HDPE MANHOLE & CHAMBER

Inspection and network Applications

KAI

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 72,000 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 euipped with modern equipment's capable to perfom necessary test recommended by the manufacturing standads. All the equipments are frome reputed suppliers as well they are calibrated regularly .

KAI products are continuesly monitored at every stage of manufacturing .

HDPE MANHOLE & CHAMBER

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Through innovative techniques, KAI manholes are made in a state of the art fabrication center. Using this method, KAI is able to provide a wide range of sizes based on the needs of the customer.

KAI's HDPE manholes are fabricated from high quality material .

The Manhole structural adequecy is verified according to the standards.
(Refer to page 11)

FABRICATION



Kai manholes are custom fabricated for a variety of applications such as municipal, industrial, sewer water,storm water , electrical handhoe , and inspection telecommunication handhole, leachate collection, swewr lift stations, siphon structures, pupm stations , bio-treatment of sewage, ETC . We pride ourselves on the top-tier machinery and 100% virgin HDPE material used in the production of these manholes .

Benefits

- Can be easily connected to various types of piping systems.
- Lightweight and easy to install smallar equipments and less manpower required.
- Resistant to chemicals, acids, and bases.
- Resistant to organic compounds.
- Resistant to hydrogen sulfide (primary cause of corrosion).
- Inlets and outlets are welded in to make it leak free.
- Ensures 100% sealing (leak proof system).
- Resistant to abrasion.
- Upon request lifting lugs are fabricated on the HDPE manhole.
- Upon request ladders can be fabricated inside the HDPE manhole.
- To increase water flow, a benched, or half pipe formed bottom is available, co nnecting to inlet and outlet.
- Smooeh benching surfaces that facilitate perfect flow.
- Environment frindnly
- HDPE manhole can withstand heavy traffic loads.
- Operating services temperatures may be from 10˚C or lower, up to 76˚C.
- Under specific circumstances it can handle temperatures up to 82˚C
- Can be stored in the sun (UV protected).
- Minimal maintenance cost.

COMPONENTS

Inlet and outlet for HDPE manholes can be attached anywhere around the circumference of the manhole.
The benching is connected to inlet and outlet for easy flow.

Inlet & Outlet Connections

KAI HDPE manholes have special inlets and outlets to provide the following connections between the manhole, and the piping system

- uPVC pipes with a controlled outer diameter.
- HDPE corrugated pipes with a controlled inner diameter.

All above connections are linked with rubber seal leak proof joints. The orientation should be specified by the engineer, along with the slope for the gravity-flow inlet and outlets. The slope should be at least 1%.

- For reliable handling, the lifting lugs are extrusion welded at the top of KAI manholes.



ACCESSORIES

Ladders

The client decides whether or not a permanent ladder will be provided. KAI offer HDPE ladders that are extrusion welded inside the manholes. Ladders are made and tested in accordance with standard PrEN 13598-2 *

Manhole Cover

KAI Manhole is compatable with all typical covers. *

Lifting Loges

Various designs of lifiting hooks are available *

Other Options

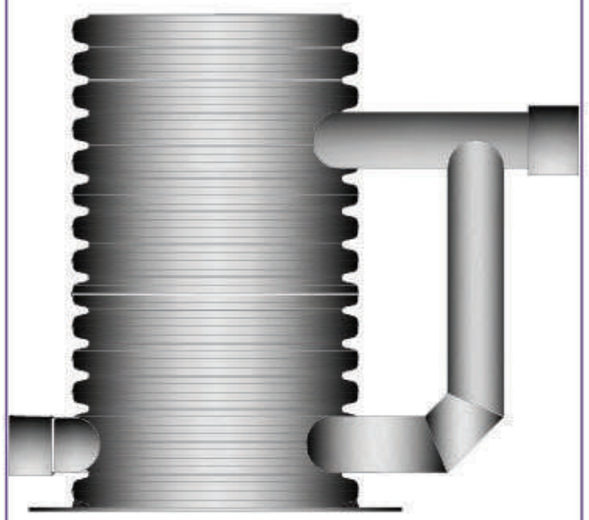
KAI can accomodate special requests such as adding code numbers, logos, special design ...Etc*

*none standard and can be provided on request.

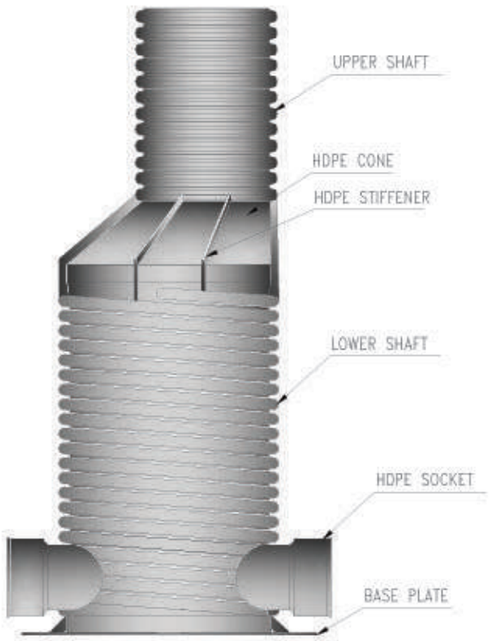


MANHOLE TYPES

KAI HDPE MANHOLE WITH BACK DROP



KAI HDPE MANHOLE FOR ABOVE THREE METER DEPTH



WELDING

The benched or half pipe-formed bottom is constructed manually with using extrusion welding techniques connecting to inlet and outlets. The benching significant imporovement in folw of water through manhole.

The extrusion wwlding according to DVS2207-4 standard
All manholes are tested for leakage hydraulically prior to the delivery.

Installation ASTM D2321

1. Inlet & Outlet Connections: manhole inlet and outlet connections are made to be joined to any type of piping system. Connections between the pipe and manhole are made using a rubber seal or Butt welding / Extrusion welding to provide a leak proof joint.

2. Foundation / Base: KAI manhole should be installed on a stable base consisting of at least 30.5cm of Class I material compacted to at least to 95% standard proctor density or a concrete slab when installed in areas with water table to anchor the manhole in place.

3. Backfill & Compaction: KAI recommends installing manholes in backfill consisting of Class I or Class II material compacted to a minimum of 90% standard proctor as defined by ASTM D 2321. The backfill should extend 1 meter from the perimeter of the manhole for the full length of the manhole and extending laterally in situ soil.

4. Top Slab: When the manhole is installed in high traffic areas a concrete slab should be designed to disperse the live load into the soil. The slab should be resting on the soil (no direct contact with the manhole). The slab thickness should be suitable to the given traffic load.

Foundation

• The KAI manhole should be installed on a stable foundation.
• We also recommend that the
placement of the manhole be on a concrete slab.

Backfill And Compaction

• KAI recommend the use of Class I or class II material as defined by standard ASTM D2321 for embedment of manholes
• Place in lifts not exceeding 200mm(8") and mechanically compact to the density specified by the engineer or 90% standard proctor (95% under streets), whichever is higher.
• Compacted backfill must extend to the trench wall or undisturbed soil
(at least 1 meter)
• Minimum embedment requirements for both the pipe, and the manhole must be met, when lateral pipes enter the manholes.

STANDARD

ASTM F1759
Standard Practice for Design of High-Density Polyethylene (HDPE) Manholes for Subsurface Applications (Reference standard)

EN 13476
Plastics piping systems for non-pressure underground drainage and sewerage. Structured-wall piping systems of unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE).

DIN 16961
Thermoplastic pipes and fittings with profiled outer and smooth inner surfaces.

EN 13598-2
Plastics piping systems for non-pressure underground drainage and sewerage - Unplasticized poly(vinyl chloride) (PVC-U), polypropylene (PP) and polyethylene (PE) - Part 2: Specifications for manholes and inspection chambers in traffic areas and deep underground installations.

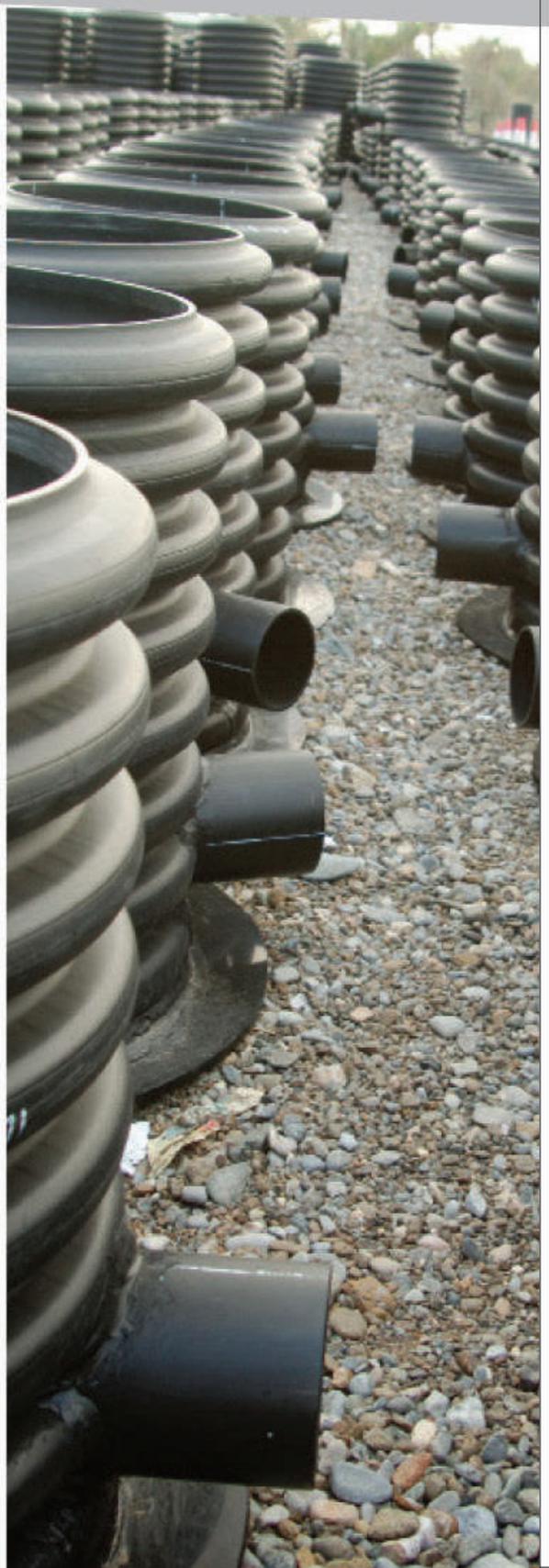
ISO 9969
Thermoplastics pipes -- Determination of ring stiffness

ISO 9001
Quality Management Systems

DVS 2207-4
Welding of thermoplastics – Extrusion welding of pipes, piping parts and panels – Processes and requirements

EN 1610
Construction and testing of drains and sewers

ASTM D2321
Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications



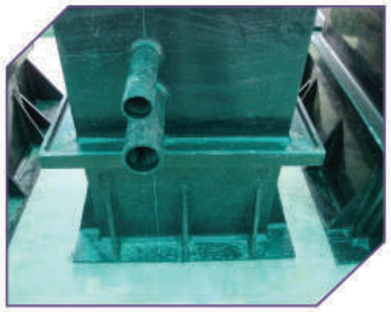
ELITE PROJECTS

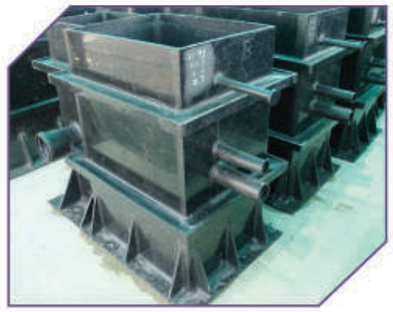
Project Name	Country	Supply Duration	Quantity of Manholes
Alghobra Area Alseeb Area Water Front	OMAN	2009-2012	4000.PCS
Main Support & Operation Center	KUWAIT	2013	60.PCS
Light Emanation Factory	KUWAIT	2018	154.PCS
Warning Radar	KUWAIT	2016	62.PCS

OTHER INSPECTION CHAMBERS

Vacuum chambers

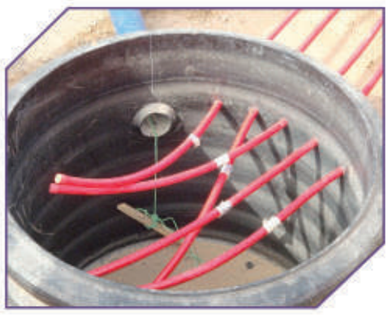
A vacuum sewer system is a method of transporting sewage from its source to a sewage treatment plant. It maintains a partial vacuum, with an air pressure below atmospheric pressure inside the pipe network and vacuum station collection vessel.





Telcommunication & Electrical chambers

KAI's manhole and hand holes are used for access for cables under the ground and connecting several networks to each other and placing telecommunication switches. For example, in telecommunication systems, for connecting some cables from different areas to each other and directing them to a path and communication center, manholes are used same goes for electrical connections .



APPROVALS

Ministry Of Public Works

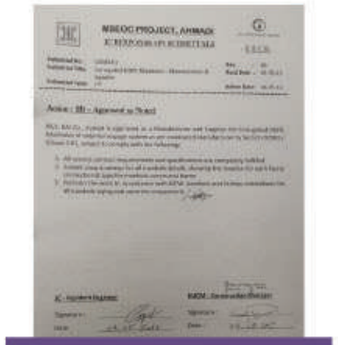
Kuwait University

Ministry Of Defence

Touristic Enterprises Company

National Guard

Ministry Of Municipality Oman



Oil Sector Services Company

Ministry Of Education

PIPE AND JOINT CONNECTIONS

Compatible With Various Types

CLAY PIPE

FLEXIBLE JOINT

EXTRUSION WELDING

HDPE SOLID WALL PIPE

ELECTRO FUSION

BUTT WELDING

HDPE CORRUGATED & SPIRAL PIPE

MONO SOCKET

EXTRUSION WELDING

RUBBER SEAL / GASKET

POLYCRETE PIPE

METAL PIPE

FLANGE CONNECTION

PVC SOCKET

MONO SOCKET

PVC PIPE

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.

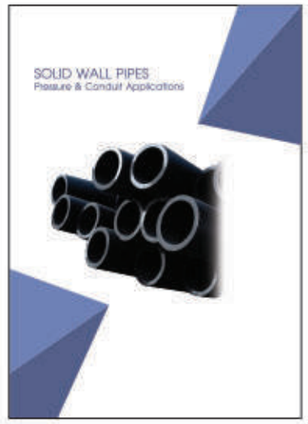
Packing

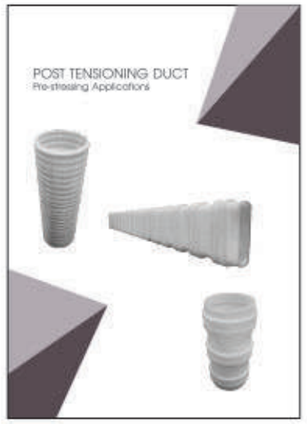
At Kai packaging department, we use well-designed packaging which plays an important role in delivering more sustainable products .

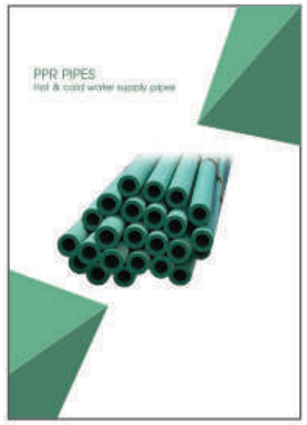
We choose packaging materials to ensure product sterility and protection, while minimizing excess package size, mass, volume and material. In addition, we are looking to ensure that packaging materials are responsibly sourced, and we are evaluating use of certified materials.

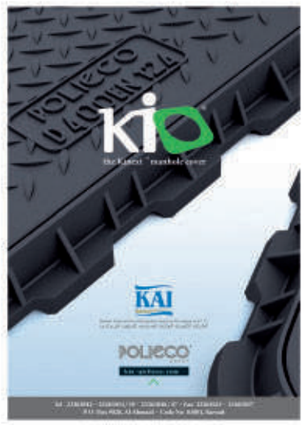
Customers must be completely satisfied and receive defect free services and products.
We demand and ensure that all products collected or delivered are in optimum condition for both operating & storing purposes.

OTHER VALUE PRODUCTS









المنتج الوطني

الحملة الإعلامية لدعم وترويج المنتج الوطني

KAI

kai.kw

www.kiaico.com

kiaico

Tel.: +965 2326 3042/6/7

Fax :+965 2326 3043

Find us on google maps

Kuwait International Advanced Industries Company