

Ori-Plast®
LIFE LINES... NOT JUST PIPE LINES

ISO 9001 : 2000 COMPANY

Head Office
40, Strand Road
Kolkata - 700 001, WB
Phone: +91 33 2243 3396/97
Fax: +91 33 2243 2395
Email: sales@oriplast.com

Jaipur Branch Office
Plot No.: K-53
Flat No.: G-3 Kishan Nagar (Shyam Nagar)
Jaipur - 302 019, Rajasthan
Fax: +91 141 229 7111, Email: sales@adventec.in

Bhubaneswar Branch Office
A1, 34/A, VIP Area,
IRC Village, Nayapalli
Bhubaneswar - 751 015, Odisha
Fax: +91 2551 1336, Email: bbsr@oriplast.com

Raipur Branch Office
Khushi Residency, Block - A
Flat No. 203, Mouza Telbandha
Labhandi, G. E. Road, Near Magnet Mall,
Raipur - 492 010, Chattisgarh, Phone: +91 79801 92901

Bagnan Works
Khadinan, Bagnan,
Howrah - 711 303 (WB)
Phone: +91 96811 58608/96810 27489
Fax: +91 32 1426 6161
Email: contactus@paramppolymers.com

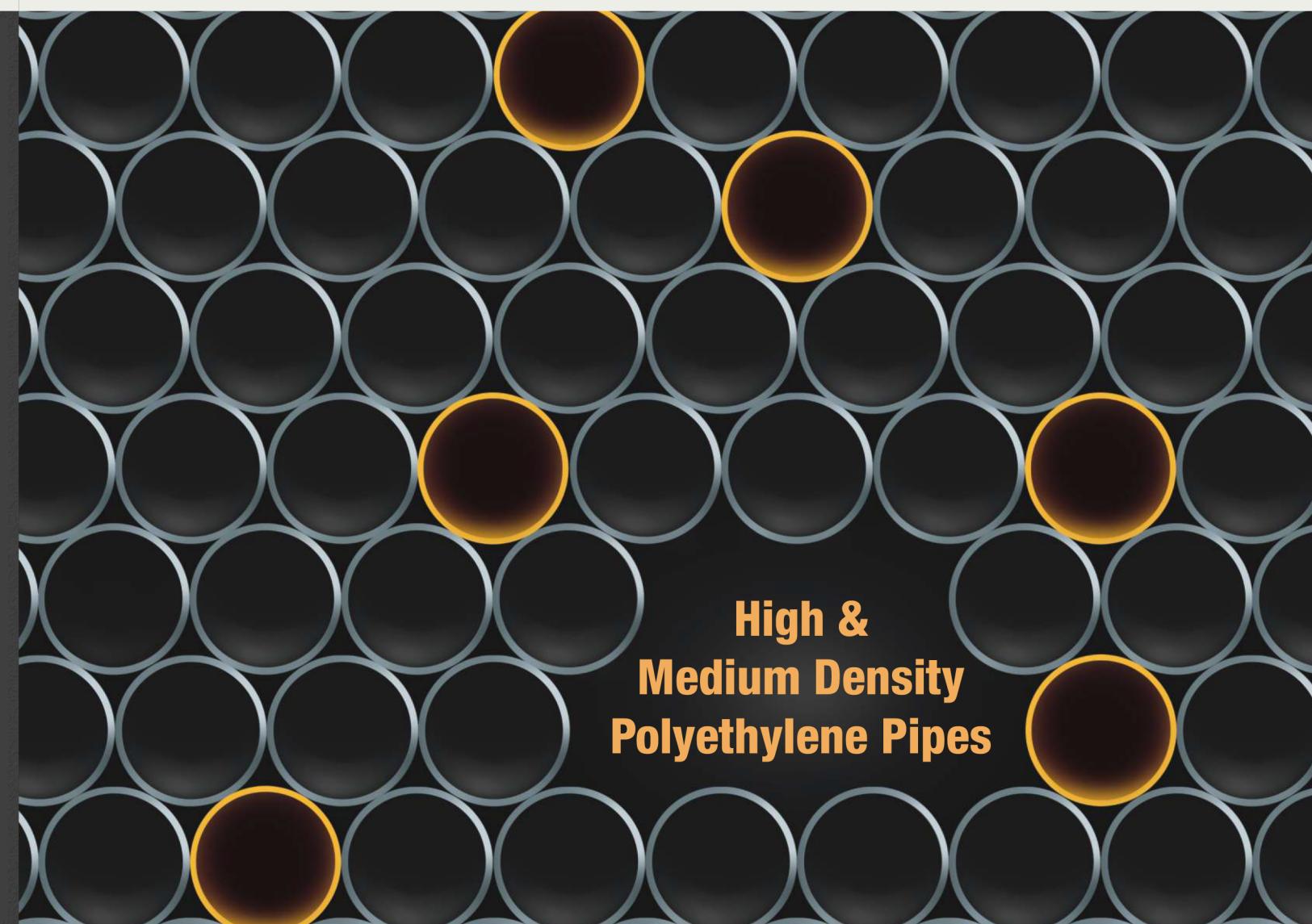
Behror Works
F-188 (K & L), RLICO Industrial Area, Phase II
Behror, Dist - Alwar, Rajasthan - 301 701
Phone: +91 1494 22 0064/2396
Fax: +91 1494 22 2234
Email: contactus@adventec.in

C & F Agent, Cuttack
M/s. Aditya Logistic, 202/C, P.O.: Naya Bazar, P.S.: Chaulaganj, Cuttack - 753 004, Odisha
Phone: +91 671 244 0419/320 2318, Email: cuttackdepot@oriplast.com



Toll Free No: 1800 123 2123

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**High &
Medium Density
Polyethylene Pipes**

HDPE Pipes & Fittings cater to every large scale need



back

cover

INVISIBLE PROVIDER... VISIBLE BENEFITS

The picture you see below will soon be covered by a beautiful landscape or concrete. You never get to see the vital arteries that work for our lives, tirelessly, twenty-four hours a day, day in day out, come rain or sunshine. Ori-Plast pipes play a very similar and critical role across all areas of human experience, in a city or a remote rural area, in commerce or industry, in agriculture or infrastructure. They perform unseen, incessantly, always efficient because life depends on them.

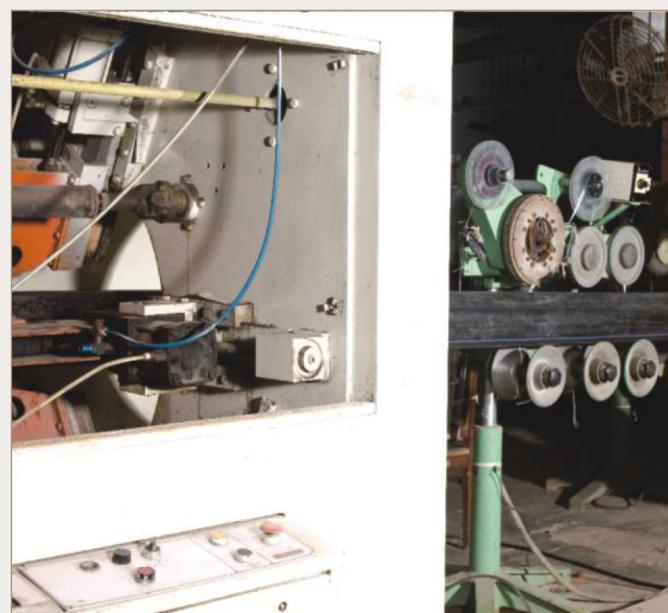
**BACKGROUND**

For over five decades Ori-Plast has looked only forward (1965 to 2015 and beyond). The founder of the company the late and honourable Mr. S R Agarwal, had a knack for transforming opportunities into achievements. Harnessing the benefits of plastic pipes and turning it into a widely accepted material for a diverse range of applications was his pioneering vision, and it was shared by all who teamed up with him. In the process Ori-Plast started producing pipes at a time when very few people had heard, much less understood their potential.

With dedication, commitment and technological finesse for doing things in a distinct manner, Ori-Plast has been able to achieve credibility across its ventures, which has created value for customers, end-users and all other stakeholders.

Today Ori-Plast has become the acknowledged leader across a gamut of advanced piping applications. In recent times customer needs have become more discerning than ever before, but the company has stayed focused on the trends and needs of the customers. One can see the company's readiness to change in the way it is streamlining operations, rethinking the basics, serving customers better with innovative new product developments, strengthening competitiveness, and providing timely solutions to pressing problems.

These are only a few of the many reasons for trusting Ori-Plast to provide you with the most suitable solutions for your varied requirements.



COMPLETE PIPING SOLUTIONS

Ori-Plast manufactures a wide range of Polyethylene pipes (HDPE & MDPE), conforming to various standards such as BIS, BS, DIN and ISO to name a few.

It now caters to every conceivable application - from drinking water supply, gas distribution and tube well systems to transportation of pulverized solids and dredging to cable ducting - in a wide variety of pipe sizes.

Plus, it also offers an extensive range of uPVC, cPVC, SWR and bore-well pipes and fittings.

Ori-Plast has earned the love and trust of its customers, and this has always acted as a catalyst that fires our commitment towards achieving still greater heights of perfection and excellence.



ORI-PLAST PE PIPES

Polyethylene is a thermoplastic polymer consisting of long chains of ethylene or ethene. It is a wax like thermoplastic with density varying from 934.0 kg/m³ to 960.0 kg/m³ which is less than the density of water.

The only two additives that are added to polyethylene are Carbon Black, within the range limit of 2-3% in order to add reinforcement and to increase polyethylene's weathering properties and trace amounts of anti-oxidant.

High Density Polyethylene (HDPE) has a relatively high molecular weight compared to MDPE and is superior in terms of abrasion resistance and impact strength. It is also strongly resistant to stress cracking and has low creep rupture properties.

It has excellent insulation properties over a wide range of frequencies and is not chemically active.

HDPE Pipes are one of the two largest thermoplastic pipelines available and by far the most versatile.

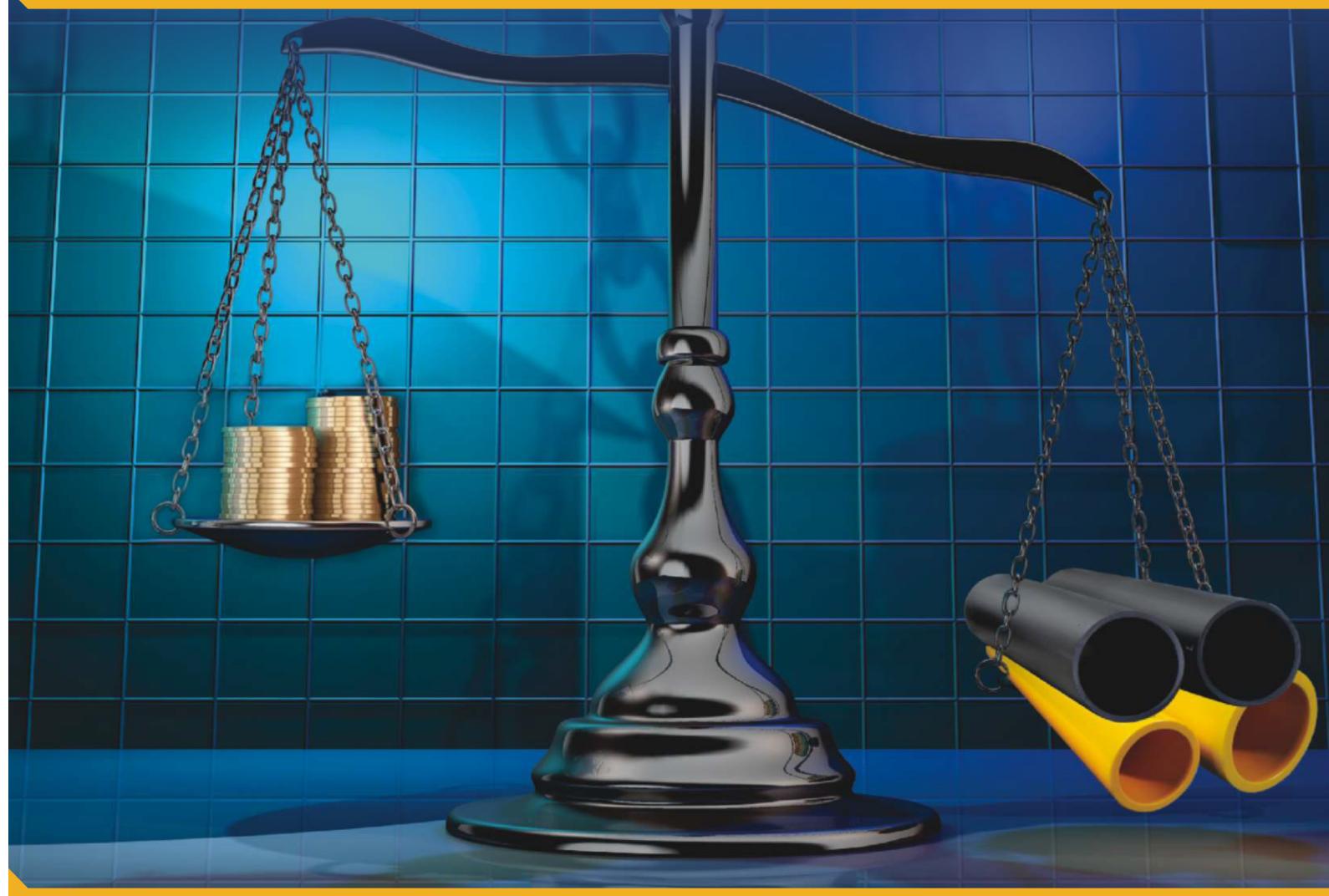
Ori-Plast HDPE pipes are manufactured from both indigenous and imported raw materials.



ORI-PLAST HDPE PIPES SPECIAL PROPERTIES

Ori-Plast HDPE pipes have the following advantages :

- Light weight, strong, long lasting and maintenance free.
- Flexible due to inherent elasticity and can be supplied joint less in long lengths of up to 100 meters, particularly the smaller diameter pipes.
- Tough due to high flexural and impact strength
- Capable of withstanding high internal and external loads by balancing internal fluid pressure with external soil pressure.
- Chemically inert and resistant to chemicals and hostile corrosive soil.
- Strongly resistant to acids, as well as alkalis and can be laid in marshy and corrosive soils without any coating or cathode based protection.
- Highly resistant to abrasion and suitable for transportation of slurry, boiler ash, ores, beach sands etc.
- Highly efficient as insulating media and requires minimal insulation while carrying chilled water.
- Offers very low frictional resistance to fluid flow and saves pumping energy costs.
- Remains free from encrustation throughout its life span and provides uniform flow throughout.
- Easy weldability ensures quick joining by most reliable Butt Fusion techniques
- Physiologically harmless as the pipes are tasteless, odourless and cause no bacterial growth. Suitable for transportation of potable water.



APPLICATION

Drinking Water Supply Systems

- Water Mains
- Distribution Network
- Service Pipes

Slurry Disposal Systems

- Corrosive Industries
- Slurry Dredging

Drainage Pipe Systems

- Surface and Rain Water
- Waste Water
- Sub-soil Water

Sewerage Pipe Systems

- Domestic
- Sanitary
- Internal Sewers
- Main Sewers
- Sub-mains

Irrigation Pipe Systems

- Fields
- Tea Plantation (Sprinkler)
- Liquid Fertilizer
- Suction & Delivery pipe from pumps

Electrical Conduit System

- Jumper Connection

Good Processing Systems

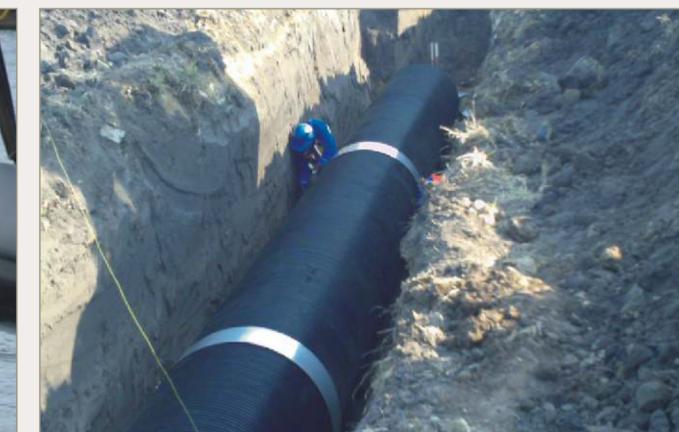
- Transportation of Milk
- Transportation of Edible Oil

Oil & Petroleum Transportation Systems

- Oil Main
- Crude Oil
- L P G
- Refinery Effluent

Ducting System

- Air Conditioning
- Refrigeration
- Humidification
- Fume Extraction



ORI-PLAST HDPE PIPES FOR CONVEYANCE OF POTABLE WATER IS 4984 AND OTHER INTERNATIONAL STANDARDS

The most commonly used application of HDPE Pipes globally is conveyance of potable water.

The Central Public Health Engineering Research Institute, Nagpur and the Ministry of Health, Govt. of India had long back certified the use of HDPE Pipes for conveyance of drinking water. HDPE pipes are non toxic and do not impart any foul taste or smell to the water that is conveyed through it.

The Central Public Health Engineering Research Institute, Nagpur in its report ISI No. BDC 3 : 8/t -1 dated 12th September, 1967 had confirmed that there is no greater bacterial growth in plastic pipes compared to piping of any other material.

Further the Ministry of Health, Govt. of India had issued a letter no. 15-05/66 PHE dated 20th August, 1968 to all State Governments recommending the use of HDPE pipes for drinking water transportation, especially in view of the scarcity of indigenous metals e.g. brass and zinc required for manufacturing fittings and for the galvanization of iron pipes which makes metal pipes prohibitively expensive.

Ori-Plast is a pioneer when it comes to manufacturing these pipes starting from 20mm OD and upto 630 mm OD with pressure ratings of PN 2.5 to PN 16 as per IS 4984, ISO 4427, DIN 8074 etc.

ORI-PLAST also holds BIS licenses to manufacture a vast range of HDPE pipes of different diameters, pressure ratings for all the three grades of Polyethylene material designated as PE 63, PE 80 and PE 100.

ORI-PLAST has always strived for perfection and quality, backed by an excellent service network.

ORI-PLAST offers only the best quality products and its quality has been acknowledged and certified by reputed institutes.

ORI-PLAST has focused on achieving and providing a foolproof, healthy and economic solution to common piping problems.

Satisfied Customers:
Essar Oil
Garware Wall Ropes
GWSSB
Hindusthan Paper
IOCL
L & T
Nagarjuna Construction
NTPC
Ramky Infrastructure
Shapoorji & Palonji
Siemens
TATA Pigments
TISCO



ORI-PLAST HDPE PIPES FOR SEWERAGE IS 14333 : 1996

IS 14333:1996 was formulated exclusively for conveying sewerage and industrial effluents by recommending a derating factor of 0.75 over the 'Maximum Hydrostatic Design Stress' of 4.0 MPa for PE 63 material, the only grade of PE available at that time. Later when two more grades of materials were added, through Amendment No. 1 in October, 2000; the values of Maximum Allowable Hydrostatic Design Stresses for these three grades of HDPE material were reclassified as follows

- for PE 63 -3.0 MPa
- for PE 80-4.0 MPa
- for PE 100 -5.0 MPa

and three separate wall thickness charts were recommended.

Ori-Plast manufactures HDPE pipes of all sizes and pressure ratings specified in IS 14333:1996

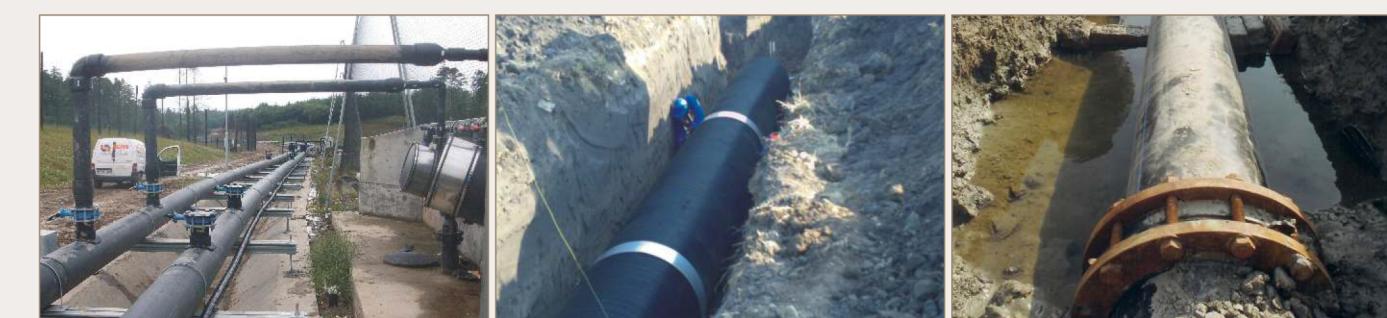
Other than the properties that were highlighted for ORI-PLAST HDPE pipes earlier, some additional properties that make these suitable for conveyance of sewerage and industrial effluents are:

- (a) Non-corrosive and chemically inert
- (b) Abrasion resistance
- (c) Flexibility in selection, while lower pressure ratings pipes e.g. PN 2.5 & PN 4 can be considered for gravity mains, pipes of pressure ratings PN 6 to PN 16 are better suited for pressure mains in lieu of CI/DI pipes.
- (d) Favorable mechanical properties including toughness
- (e) Greater burst strength due to greater flexibility
- (f) Improved fluid flow area due to smoother inner surface
- (g) Greater longevity

HDPE pipes can also be compared with the limitations of other pipes which are commonly used for conveyance of sewerage.

Limitation of other pipes are:

- Limited size & Length availability as in the case of stoneware and vitrified clay pipes
- Majority of these pipes are either too brittle or too sensitive to aggressive chemicals and soil conditions
- The pipes require either internal or external protection or both
- They are susceptible to root intrusion
- Concrete (including pre-cast concrete) pipes requires special bedding or concrete cradle to improve self supporting strength
- All loads whether static or dynamic are carried by the concrete pipes. As such they are prone to failure through wrong loads caused by soil movement or ground slippage.



ORI-PLAST MDPE PIPES FOR GASEOUS FUELS IS 14885 : 2001

Polyethylene pipes were first developed for use in crude oil extraction and transportation in oil fields before it was introduced for conveyance of potable water. A flexible, tough and light weight piping product was needed to fulfill the needs of a rapidly developing oil and gas production industry. Its success in these installations quickly led to its use in natural gas distribution where a coatable, corrosion free piping material that could be fusion jointed in the field to assure a leak free method of transporting natural gas to homes and industries was required. Today it is the material of choice for natural gas distribution all over the world.

Advantages

The advantages of the most recently developed third generation MDPE (Medium Density Polyethylene) compound designated as PE 80 & PE 100 and having almost equivalent MRS values as that of HDPE of

similar specifications are as follows:

- Very good creep properties
- Excellent toughness / ductility
- High resistance to both slow and rapid crack propagation
- Excellent ESCR
- Extremely smooth internal surface
- Retards permeation of gases
- Resistant to aggressive media & soil
- No deposition, encrustation and leaching out
- Excellent fusion characteristics
- Very wide service temperature range, 40°C to 80°C
- Very good reeling properties
- Excellent squeeze-off properties

CLASSIFICATION OF THE MATERIAL AS PER IS 14885 : 2001 (Ref: Table 1, Clauses 4.2.1 and 5.9)

Material	Minimum Required Strength of material in MPa at 200°C for 50 Years	Maximum Allowable Hydrostatic Design Stress (σ) in MPa at 20°C
PE 80	8.0	4.0
PE 100	10.0	5.0

The values of Hydrostatic Design Stress (σ) given above are arrived at by dividing the MRS values by the Service Design Coefficient 'C' i.e. $\sigma = \text{MRS} / C$



Available Sizes and Specifications:

Ori-Plast manufactures MDPE pipes conforming to both IS : 14885 : 2001 and ISO : 4437 standard specifications. We have licenses to manufacture MDPE gas pipes using PE 80 and PE 100 grades of MDPE materials.

- Outside Diameter : 20 mm to 630 mm
- Standard Dimension Ratio (SDR) : 17.6, 13.6, 11.0 & 9.0
- Service Design Coefficient 'C' (minimum) : 2.0



Ori-Plast MDPE gas pipes are manufactured out of bimodal cadmium free imported raw material and tested under a fully integrated Quality Assurance System (QAS) which covers all aspects of design and Manufacture from raw material selection to final product testing (both destructive and non-destructive), to ensure that high performance standards established for the products are consistently achieved. For supplies made by us, the materials (both raw material and finished) can also be inspected by reputed third party inspectors appointed by the indenters i.e. SGS India (P) Ltd., TV-SD South Asia (P) LTD, DNV, Tata Projects Ltd., Germanischer Lloyd Industrial Services, MECON Ltd. etc.



CHARACTERISTICS OF POLYETHYLENE COMPOUND AS PER IS 14885 : 2001 (Ref: Table 2 & Clause 5.1)

Characteristic	Units	Requirements	Test Parameters	Test Method
Conventional Density	kg/m³	= 928.4 (base polymer) = 930.0 (base polymer)	23°C 27°C	IS 7328 : 1992
Melt Flow Index	g/10 min	± 20% of value nominated by Compound producer	190°C/5.0 kg	IS 2530 : 1963
Thermal Stability	min	= 20	200°C	Annex D
Resistance to gas Constituents	h	= 20	80°C	Clause 5.5
Pigment Dispersion	Grade	= 3		Annex E

Applications:

- Domestic and commercial piped gas supply lines across different sizes and densities of urban agglomeration and industrial installations.
- Relining of old and defunct metallic gas pipelines

Joining Procedure:

Polyethylene pipes for conveyance of gaseous fuel are most commonly joined by:

- Butt fusion
- Electrofusion

List of satisfied Customers:

Following are the names of a few satisfied customers of ORI-PLAST:

- Greater Calcutta Gas Supply
- GSPC Gas
- Gujarat Gas
- Gujarat Gas Financial Services
- Indraprastha Gas
- Mahanagar Gas
- Maharashtra Natural Gas
- Tripura Natural Gas