INTRODUCTION TO HDPE PIPES : -

HDPE pipes conform to IS-4984/95 and manufactured also as per IS-14333, ISO-4427, ISO-4437 & DIN 8074 specifications.

HDPE pipes are best preferred for potable water supply, irrigation schemes, chemicals and edibles transportation, effluent / slurry collection and disposal system, submarine and underwater pipe lines, hydro transport system, gas/compressed air system, cable ducting etc.

HDPE pipes have been preferred over other available resources due to varied salient features :-

- High corrosion resistance, resulting into a longer life.
- High impact strength.
- Extremely light weight and hence easy to handle.
- High flexibility.
- High abrasion resistance.
- Excellent water hammer characteristics, helps sustaining surges.
- Excellent flow characteristics leading to significant energy saving.
- No exfiltration and infiltration, helps maintaining the quality of fluid being conveyed.
- No trenches needed, resulting into easy and economical installation.
- High UV resistance.
- High resistance to scaling and biological build up.
- High chemical resistance, absolutely inert to any pH value.
- Virtually maintenance free.

APPLICATIONS : -

INDUSTRIAL -

- In petrochemical, paper, dye, paint, cement and other chemical industries for disposal of chemical effluent and waste.
- Oil and milk transportation in industries and dairies
- Discharge of radioactive waste
- Acid and Slurries transportation
- Compressed gas supply at mines and construction sites
- External & internal drainage and sewage
- Salt water handling

AGRICULTURAL -

- Water supply for irrigation in fields
- Drip irrigation scheme
- Sprinkler irrigation
- Insecticide spraying
- Drawing water from pump set for distribution
- Most suitable for submersible pumps and jet pumps.

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OTHERS –

- Dredging applications.
- For potable water supply in rural and urban areas.
- Telecommunication & Electrical cable ducting.
- Bio-gas, coal gas & natural gas distribution lines for domestic and industrial use.
- Air conditioner ducting.
- Submarine delivery system.

OTHER SALIENT FEATURES : -

Strong and Durable

HDPE Pipes are strong, resilient and impact resistant.

Light Weight

Are easy in handling, transportation & installation, even on difficult terrain.

Length as Required

Are available in straight as well as coil lengths, so less joints & couplers needed.

Better Flow Characteristic

There is no deposit formation, so diameter of pipe remains the same and hence better flow.

Hygienic & Odourless

There is no contamination as the pipes are resistant to -

- Scale formation
- Chemical formation
- Biological formation

Energy Saving

Have smooth internal surface which implies low frictional loss. Hence the power consumption is on lower side.

Leak Proof

Are leak proof due to close dimensional tolerance & precision designing and joining.

Chemical Resistance

Are totally inert to all the chemicals.

Economical

Are reasonably priced and long lasting. These pipes have better flow characteristics so a
smaller diameter pipe can be used.

Long Lasting

Are in fact 10 times longer lasting than GI or Rubber pipe. These pipes are free from
rusting, weathering & abrasion therefore are an investment for a life time.

Maintenance Free

Have no breakage and are unaffected by environmental stress.

AVAILAIBILITY :-

HDPE pipes are available in sizes ranging from 20 mm - 630 mm in 2.5, 4.0, 6.0, 8.0, 10.0, 12.5 and 16kg/cm² pressure rating.
Sizes ranging from 25 mm to 110 mm for suction, submersible and jet pump applications. Pressure class depends upon the depth of the bore.

Recommendations:-

SR.	Depth of the bore	Pressure of pipe
1.	Upto 55 mtrs	4.0 kg/cm²
2.	Upto 90 mtrs	6.0 kg/cm²
3.	Upto 140 mtrs	10.0 kg/cm²
4.	Upto 170 mtrs	12.5 kg/cm²

Length / Packing :-

SR.	Size Range	Length
1.	20 mm to 50 mm	100, 200, 300, 500 mtrs coil
2.	63 mm to 90 mm	100, 200 mtrs coil.
3.	110 mm to 125 mm	50, 100 mtrs coil.
4.	20 mm to 630 mm	5 / 6 / 12 mtrs straight pipe

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COMPARISON OF HDPE PIPES WITH PVC PIPES

PARTICULARS	HDPE	PVC	ADV OF HDPE
Density (gm/cc)	0.945 -0.956 High	1.40 - 1.46 Rigid (no flexibility)	Easy handling Easy laying
Length	50m, 100m, 300m, 500 mts (20-110mm) 6/12 Mt (20-1000mm)	3 / 4 / 5 or 6m	HDPE more suitable for continuous and cost effective installation
Trench	Not needed	Needed	Lower installation cost Better life, safe for drinking water.
UV stability	Excellent	Moderate	
Temperature	- 50° C To 80° C	-5 To 60° C	Suitable for all conditions.
Vicat softening temperature	125° C	80° C	
Decomposition temperature	360° C	160° C	Very Long Life – more than 70 years.
Impact Strength	Excellent	Good	
Chemical resistance	Very good	Good	
Surge pressure	High	Moderate	
Power cost	Low	Higher than HDPE	Saves energy
Reuse of pipes	Easy	Inconvenient	
Installation	Easy and quick	Requires extra skill and time	Saves time and money
Joining	100 % leak free and lesser joints	Many joints and develops leakage later.	

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COMPARISON OF HDPE PIPES WITH GI/CI/MS/DI PIPES

PARTICULARS	HDPE	GI/CI
Length	HDPE pipes are available in 5/6/12 mtrs length. It is flexible and can be coiled also upto 125mm od.	GI pipes are available in 6 m length. Threading is laborious, expensive and time consuming.
Size and Pressure	Wide range from 20mm to 630mm sizes with 2.5 to 16 kg/cm² pressure rating.	Limited range compared to HDPE pipes.
Corrosion	Possesses excellent corrosion resistance to water, acids & alkalies.	Corrodes faster specially in water submergence.
Internal Surface	Smooth surface offers very low frictional resistance. Resistance to encrustation / abrasion.	Offers resistance to flow due to lesser and rough inner surface due to corrosion over a period of time.
Flexibility	Can take curvature up to a radius of 25 times the Pipe outer dia.	No flexibility. Can be used in straight length only.
Weight	It is approx. 4 to 5 times lighter then GI pipes for applications like suction & delivery pipes.	Heavier than HDPE Pipes, so it is costly is transportation, installation & manpower.
Maintenance & Life	Virtually maintenance free. The joints are 100% leakproof. Have a long life.	Requires maintenance frequently. Life is not more than five years.
Installation	Easy, as no special equipments are required. Submersible pump can be installed in 1 hour time for depth more than 80m to 100m.	Cumbersome. Chainpully required with holding clamps. Takes almost 5 to 8 hours depth of 80m to 100m.
Cost	Unit cost of delivered water is approx. 15 to 20% lower than GI.	Unit cost of delivered water is more in GI pipes as compared to HDPE.

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Energy saving with HDPE Pipe as compared to CI/GI/DI/MS pipes :-

Case Study for 225 X 197 mm x 4000mtrs line

SR.	PARTICULARS	CI/GI/DI/MS	HDPE
1.	Velocity (m/sec)	1	1
2.	C value (Hazen williams formula)	110	150
3.	ID of Pipe(mm)	200.00	197.00
4.	Length of Pipe (m)	4000.00	4000.00
5.	Head Loss in 4000 meters	29.0	17.0
6.	Static Head (m)	12.0	12.0
7.	Suction Head (m)	6.0	6.0
8.	Total Pressure Drop (m)	47.0	35.0
9.	Recommended Pump (hp)	30.0	20.0
10.	KW Required	22.0	15.0
11.	Power per year in KWH based on 10 hour Pumping per day.	80,300	54,750
	Energy Saving Per Annum –		25,550 units
	* This saving increases year by year, because the ID of the metal pipe decreases due to corrosion thus increasing the load on the pump and that results in higher consumption.		

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