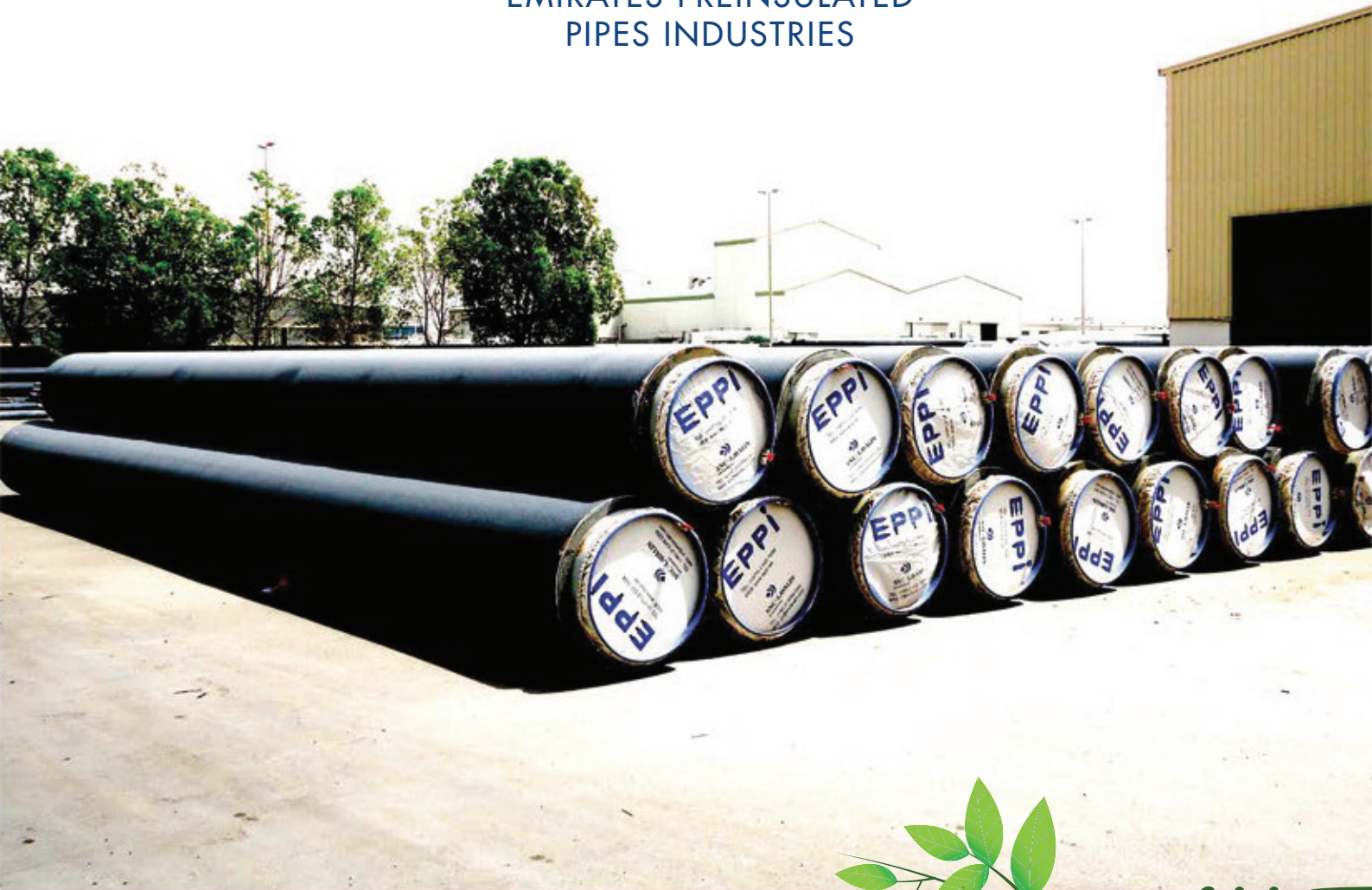


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PRODUCT CATALOGUE



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ABOUT US

EPPI, a subsidiary of National Central Cooling Company (Tabreed), was established in the year 2000. The purpose of the company is to manufacture preinsulated systems of pipes and fittings for applications involving the transport and distribution of hot and cold fluids in the district cooling/heating, oil/gas and any similar energy related sectors.

EPPI manufacturing facility is located in Industrial City of Abu Dhabi (ICAD-1), at musaffah with two major factories occupying a combined plant area of 48000 square meters. Our storage areas are capable of stockpiling more than 50km of pipes in mixed sizes, several thousands of fittings, hundreds of tons of raw material of both plastics and chemicals.



The range of major products on offer to caters for a whole host of applications includes

- a. Preinsulated carbon steel pipes and fittings
- b. Preinsulated HDPE pipes and fittings
- c. High Density Polyethylene (HDPE) Pipes and fittings
- d. Tubular sleeves (Rayjoints) for field joints
- e. Preinsulated HDPE coil pipes.

EPPI is equipped with the latest technology in polyurethane (PUR) foam dispensing and processing techniques to ensure the quality of the factory-applied insulation. Our insulation processing is among the foremost in the region to be 100% CFC-free, which supports the elimination of ozone-depleting potential with ZERO-ODP. Our extrusion technology is state-of-the-art with fully-automated processes to produce seamless solid-wall high density polyethylene (HDPE) pipe profile.

EPPI quality management system is an ISO-9001 certified throughout the entire manufacturing processes. We provide quality products, piping system stress analysis incorporation of leak detection and surveillance systems, on-site technical assistance and installation supervision whenever is needed.

EPPI HDPE pipes are approved by WRAS for transporting potable water.



2. PRE-INSULATED CARBON STEEL PIPES



2.1 System in brief

The preinsulated pipe system is made up of steel carrier pipe, 100% CFC free polyurethane insulation foam and seamless solid wall HDPE jacket.



assembly. Air vent plugs made of plastic are fitted on the metal end caps to let the air entrapped in the annular space between the core and the casing to dispense.

2.2 Steel core pipe

Types: ERW (Electric resistance welded), SAW(Submerged arc welded) & Seamless

Wall thickness: Std, Sch 40, XS, others as dictated by project specs.

Material: API 5L Grade B, ASTM A53 Grade B, ASTM A106, others as dictated by project specs.

2.3 Insulation

The insulation is made of 100% CFC free polyurethane foam. The required amount of foaming mixture, usually 25% over packed is injected in to the cavity between the steel core and the casing pipe via the injection hole in the metal end caps at the top of the pipe

2.3.1 Insulation physical properties

Thermal conductivity : In the range of 0.0230 to 0.0280 W/m²K as per ASTM C518

Core density : 48 to 90 kg/m³ as per ASTM D1622

Compressive strength : 300 KPa (minimum)

PU system : Water, HCFC, HFO

Typical operating temperature: -17 to 120 C°

2.3.2 High pressure PU injection

The expanding polyurethane foam flows between the specially designed foam spacers, completely filling the annular space while exerting pressure against the jacket , insuring that the jacket is water tight without any pin holes, cracks or crazes that can allow moisture penetration into the insulation.



2.4 Seamless HDPE casing

The casing is separately manufactured pipe of HDPE by extrusion process. The casing pipe material is black coloured PE containing antioxidants ,UV stabilizers, carbon black is necessary for the manufacturing and meeting the EN253 specifications.

2.4.1 HDPE casing physical properties

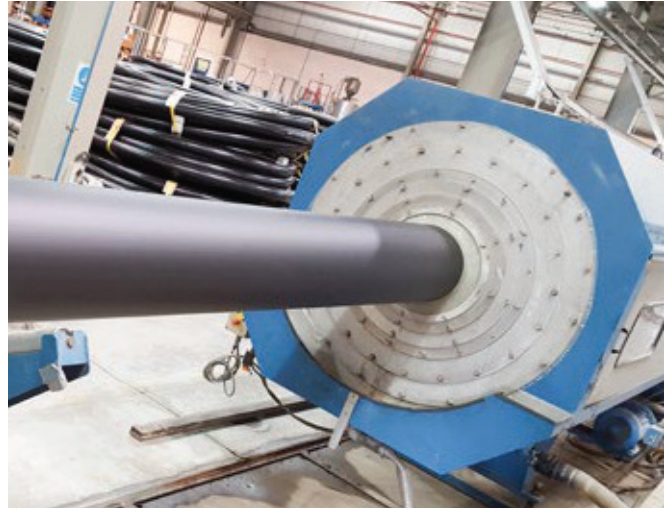
Melt flow rate: 0.2 to 1.4 g/10 min @ 5kg/190°C

Outer casing diameter/wall thickness: As per EN253

Carbon black content: 2 to 3 % by mass

Elongation at break : above 350% as per EN253

Density : above 950 kg/m³



2.5 Steel blasting and coating

Blasting is a mechanical method of cleaning, utilizing steel shots or grits at high pressure. This is done automatically when a pipe is fed in to machine. The process is applicable to steel surfaces used primarily as core component of a product. Surface cleanliness is evaluated based on ASTM D2200 pictorial surface preparation for painting steel surfaces or based on ISO 8501-1 visual assessment of surface cleanliness. Surface profile is evaluated based on ASTM D4417 surface profile of blast cleaned steel or based on 8503 surface roughness characteristics of blast-cleaned steel substrates.



Coating process is a method of protecting blasted surfaces by airless spray application at high pressure utilizing a range of coating systems to suit diverse requirements of the product. The process is applicable to all blasted surfaces of the steel core. The thickness of dry coating of pipe after the coating application of core component is measured based on ASTM D1186 non-destructive measurement of dry film thickness.

2.6 Standard pre insulated CS pipe dimensions

Steel - Core					HDPE Casing		PU Foam Insulation	*U - Value
Dia.		WT.			OD.	WT.	Thk.	
Inch	mm	Std	Sch 40	XS	mm	mm	mm	W/m²K
1	33.4	3.38	3.38	4.55	125	3.0	42.8	0.352
1.25	42.2	3.56	3.56	4.85	125	3.0	38.4	0.431
1.5	48.3	3.68	3.68	5.08	140	3.0	42.9	0.391
2.0	60.3	3.91	3.91	5.54	160	3.0	46.9	0.372
2.5	73.0	5.16	5.16	7.01	180	3.0	50.5	0.357
3.0	88.9	5.49	5.49	7.62	200	3.2	52.4	0.359
4.0	114.3	6.02	6.02	8.56	225	3.4	52.0	0.384
5.0	141.3	6.55	6.55	9.53	250	3.6	50.8	0.412
6.0	168.3	7.11	7.11	10.97	280	3.9	52.0	0.414
8.0	219.1	8.18	8.18	12.7	355	4.5	63.5	0.344
10.0	273.1	9.27	9.27	12.7	400	4.8	58.7	0.390
10.0	273.1	9.27	9.27	12.7	450	5.2	83.3	0.261
12.0	323.9	9.53	10.37	12.7	450	5.2	57.9	0.405
12.0	323.9	9.53	10.31	12.7	500	5.6	82.5	0.271
14.0	355.6	9.53	11.13	12.7	500	5.6	66.6	0.350
16.0	406.4	9.53	12.7	12.7	560	6.0	70.8	0.333
18.0	457.2	9.53	14.27	12.7	560	6.0	45.4	0.548
18.0	457.2	9.53	14.27	12.7	630	6.6	79.8	0.296
20.0	508.0	9.53	15.09	12.7	630	6.6	54.4	0.455
24.0	609.6	9.53	17.48	12.7	730	7.2	53.0	0.475
24.0	609.6	9.53	17.48	12.7	800	7.9	87.9	0.277
28.0	711.0	9.53	-	12.7	900	8.7	85.8	0.286
30.0	762.0	9.53	-	12.7	900	8.7	60.3	0.420
30.0	762.0	9.53	-	12.7	1000	9.4	109.6	0.220
32.0	812.8	9.53	17.48	12.7	1000	9.4	84.2	0.295
36.0	914.4	9.53	19.05	12.7	1100	10.2	82.6	0.304
40.0	1016.0	9.53	-	12.7	1200	11.0	81.0	0.313
42.0	1066.8	9.53	-	12.7	1200	11.0	55.6	0.465

* K Value (Steel) -43.0 W/m²K, K Value (HDPE) -0.43 W/m²K, K Value (PU foam) -0.028 W/m²K

3. PRE-INSULATED CARBON STEEL FITTINGS



3.1 System in brief

The preinsulated carbon steel fitting system is made up of steel carrier fitting, 100% CFC free polyurethane and fabricated HDPE casing pipe.

3.2 Steel core fitting

The steel core fittings are made of carbon steel ASTM A234 and the dimensions are according to ASME B16.9. All procured steel fittings undergo factory fabrication process whereby a minimum of 300 mm steel pipe piece is welded to each end of the fitting.



3.3 Fitting insulation

The insulation is made of 100% CFC free polyurethane foam. The required amount of foaming mixture is injected into the cavity between the steel core fitting and the fabricated casing pipe via the injection hole in the metal end caps of the fitting assembly.

3.3.1 Insulation physical properties

Thermal conductivity : In the range of 0.0230 to 0.0280 W/m²K as per ASTM C518

Core density : above 48 kg/m³ as per ASTM D1622

Compressive strength : 300 KPa (minimum)



3.4 Moisture barrier

Factory applied end seals are provided at each exposed end of the insulation to prevent moisture ingress during storing, transportation and field handling.

3.5 Grooving

The factory is equipped with grooving facility to provide steel pipe ends with standard grooving dimensions. The pipes and the fittings with machined groove ends are insulated to the standard requirements. The grooved piping can be installed without any weld.

3.6 Casing fabrication

The casing fabrication is a method of fabricating casing components to be used for fittings, spools and other irregular-shaped configuration. This operation includes contour-forming, thermoplastic welding and other applicable methods to all pre-formed raw material casing such as thermoplastic (HDPE) and others.



3.7 Steel fabrication

The fabrication assembly operation involves cutting, end-preparation, tacking and welding.

3.7.1 Steel welding

This process covers manual welding of steel components of the product which will be performed by qualified welders under the steel fabrication sub-section. As part of the manufacturing overall workmanship requirements and standard method of operations, the welding process maintains the standard requirements of the American Petroleum Institute (API 1104), American Society of Mechanical Engineers (ASME) for Boiler and Pressure Vessel Code, Section IX. The Welding Procedure Specifications (WPS), Welding Performance Qualification (WPQ) of Welders or Welding Operators are pre-qualified and certified by an authorized independent laboratory.



3.7.1.1 Gas Tungsten Arc Welding

(GTAW) is a type of fusion process for joining metals commonly known as TIG welding (Tungsten inert gas) whereby it uses a continuous electrode for filler metal and an externally supplied gas for shielding.

3.7.1.2 Shielded Metal Arc Welding

(SMAW) is a type of fusion process for joining metals which is commonly called stick-electrode welding or manual welding.

3.7.2 Non destructive testing

All factory welded steel joints undergoes applicable non destructive testing (100%) namely RT, UT, MPI and LPI to assure the integrity of the fusion joints.

3.7.2.1 Radiography Testing

The process involves testing of steel material up to 50mm thickness and uses gamma ray sources. The test is based on ASME Sec 5, ASME Sec. 8 and API 1104.

3.7.2.2 Ultrasonic Testing

The process involves testing of steel component using ultrasonic flaw detector with a frequency range of 1-6 M Hz. The test is based on ASME Sec 5, ASME Sec. 8 and API 1104.

3.7.2.3 Magnetic particle inspection

Magnetic Particle Test is determines the discontinuities on the welded joint by wet or dry methods. This test is based on ASME Sec.5/ API 1104.

3.7.2.4 Dye Penetrant inspection

Dye Penetrant Test is determines the discontinuities on the welded joint using visible penetrants type water washable or solvent washable. This test is based on ASME Sec.5/API 1104.



4. PRE INSULATED HDPE PIPES AND FITTINGS



4.1 System in brief

The preinsulated HDPE pipe system is made up of HDPE carrier pipe or fittings, 100% CFC free polyurethane insulation foam and HDPE jacket.

Core pipe shall be rigid HDPE-PE100, in accordance with ISO 4427/DIN 8074/8075.

Thermal insulation is made of 100% CFC free polyurethane (PUR) foam; having a minimum density of 48 kg/m³ and thermal conductivity coefficient (λ) in the range of 0.0230 to 0.0280 W/m²K.

The outer casing or protective jacket shall be HDPE pipe, black, UV - resistant, having a minimum density of 950 kg/m³.

Preinsulated HDPE fittings are made up of fabricated HDPE fittings as per ISO4427, 100% CFC free polyurethane insulation foam and fabricated HDPE casing.

4.2 Dimensions

HDPE - Core (PE100)			HDPE Casing		PU Foam Insulation
Dia.	WT. (mm)		OD.	WT.	Thk.
mm	SDR 17, PN10	SDR 11, PN16	mm	mm	mm
125	7.4	11.4	250	3.6	58.9
160	9.5	14.6	280	3.9	56.1
200	11.9	18.2	315	4.1	53.4
250	14.8	22.7	400	4.8	70.2
315	18.7	28.6	450	5.2	62.3
355	21.1	32.2	500	5.6	66.9
400	23.7	36.3	560	6.0	74.0
450	26.7	40.9	630	6.6	83.4
500	29.7	45.4	630	6.6	58.4
560	33.2	50.8	730	6.6	78.4
630	37.4	57.2	800	7.9	77.1

* Pipe sizes above 630mm are upon request



5. PRE INSULATED HDPE FLEXIBLE PIPES



5.1 System in brief

The Preinsulated HDPE coil pipe (EPPI-Flex) is made up of HDPE coil pipe, 100% CFC free Polyurethane insulation foam and corrugated LDPE seamless casing.

EPPI-Flex is durable and light weight, buried faster, installation and more economical to fix. EPPI-Flex installation is very ideal for conditions in the Middle East due to its availability in long lengths that can be custom cut to fit any application. It is easier to handle and requires less number of joints.



5.2 Core pipe

Core pipe shall be flexible HDPE-PE100 in accordance with ISO 4427/DIN 8074/ DIN 8075 and with pressure rating of 16 bar (SDR11)

5.3 Insulation

Thermal insulation shall be closed cell CFC polyurethane (PUR) foam; having a density of 48 kg/m³ (minimum) and thermal conductivity coefficient (λ) of 0.0280 W/m²K maximum. The foam insulation is applied over the pipe and then the seamless LDPE jacket is extruded around it.



5.4 Casing pipe

The outer casing or protective jacket shall be made of extruded corrugated LDPE pipe black UV-resistant, having a density above 923 kg/m³.

5.5 Pre insulated flexible pipe dimensions

HDPE Core/PE100 SDR11			LDPE - Casing		Insulation	
OD.	WT.	Coil Length.	OD.	WT.	Material.	Thickness.
mm	mm	M	mm	mm	-	mm
25	2.3	100	113	2.4	PUF	41.6
32	2.9	100	113	2.4	PUF	38.1
40	3.7	100	113	2.4	PUF	34.1
50	4.6	100	113	2.4	PUF	29.1
63	5.8	100	143	3.0	PUF	37.0
75	6.8	100	143	3.0	PUF	31.0
90	8.2	100	163	3.2	PUF	33.3
110	10.0	100	163	3.2	PUF	23.3

6. HDPE PRESSURE PIPES



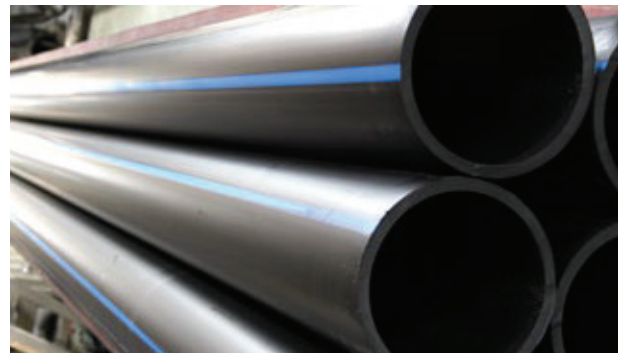
6.1 Product in brief

HDPE is a polyethylene thermoplastic made from petroleum. HDPE pipe is ideal for many different applications including water supply, sewage, industrial effluent disposal, agriculture, irrigation, drainage and many more.

HDPE pipe is also more environmentally sustainable option as it is non-toxic, corrosion and chemical resistant, has a long design life, and is ideal for trenchless installation methods because of its flexibility.



EPPI plastic division manufacture High Density Polyethylene Pipes (EPPI-PE) using the most reliable extrusion machineries. EPPI-PE ranges from (OD) 20mm to 1200mm and the PN from 6 bars to 25 bars.



6.2 Maximum Operating Pressure

The maximum operating pressure (MOP) in bar which is allowed in continuous use is given by $MOP = 20 \times \text{Allowable Design Stress} / (SDR-1)$ (Example: Allowable design stress is 8 MPa at 20 degree centigrade for PE100)

6.3 Physical characteristics

Characteristics	Test Methods	Typical Values
Elongation @break	ISO 6259-1 / ISO 6259-3	> 350 %
Longitudinal Reversion	ISO 2505	< 3%
Melt Flow Rate	ISO 1133	0.25 g/10 min@190°C/5 kg.
Carbon black content	ISO 6964	2.5 %
Density	ISO 1183-2	> 930
Oxidation Induction	ISO 11357	> 20 min.
Hydrostatic Strength	ISO 1167-1 / ISO 1167-2	100 h@20°C, 165 /1000 h@80°C



6.4 Standard HDPE pipe dimensions (PE100) as per ISO 4427

Nominal Size, OD	PN 25 / SDR 7.4 W.T.	PN 20 / SDR 9 W.T.	PN 16 / SDR 11 W.T.	PN 12.5 / SDR 13.6 W.T.	PN 10 / SDR 17 W.T.	PN 8 / SDR 21 W.T.	PN 6 / SDR 26 W.T.
16 mm	2.3 mm	2.0 mm	-	-	-	-	-
20 mm	3.0 mm	2.3 mm	2.0 mm	-	-	-	-
25 mm	3.5 mm	3.0 mm	2.3 mm	2.0 mm	-	-	-
32 mm	4.4 mm	3.6 mm	3.0 mm	2.4 mm	2.0 mm	-	-
40 mm	5.5 mm	4.5 mm	3.7 mm	3.0 mm	2.4 mm	2.0 mm	-
50 mm	6.9 mm	5.6 mm	4.6 mm	3.7 mm	3.0 mm	2.4 mm	2.0 mm
63 mm	8.6 mm	7.1 mm	5.8 mm	4.7 mm	3.8 mm	3.0 mm	2.5 mm
75 mm	10.3 mm	8.4 mm	6.8 mm	5.6 mm	4.5 mm	3.6 mm	2.9 mm
90 mm	12.3 mm	10.1 mm	8.2 mm	6.7 mm	5.4 mm	4.3 mm	3.5 mm
110 mm	15.1 mm	12.3 mm	10.0 mm	8.1 mm	6.6 mm	5.3 mm	4.2 mm
125 mm	17.1 mm	14.0 mm	11.4 mm	9.2 mm	7.4 mm	6.0 mm	4.8 mm
140 mm	19.2 mm	15.7 mm	12.7 mm	10.3 mm	8.3 mm	6.7 mm	5.4 mm
160 mm	21.9 mm	17.9 mm	14.6 mm	11.8 mm	9.5 mm	7.7 mm	6.2 mm
180 mm	24.6 mm	20.1 mm	16.4 mm	13.3 mm	10.7 mm	8.6 mm	6.9 mm
200 mm	27.4 mm	22.4 mm	18.2 mm	14.7 mm	11.9 mm	9.6 mm	7.7 mm
225 mm	30.8 mm	25.2 mm	20.5 mm	16.6 mm	13.4 mm	10.8 mm	8.6 mm
250 mm	34.2 mm	27.9 mm	22.7 mm	18.4 mm	14.8 mm	11.9 mm	9.6 mm
280 mm	38.3 mm	31.3 mm	25.4 mm	20.6 mm	16.6 mm	13.4 mm	10.7 mm
315 mm	43.1 mm	35.2 mm	28.6 mm	23.2 mm	18.7 mm	15.0 mm	12.1 mm
355 mm	48.5 mm	39.7 mm	32.2 mm	26.1 mm	21.1 mm	16.9 mm	13.6 mm
400 mm	54.7 mm	44.7 mm	36.3 mm	29.4 mm	23.7 mm	19.1 mm	15.3 mm
450 mm	61.5 mm	50.3 mm	40.9 mm	33.1 mm	26.7 mm	21.5 mm	17.2 mm
500 mm	-	55.8 mm	45.4 mm	36.8 mm	29.7 mm	23.9 mm	19.1 mm
560 mm	-	62.5 mm	50.8 mm	41.2 mm	33.2 mm	26.7 mm	21.4 mm
630 mm	-	-	57.2 mm	46.3 mm	37.4 mm	30.0 mm	24.1 mm
710 mm	-	-	64.5 mm	52.2 mm	42.1 mm	33.9 mm	27.2 mm
800 mm	-	-	-	58.8 mm	47.4 mm	38.1 mm	30.6 mm
900 mm	-	-	-	66.2 mm	53.3 mm	42.9 mm	34.4 mm
1000 mm	-	-	-	-	59.3 mm	47.7 mm	38.2 mm
1200 mm	-	-	-	-	67.9 mm	57.2 mm	45.9 mm

PN-Nominal Pressure in Bar WT-Wall thickness in mm

(Dimensions in the table are the most common requirements in the market. However other specific dimensions and PE Grade can be extruded as per customer requirements)

7 RAYJOINT TUBULAR SLEEVES



7.1 System in brief

Rayjoint is used as a field joint material when the preinsulated pipes and fittings are joined at field. The rayjoint can be pressure tested at 0.5 bar. The product is stored in a covered storage area, individually packaged to avoid direct sunlight exposure.



EPPI is equipped with the facility to produce tubular shrinkable HDPE coupling (Rayjoint). The standard size ranges from 90 mm to 1600 mm in diameter. The Rayjoint system has successfully undergone sandbox test as per EN489.



Tensile strength-above 17MPa@100 cycles according to EN489 and water permeability test according to EN489 at a third-party facility.

7.2 Rayjoint physical properties

Material : Cross linked polyethylene

Tensile strength : above 17 MPa@23° C

Ultimate elongation : above 500%@23° C



7.3 Rayjoint dimensions

Casing. OD.	RJC. ID.	RJC. WT.	Width.	Rayjoint.
mm	mm	mm	mm	RJC
90	110	2.4	660	RJC-90
110	133	2.4	660	RJC-110
125	150	2.4	660	RJC-125
140	165	2.4	660	RJC-140
160	185	2.4	660	RJC-160
180	210	2.4	660	RJC-180
200	230	2.4	660	RJC-200
225	250	2.4	660	RJC-225
250	280	2.4	660	RJC-250
280	320	2.4	660	RJC-280
315	355	3.2	660	RJC-315
355	394	3.2	660	RJC-355
400	447	3.2	660	RJC-400
450	498	3.2	660	RJC-450
500	551	3.2	660	RJC-500
560	615	4.0	660	RJC-560
630	687	4.0	660	RJC-630
710	771	4.8	660	RJC-710
800	867	4.8	660	RJC-800
900	971	5.6	660	RJC-900
1000	1075	6.4	660	RJC-1000
1100	1179	6.4	660	RJC-1100
1200	1283	7.2	660	RJC-1200
1300	1387	8.0	660	RJC-1300
1400	1491	8.0	660	RJC-1400
1500	1594	8.8	660	RJC-1500
1600	1697	8.8	660	RJC-1600

8. ACCESSORIES FOR PRE INSULATED PIPES AT FIELD



8.1 Leak detection system – CWA 9000

A leak detection system can be an integral part of the piping system, utilizing two monitoring wires embedded in the foam insulation, connected to an individual line monitoring unit.

- a. Sensing water, hydrocarbons, solvents and mixtures
- b. Monitors up to 4000 m of piping from one unit
- c. Leaks are detected and located directly and within +/- 1% of the distance displayed
- d. 3 security levels with separate passwords and personal codes
- e. 20 years of experience in pipe monitoring systems



8.2 Field insulation methods for preinsulated pipes

The field joint is the area where two pipe joints meet and that must be thermally insulated after field welding or other mechanical joining methods.

8.2.1 Rayjoint – Installation and foaming

Rayjoint field insulation consist of polyurethane foam chemicals (2-components) poured in a heat shrinkable tubular sleeve (Rayjoint), fixed around the joint and its ends are heat-shrunk to finish the joint. The Rayjoint heat shrinkable tubular sleeve is pressure testable.



8.2.2 GI sheet – Installation and foaming

The GI sheet field insulation consist of polyurethane foam chemicals (2-components) poured into a sheet metal roll-up wrapped around the joint. A heat shrinkable sleeve with closure patch is applied and heat shrunk to finish the joint.



8.2.3 HDPE – installation and foaming

The HDPE field joint insulation consists of polyurethane foam chemical (2-component) poured into the HDPE roll-up fused around the joint by extrusion welding.

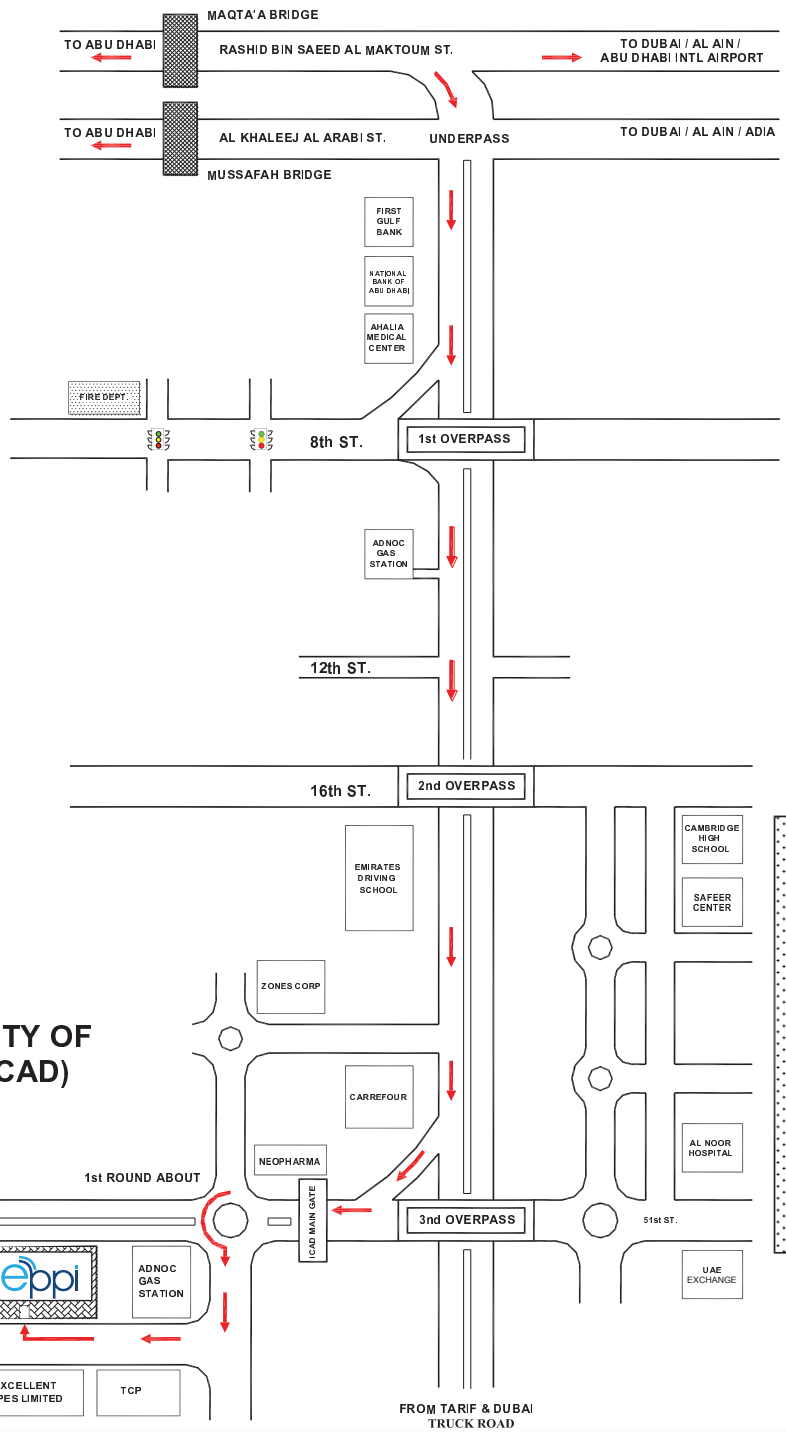
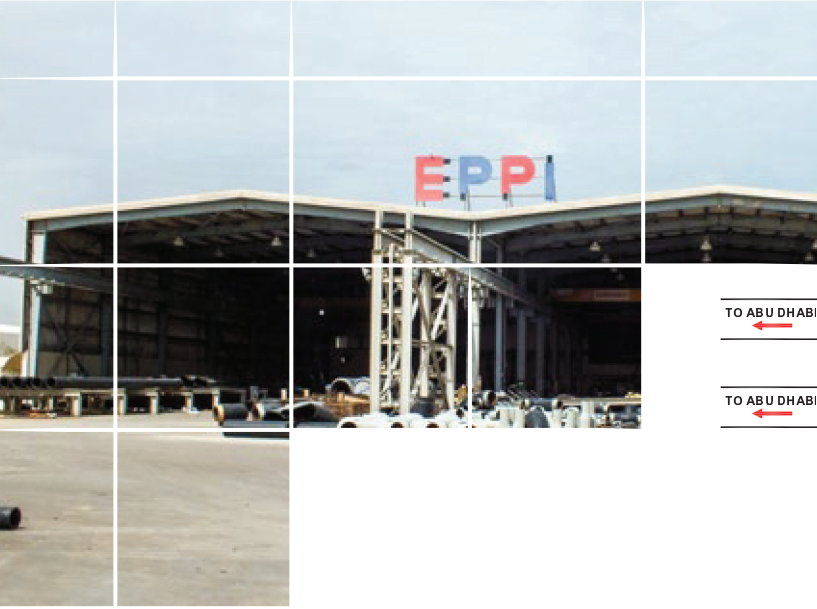
9. QUALITY AT WORK



EPPI quality management system is certified as per ISO 9001:2008 requirements. Surveillance audits are conducted annually by a third party. The factory is equipped with a lab facility to conduct all the applicable tests for the preinsulated pipes and extruded high density polyethylene core and casing pipes. The tests are done as per various international standards ASTM/ISO /EN etc.

- a. Thermal conductivity -PU Foam
- b. Density-PU foam
- c. Compressive strength-PU Foam
- d. Water absorption-PU Foam
- e. Axial shear strength -Preinsulated pipe
- f. Density-HDPE
- g. Longitudinal reversion-HDPE
- h. Carbon black content-HDPE
- i. Carbon black dispersion-HDPE
- j. Hydrostatic strength-HDPE pipe
- k. Tensile strength-HDPE pipe
- l. Percentage elongation-HDPE pipe
- m. Melt flow rate-HDPE
- n. ESCR (HDPE)





Emirates Preinsulated Pipes Industries L.L.C.
P.O.Box 73830, Industrial City of Abu Dhabi
Musaffah, Abu Dhabi, UAE
Tel: +971 2 550 1991/4, Fax: +971 2 550 1992
✉ eppi@eppi.ae 🌐 www.eppi.ae