

POLYETHYLENE
PIPING SYSTEMS FOR IRRIGATION



ISO 4427/4437
BS EN 1329/1401
EN 1519
BS EN 1452

Cosmoplast, a primary member of Group Harwal, has been at the forefront of the plastic industry in the Gulf region since its founding in 1976. Through constant growth and product diversification, the company continues to be the largest thermoplastic pipe manufacturer in the region.

Continuously enhancing its capabilities in plastic manufacturing technologies, Cosmoplast now utilizes a diverse range of materials such as uPVC, polyethylene (PE100, PE80, LLDPE), cross linked polyethylene (PEX), random copolymer polypropylene (PP-R), and glass-reinforced plastic (GRP).

Cosmoplast's ongoing research and development programs continue to add new products to its pipeline systems product range that now includes pre-insulated pipes, reinforced thermoplastic pipes, specialized plumbing systems and fabricated uPVC and GRP manhole systems. Its state of the art engineering, design and tool room facilities are fully capable of manufacturing moulds, dies, machinery equipments and other specialized tooling requirements to meet the company's continual expansion and product development requirements.

With this extended product range, Cosmoplast's pipeline systems cater to an extensive range of market sectors and applications covering infrastructure development, plumbing, oil & gas, district cooling, irrigation, landscaping and water extraction.

An ISO 9001 certified company, Cosmoplast has its production facilities based in Sharjah, Abu Dhabi and Dubai converting over 75,000 metric tons of plastic per annum. In addition to these, Cosmoplast also has upcoming facilities in Saudi Arabia, Moscow and Kaliningrad.

COSMOPLAST PIPELINE SYSTEMS PRODUCT RANGE INCLUDES:

INFRASTRUCTURE PIPELINE SYSTEMS (uPVC, PE, GRP)

uPVC and Polyethylene pipeline systems with sizes ranging from 15mm up to 2000mm, well casings and screens and GRP pipeline systems with sizes from 100mm up to 1400mm for applications including

- Water extraction • Water distribution • Drainage • Sewerage • Gas distribution • Cable ducting

PLUMBING SYSTEMS (uPVC, PP-R, PEX, HDPE DRAINAGE)

Comprehensive range includes uPVC systems for drainage, random polypropylene (PP-R) [plain and aluminium composite] and cross linked polyethylene (PEX) systems for water and sanitary applications and uPVC high pressure pipes and fittings for water supply and A/C drain. Plumbing accessories such as pipe clamps, polyethylene compression fittings, solvent cements, lubricants and adhesives compliment this product range.

PRE-INSULATED PIPES (HDPE-HDPE, HDPE-GRP, HDPE-STEEL, GRP-HDPE, GRP-GRP, GRP-STEEL)

Jacket – core pipe combination with polyurethane insulation are used for applications such as District Cooling systems, Oil & Gas and other industrial applications. Cosmoplast provides HDPE and GRP pipes as jackets and HDPE, GRP and steel as core pipes.

IRRIGATION SYSTEMS (LLDPE)

Consists of high precision inline drip pipes and landscape and lawn edging. This range also includes saline resistant valves, drainage systems, sprinklers and central controllers.

REINFORCED THERMOPLASTIC PIPES (RTP)

Available in length of upto 500m, with a working pressure of 150 Bar at a temperature of 60 degrees celsius. RTP is used for gas distribution networks, oil flow lines and water injection lines.

Polyethylene Pipes

Cosmoplast polyethylene pipes are extensively used for irrigation and water supply applications throughout the Gulf region. The advantages of these products include:

- High-corrosive and resistant to most of the chemicals and minerals.
- Excellent burst strength properties.
- Highly flexible material, light in weight and coiled for easy handling.
- Can be laid to follow the contours of trenches.
- Require simple compression couplings for connection.

PE Dripline Pipes

Specifications : Dripline 16 mm OD, 1.5 mm WT (13 mm ID)

Cosmoplast drip irrigation pipe is made of a black, bimodal linear low-density polyethylene, with an optimum balance between flexibility and strength. It has a high average molecular weight giving good toughness and impact resistance even at low temperatures. This type of low-density polyethylene is recommended for irrigation systems where flexibility and coil-ability is of importance.

Physical Properties	Typical (Unit) Value	Test Method
Density Compound	933 Kg/m ³	ISO 1183
Melt Flow Rate (190°C/5.0kg)	2.0 g/10 min	ISO 1133
Carbon Black Content	2 - 2.50%	ISO 6964
ESCR	1 Hour @ 70°C	ISO 8796
Teepol Crack Resistance Test	250 Hours @ 60°C	***
Working Pressure	4 bar	***

Specifications of Low Density Polyethylene (LDPE) Pipes

LDPE Pressure Pipe

DIN 8072 : 1972

Outer Diameter mm	Wall Thickness (mm)		
	2.5 bar	6 bar	10 bar
10	–	–	2.0
12	–	–	2.2
16	–	2.0	2.7
20	–	2.2	3.4
25	2.0	2.7	4.2
32	2.0	3.5	5.4
40	2.0	4.3	6.7
50	2.4	5.4	8.4
63	3.0	6.8	10.5
75	3.6	8.1	12.5
90	4.3	9.7	15.0
110	5.3	11.8	18.4
125	6.0	13.4	20.9
140	6.7	–	–
160	7.7	–	–

Calculated with an average density of 0.933 gm/cm³ . Here half the permissible variation in wall thickness was added to the minimum wall thickness

Details of PE Pipe According to BSEN 12201:2:2003

Nominal size (mm)	SDR11 - S5 - PN 12.5	
	Wall Thickness (mm)	
	Min	Max
20	2.00	2.30
25	2.30	2.70
32	3.00	3.40
40	3.70	4.20
50	4.60	5.20
63	5.80	6.50

LDPE Pressure Pipe Type 50

BS 3284 : 1967

Nominal size	Outside diameter		Wall thickness			
			Class C		Class D	
Inch	Min (mm)	Max (mm)	Min (mm)	Max (mm)	Min (mm)	Max (mm)
3/8	17.0	17.3	—	—	1.9	2.1
1/2	21.2	21.5	1.8	2.0	2.3	2.6
3/4	26.6	26.9	2.3	2.6	2.9	3.2
1	33.4	33.7	2.8	3.1	3.7	4.1
1 1/4	42.1	42.5	3.6	4.0	4.6	5.1
1 1/2	48.1	48.5	4.1	4.5	5.3	5.8
2	60.1	60.6	5.1	5.6	6.6	7.3
3	88.6	89.3	7.5	8.2	9.7	10.7
4	113.9	114.7	9.6	10.6	—	—

LDPE Pressure Pipe Type 32

BS 1972 : 1967

Nominal size	Outside diameter		Wall thickness						Standard Coil Strength
			Class B		Class C		Class D		
Inch	Min (mm)	Max (mm)	Min (mm)	Max (mm)	Min (mm)	Max (mm)	Min (mm)	Max (mm)	
1/2	21.2	21.5	—	—	2.7	3.0	3.4	3.7	150 m
3/4	26.6	26.9	2.3	2.6	3.4	3.7	4.3	4.7	150 m
1	33.4	33.7	3.0	3.3	4.2	4.6	5.4	5.9	150 m
1 1/4	42.1	42.5	3.7	4.1	5.3	5.8	6.8	7.5	150 m
1 1/2	48.1	48.5	4.3	4.7	6.1	6.7	7.8	8.6	150 m
2	60.1	60.6	5.3	5.8	7.6	8.4	—	—	150 m
3	88.6	89.3	7.3	8.6	11.0	12.3	—	—	150 m
4	113.9	114.7	10.0	11.0	—	—	—	—	150 m

Class B = 6.1 kgf/cm²

Class C = 9.1 kgf/cm²

Class D = 12.2 kgf/cm²

(0.60 MN/m² : 200 ft hd : 86.7 lbf/inch²)

(0.89 MN/m² : 300 ft hd : 130 lbf/inch²)

(1.20 MN/m² : 400 ft hd : 173 lbf/inch²)

LDPE Pressure Pipes to BS1972 : 1961 Type 425

Normal Gauge (Recommended Working Pressure 4 bar) For cold water services.

Nominal Size	Outside Diameter		Wall Thickness	
	Minimum	Maximum	Minimum	Maximum
Inch	mm	mm	mm	mm
1/2	16.9	17.3	2.3	2.6
3/4	24.9	25.4	3.1	3.5
1	31.2	31.8	3.1	3.5
1 1/4	37.5	38.1	3.1	3.5
1 1/2	43.8	44.5	3.5	3.9
2	60.0	60.8	4.6	5.2

LDPE Pressure Pipes to BS1972 : 1961 Type 425

Heavy Gauge (Recommended Working Pressure 6 bar) For cold water services.

Nominal Size	Outside Diameter		Wall Thickness	
	Minimum	Maximum	Minimum	Maximum
Inch	mm	mm	mm	mm
1/4	13.5	13.8	3.5	3.9
3/8	16.9	17.3	3.7	4.2
1/2	21.1	21.5	4.3	4.8
3/4	26.5	26.9	4.3	4.8
1	33.3	33.8	4.3	4.8
1 1/4	42.0	42.6	5.0	5.6
1 1/2	48.0	48.6	5.3	5.9

Note : "Working Pressure" is the pressure that can be continuously applied to the pipe at temperature not exceeding 20 °C

Cosmoplast Drip Irrigation Pipes “GULF DRIP”

Drip irrigation is a technique in which the water is filtered and pumped in LDPE lateral lines pre-fitted with drippers, which lets the water out in droplets through the drip nozzles directly on the plants.

Cosmoplast “Gulf Drip” pipes are manufactured according to ISO 9261 : 2004

Specifications

Material : Special LLDPE UV stabilized black compound from Borouge with the following properties

Properties	Typical (Unit) Value
Density	933 kg/m ³
Melt Flow Rate (190°C/2.16 Kg)	0.5 g/10 min
Melt Flow Rate (190°C/5Kg)	2.0 g/10 min
Carbon Black Content	2 - 2.50%
ESCR	1 Hour @ 70°C
Flow Test	Avg. flow 2 or 4L/Hr with CV < 7%



Nominal OD	: 16 mm
Nominal Thickness	: 1.2 mm
Roll length	: 400 m
Dripper	: 2 and 4 LPH PC, cylindrical, large silicon rubber membrane.
Spacing	: 30 cm, 50 cm or as per customer specifications.
Filtration	: Requires mesh 120 filtration.

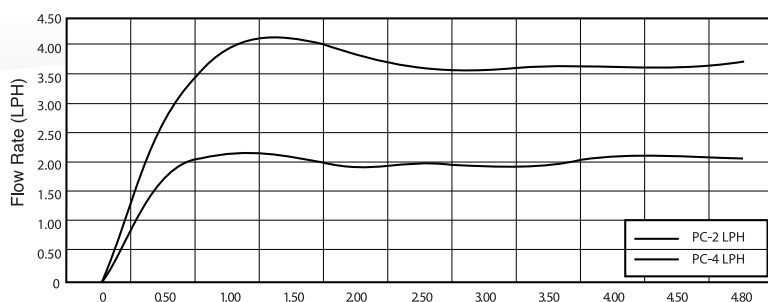
Cosmoplast GULF DRIP is officially approved by Municipalities in the UAE

Field Application:
Municipal Landscaping



State of the Art ISO
9261: 2004 Flow Tester

Dripper Performance Table And Chart



Pressure (Bar)	Mean Discharge (LPH)	
	PC-4 model	PC-2 model
0.0	0.0	0.0
1.0	3.94	2.18
1.5	4.16	2.15
2.0	3.87	1.95
2.5	3.66	2.05
3.0	3.63	2.01
3.5	3.72	2.03
4.0	3.67	2.18
4.5	3.69	2.18
4.8	3.79	2.18

Features of “Gulf Drip” :

- Accurate pressure compensated Drifter
- Robust Drifter - Suitable for all applications.
- Large Membrane - Accurate discharge.
- Available in 2.0 and 4.0 LPH
- Pressure regulation : 1.0 - 4.8 bar
- Large Turbulent Labyrinth
- Available with a retention type (No-Drain)
- No spike in flow at startup



Distinctive Pressure Compensation Mechanism

Cosmoplast in-line drip pipe is based on a new concept of Pressure Compensation. The constant flow rate is achieved by dynamically changing the labyrinth length as a function of the water pressure applied. This innovative mechanism changes the labyrinth length causing the water to flow through a longer labyrinth when higher pressures are applied and a shorter labyrinth when lower pressures are applied. This method of compensation keeps the cross section of the entire labyrinth constant at 1.0 mm², which is about 50 times larger than other competitive drifter products in the market. The drifter system applies no constriction in the water outlet and the constant large labyrinth cross section is significantly less prone to clogging. In addition to this, the larger labyrinth dimension improves the drip pipe performance making it substantially more tolerant to the high ambient working temperatures of the Gulf region.

Landscape Edging

Cosmoplast manufactures landscape edging which is a product addition to its already existing irrigation product range that includes drip pipes, saline resistant valves and sprinklers.

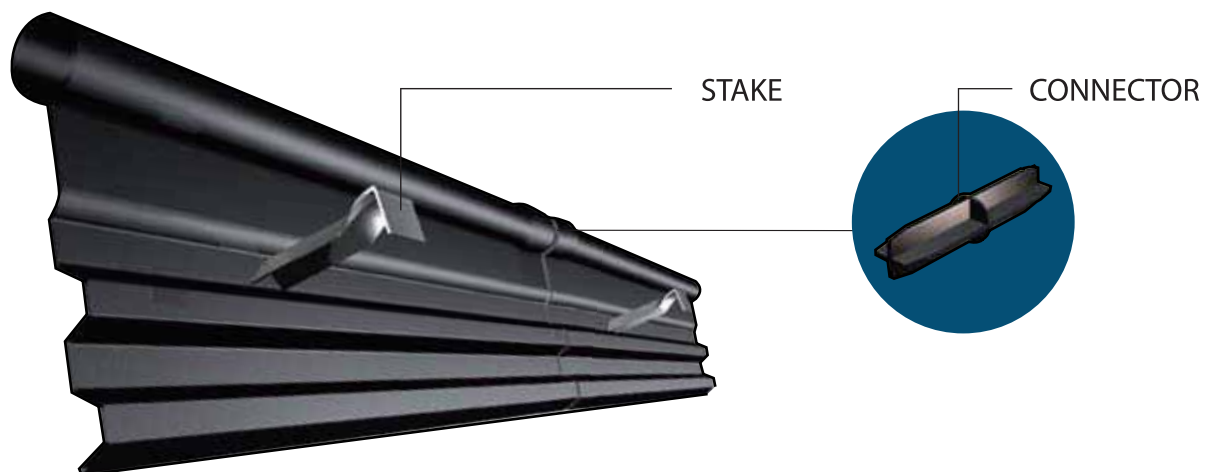


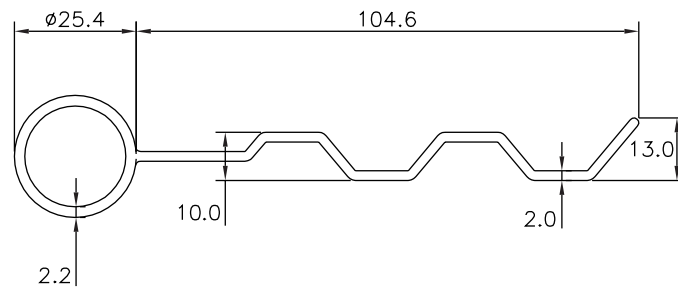
Application

Cosmoplast landscape edging is used for providing physical separation among lawn, ground cover and mulch (gravel, wood and bark).

Structure

Cosmoplast landscape edging is manufactured using LDPE. The structure in the cross-section below consists of a rounded edge at one end and a corrugated section at the other. The corrugated section is inserted into the ground in such a way that the rounded end acts as an edge to the landscape and corrugated part prevents the plants roots from crossing. Cosmoplast landscape edging is heavy duty, produced for hot climates.





Physical Properties

Properties	Typical (Unit) Value
Density	933 Kg/m ³
Melt Flow Rate (190°C/2.16 kg)	0.5g/10 min
Melt Flow Rate (190°C/5.0 kg)	2.0g/10 min
Vicat Softening Temperature (10 N)	108°C
ESCR - 10% Lgepal / F50	>5000 Hours

Average Dimensions

Outside Diameter, OD (Round end)	25.4 mm
Thickness (Round end)	1.69 - 2.20 mm
Thickness (Corrugated section)	1.88 - 2.28 mm

Packing

Strip Length : 5.8 m or as per customer requirements.

Accessories per Strip : 4 pieces of heavyduty steel stakes and 1 connector

Transportation

- Vehicles transporting pipes should have a flat bed, which include supports that are free of sharp edges or projections.
- Pipes should be evenly supported over their full length and not overhang the vehicle.
- Where different sizes of pipe are to be transported together larger diameter pipe should be loaded first with the vehicle having side supports at no larger than 1.5 meter intervals.

Handling Of Polyethylene Coils

- Care and attention should always be applied when handling pipes. This should be done not only for the protection of the pipes but also for the safety of the handling personnel.
- Coils should never be dropped onto hard or uneven surfaces.
- Coils should never be thrown from vehicles.
- Coils should never be dragged or rolled along the ground.
- Where possible, coils should always be unloaded individually. In cases where coils are bundled into frames, proper lifting equipment (lift truck etc.) should be used.
- Metal chains, hooks or ropes should never be used.





Inline with our product development programme, Cosmoplast reserves the right to modify or change any of the information contained herein without prior notice.

Pipeline Systems



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