

# POST TENSIONING DUCT

Pre-stressing 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](http://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<sup>2</sup> 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 regularly. The product continuously monitoring before during & past prior delivered to the customer.



## POST TENSIONING DUCT

### Pre-stressing Applications

PT Duct is an effective method for corrosion protection of internal post tensioning tendons; It provides corrosion resistance by complete encapsulation of the tendons. The usage of plastic ducts as corrosion protection started in the early 1990's. Initially HDPE ducts were used then it evolved based on projects actual experiences where new designs and material i.e. Polypropylene (PP) was used to achieve better performance.

HDPE & PP both are thermoplastic material used in the production of PT ducts; they both have similar basic properties. HDPE in comparison to PP material have better flexibility, better impact strength and easier to handle and weld whereas PP material have better stiffness, can withstand higher temperatures and have better appraising resistance. KAI produce PT-duct using both types of material.

End of 2002 Bulletin 7 was established to standardize the requirements of PT-ducts. KAI produce PT-Duct that adheres to bulletin 7 requirements for PP & HDPE material.





## PP Duct for Post tensioning application

All ducts are produced according to the following standards

1. AASHTO LRFD Bridge Construction Specification for internal, external, HDPE and PP ducts.
2. Raw material classified by ASTM D4101, ASTM D3350

### APPLICATIONS

Corrosion Protection for Post Tensioning Strands for  
Flyovers and bridges  
Nuclear containments  
Offshore platforms  
Via ducts  
Under passes  
Tunnels  
Structures exposed to high humidity  
Waste water treatment plants  
Acid Tanks  
Silos

### ADVANTAGES

- Better corrosion protection
- Improved tendon fatigue performance
- Reduced tendon friction
- Reduce construction time with the help of post-tensioning slabs (Flat Ducts)



## Couplers for PT Ducts

### Description

The couplers are manufactured to suit our PT Ducts,

### Raw material

The ducts are manufactured from polypropylene resin (PP)

### APPLICATIONS

Flyover & Bridges, Offshore platforms structures exposed to high humidity  
Under passes, Tunnels

### Geometrical Properties

Suitable to KAI PP PT Duct; Nominal Size	Nominal outside diameter (mm)	Nominal thickness (mm)	Nominal length (mm)
76	101	5.0	150
85	111	5.5	150
100	126	5.0	150
115	142	4.5	200
130	161	5.5	200
144	181	5.5	200

### Physical properties

Description	Test method	Limits	Unit
Density@ 23°C (kg/m <sup>3</sup> )	ASTM D792	>900	kg/m <sup>3</sup>
Deflection Temperature at 455KPa	ASTM D648	80 - 120	°C
Izod impact @23°C	ASTM D256	300 - 700	J/m
Flexural modulus @1.3mm/min	ASTM D790	750 - 1,000	MPa
Tensile stress at yield @50mm/min	ASTM D638	20 - 30	MPa





## Round Polypropylene PT Duct

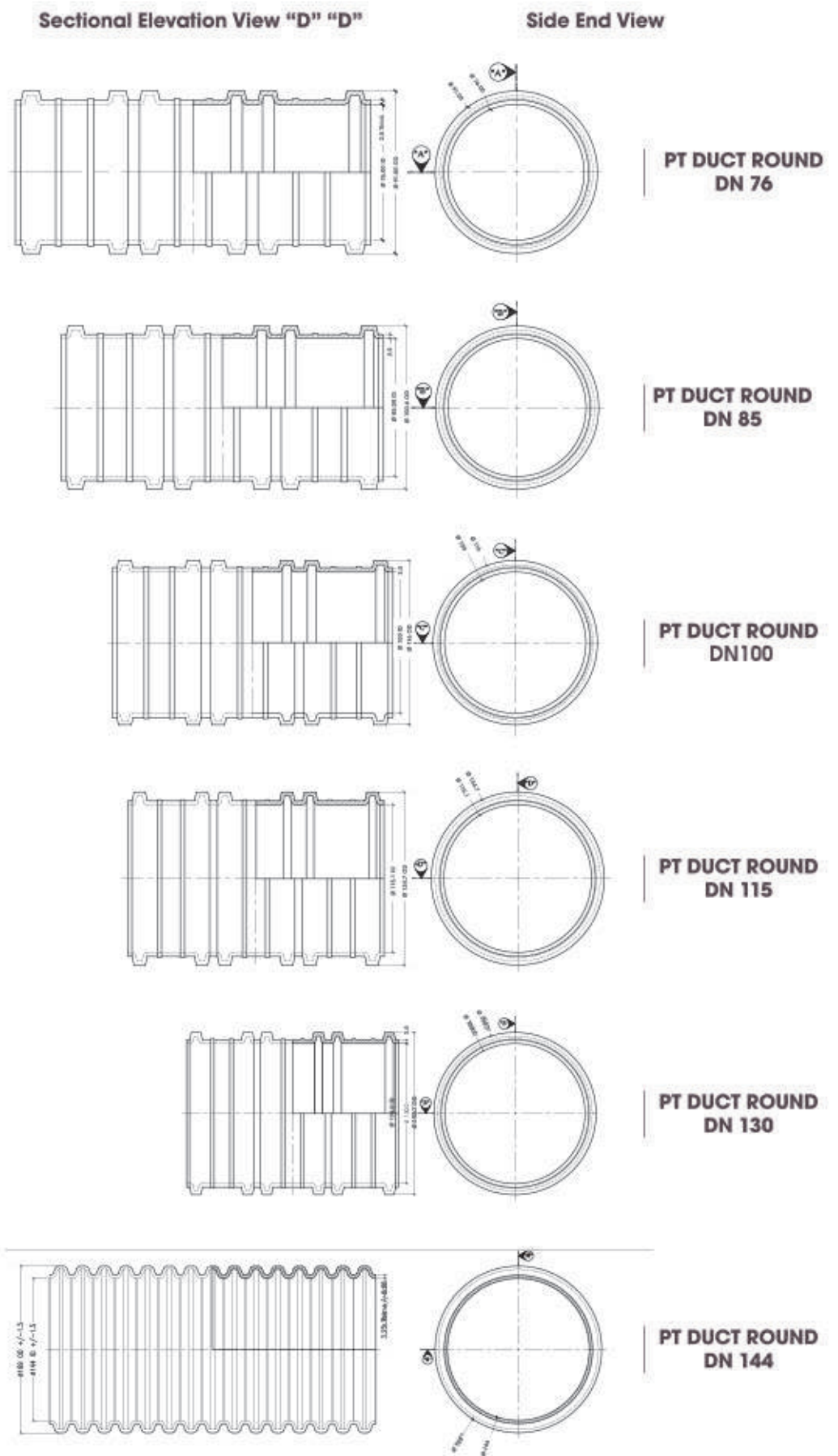
Diameter Size	Inside Diameter of the duct	Outside Diameter of the duct	t- Wall thickness	Length	Jointing	Packing	
	mm	mm	mm			Local	Overseas
76	74 ±1.5	90 ±1.5	2.5 ±0.25	6m ± 1% and 12m ± 1%	<ul style="list-style-type: none"><li>• socket coupler</li><li>• shrink sleeve</li><li>• butt welding</li></ul>	12m x 25Nos	1.8M Loose
85	85 ±1.5	101 ±1.5	2.5 ±0.25				
100	99 ±1.5	114 ±1.5	3.0 ±0.25				
115	113 ±1.5	133 ±1.5	3.0 ±0.25				
130	130 ±1.5	152 ±1.5	3.0 ±0.25				
144	143 ±1.5	169 ±1.5	3.25 ±0.25				
Raw Material			Color				
Polypropylene			White				

### Physical properties

Description	Test method	Value	Unit
Tensile Strength at yield	ASTM D638	20 - 30	MPa
Deflection Temperature at 455KPa	ASTM D648	80 - 120	°C



## Round Polypropylene PT Duct





# Flat/Oval Polypropylene PT Duct



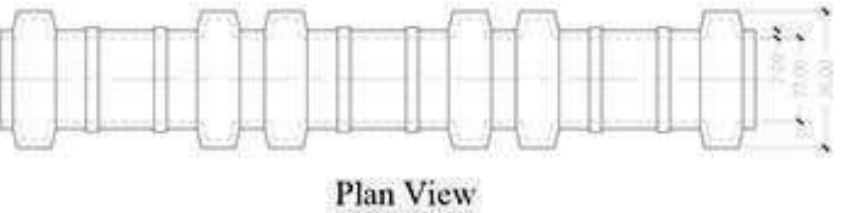
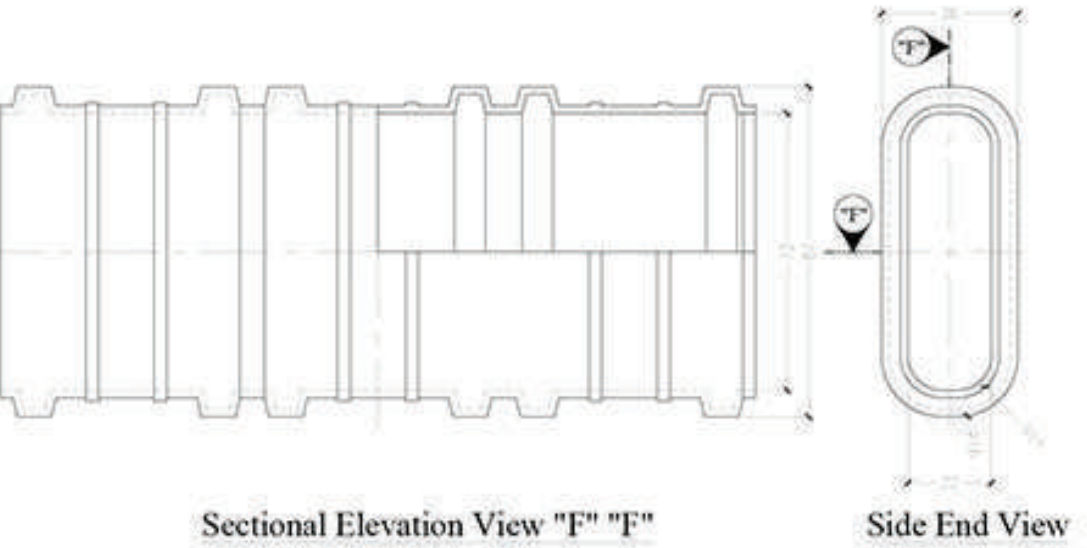
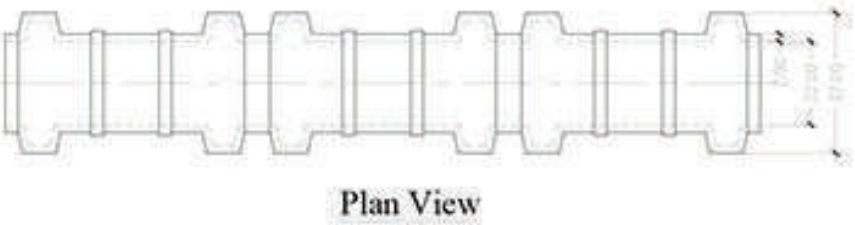
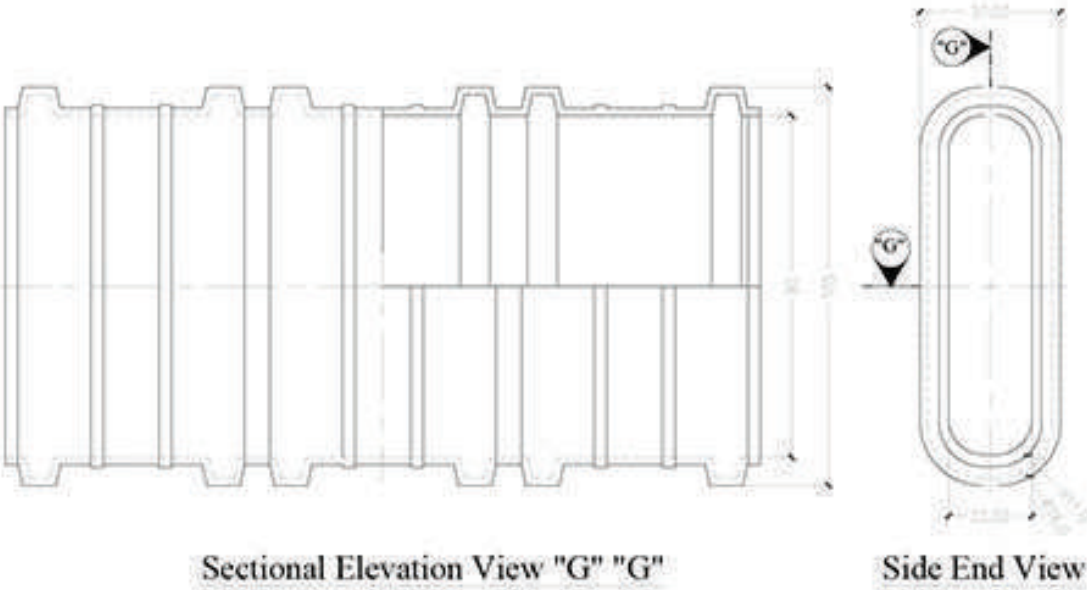
Diameter Size	Inside Diameter of the duct		Outside Diameter of the duct		t- Wall thickness		Length	Joining	Packing
	mm		mm		mm				
73x22	72 ±1.0	19 ±1.0	88 ±1.0	35 ±1.0	2.0 ±0.25	2.0 ±0.25	6m ± 1% and 12m ± 1%	• socket coupler  • shrink sleeve  • butt welding	Coil 200 m
90x22	86 ±1.0	19 ±1.0	102 ±1.0	35 ±1.0	2.0 ±0.25	2.0 ±0.25			
Raw Material						Color			
Polypropylene						White			

## Physical properties

Description	Test method	Value	Unit
Tensile Strength at yield	ASTM D638	20 - 30	MPa
Deflection Temperature at 455KPa	ASTM D648	80 - 120	°C



# Flat/Oval Polypropylene PT Duct











KAI is proud to participate in this exceptional project Jaber Al-Ahmed Bridge with our post tensioning ducts



## 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







kalkw



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