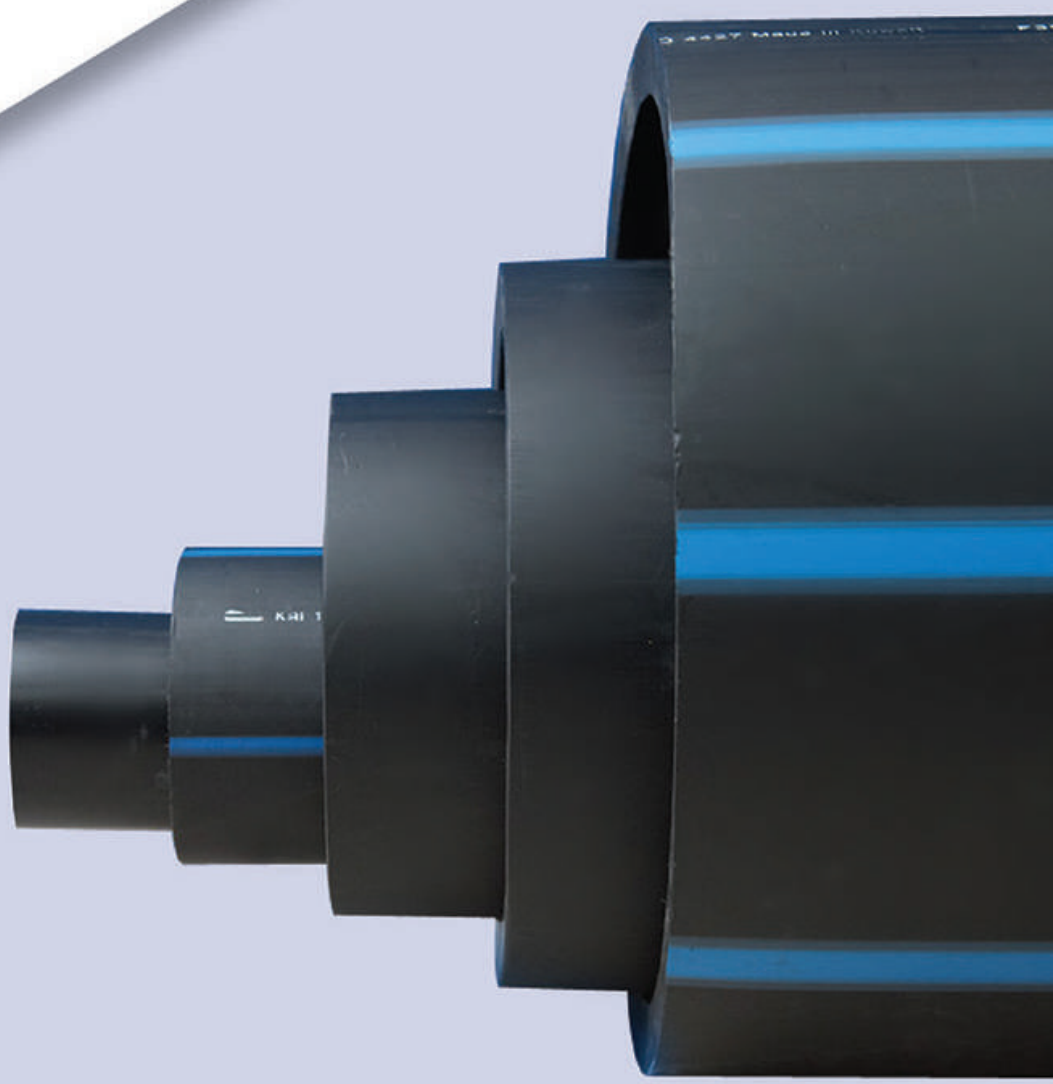
SOLID WALL PIPES

Pressure & Conduit Applications

Kuwait International Advanced Industries Company (K.S.C.C)
الشركة الكويتية العالمية للصناعات المتطورة (ش.م.ك.م.)



MADE IN KUWAIT

www.kiaico.com

THE COMPANY

FIRST HDPE CORRUGATED PIPE FACTORY IN KUWAIT

Kuwait International Advanced Industries Company K.S.C.C. (KAI) was established in 1998. We at KAI manufacture an extensive range of products for both industrial and domestic applications. Having been a key player in the market for over a decade, KAI's products continue to lead by example in keeping up to date with the increasing demands of the modern world. Over the years, our 73,000 m^2 facility has produced an increasing number of different products to cater and to satisfy the majority of our customer demands.

Initially exclusively a pipe manufacturing facility, KAI now manufactures a wide array of plastic products ranging from varying piping and ducting applications, public and residential manhole systems, water storage tanks, road safety barriers, and other custom fabricated products and solutions.

Locally manufactured, our products are a result of the latest technology and machinery and are made of the highest quality of raw materials. By adhering to the technical requirements of internationally recognized standards, our products enjoy a proven regional track record of excellence.

OUR REACH

KAI's ever expanding reach caters to both emerging and developed markets throughout most of the MENA region. KAI's aggressive development plans are consistently seeking feasible opportunities for expansion. Our superior brand, coupled with our flexible marketing strategy, yield a guaranteed result of customer satisfaction.

OUR VISION

KAI's vision has always been to become the partner of choice in the communities where we operate in. A major milestone towards maintaining this ambition is to ensure seamless transition between sales and dispatch.
Not only do we deliver our products in an orderly and time efficient manner, they must be packaged in a way that is deemed convenient by our valued clients.

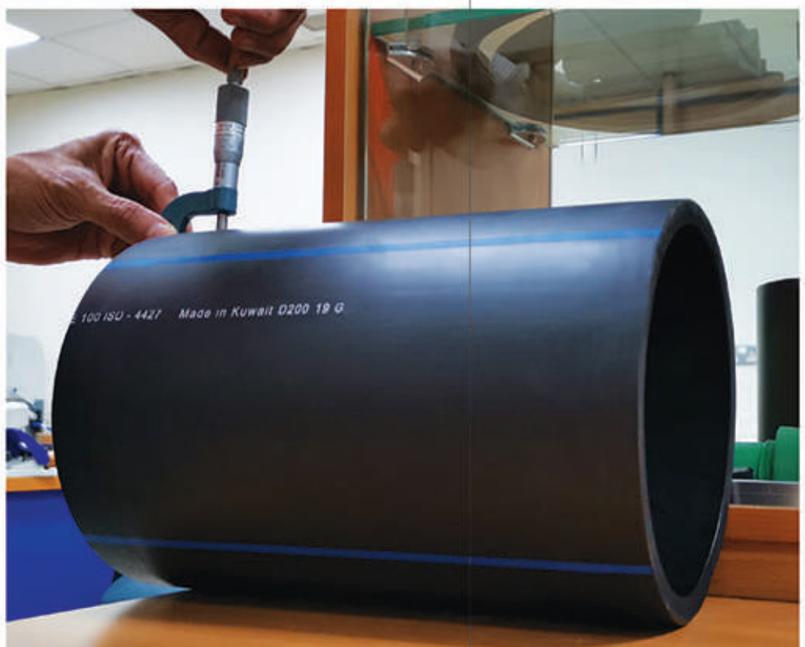
QUALITY CONTROL

Since inception, our philosophy has been to work towards diversifying our business and expanding our capabilities in order to provide greater value to the communities and the countries where we operate

Identifying, assessing, and delivering superior products with potential for future growth and value creation has always been a key ingredient of KAI's strategy.
We pride ourselves on delivering the highest quality products derived from the highest grade of raw materials. Our in-house lab ensures that our standards are never compromised.

KAI has a comprehensive Quality Control system that monitors every stage of the manufacturing process, from receipt of raw material to delivery of product. KAI is ISO 9001:2015 certified and is regularly audited by outside parties for compliance to this standard.

All KAI personnel are responsible for maintaining high quality standard. KAI is striving to continuously improve at all levels. Our in-house lab regularly adds new testing capabilities to ensure that KAI's products meet the requirements of relevant international standards.



KAI in-house Lab is well equipped with the modern equipment's Capable to perform necessary test recommended by the manufacturing standards.
All the equipments are from reputed suppliers as well calibrates regurlarly.
The product continueusly monitoring before during & past prior delivered to the customer.

SOLID WALL PIPES

Pressure and Conduit Applications

Polyethylene (PE) pipes usage started in the 1950s with small diameter pipes used for rural, irrigation and industrial applications. Since then, PE pipes applications have grown to include gas, irrigation, water supply networks etc.
In the 1990's PE 100 polyethylene material was developed which has higher strength, toughness and resistance to slow-crack growth compared to earlier generation materials (PE63, PE80). KAI uses PE 100 polyethylene material to manufacture PE pipes according to international standards.

Polyethylene (PE) pipes are designated by their outside diameter or nominal diameter. The maximum allowable operating pressure with a minimum service coefficient is designated by the pressure rating or nominal pressure. The ratio of the outside diameter and the minimum wall thickness is called SDR of a PE 'Standard Dimension Ratio' which describes the geometry of the pipe. Pipes with a higher SDR have a lower pressure rating than pipes with a lower SDR.
PE pipe can be supplied in straight lengths (standard 12 meters) or in coils, reducing the need for joints and fittings. PE pipes can be jointed using butt-fusion, electro-fusion techniques or using compression fittings.

SOLID WALL PRESSURE PIPES

- KAI pressure pipes are produced with pressure ratings ranging from pn4 to pn25.
- KAI pn4 pressure pipes can be used for drainage, while the higher pressure classes are used for pressurised fluid systems.

Applications

KAI Pressure Pipes can be used for:

- Drainage
- Potable Water
- Brackish Water
- Treated Sewage Effluent
- Irrigation Systems
- Fresh Water
- Gas
- Lining of metal pipes

advantages

- Non-Corrosive
- Energy saving because of decreased pressure loss
- Resistant to ageing
- Resistant to radiation
- Resistant to chemicals, untreated industrial waste water and other corrosive materials
- Resistant to Ultra-Violet Rays
- Perfectly Weldable
- Freeze resistant
- Hygienic and non-toxic
- Easy installation
- Flexibility
- Visco elasticity

Dimensions and Standards

Size

KAI Pressure Pipes are available in sizes ranging from 16mm to 800mm (Nominal Outside Diameter)

Length

Straight pipes are available in lengths of 12m or more.

Coil pipes can be available in rolls of 50m or 100m and up to 300m, depending on pipe Diameter. Available ranges are 16mm to 110mm.

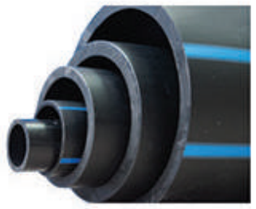
SOLID WALL PRESSURE PIPES

PE 100 - POLYETHYLENE PIPES - GERMAN STANDARD

Standard Dimension Ratio	SDR 33		SDR 26		SDR 21		SDR 17		SDR 13.6		SDR 11	
PN(bar) at 20°C, Factor of safety 1.25	PN 5		PN 6.3		PN 8		PN 10		PN 12.5		PN 16	
de min (mm)	d im (mm)	e min (mm)	d im (mm)	e min (mm)	d im (mm)	e min (mm)	d im (mm)	e min (mm)	d im (mm)	e min (mm)	d im (mm)	e min (mm)
16	--	--	--	--	--	--	--	--	--	--	--	--
20	--	--	--	--	--	--	--	--	16.2	1.80	16.0	1.90
25	--	--	--	--	--	--	21.2	1.80	21.0	1.90	20.1	2.30
32	--	--	--	--	--	--	28.0	1.90	26.9	2.40	25.9	2.90
40	--	--	36.2	1.80	36.0	1.90	34.9	2.40	33.7	3.00	32.2	3.70
50	46.3	1.80	45.9	2.00	45.0	2.40	43.8	3.00	42.3	3.70	40.4	4.60
63	58.9	2.00	57.8	2.50	56.8	3.00	55.1	3.80	53.2	4.70	50.9	5.80
75	70.3	2.3	69.1	2.9	67.6	3.6	65.7	4.5	63.4	5.6	60.9	6.8
90	84.4	2.8	82.9	3.5	81.2	4.3	78.9	5.4	76.2	6.7	73.0	8.2
110	103.1	3.4	101.4	4.2	99.1	5.3	96.4	6.6	93.2	8.1	89.3	10.0
125	117.2	3.9	115.3	4.8	112.8	6.0	109.8	7.4	106.0	9.2	101.4	11.4
140	131.4	4.3	129.1	5.4	126.4	6.7	123.0	8.3	118.8	10.3	113.8	12.7
160	150.3	4.9	147.5	6.2	144.4	7.7	140.6	9.5	135.8	11.8	129.9	14.6
180	169.1	5.5	166.2	6.9	162.6	8.6	158.2	10.7	152.7	13.3	146.2	16.4
200	187.6	6.2	184.5	7.7	180.5	9.6	175.7	11.9	169.8	14.7	162.4	18.2
225	211.4	6.9	207.8	8.6	203.2	10.8	197.7	13.4	191.0	16.6	182.8	20.5
250	234.8	7.7	230.8	9.6	226.0	11.9	219.9	14.8	212.3	18.4	203.3	22.7
280	263.0	8.6	258.6	10.7	252.9	13.4	246.2	16.6	237.8	20.6	227.7	25.4
315	295.9	9.7	290.8	12.1	284.8	15.0	277.0	18.7	267.5	23.2	256.2	28.6
355	333.5	10.9	327.8	13.6	320.9	16.9	312.0	21.1	301.5	26.1	288.7	32.2
400	375.7	12.3	369.4	15.3	361.4	19.1	351.8	23.7	339.8	29.4	325.3	36.3
450	422.7	13.8	415.5	17.2	406.5	21.5	395.6	26.7	382.1	33.1	365.8	40.9
500	469.6	15.3	461.6	19.1	451.6	23.9	439.4	29.7	424.5	36.8	406.4	45.4
560	525.8	17.2	517.0	21.4	505.9	26.7	492.2	33.2	475.4	41.2	455.3	50.8
630	591.5	19.3	581.4	24.1	569.1	30.0	553.5	37.4	534.8	46.3	511.9	57.2
710	666.5	21.8	655.1	27.2	641.1	33.9	623.8	42.1	602.6	52.2	576.8	64.5
800	750.8	24.5	738.0	30.6	722.2	38.1	702.7	47.4	678.8	58.8	--	--

SOLID WALL PRESSURE PIPES

PE 100 - POLYETHYLENE PIPES - INTERNATIONAL STANDARD ISO 4427:1996 (E)



Standard Dimension Ratio (SDR)	SDR 11		SDR 17		SDR 26	
PN(bar) at 20°C, Factor of safety 1.25	PN 16		PN 10		PN 6	
de min (mm)	d im (mm)	e min (mm)	d im (mm)	e min (mm)	d im (mm)	e min (mm)
16	--	--	--	--	--	--
20	15.9	2.0	--	--	--	--
25	20.2	2.3	--	--	--	--
32	25.8	3.0	27.9	2.0	--	--
40	32.3	3.7	35.0	2.4	--	--
50	40.4	4.6	43.8	3.0	45.9	2.0
63	50.9	5.8	55.1	3.8	57.8	2.5
75	60.9	6.8	65.7	4.5	69.1	2.9
90	72.9	8.2	78.8	5.4	82.8	3.5
110	89.3	10.0	96.4	6.6	101.4	4.2
125	101.3	11.4	109.7	7.4	115.2	4.8
140	113.7	12.7	122.9	8.3	129.0	5.4
160	129.7	14.6	140.4	9.5	147.3	6.2
180	146.0	16.4	158.0	10.7	166.0	6.9
200	162.2	18.2	175.5	11.9	184.3	7.7
225	182.5	20.5	197.4	13.4	207.5	8.6
250	203.0	22.7	219.6	14.8	230.5	9.6
280	227.4	25.4	245.9	16.6	258.3	10.7
315	255.8	28.6	276.6	18.7	290.4	12.1
355	288.3	32.2	311.6	21.1	327.4	13.6
400	324.8	36.3	351.3	23.7	368.9	15.3
450	365.4	40.9	395.2	26.7	415.1	17.2
500	406.0	45.4	439.0	29.7	461.2	19.1
560	454.9	50.8	491.8	33.2	516.6	21.4
630	511.6	57.2	553.2	37.4	581.1	24.1
710	577.6	64.5	624.6	42.1	655.9	27.2
800	651.0	72.6	703.9	47.4	739.2	30.6

SOLID WALL PRESSURE PIPES

ALLOWABLE WORKING PRESSURE (BAR) AND YEARS OF SERVICE AT VARIOUS TEMPRETURES FOR PIPES MADE FROM PE 100, CONVEYING WATER WITH A SAFETY FACTOR OF 1.25

Temperature c°	Years of Service	Pipe Series							
		25	20	16	12.5	10	8	6.3	5
		Standard Dimension Ratio (SDR)							
		51	41	33	26	21	17	13.6	11
		Allowable Working Pressure (bar)							
10	5	4	5	6.3	7.9	10.1	12.6	15.7	20.2
	10	3.9	4.9	6.2	7.8	9.9	12.4	15.5	19.8
	25	3.8	4.8	6	7.6	9.6	12.1	15.1	19.3
	50	3.8	4.7	5.9	7.5	9.5	11.9	14.8	19
	100	3.7	4.6	5.8	7.3	9.3	11.6	14.6	18.7
20	5	3.3	4.2	5.3	6.6	8.4	10.6	13.2	16.9
	10	3.3	4.1	5.2	6.5	8.3	10.4	13	16.6
	25	3.2	4	5	6.4	8.1	10.1	12.7	16.2
	50	3.2	4	5	6.3	8	10	12.5	16
	100	3.1	3.9	4.9	6.1	7.8	9.8	12.2	15.7
30	5	2.8	3.6	4.5	5.6	7.2	9	11.2	14.4
	10	2.8	3.5	4.4	5.5	7	8.8	11	14.1
	25	2.7	3.4	4.3	5.4	6.9	8.6	10.8	13.8
	50	2.7	3.3	4.2	5.3	6.7	8.4	10.6	13.5
40	5	2.4	3	3.8	4.8	6.1	7.7	9.6	12.3
	10	2.4	3	3.8	4.7	6	7.6	9.5	12.1
	25	2.3	2.9	3.7	4.6	5.9	7.4	9.2	11.8
	50	2.3	2.9	3.6	4.5	5.8	7.2	9.1	11.6
50	5	2.1	2.6	3.3	4.2	5.3	6.7	8.3	10.7
	10	2	2.6	3.2	4	5.2	6.5	8.1	10.4
	15	1.9	2.3	2.9	3.7	4.7	5.9	7.4	9.5
60	5	1.5	1.9	2.4	3	3.8	4.8	6	7.7
70	2	1.2	1.5	1.9	2.4	3.1	3.9	4.9	6.2

SOLID WALL PRESSURE PIPES

EN 1519 for Polyethylene Pipes
Plastics Piping Systems for Soil and waste discharge (low and high temperature) within the building structure - Polyethylene (PE)

Pipe Size	Mean I.D. (mm)	Min. Wall Thickness (mm)	Mean I.D. (mm)	Min. Wall Thickness (mm)
32	25.7	3.00	25.7	3.00
40	33.7	3.00	33.7	3.0
50	43.8	3.0	43.8	3.0
*56	49.8	3.0	49.8	3.0
63	56.8	3.0	56.8	3.0
75	68.9	3.0	68.9	3.0
*80	73.9	3.0	73.7	3.1
90	84.0	3.0	82.9	3.5
*100	93.5	3.2	92.3	3.8
110	103.1	3.4	101.4	4.2
125	117.2	3.9	115.3	4.8
160	150.3	4.9	147.5	6.2
200	187.6	6.2	184.5	7.7
250	234.8	7.7	230.8	9.6
315	295.9	9.7	290.8	12.1

Polyethylene Pipes - German Standard DIN 16874

DN	Mean ID	Minimum Wall Thickness	Mean ID	Minimum Wall Thickness	Mean ID	Minimum Wall Thickness
mm	mm	mm	mm	mm	mm	mm
dn		e				
32	--	--	28.2	1.8	25.9	2.9
40	36.2	1.8	35.1	2.3	32.2	3.7
50	45.9	2.0	44.0	2.9	40.4	4.6
63	57.8	2.5	55.5	3.6	50.9	5.8
75	69.1	2.9	66.1	4.3	60.9	6.8
90	82.9	3.5	79.5	5.1	73.0	8.2
*106	97.6	4.1	93.4	6.1	---	---
110	101.4	4.2	97.0	6.3	89.3	10.0
125	115.3	4.8	110.4	7.1	101.4	11.4
*126	116.1	4.9	111.2	7.2	---	---
140	129.1	5.4	123.7	8.0	113.8	12.7
*158	145.7	6.1	139.4	9.1	---	---
160	147.5	6.2	141.4	9.1	129.9	14.6
200	184.5	7.7	176.7	11.4	162.4	18.2
225	--	--	199.0	12.8	182.8	20.5

*on request

SOLID WALL PRESSURE PIPES

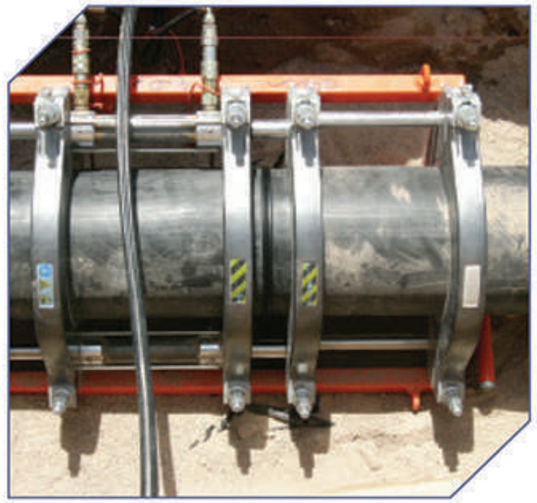
GAS APPLICATION ISO 4437
INTERNATIONAL STANDARD

Standard Dimension Ratio (SDR)	11		17	
Outside Diameter (mm)	Mean I.D. (mm)	Min. Wall Thickness (mm)	Mean I.D. (mm)	Min. Wall Thickness (mm)
16	11.2	2.3	--	--
20	15.2	2.3	--	--
25	20.2	2.3	--	--
32	25.8	3.0	27.8	2.0
40	32.3	3.7	35.0	2.4
50	40.4	4.6	43.8	3.0
63	50.9	5.8	55.1	3.8
75	60.9	6.8	65.7	4.5
90	72.9	8.2	78.8	5.4
110	89.3	10.0	96.4	6.6
125	101.3	11.4	109.7	7.4
140	113.7	12.7	122.9	8.3
160	129.7	14.6	140.4	9.5
180	146.0	16.4	158.0	10.7
200	162.2	18.2	175.5	11.9
225	182.5	20.5	197.4	13.4
250	203.0	22.7	219.6	14.8
280	227.4	25.4	245.9	16.6
315	255.8	28.6	276.6	18.7
355	288.3	32.2	311.7	21.1
400	324.6	36.4	351.3	23.7
450	365.4	40.9	395.2	26.7
500	405.8	45.5	439.0	29.7
560	454.7	50.9	491.8	33.2
630	511.4	57.3	553.2	37.4

JOINING PIPE TO PIPE

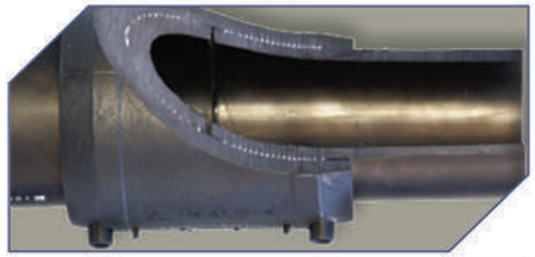
HDPE to HDPE

AS A THERMOPLASTIC MATERIAL, HDPE IS HIGHLY SUITED TO WELDING TECHNIQUES, PROVIDING A 100% LEAK FREE JOINT WITH NO INTERFACE MATERIAL. KAI PRESSURE PIPES CAN BE JOINTED BY BUTT FOUSION, ELECTROFUSION WELDING, AND MECHANICAL JOINTING



- ALL MATERIALS FOR JOINTING ARE SUPPLIED BY KAI

- CROSS SECTION OF PE ELECTROFUSION COUPLER WELDED WITH PIPE



- PE ELECTROFUSION ELBOW 90 DEGREES WELDED WITH PIPE

Butt Fusion

Butt fusion (or butt welding) is a simple and quick jointing method to connect PE pipes and fittings. The process starts by planing or trimming the pipe ends to be joined. The ends are then heated using a heater plate for a predetermined duration while being pressed against the heater plate at a given pressure (heating duration and pressure according to machine welding parameters). The polyethylene becomes soft and a bead is formed at both ends. The heater plate is then removed and the pipe ends are pressed together and allowed to cool under pressure (cooling duration and pressure according to machine welding parameters). This will form a welded joint that is water tight and homogenous.

Electrofusion

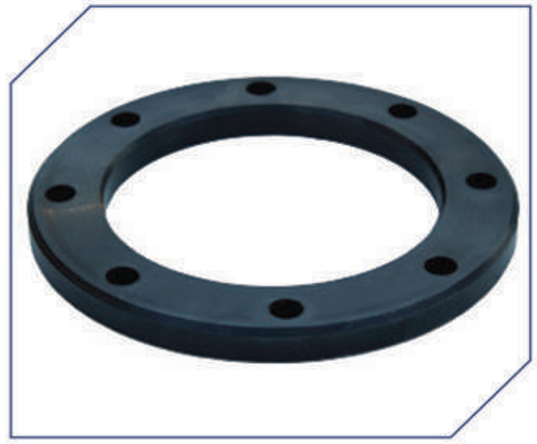
This jointing method is utilized to connect PE pipes and fittings using special fittings that have built-in electric heating elements which are used to weld the joint together. The pipe ends to be joined are squared, cleaned and scraped, then inserted into the electrofusion fitting (with a temporary clamp if required). The electrofusion welding machine is connected to the fitting using electrical wires; fitting welding parameters (heating time, voltage, cooling time) will be entered via a bar code reader or manually. The welding machine supplies the electrical energy necessary to heat the coil for a fixed time depending on the fitting in use. The built in heater coils melt the inside of the fitting and the outside of the pipe wall, which fuse together. The assembly is then left to cool for a specified time and the melted material solidifies to form a sound joint.

HDPE TO OTHER PIPES

HDPE Pipes can be joined with various types of pipe materials including steel, grey cast iron, ductile iron, asbestos cement, uPVC, GRP, concrete, polythene and ABS.

Fittings like couplings, stepped couplings & flange adaptors are used to join pipes of same/different materials and having same/different outside diameters.

This eliminates the need to replace the old existing piping system with HDPE piping system at once, thereby distributing the cost of replacement over a longer period of time.



LAYING OF PIPES

KAI pressure pipes offer a distinct weight advantage compare to other piping products.

• Polyethylene pipes are produced in straight lengths up to/more than 12m long, and coiled in diameters up to 110mm. Coiled lengths up to 300 meters are available depending on pipe diameter

• The combination of flexibility and leak free joints allow for unique and cost effective types of installation methods that the rigid PVC and Ductile Iron pipes can't use with bell and spigot connections. These alternate installation methods (Horizontal Directional Drilling, Pipe-Bursting, Slip-Lining, Plow and Plant, Submerged or Floating Pipe, etc...) can save considerable time and money in most potable water and sewage applications

• Polyethylene is about one-eighth the density of steel pipe, it does not require the use of heavy lifting equipment for installation

• Natural snaking property reduces use of fittings for directional change

The following specifications apply to the laying of KAI Pressure Pipes:

• The trench foundation should be smooth, stable, and free of roots, rocks & other sharp objects

• The height of the bedding should be 150mm and should consist of soil classifiable as ASTMD #2321 Type II SP, and ASTMD #2774 Compacted to 90% DPr (Degree of Proctor)

• Haunching and back filling soil type is the same as used for bedding, and soil should be placed to successive lift of 150mm and compacted to 90% DPr

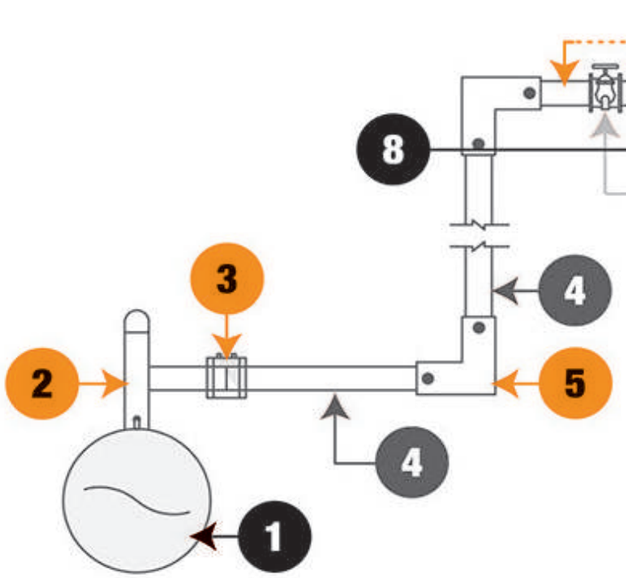
• Height for final back fill - 300mm

HOUSE CONNECTIONS

HDPE pipes have replaced galvanised and polybutylene pipes as the preferred material for house connections.

Water is tapped from the mainline using a tapping saddle clamp
and connected to a HDPE pipe servicing the house. A typical house connection is illustrated below:

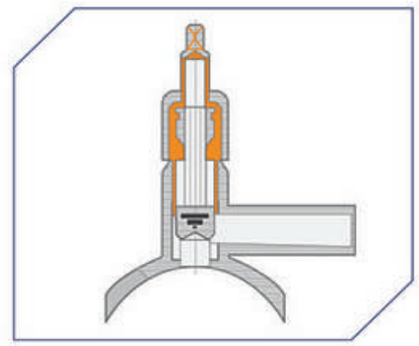
HOUSE CONNECTION FROM MAIN



BILL OF MATERIALS

SR No.	Description	Quantity
1	HDPE Main	N/A
2	Tapping Saddle Electrofusion	1
3	Coupler Electrofusion	1
4	HDPE Pipe DN-63 PN-10	2
5	Elbow - 90° Electrofusion	2
6	House Connection Pipe	4
7	Valve	2
8	Water Meter	1

Note: the length of SR No. 4&6 will depend upon site condition.



PACKING & LOGISTICS

Logistics

Our Logistics team handles the storage and the distribution of goods. They ensure that the right products are delivered to the right location on time and in excellent condition. Whether our products are being delivered via land, air, or sea, our experienced personnel will ensure the best possible conditions to exactly match our client's requirement.

Storage

Our Store Department is equipped with storage management software, that tracks the movement of goods to the supplier, the storage and packaging at the point of retail. Our experienced team ensures that goods are stored according to the high international standard.

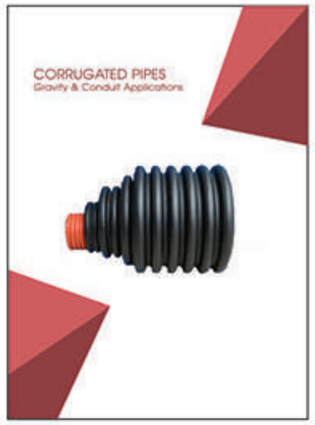
Packing

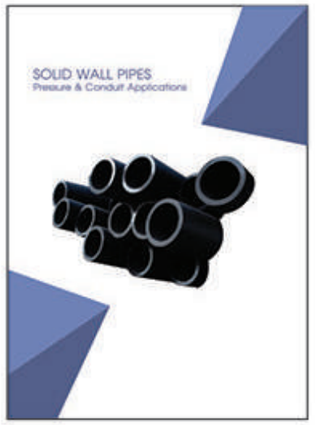
At Kai packaging department, we use well-designed packaging which plays an important role in delivering more sustainable products .

We choose packaging materials to ensure product sterility and protection, while minimizing excess package size, mass, volume and material. In addition, we are looking to ensure that packaging materials are responsibly sourced, and we are evaluating use of certified materials.

Customers must be completely satisfied and receive defect free services and products.
We demand and ensure that all products collected or delivered are in optimum condition for both operating & storing purposes.

OTHER VALUE PRODUCTS





المنتج الوطني

الحملة الإعلامية لدعم وترويج المنتج الوطني

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