years, as the various safety factors that are incorporated into the design means that the actual lifetime will be many times greater. In order to generate the burst strength of the material at 50 years, a number of pipe samples are pressure tested to failure at lifetimes between 10 and 10,000 hours.

The results of these tests are graphically and numerically analysed to obtain minimum required strength (MRS) at 50 years. A graphical representation of this process is shown in the figure below. Within the ISO standards it is recommended that the MRS value is based on the 97.5% lower confidence limit obtained by regression analysis. Thus the minimum required strength (MRS) for the different polymers is listed below.

Type	MRS (Mpa)	Design Stress	
PE 63	6.3	MRS* 1.25	5
PE 80	8		6.3
PE 100	10		8

\*1.25 ~ Service co-efficient for water





## PE Pipes - Transportation of Potable Water as per IS:4984:1995, ISO 4427-1:2007

HDPE Pipes all over the world are widely used for conveyance of potable water. HDPE Pipes are non-toxic and do not impart any foul taste or smell to the water that is conveyed through it. They do not pose any damage through disinfectant also.

TTL is manufacturing these pipes starting from 20 mm OD up to 1400 mm OD in Pressure rating of PN 2.5 to PN 16 as per IS:4984: 1995. for all three grades of polyethylene material designated as PE-63, PE-80 and PE-100.

**Applications :-** Water Mains, Distribution, Service pipes.




Water Mains & Distribution line



Offshore Pipeline


## PE Pipes - Sprinkler Irrigation as per IS: 14151. 1999 Part I & Part II

Farmers in India can avail the benefits of irrigating their fields with Sprinkler Irrigation System which is one of the modern methods of irrigation where the water is pumped through pipeline and sprayed under pressure across the field through a few rotating device called Sprinkler like artificial rains. The rotation is achieved by the water pressure only. It can also be used by them for Irrigation purposes.

TTL is manufacturing  PE Pipe – Sprinkler Irrigation of both Medium-duty and Heavy-duty type.

Medium-duty type – sizes ranging from 63 mm OD to 110 mm OD and suitable for general agriculture crops like wheat, pulses, vegetables, etc.

Heavy-duty type – sizes ranging from 63 mm OD to 200 mm OD and suitable for plantation crops like tea, coffee, spices, etc.

 PE Pipes – Sprinkler Irrigation have the following advantages.



- 1) Water economy – Coverage of maximum area with minimum available water.
- 2) No run off of excess water and thus saves soil erosion.
- 3) Able to withstand high operating pressure.
- 4) Light in weight, flexible, easy to transport, handle and install.
- 5) Non-corrosive and resistant to most chemicals and fertilizers.
- 6) Savings in manpower and energy.

**Applications :-** Fields, Tea plantation (Sprinkler), Liquid fertilizer, Suction & delivery pipe from pump.



Sprinkler Irrigation System

## PE Pipe – Drainage & Sewerage Disposal as per IS:14333:1996.

 PE Pipe for transportation of sewerage and industrial effluents are made as per IS:14333:1996. The main advantages of  PE pipes for conveyance of Sewerage and Industrial Effluents are.

- 1) Resistance to chemicals.
- 2) Abrasion resistant.
- 3) Resistant to treated or untreated water.
- 4) Favourable mechanical properties including toughness.
- 5) Greater burst strength due to flexibility.
- 6) Excellent free flowing characteristics due to smoother inner surface.
- 7) Higher longevity.

**Applications :-** Surface & Rain Water, Waste Water, Sub-soil Water, Domestic & Sanitary Sewage, Internal Sewers, Main Sewers, Sub-mains.



### Applications of PE Pipes

Water Supply Systems	Industrial	Environmental Protection	Agriculture	Others
Transportation and distribution system	Effluents, chemicals and treated/untreated water disposal	Underground drainage and sewerage application/ rehabilitation of existing sewer	Column piping for submersible and jet pumps	Transportation of chemicals, solids, gas and oils
House service connection e.g. Municipal water bodies, SEZ's, layout's, etc.	As hydro transport system for handling and conveyance of iron, coal and cement slurry in mines	Effluent and waste treatment plants	Suction and delivery pipes	Underwater pipelines/ desalination plants
	For conveyance of edible oil, fruit pulps, juices, milks and other food materials	Dust suppression piping systems in cement industry	Sprinkler and drip irrigation systems	Telecommunication cable ducting (PLB duct.)
	As a ventilation and air conditioning duct	Sand slurry disposal pipes in dredging	Lift irrigation	
		De-gassing pipes in water effluent marine outfalls	Insecticide spraying	



## PE Pipes Jointing methods

PE pipes can be joined by different means depending upon end use requirements.

Some of the jointing techniques are as follows.

For permanent joints :-

- 1) Butt Fusion Welding joint (widely used)
- 2) Socket Fusion joint
- 3) Electro Fusion joint

### 1) Butt Fusion Welding joint

- Clean both ends with a damp cloth to dislodge any foreign matter or dirt deposited on the pipe.
- Hold the pipes firmly with the clamps of a specially designed welding jack.
- Bring both the faces to axial alignment by using support rollers to minimize mismatch of the faces by rotating, if necessary.
- Carefully remove the oxidized layer on the butts by using a scraper or a planner.
- Bring both faces in contact with an electrically heated welding mirror maintained at temperature of  $210 \pm 5^{\circ}\text{C}$ . Fuse the butts by applying a slight pressure of around  $0.2 \text{ kg/cm}^2$ . The pipe material melts and forms a uniform circular rim on the periphery of both the pipe faces.
- Remove the heating mirror and quickly bring both ends in contact with enough pressure.
- Allow the joint to cool to ambient temperature under pressure.
- Open the clamps and remove the pipes from the welding jack.



Butt Fusion Welding joint

### 2) Socket Fusion joint

- For smaller diameter PE pipes, socket heat fusion technique is adopted.
- In this technique individual pipe lengths are joined by heat fusing the outside surface of the pipe to the inside surface of fitting.
- It is mainly used for industrial & domestic plumbing systems.
- For this purpose a special equipment is available that simultaneously heats these two surfaces to fusion temperature.

### 3) Electro Fusion joint

- In this method the socket of the fitting incorporates an electrical heating coil.
- When energized by an electronic control unit, the coil causes the material around it to melt and form an expanding pool which comes in contact with the surface of the pipe. This causes the pipe to melt, leading to fusion of pipes & socket.
- Used for air / gas distribution lines.



Socket Fusion joint

**For Mobile (detachable) joints :-**

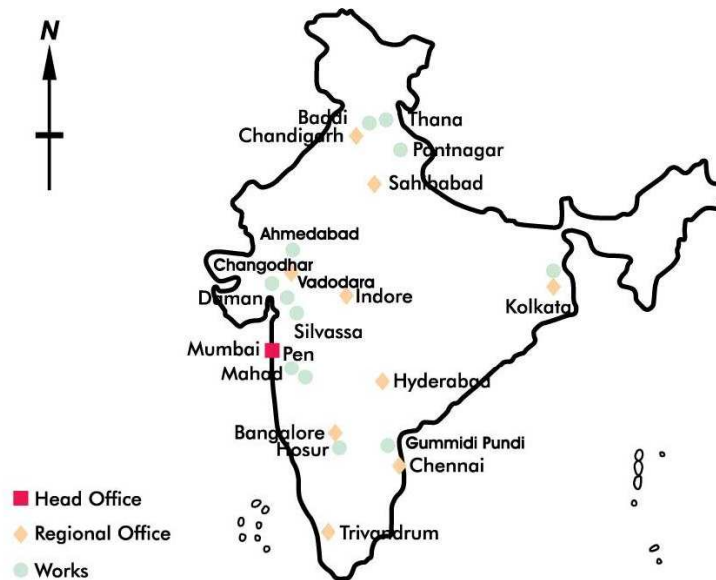
- 1) Compression joint
- 2) Flanged joints
- 3) Quick release joints
- 4) Insert joints

## Handling & Transportation of **maxMPE** Pipes

- ☐ Care and attention should always be applied when handling pipes, not only for the protection of the pipes but also for the handling personnel.
- ☐ Pipes should never be dropped onto hard or uneven surfaces and should never be thrown from vehicles.
- ☐ Pipes should never be dragged or rolled along the ground. Metal chains, hooks or ropes should never be used.
- ☐ Where possible, pipes should always be loaded individually. In cases where pipes are already bundled into frames, proper lifting equipment (lift truck etc) should be used.
- ☐ Where the pipe weight exceeds handling personnel weight capability, rope or web slings should be used with mechanical lifting equipment. Vehicles transporting the pipes should have a flat bed, which includes supports that are free of sharp edges or projections.
- ☐ Pipes should be evenly supported over their full length and not overhang in the vehicle.
- ☐ Where different sizes of pipes are to be transported together, larger diameter pipes should be loaded first with the vehicle having side supports at no larger than 1.5m intervals.

## Project Execution Services

- ☐ We also offer turnkey solutions for the laying, jointing, and commissioning of the pipelines.
- ☐ Project consultancy and designing can also be undertaken by us, if required.



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