

# Transforming Oman's Infrastructure Using HDPE

*The Right Choice*



## Pressure Pipes - Technical Guide



صناعات الخليج المتحدة للأنابيب ش.م.م.  
UNITED GULF PIPE MANUFACTURING CO. LLC



Photograph courtesy : Machine & Pipe Photographs from **battenfeld-cincinnati**  
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United Gulf Pipe Manufacturing Co LLC (UGPM) was established in 2009 for the purpose of manufacturing plastic products in the Sultanate of Oman. It is a joint venture between established groups and high net-worth individuals from Sultanate of Oman and Kuwait, UGPM manufactures HDPE, PP pipes, PE-GFR pipes, manholes and other accessories in the Sultanate of Oman. The pipes have many different applications, including: Outfall pipelines, Sewage/potable water system, Sewer/ waste water treatment plant, Storage tanks and containers, Mining – slurry pipes, storm water retention tanks, ventilation pipe systems. The company is on the way to establish manufacturing facilities for pressure pipes ranging from DN/ID 90mm to DN/ID 400mm.

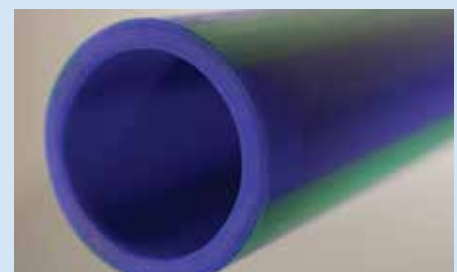
PE GFR pipes, of diameters ranging from DN/ID 300mm to 4000mm are being introduced. They are made up polyethylene compounds reinforced with fibres to unite the well-known properties of thermoplastics with the significant characteristics of fibers. Various formulations of different grades of high density polyethylene can be used to produce a customized end product, thus providing all positive characteristics compared to other stiff pipe materials like concrete, steel, etc.

The products for gravity and pressure applications manufactured have several attributes, such as lightweight, ease in installation, homogenous product, resistant against various damages, high static load capacity, have double wall construction against leakage control. The company maintains the following certificates: Certification to Quality Management System (ISO 9001:2008), Environment (ISO 14001:2004), OHSAS (18001:2007).



**Eng. Mohammed Al Hashani**

Managing Director



## Compliance with International Standards

UGPM can comply with the following international standards for the manufacture of HDPE pipes for pressure applications, among others;

- ◆ International Organization for Standardization (ISO)
- ◆ British Standards Institution (BS EN)
- ◆ German institute for standardization (DIN)
- ◆ American Petroleum Institute (API)
- ◆ National Electrical Manufacturers Association (NEMA)
- ◆ Design And Engineering Practice -Shell International (DEP)

### Standards complied with for current range of products is as follows:

- ◆ ISO 4427 / BS EN 12201, ISO 4437 / BS EN 1555, DIN 8074/BS EN 13244

### Standards complied with for range of products to be available soon is as follows:

- ◆ SP 2094, API 15LE, DEP31.40.30.04, NEMA TC7, BS EN 50086

HDPE PIPE PE 100 is produced according to relevant ISO 4427 and DIN 8074								
PE100 ,Design stress 8.0 MPA								
WALL SERIES								
SIZE DESIGNATION DN	SDR 26		SDR 17		SDR 11		SDR 9	
	S-12.5		S-8		S-5		S-4	
	NOMINAL PRESSURES							
	PN 6,3		PN 10		PN 16		PN 20	
de mm	e mm	di mm	e mm	di mm	e mm	di mm	e mm	di mm
90	3,5	83,0	5,4	79,2	8,2	73,6	10,1	69,8
110	4,2	101,6	6,6	96,8	10,0	90,0	12,3	85,4
125	4,8	115,4	7,4	110,2	11,4	102,2	14,0	97,0
140	5,4	129,2	8,3	123,4	12,7	114,6	15,7	108,6
160	6,2	147,6	9,5	141,0	14,6	130,8	17,9	124,2
180	6,9	166,2	10,7	158,6	16,4	147,2	20,1	139,8
200	7,7	184,6	11,9	176,2	18,2	163,6	22,4	155,2
225	8,6	207,8	13,4	198,2	20,5	184,0	25,2	174,6
250	9,6	230,8	14,8	220,4	22,7	204,6	27,9	194,2
280	10,7	258,6	16,6	246,8	25,4	229,2	31,3	217,4
315	12,1	290,8	18,7	277,6	28,6	257,8	35,2	244,6
355	13,6	327,8	21,1	312,8	32,2	290,6	39,7	275,6
400	15,3	369,4	23,7	352,6	36,3	327,4	44,7	310,6

S = Pipe series number  
 de = out side diameter of the pipe  
 e = wall thickness

SDR = Standard dimension ratio  
 di = inside diameter of the pipe  
 PN = nominal pressure rating (bar)





High Density Polyethylene used in the manufacture of Pressure Pipes is a black, bimodal, high density polyethylene is produced by using advanced technologies. Well dispersed carbon black gives it outstanding UV resistance. Long term stability is ensured by an optimized stabilization system. It can be processed for a whole range of diameters, with special focus on the production of larger diameter, thick wall pipe,. It also shows excellent resistance to rapid crack propagation and slow crack growth.

The company is utilizing state of the art equipment from battenfeld-cincinnati, a reputed global leader in extrusion technology.



## Welding

In order to maintain homogeneity advantage in the product, it is essential that the joints are well secured. Advanced techniques in welding for plastics allow this advantage to exist. One of the technologies used in this case is butt welding technology. The process requires same type of resin at both ends to be welded by providing high temperatures to melt the ends of the pipe. The melted parts are then joined by pressing together and allowed to cool. For optimum results, welding parameters as specified in the company's installation guidelines need to be followed.

## Storage and Handling

A key characteristic of HDPE pipes is that they command high strength despite their low weight. This, however, leads to the tendency of mishandling during storage and handling activities. Specific guidelines have been established, which should be followed, in order to reduce chances of product damage.

Specifically, the pipes should be loaded/offloaded using machinery such as forklifts/cranes. The pipes should be stored in a criss-cross fashion, in areas clear of any sharp protrusions, with height of the stored pipes not exceeding 2 meters, secured against sideways slippage and packed in wooden frames with uniform support at the bottom.

# Quality

The company places tremendous emphasis towards its quality program, which is reflected in the fact that the Quality Manager reports directly to the Managing Director. It is certified by Bureau Veritas for the ISO certification. The company performs various types of quality checks on its raw materials, consumables, outsourced products and finished goods at regular interval.

In order to ensure that all the products are of the highest standards, they undergo the following testing procedures; Dimensions, Ring stiffness, Melt flow rate, Creep strength, Load bearing capacity, Impact resistance of manhole base, Load bearing of ladder – vertical, Pull out of resistance of ladder – horizontal, Water tightness of house connection chamber, Heat resistance (Oven test), Hydrostatic pressure test, Oxidation Induction Time (OIT) and Density Test.

The company maintains the following certificates: Certification to Quality Management System (ISO 9001:2008), Environment (ISO 14001:2004), OHSAS (18001:2007), All Krah ® welding certificates, Equipment and Machinery Calibration Certificate, Calibration Traceability Certificate, and Metabo® Power Tools Training Certificates.





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