



Dear Valued Customer,

We would like to welcome you as a valuable customer. We are confident that you will be satisfied with our products and with the timely service we provide. We warmly invite you to consider purchasing our latest offerings as your first choice. We have enclosed our product catalogue for black & galvanized carbon steel pipes with external coating applications including 3LPE, 3LPP, FBE, FBP, and with/ without internal cement mortar lining, along with all associated fittings and accessories. It includes all needed information, product data, standards and production schemes, all for your reference. We would much appreciate going over the offered information and standards while planning your bid or placing your order. We also wish to receive your order for all your needs from coated and lined steel pipes as well as their fittings, and accessories. Kindly, feel free to contact our sales department to discuss it further.

We look forward serving you and getting to know you. You always find us at

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انطلاقاً من خبرة طويلة في مجال مشاريع البنية التحتية و حاجة السوق الفلسطيني لهذا النوع من الصناعة و لتوفير منتج بسعر مناسب وجودة عالية، انطلقت شركة المستقبل لأنابيب البنية التحتية في العام 2009 بأكورة مصانعها بافتتاح مصنع عزل الأنابيب المعدنية من الخارج بثلاث طبقات من البولي إيثيلين ومن الداخل بالملاط الاسمنتي. بالإضافة الى طلاء الانابيب بمادة اليبوكسي المقاومة للصدأ وطلاء أنابيب خطوط الاطفاء بمادة البوليستر.

تستخدم هذه الانابيب في مشاريع البنية التحتية و التي تتضمن شبكات و خطوط مياه الشرب و الغاز و الصرف الصحي و الحريق و جميع الأعمال ذات الصلة.

ولتعزيز ثقة الزبائن بمنتجاتها فقد حصلت الشركة على العديد من شهادات الجودة المحلية و العالمية و منها شهادات الجودة الفلسطينية PS-، PS-136، PS-126 و شهادة ادارة الجودة العالمية ISO9001:2015.

و استكمالاً لمسيرتها و تعزيزاً لنجاحاتها اضافت الشركة في العام 2018 مصنعا جديداً لانتاج أنابيب البولي إيثيلين لاستخدامات مياه الشرب والغاز والري والصرف الصحي وذلك باستخدام أحدث خطوط الانتاج لتكون منتجاتها من هذه الانابيب الأولى من حيث الجودة و الأسعار ومطابقة المواصفات العالمية والمحلية.

منتجات الشركة

أنابيب معدنية معزولة من الداخل والخارج

- أنابيب معزولة بثلاث طبقات من البولي إيثيلين /أو البولي بروبيلين 3LPE/3LPP ومن الداخل بالملاط الإسمنتي للأقطار من 1/2" ولغاية 16".
- أنابيب مطلية ببودرة الالبوكسي تحت التأثير الحراري(FBE) للأنابيب المغمورة بالمياه أو السطحية أنابيب مطلية ببودرة البوليستر تحت التأثير الحراري(FBP) وذلك لأنظمة إطفاء الحريق
- عزل وصلات الأنابيب المعدنية بأنواعها المختلفة من الداخل بالملاط الإسمنتي.

أنابيب البولي إيثيلين

- أنابيب البولي إيثيلين عالي الكثافة لاستخدامات مياه الشرب بأقطار من 16 ملم الى 160 ملم.
- أنابيب البولي إيثيلين عالي الكثافة للصرف الصحي والارتبة 50 ملم، 75 ملم، و 110 ملم.
- أنابيب البولي إيثيلين منخفض الكثافة للاستخدامات الزراعية بأقطار من 16 ملم الى 63 ملم.
- أنابيب البولي إيثيلين عالي الكثافة لاستخدامات الغاز بأقطار من 16 ملم الى 160 ملم.

Production Standards

Related Standards and Specifications

Origin	Standard	Description
External Coating		
Palestinian	PS 325-6	Steel pipes with protective coatings –external extruded polyethylene coating –three layer coating
American	AWWA C215/ SI5089	Extruded polyethylene coatings for exterior of steel water pipelines
German	DIN 30670	Polyethylene coatings of steel pipes and fittings
British	BS EN ISO 21809-1:2011	Petroleum and natural gas industries. External coatings for buried or submerged pipelines used in pipeline transportation systems. Polyolefin coatings (3-layer PE and 3-layer PP)
German	DIN 30678	Polypropylene coatings for steel pipes
Internal Cement Lining		
Palestinian	PS 325-1	Steel pipes with protective coating-internal coating by cement mortar
American	AWWA C205 / SI5207	Cement-Mortar Protective Lining and Coating for Steel Water Pipe
American	NSF-61	Drinking Water System Components -- Health Effects
External painting		
American	AWWA C210	Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines
American	AWWA C213	Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines
Steel Pipes		
Palestinian	PS186	Steel welded pipes for general use
Palestinian	PS141	Steel pipes suitable for screw threading
German	DIN2440	Steel tubes medium weight suitable for screwing
German	DIN 2441	Steel tubes; heavy-weight threaded pipes
American	ASTM A53	Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
American	ASTM A106	Seamless Carbon Steel Pipe for High-Temperature Service
American	ASTM A795	Black and Hot-Dipped Zinc-Coated (Galvanized) Welded and Seamless Steel Pipe for Fire Protection Use
American	ASTM A589	Seamless and Welded Carbon Steel Water-Well Pipe
American	API 5L	Welded and Seamless pipe suitable for use in conveying gas, water, and oil in both the oil and natural gas industries
American	AWWA C200	Steel Water Pipe—6 In. (150 mm) and Larger
American	ASME / ANSI B36.10	welded and seamless wrought steel pipe
	SI 530	steel welded pipes for general use
	SI 103	Steel pipes suitable for screw threading
Jordanian	JS1832:2008 ASTM A106:2006 /SI10255	Standard specification for seamless carbon steel pipe for high -temperature service
Jordanian	JS 137-2006	Pipe-steel pipes welded and seamless used for gas and water
Quality Management Standard		
International	ISO 9001:2015	Quality management systems

*Please contact us for your special requirement out of our general production standards .



Coating and Lining

Definition, Types, and Applications

Future Iron Pipes adopts quality and preciseness in the matter of coating and Lining. It provides coating options of polyethylene ,Polypropylene , Epoxy, Polyester and internal cement Lining .

Types of coating and Lining

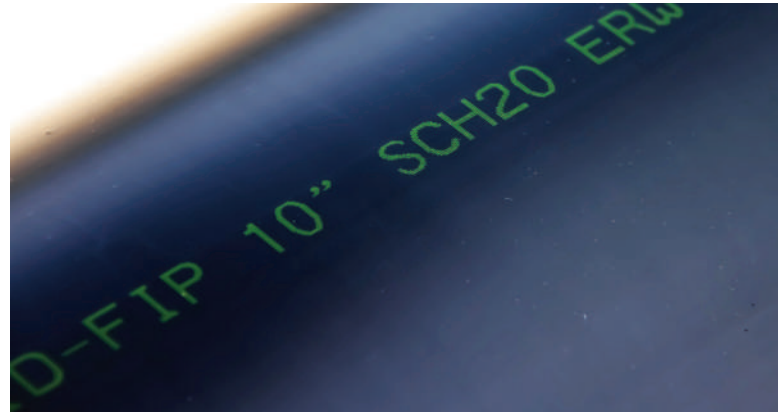
3LPE :Three Layer Polyethylene Coating.

3LPP : Three Layer Polypropylene Coating.

FBE: Fusion Bonded Epoxy Powder Coating.

FBP: Fusion Bonded Polyester Powder Coating.

Cement Mortar Lined Steel Pipe.



Fusion Bonded Epoxy Polyester Powder Coating

Description

FBE: Fusion Bonded Epoxy Powder Coating

FBE is a high performance anti-corrosion coating that provides excellent protection for small and large diameter pipelines with moderate operating temperatures. The thickness of the FBE coating is up to 400 microns.

FBP: Fusion Bonded Polyester Powder Coating

(FBP) is widely used in fire protection systems almost everywhere. Practically, they are produced by External coating for galvanized or black steel pipes are performed with the aid of fusion-bonded polyester powder with minimum thickness of 150 microns.



PRODUCTION STAGES

Abrasive cleaning with steel grit/shot is required to achieve a surface purity grade of Sa 2 1/2 with anchor pattern of (40-90 μ m). The steel must reach a temperature of 170-220°C. The FBE/P is deposited by an electro-static spray process. The coating cures quickly. Once cured, the pipe is cooled for safe handling and inspection. Thus it can be said that the coated pipe is ready for installation and use.

Three Layer Polyethylene / Polypropylene Coating

Description:



The 3-layered Polyethylene (3LPE) is a multilayer thermoplastic coating that is designed to provide maximum long term corrosion resistance and mechanical protection to steel pipes. This Technology has the advantages of excellent adhesion; the provision of superior long term corrosion, cathodic disbandment and impact resistance where these properties are essential for maintaining pipeline integrity and durability.

3LPE coating

the composition of the 3 layers is

- Base layer (Epoxy): The base layer is an Epoxy layer that protects the steel, improves the adhesive surface and the resistance to cathodic disbondment.
- Adhesive layer: This layer role is to improve the adhesion of the polyethylene layer to the epoxy layer and to strengthen its resistance to peeling.
- Polyethylene layer: Protects the pipe from any mechanical damage or corrosion, it also works as an electric insulator to the steel pipe.

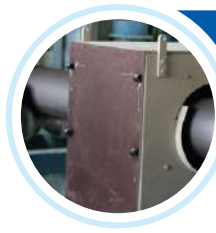
Production Stages



First Stage

1

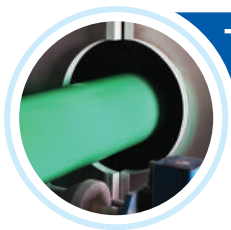
The surfaces that are to be coated should be first thoroughly cleaned of any dirt, rust and scales. The surfaces of pipe is cleaned by spraying steel shot grid by using special blasting machine to the degree of Sa 2 1/2.



The Second Stage

2

The pipes must be heated according to the raw material specifications of the manufacturer (usually to a degree of 180-200°C) so that the epoxy layer adhere to the pipe surface.



Third Stage

3

Special powder epoxy paint (FBE). This layer provides corrosion resistance by an electro-static spray process to a thickness larger than 60 microns.



Fourth Stage

4

Special adhesive is applied to pipe surface by extrusion method. Adhesive layer provides good adhesion of FBE and polyethylene the minimum layer thickness is 140µ.



Fifth Stage

5

Polyethylene/ Polypropylene is applied by extrusion method according to the specifications and technical requirement. Polyethylene layer ensures protection against mechanical damage and excellent protection against factors risks such as heat and UV layer.

The Following table shows the thickness of PE :

Pipe size (inches)	Thickness(mm)		
	Normal	Medium	Large
Up to 4"	1.5	1.8	2.5
4" -10"	1.8	2.0	2.7
10"-16"	2.0	2.2	2.9



Sixth Stage

6

The pipe is cooled immediately after extrusion for safe handling and inspection



seven Stage

7

The length of the cut back shall be at least 100mm for pipes sizes < 4". whereas for pipes sizes larger than 4", the cut back shall be 150±20mm with a beveling angle of <30°; unless otherwise noted by the customer.



Marking

Each pipe is marked according to appropriate standards, mainly the following Characteristics are identified:

Pipe manufacturer's code or name.

Nominal Pipe Size (NPS)

Wall thickness measured in mm.

Grade of pipe.

The word (3LPE).

Coating Thickness.

Applicable Standards.

The date and hour of production
(dd/ mm/yy, hh:mm).

The following advantages are achieved in the 3LPE system

- High resistance to penetration.
- High Compressive and impact strength.
- High rigidity.
- High elasticity and resistance to tearing.
- High electric insulation.
- High resistance to chemicals and oxidization
- Withstand high temperatures ;(PE resists up to 70Co, while PP resists up to 120Co.)





Coating Repair

The coating shall be repaired with the methods mentioned below. It also should meet the requirements of ANSI/ AWWA C216, ANSI/AWWA C215, ANSI/AWWA C203, ANSI/AWWA C209 or to be as recommended by the manufacturer.

Manufacturer Repair

Mill coating repair: Pipe requiring repair because of coating imperfections. Small defects shall be repaired by:

1. Suitable polyolefin repair-patch methods.
2. Polyethylene melt sticks, as recommended by the manufacturer.

Note

Extrusion-coated pipe with more than four repairs per length shall be repaired by double coating. The pipe lengths that are double coated shall be identified.

Major defects. Pipe sections with major coating defects, such as partial coating, excessive holidays, or inadequate coating thickness, shall be double coated to meet the requirements of this standard.

On Site Repair

During loading or unloading steel pipes, some defects may occur. These defects shall be repaired by heat shrinkable sheet.



Cement Mortar Lining(CML)

Introduction About The Industry

The internal cement mortar lining provides protection to the pipeline in two ways. First, it is a “cement pipe within a steel pipe”. Second, by creating a “Zone of Alkalinity”. This “zone” between the cement lining and the pipe wall, neutralizes the corrosive properties of the liquid medium and blocks corrosion of the pipe wall. As a result effect, the “Zone of Alkalinity” serves as a second layer of defense against internal corrosion. Unlike other types of internal linings, which allow pipe corrosion to spread down the line once they are chipped or damaged in any spot, the cement lining prevents corrosion from spreading along the pipe wall.

Description

Cement Mortar Lining (CML) is a centrifugally applied continuous lining of dense Portland cement mortar with a smooth and uniform finish. This product was developed to provide an economical form of internal corrosion and abrasion protection for potable water pipes.

Sulfate resistance cement (SRC) is primarily used when the nature of the environment is highly concentrated with sulfate that would generate several reactions that could attack the cement and damage it , such as sewage water and highly concentrated soils.

Applications: specially used for lining sewage usage pipes due to its high durability and resistance against sulfate attacks.

Advantages:

- Excellent durability to sulfate attack due to low C3A and low alkali content
- High strength.
- Low alkali reduces the availability of the sulfate ions to react with the C3A thereby further improvement to sulfate attack resistance.





Production Stages

The lining is applied by using a high-speed centrifugal process. By using this method, excellent quality control of the cement-mortar lining is maintained. FIP produces cement lining products which are dense, smooth, uniform, well bonded to the pipe wall, and offer very little frictional resistance to the flow of water.

The pipe is spun at a very high rate accompanied by vibration to produce a dense lining. This high speed lining brings water and latence to the lining surface. The latence is immediately washed out of the pipe with water. The immediate result is a smooth, dense, and well-compacted cement-mortar lining.

After the application process, the pipes will be completely closed and stored for curing for 96 hr to prevent rapid loss of moisture from the mortar. The process is summarized as follows:

Stage	Description	Illustration
Cleaning	The internal surface of the pipe is cleaned from any mill residues or tabulations or any accumulation of dirt, rust or oil and grease.	
Lancing	The machine is calibrated to apply a specific amount of cement according to the pipe size and the required thickness of the coating and then the cement is applied to the pipe using a cement hose.	
Spinning	The pipe then is spun to distribute the cement uniformly using centrifugal spinning in this way the water to cement ratio is lower and the lining will have improved cement strength.	
Curing	After spinning the water is expelled from the pipe then the pipe is closed with a cap to ensure good hydration of the cement mortar, the humidity and temperature are controlled to maximize the strength of the mortar	

Requirements

Cement-mortar lining shall be the same in thickness, except at joints or other discontinuities in the pipe wall. Lining thickness shall be as listed in the table below or as specified by the purchaser. Ends of lining shall be left uniform with regard to the longitudinal axis of the pipe, and the lining holdback shall be as specified by the purchaser for the type of joint required. The lining thickness requirements shall be maintained by mechanical-end retaining rings and verified by physical measurements.

Pipe Size (inch)	Lining Thickness (mm)	Allowed Tolerance (mm)
3-6"	4	-1.0 , +2.0
8-10"	6	-1.5 , +2.0
12-22"	8	-1.5 , +3.0

According to PS325-1

Pipe Size (inch)	Lining Thickness(mm)	Allowed Tolerance (mm)
4-10"	6	-1.6, +3.2
11-23"	8	-1.6, +3.2

According to AWWA C205-07

Materials and Application



Future Infrastructure Pipes
شركة المستقبل لأنابيب البنية التحتية

Raw Materials

Sand

Fine aggregate for cement mortar consists of sea washed sand, with a 100% percent passed Sieve No. 4. Sand provided to the plant is usually sieved in order to prevent any larger size stones from entering the mixture. When the source of material is changed, new sieve test is to be conducted.

Cement

A - Portland cement.

The used cement is Portland cement. Cement is stored in a weather-tight, dry, and well ventilated. Cement containing lumps is rejected and not used in the lining process.

B -Sulfate Resistance Cement.

Water

The water used for cement mortar and for curing linings shall conform to the applicable requirements of ASTM C94. The used water is fresh potable drinking water free from injurious amounts of oil, acid, strong alkalies, salts, or organic matter.

Mixing and Application

Preparations:

Before lining, surfaces to be lined shall be cleaned to assure the removal of any impurities and mill residues that could affect the adherence between the lining and the pipe internal surface. The mixture shall be homogenous without containing any impurities that affect the lining quality.

Placement

During the application of the lining by a spinning machine, the entire quantity of mortar required for completion of the lining of the pipe section shall be placed without interruption. After the cement mortar is distributed to a uniform thickness, the spinning speed is increased to produce a dense mortar with a smooth surface. Surplus water is removed by tilting the pipe when moving on the outbound rack.

The lining at the ends of the pipe section shall be left square and uniform with regard to the longitudinal axis of the pipe, and the lining holdbacks shall be as specified by the purchaser for the type of joint required. The default ends have no holdbacks.

Curing

Immediately after the completion of spinning, the pipe sections are moved to a curing area. Care shall be exercised to prevent damage to the lining. The total curing period shall be equivalent to 96 hr of moist cure and the minimum, pipe ends are covered with plastic during the curing period.

Sampling and Testing

Mixed cement mortar for pipe-lining work are sampled from each working day. Compression test samples of (10cm x 10cm x 10cm) are prepared to satisfy the quality control requirements of the used standards or the client requirements. The samples shall attain compressive strength of 31 MPA (cylinder) in 28 days or at the time of shipment if less than 28 days.



How to Order ?

USAGE AREAS	Steel Pipe					External Coating			Internal Lining	
	Size	Steel Grade	Standards	Preprocess	Wall Thickness	Type	Thickness (mm)	Standard	Internal Lining	Standard
Waterworks	"3	GRB	ASTM A53	Black Steel	3.96mm	3LPE	1.8mm	PS325-6	CML	PS325-1
Waterworks/ Waste Water Pipelines		→ GRA		→ Black Steel		→ 3LPE	→ 1.5-2.9	→ DIN30670	→ CML ³	→ PS325-1
Oil & Gas Pipelines	1/2"-16"	→ GRB	Refer to Data Tables ¹	→ Galvanized	Refer to Data Tables ²	→ 3LPP	→ 1.5-2.9	→ PS325-6	→ SRC ⁴	→ AWWA C215
Fire Fighting Systems		→ X42				→ FPE	→ Up to 0.4	→ AWWA		
Industrial Products						→ FPP	→ Up to 0.4	→ C215	→ No Lining	

¹ Related Standards and Specifications

² Mechanical, and Statistical Data of Steel Pipes

³ Cement Mortar Lining

⁴ Sulfate Resistance Cement

Quality Control

The quality control starts with metallographic inspection of the raw material to be used in the production and continues up to shipping stage. As a result of quality control processes , final inspection and laboratory tests in the production are to be done in accordance with the national and international standards , Our products are shipped by 100% quality assurance.

Quality Standards

Final inspection and laboratory tests in the production in accordance with the national and international standards:

1. PS 325
2. AWWA C215-04
3. DIN 30670
4. AWWA C205-07
5. SI5089 / SI5207



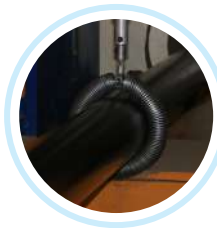
TEST AND INSPECTIONS



1
**Cleanliness and
Roughness Test**



2
**Thickness of
Overall Coating .**



3
**Coating
Continuity.**



4
**Wet /Dry Cement
Thickness .**

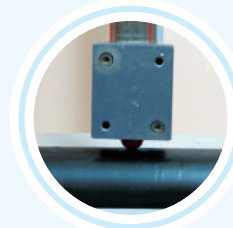


5
**Wet /Dry Cement
Surface .**

COATING LABORATORY TESTS



1
Peeling test



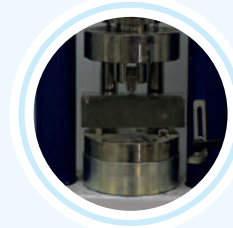
2
Impact Test.



3
**indentation
test**



4
Elongation Test.



5
**Compressive
Strength.**

6 **Water /Cement Ratio after centrifugal
applying of cement -mortar.**

7 **Cement /Sand Ratio.**

Repair

Defective lining

Defects, including but not restricted to sand pockets, voids, over sand-ed areas, blisters and cracking as a result of impacts, shall be removed and replaced by hand or pneumatic placement to the same thickness as required for the cement-mortar lining.

Lining Cracks

Temperature and shrinkage cracks in the cement-mortar lining less than 1/16 in. (1.6 mm) in width need not be repaired since they are autogenously repaired under continuous soaking in water. Cracks wider than 1/16 in. (1.6 mm) shall be repaired by applying cement water grout and spin the pipe to insure that the cracks are filled with the grout.

Mixing and Application

Preparations

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Placement

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The lining at the ends of the pipe section shall be left square and uniform with regard to the longitudinal axis of the pipe, and the lining holdbacks shall be as specified by the purchaser for the type of joint required. The default ends have no holdbacks

Curing

Immediately after the completion of spinning, the pipe sections are moved to a curing area. Care shall be exercised to prevent damage to the lining. The total curing period shall be equivalent to 96 hr of moist cure and the minimum, pipe ends are covered with plastic during the curing period.

Sampling and Testing

Our Quality control plan is summarized as :

Type of Test	Method Of Test	Frequency
Pipe Surface	visual	every pipe
Blast cleaning and Roughness	using special measuring device	twice per shift
Pipe temperature	heat sensor	continuously
Appearance and continuity	visual	every pipe
Coating Thickness testing	thickness gauge	three time per shift
Cut back	meter tape	once per shift
Holiday inspection	on-line holiday detector	100%
Impact resistance	according to standards	once per order
Adhesion (Peeling resistance) test	according to standards	once per order
Indentation test	according to standards	once per order
Elongation test	according to standards	raw material change/ customer request

Mechanical, and Statistical Data of Steel Pipes:

Nominal Diameter of pipe	DN Designator	Outside Dia	Wall Thickness		Nominal weight (Mass) (Kg/m)			
					BPE	BTC	GPE	GTC
Inch	mm	mm	Inch	mm				
1/2	15	21.3	0.104	2.65	1.22	1.23	1.27	1.28
3/4	20	26.7	0.104	2.65	1.58	1.59	1.65	1.66
1	25	33.4	0.128	3.25	2.44	2.46	2.53	2.55
1 1/4	32	42.2	0.128	3.25	3.14	3.17	3.26	3.29
1 1/2	40	48.3	0.128	3.25	3.61	3.65	3.74	3.78
2	50	60.3	0.144	3.65	5.10	5.17	5.27	5.34
3	80	88.9	0.159	4.05	8.47	8.64	8.73	8.90
4	100	114.3	0.177	4.50	12.10	12.40	12.44	12.74
6	150	168.3	0.191	4.85	19.20	19.80	19.70	20.30

BPE: Black Plain End

BTC: Black Threaded Coupled

GPE: Galvanized Plain End

GTC: Galvanized Threaded Coupled

Hydro test at a pressure of 50 bar.

¹:Grade B

(DIN 2440 / SI 103¹ / ASTM A53 / PS 141¹)



Mechanical, and Statistical Data of Steel Pipes(Cont):

Nominal Diameter of pipe	DN Designator	Outside Dia	Wall Thickness		Nominal weight (Mass) (Kg/m)				Test Pressure(Bar) ¹
			Inch	mm	BPE	BTC	GPE	GTC	
1/2	15	21.3	0.109	2.77	1.27	1.27	1.33	1.33	48.0
3/4	20	26.7	0.113	2.87	1.69	1.69	1.75	1.75	48.0
1	25	33.4	0.133	3.38	2.50	2.50	2.60	2.60	48.0
1 1/4	32	42.2	0.140	3.56	3.39	3.40	3.51	3.52	76.0
1 1/2	40	48.3	0.145	3.68	4.05	4.04	4.19	4.20	76.0
2	50	60.3	0.154	3.91	5.44	5.46	5.62	5.64	172.0
3	80	88.9	0.216	5.49	11.29	11.35	11.55	11.61	172.0
4	100	114.3	0.237	6.02	16.07	16.23	16.44	16.63	151.0
6	150	168.3	0.280	7.11	28.26	28.58	28.81	29.13	124.0

BPE: Black Plain End
 BTC: Black Threaded Coupled
 GPE: Galvanized plain end
 GTC: Galvanized Threaded Coupled
 1:Grade B

(ASTM A 53 SCH 40)

Black Steel Pipes

Outside Dia		Test Pressure(Bar)			Allowable Working Pressure(Bar)			Wall Thickness		C-M thickness	Weight			Flow Data	
											pipe	pipe+C-M	water Content	pipe C-M I.D	Cross section
Inch	mm	GRA	GRB	X42	GRA	GRB	X42	Inch	mm	mm	Kg	Kg	Kg	Cm	Cm ²
3	88.9	111	129	156	92	106	129	5/32	3.97	4	8.3	10.5	4.2	7.3	42
		133	155	187	111	129	155	3/16	4.76	4	9.9	12.1	4	7.1	40
		155	181	207	129	151	181	7/32	5.56	4	11.4	13.6	3.8	7.0	38
4	114.3	86	101	122	72	84	101	5/32	3.97	4	10.8	13.8	7.6	9.8	76
		103	121	146	87	101	121	3/16	4.76	4	12.9	15.8	7.4	9.7	74
		121	141	169	100	117	141	7/32	5.56	4	14.9	17.8	7.1	9.5	71
		138	161	194	115	134	161	1/4	6.35	4	16.9	19.7	6.9	9.4	69
6	168.3	59	68	102	44	57	68	5/32	3.97	4	16.1	29.6	18.2	15.2	182
		70	82	123	58	68	82	3/16	4.76	4	19.2	23.7	17.8	15.1	178
		82	96	144	69	80	96	7/32	5.56	4	22.3	26.7	17.5	14.9	175
		94	109	164	78	91	109	1/4	6.35	4	25.4	29.7	17.1	14.8	171
		105	123	184	87	102	123	9/32	7.14	4	28.4	32.7	16.7	14.6	167
		117	137	205	98	114	137	5/16	7.94	4	31.4	35.7	16.4	14.4	164
		141	164	207	117	137	164	3/8	9.53	4	37.3	41.5	15.7	14.1	157
8	219.1	45	52	79	38	44	52	5/32	3.97	6	21.1	29.9	31.1	19.9	311
		54	63	94	45	52	63	3/16	4.76	6	25.2	34.0	30.7	19.8	307
		63	73	110	52	61	73	7/32	5.56	6	29.28	38.0	30.2	19.6	302
		72	84	126	60	70	84	1/4	6.35	6	33.3	42.0	29.7	19.4	297
		81	94	142	69	79	94	9/32	7.14	6	37.3	46.0	29.2	19.3	292
		90	105	157	75	87	105	5/16	7.94	6	41.3	49.9	28.7	19.1	287
		108	126	189	90	105	126	3/8	9.53	6	49.2	57.6	27.8	18.8	278
		126	147	207	105	122	147	7/16	11.11	6	57	65.3	26.8	18.5	268

(ASTM A53 / ASTM A106 / API 5L / (ASME / ANSI B36.10) / SI 530 / PS186)



Outside Dia		Test Pressure(Bar)		Allowable Work- (ing Pressure (Bar		Wall Thickness		C-M thickness	Weight			Flow Data	
									pipe	pipe+C-M	water Content	pipe C-M I.D	Cross section
Inch	mm	GRB	X42	GRB	X42	Inch	mm	mm	Kg	Kg	Kg	Cm	Cm ²
10	273.1	42	63	35	42	5/32	3.97	6	26.3	37.6	50.3	25.3	503
		50	76	42	51	3/16	4.76	6	31.5	42.7	49.7	25.2	497
		59	88	49	59	7/32	5.56	6	36.7	47.7	49.1	25.0	491
		67	101	56	67	1/4	6.35	6	41.8	52.8	48.4	24.8	484
		76	114	63	76	9/32	7.14	6	46.8	57.8	47.8	24.7	478
		84	126	70	84	5/16	7.94	6	51.9	62.8	47.2	24.5	472
		101	152	84	101	3/8	9.53	6	61.9	72.7	46.0	24.2	460
		118	177	98	118	7/16	11.11	6	71.8	82.4	44.8	23.9	448
		134	207	112	135	1/2	12.7	6	81.5	92	43.6	23.6	436
12	323.9	36	53	30	35	5/32	3.97	8	31.3	49.1	70.6	30.0	706
		43	64	35	43	3/16	4.76	8	37.5	55.2	69.9	29.8	699
		50	75	41	50	7/32	5.56	8	43.6	61.2	69.2	29.7	692
		57	85	47	57	1/4	6.35	8	49.7	67.2	68.4	29.5	684
		64	96	53	64	9/32	7.14	8	55.8	73.2	67.7	29.4	677
		71	107	59	71	5/16	7.94	8	61.8	79.2	67.0	29.2	670
		85	128	71	85	3/8	9.53	8	73.8	91	65.5	28.9	655
		99	149	83	99	7/16	11.11	8	85.7	102.7	64.1	28.6	641
		113	193	95	114	1/2	12.7	8	97.5	114.2	62.7	28.2	627
14	355.6	32	48	27	32	5/32	3.97	8	34.4	54.1	86.4	33.2	864
		39	58	32	39	3/16	4.76	8	41.2	60.7	85.6	33.0	856
		45	68	38	45	7/32	5.56	8	48	67.4	84.7	32.8	847
		52	78	43	52	1/4	6.35	8	54.7	74.1	83.9	32.7	839
		58	87	48	58	9/32	7.14	8	61.4	80.7	83.1	32.5	831
		65	97	54	65	5/15	7.94	8	68.1	87.2	82.3	32.4	823
		78	116	65	78	3/8	9.53	8	81.3	100.3	80.7	32.1	807
		90	136	75	91	7/16	11.11	8	94.4	113.2	79.1	31.7	791
		103	155	86	103	1/2	12.7	8	107.4	126	77.5	31.4	775
16	406.4	28	42	24	28	5/32	3.97	8	39.4	62	114.9	32.8	1149
		34	51	28	34	3/16	4.76	8	47.2	69.7	113.9	38.1	1139
		40	59	33	40	7/32	5.56	8	54.9	77.3	113.0	37.9	1130
		45	68	38	45	1/4	6.35	8	62.6	84.9	112.0	37.8	1120
		51	76	42	51	9/32	7.14	8	70.3	92.5	111.1	37.6	1111
		57	85	47	57	5/16	7.94	8	78	100.1	110.2	37.5	1102
		68	102	57	68	3/8	9.53	8	93.2	115.2	108.3	37.1	1083
		79	119	66	79	7/16	11.11	8	108.3	130.1	106.5	36.8	1065

(ASTM A53 / ASTM A106 / API 5L / (ASME / ANSI B36.10) / SI 530 / PS186)

Mechanical, and Statistical Data of Steel Pipes(Cont): Fire Fighting Pipes

Dimensions, Weights, and Test Pressure For LightWeight Fire Protection Pipe–Schedule 10(A)

Dimensions & Weights							Test Pressure			
NPS Desingnator	Outside Diameter		Nominal wall thickness		Weight Plain End		Furnace -welded		Seamless and ERW	
	in	mm	in	mm	lb/ft	Kg/m	psi	Mpa	psi	Mpa
3/4	1.050	26.7	0.083	2.11	0.86	1.28	500	3.45	700	4.83
1	1.315	33.4	0.109	2.77	1.41	2.09	500	3.45	700	4.83
1 1/4	1.660	42.2	0.109	2.77	1.81	2.69	500	3.45	1000	6.89
1 1/2	1.900	48.3	0.109	2.77	2.09	3.11	500	3.45	1000	6.89
2	2.375	60.3	0.109	2.77	2.64	3.93	500	3.45	1000	6.89
2 1/2	2.875	73.0	0.120	3.05	3.53	5.26	500	3.45	1000	6.89
3	3.500	88.9	0.120	3.05	4.34	6.46	500	3.45	1000	6.89
3 1/2	4.000	101.6	0.120	3.05	4.98	7.41	500	3.45	1200	8.27
4	4.500	114.3	0.120	3.05	5.62	8.37	500	3.45	1200	8.27
5	5.563	141.3	0.134	3.4	7.78	11.58	B	B	1200	8.27
6	6.625	168.3	0.134	3.4	9.30	13.85	B	B	1000	6.89
8	8.625	219.1	0.188 ^C	4.78	16.96	25.26	B	B	800	5.51
10	10.75	273.1	0.188 ^C	4.78	21.23	31.62	B	B	700	4.83
A B C	Schedule 10 corresponds to Schedule 10S as listed in ANSI B 36.19 for NPS 3/4 through 6 only. Furnace-welded pipe is not made in sizes larger than NPS 4. Not Schedule 10.									

Dimensions, Weights, Test Pressures For Standard-Weight Fire Protection Pipe–Schedule 30 and Schedule 40

Dimensions & Weights								Test Pressure			
NPS Desingnator	Outside Diameter		Nominal wall thickness		Weight Plain End		Weight thread and couplings B	Furnace -welded		Seamless and ERW	
	in	mm	in	mm	lb/ft	Kg/m	lb/ft	psi	Mpa	psi	Mpa
1/2	0.840	21.3	0.109	2.77	0.85	1.27	0.85	700	4.83	700	4.83
3/4	1.050	26.7	0.113	2.87	1.13	1.69	1.13	700	4.83	700	4.83
1	1.315	33.4	0.133	3.38	1.68	2.5	1.68	700	4.83	700	4.83
1 1/4	1.660	42.2	0.140	3.56	2.27	3.39	2.28	1000	6.89	1000	6.89
1 1/2	1.900	48.3	0.145	3.68	2.72	4.05	2.73	1000	6.89	1000	6.89
2	2.375	60.3	0.154	3.91	3.66	5.45	3.69	1000	6.89	1000	6.89
2 1/2	2.875	73.0	0.203	5.16	5.80	8.64	5.83	1000	6.89	1000	6.89
3	3.500	88.9	0.216	5.49	7.58	11.29	7.62	1000	6.89	1000	6.89
3 1/2	4.000	101.6	0.226	5.74	9.12	13.58	9.21	1200	8.27	1200	8.27
4	4.500	114.3	0.237	6.02	10.80	16.09	10.91	1200	8.27	1200	8.27
5	5.563	141.3	0.258	6.55	14.63	21.79	14.82	C	C	1200	8.27
6	6.625	168.3	0.280	7.11	18.99	28.29	19.20	C	C	1200	8.27
8	8.625	219.1	0.277 ^A	7.04	24.72	36.82	25.57	C	C	1200	8.27
10	10.750	273.1	0.307 ^A	7.8	34.27	51.05	35.78	C	C	1000	6.89
A B C	NPS 1/2 through 6—Schedule 40; NPS 8 and 10—Schedule 30. Based on 20-ft (6.1-m) lengths Furnace-welded pipe is not made in sizes larger than NPS 4.										

(ASTM A795)



Installatio Applications

Heat Shrinkable Sheets

Heat shrinkable sheets are used to cover the welding areas between any two pipes in order to make sure that no corrosion is permitted in the area of welding and this to ensure to full protection of the pipes. Future Iron Pipes recommends the use of these sheets since the moisture penetration to the pipes is a very costly issue to the water lines and a costumer can request this type of sheets at the facility

Basic Installation of Shrinkable Sheets

- Clean the area at which a penetration has occurred with steel wire brush, including 10 cm of the PE coated pipes ends.
- Heat the pipe with a gas burner to 70-75Co.
- Apply the shrinkable sheets and make sure to press the sheet all over the pipe while heating the sheet and then heat the adhesive layer at the ends of the sheet.

Advantages of shrinkable sheets

- Field friendly.
- No high pre-heat required.
- Easy to install.
- Low cost.

Handling and Storage

A reasonable amount of care in handling the pipes should be taken during stockpiling. The necessary measures are taken to ensure that the pipes will not be dropped, dragged, or bumped against other pipe or objects or climbed on. Other items, such as, fittings and accessories, will be stored in a convenient area away from construction traffic, protected from damage and theft. Safety precautions will be taken during jobsite storage and stockpiling. Coated pipes and fittings will be moved using a crane with a nylon sling or cushioned cable for safe handling.

Handling

Pipes with beveled ends must be placed in an even and clean ground preventing any type of dirt or stones to contact the pipes. This can be assured by using wooden stands that are covered with rubber to protect the coating from any accidental impacts.

Lifting and transporting the pipes must be done by using soft non-metallic grips that can be used to bind the pipes without damaging the coatings.

Storing

In planning to store the pipes, it must be taken into account to store the pipes in a way that ensures avoiding any unnecessary moving to the pipes bundles. Also another way to protect the bundles during storing is storing the pipes away from the transportation routes.

It's also recommended to use thick bases to lift the pipes over the ground to protect them from moisture.

Packing

the pipes are packed either bundles or individual to achieve full protection and safe handling.

Bases and Separators

Usually the bases and separators are made from wood that does not contain any nails or barks. The following table can be very helpful to store the pipes in a proper way. Stockpiling more than 2 meters is not recommended.

Pipe size range	Number of separators (layers between pipes)	
	With internal lining	Without internal lining
60.5-168.3 mm	10	12
219.1-406.4	5	8

No. of tones	No. of wooden bases used
<10	2
10-20	4
>20	6



The minimum distance between wooden bases used (for 12.2m length pipes) must be 4 meters to ensure that the weight of the pipes is distributed evenly on the bases. Also, they must be leveled and have the same thicknesses. The following figure illustrates the way they must be placed.

It must be taken in to consideration that the width of the wooden bases and separators must be at least 100 mm.



Lifting

The lifting of pipes must always be horizontal to overcome any expected slippage or failure. It's really important not to use chains, gears or cables to lift the pipes which may cause undesired damage. Rubber or plastic coated slings are recommended for lifting the pipes. The correct place to lift the pipes bundles from is $\frac{1}{4}$ the length of the pipe from each side as in the figure.

Using a Forklift

It's possible to use a forklift to lift the pipes, but there are several considerations that must be done to assure no damages during lifting using forklifts.

1. The fork surface must be wide and clean.
2. Pipes products may not be pushed with the forklift.
3. The fork surface must be covered with rubber to avoid damages during lifting
4. Place the forks of the forklift under the bundle in a way that assures balance of the bundles.
5. Calibrate the speed so that the pipes don't roll on the forks surface.

Transporting

The transportation may be done via trucks, trains or ships. ,through this process,the following must be insured:

- Make sure that there is no abrasion between the pipes or between the pipes and the truck bars; rubber or plastic may be used to cover the bars if necessary. Bases and separators must be used as in storing the pipes to assure the stability of the pipes during transportation. Fastening lines also used to tie the bundles with the truck with a minimum width of 5 cm that does not to damage the coating.
- Plastic caps are used to close the ends of the pipes to avoid any impurities.
- The maximum number of pipes that are permitted to be loaded must be according to the following table



Pipe Data			Pipe Per Trailer
Outside			Number of Coated Pipes
			pipe
2	60.3		800
3	88.9		221
4	114.3		154
6	168.3		81
8	219.1		54
10	273.1		35
12	323.9		27
16	406.1		14

Instructions to Unloading Personnel When Arriving at The Delivery Site

1. Make sure that the truck is parked on level ground. and insure a safe case for the truck. Engage hand brakes and chock wheels.
2. The trucker's chains or straps should be removed from the load only after checking that the load has not shifted and will remain stable. Use caution straightening shifted loads.
3. Get sure that the forklift have a capacity rating that is sufficient to handle the load.
4. To prevent possible injury or damage the forks should slowly enter the pack between the top and bottom boards of the pallet.
5. . Avoid unnecessary standing on the load. stay away from dangerous area during loading and unloading.
6. Do not use backhoes, end loaders or other handling equipment to push or pull the load off the trailer. This is dangerous to unloading personnel and may damage the pipes, and/or their coating.



Steel Pipe Fittings



Future Iron Pipes company provides all required fittings and accessories related to pipe installation, designed and manufactured to meet the client requirements .

Lining of Fittings

The application of cement -mortar lining to tees, elbows, reducers, and other special sections, is accomplished by the appropriate method that insure high quality.

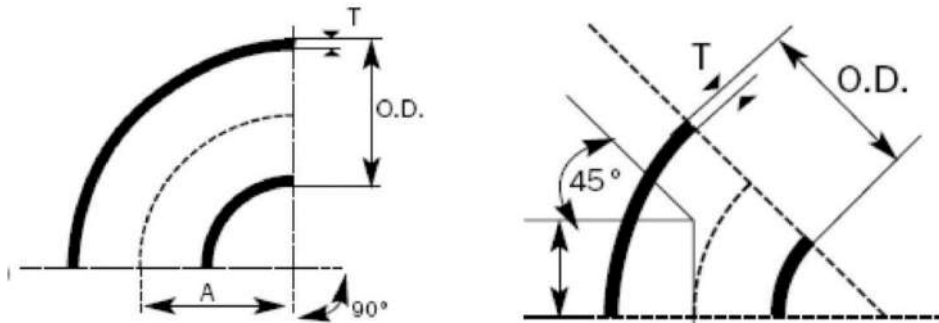
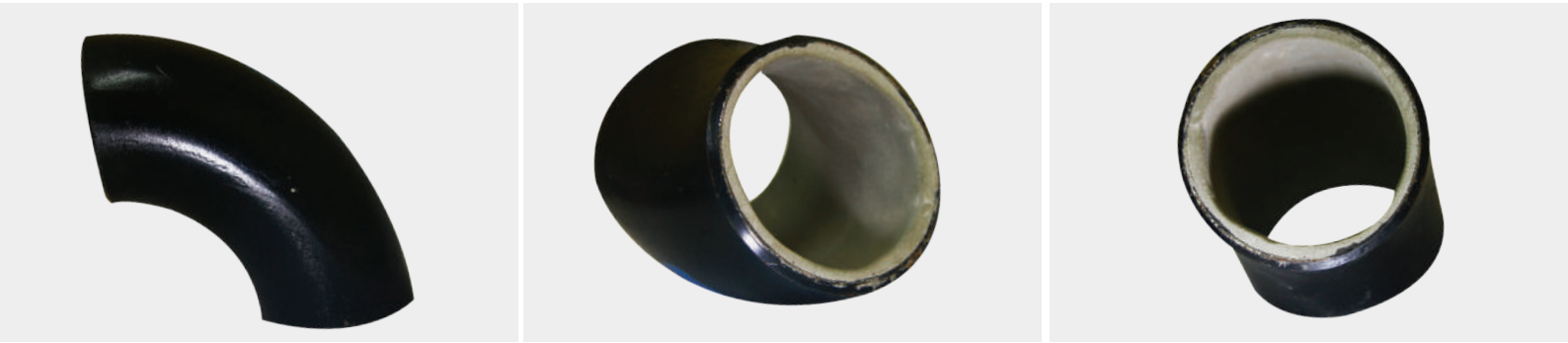
Standards

Steel pipes fittings:

ASTM A234 / A234M: Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service

Internal Cement Lining:

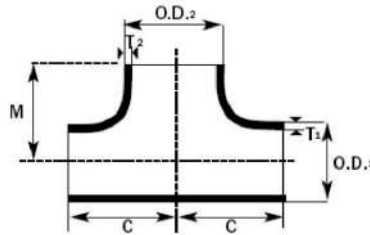
AWWA C205: Cement-Mortar Protective Lining and Coating for Steel Water Pipe



LONG RADIUS ELBOWS

Nominal Size(in)	Outside Diameter(mm)	Center To End (A)		Wall Thickness (mm)(T)								
		90 deg . Elbows	45 deg. Elbows	SCH10	SCH20	SCH30	STD	SCH40	SCH60	XS	SCH80	SCH100
2	60.3	76	35	2.77		3.18	3.91	3.91		5.54	5.54	
3	88.9	114.3	50.8	3.05		4.78	5.49	5.49		7.62	7.62	
4	114.3	152.4	63.5	3.05		4.78	6.02	6.02		8.56	8.56	
6	168.27	228.6	95.25	3.04			7.11	7.11		10.97	10.97	
8	219.08	304.8	127	3.76	6.35	7.04	8.18	8.18	10.31	12.7	12.7	15.09
10	273.05	381	158.75	4.19	6.35	7.8	9.27	9.27	12.7	12.7	15.09	18.26
12	323.85	457.2	190.5	4.57	6.35	8.38	9.53	10.31	14.27	12.7	17.48	21.44
14	355.6	533.4	222.25	6.35	7.92	9.53	9.53	11.13	15.09	12.7	19.05	23.83
16	406.4	609.6	254	6.35	7.92	9.53	9.53	12.7	16.66	12.7	21.44	26.19

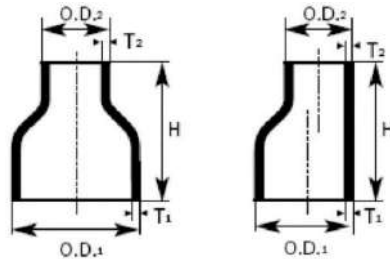
(ASTM A234 / A234M)



REDUCING TEE

Nominal Size (in)	Outside Diameter at Bevel(mm)		Center to End (mm)		Wall Thickness (mm)									
	D1	D2	C	M	SCH10		STD		SCH40		XS		SCH80	
					T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
3×2	88.90	60.30	85.85	76.20	3.05	2.77	5.49	3.91	5.49	3.91	7.62	5.54	7.62	5.54
4×2	114.30	60.30	104.90	88.90	3.05	2.77	6.02	3.91	6.02	3.91	8.56	5.54	8.56	5.54
4×3	114.30	88.90	104.90	98.55	3.05	3.05	6.02	5.49	6.02	5.49	8.56	7.62	8.56	7.62
6×3	168.27	88.90	143.00	123.95	3.40	3.05	7.11	5.49	7.11	5.49	10.97	7.62	10.97	7.62
6×4	168.27	114.3	143.00	130.30	3.40	3.05	7.11	6.02	7.11	6.02	10.97	8.56	10.97	8.56
8×4	219.08	114.3	177.80	155.70	3.76	3.05	8.18	6.02	8.18	6.02	12.70	8.56	12.7	8.56
8×6	219.08	168.27	177.80	168.40	3.76	3.40	8.18	7.11	8.18	7.11	12.70	10.97	12.7	10.97
10×6	273.05	168.27	215.90	193.80	4.19	3.40	9.27	7.11	9.27	7.11	12.70	10.97	15.09	10.97
10×8	273.05	219.08	215.90	203.20	4.19	3.76	9.27	8.18	9.27	8.18	12.70	12.70	15.09	12.70
12×6	323.85	168.27	254.00	219.20	4.57	3.40	9.53	7.11	10.31	7.11	12.70	10.97	17.48	10.97
12×8	323.85	219.08	254.00	229.00	4.57	3.76	9.53	8.18	10.31	8.18	12.70	12.70	17.48	12.70
12×10	323.85	273.05	254.00	241.30	4.57	4.19	9.53	9.27	10.31	9.27	12.70	12.70	17.48	15.09
14×6	355.6	168.27	279.40	238.00	6.35	3.40	9.53	7.11	11.13	7.11	12.70	10.97	19.05	10.97
14×8	355.6	219.08	279.40	247.65	6.35	3.76	9.53	8.18	11.13	8.18	12.70	12.70	19.05	12.70
14×10	355.6	273.05	279.40	257.00	6.35	4.19	9.53	9.27	11.13	9.27	12.70	12.70	19.05	15.09
14×12	355.6	323.85	279.40	270.00	6.35	4.57	9.53	9.53	11.13	10.31	12.70	12.70	19.05	17.48
16×6	406.4	168.27	304.8	264.00	6.35	3.40	9.53	7.11	12.7	7.11	12.7	10.97	21.474	10.97
16×8	406.4	219.08	304.8	273.00	6.35	3.76	9.53	8.18	12.7	8.18	12.7	12.70	21.474	12.70
16×10	406.4	273.05	304.8	282.70	6.35	4.19	9.53	9.27	12.7	9.27	12.7	12.70	21.474	15.09
16×12	406.4	323.85	304.8	295.40	6.35	4.57	9.53	9.53	12.7	10.31	12.7	12.70	21.474	17.48
16×14	406.4	355.60	304.8	304.80	6.35	6.35	9.53	9.53	12.7	11.13	12.7	12.70	21.474	19.05

(ASTM A234 / A234M)

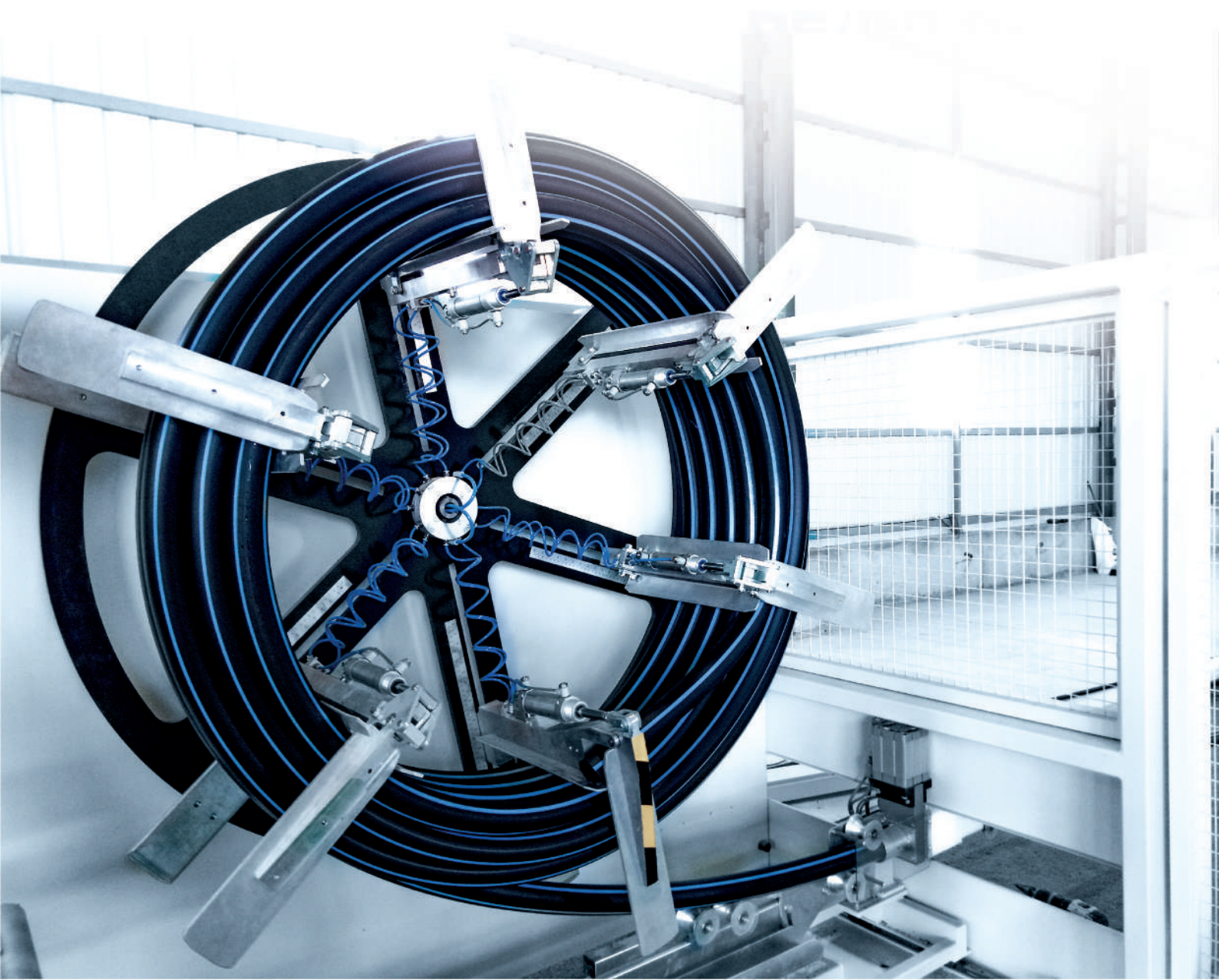


CONCENTRIC & ECCENTRIC REDUCERS BUTT WELD

Nominal Size(in)	Outside Diameter at Bevel(mm)		Wall Thickness (mm)										Length(H)
	OD1	OD2	SCH10		STD		SCH40		XS		SCH80		
			T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	
3×2	88.9	60.3	3.05	2.77	5.49	3.91	5.49	3.91	7.62	5.54	7.62	5.54	88.90
4×2	114.3	60.3	3.05	2.77	6.02	3.91	6.02	3.91	8.56	5.54	8.56	5.54	101.60
4×3	114.3	88.9	3.05	3.05	6.02	5.49	6.02	5.49	8.56	7.62	8.56	7.62	101.60
6×3	168.27	88.9	3.40	3.05	7.11	5.49	7.11	5.49	10.97	7.62	10.97	7.62	139.70
6×4	168.27	114.3	3.40	3.05	7.11	6.02	7.11	6.02	10.97	8.56	10.97	8.56	139.70
8×4	219.08	114.3	3.76	3.05	8.18	6.02	8.18	6.02	12.70	8.56	12.7	8.56	152.40
8×6	219.08	168.27	3.76	3.40	8.18	7.11	8.18	7.11	12.70	10.97	12.7	10.97	152.40
10×6	273.05	168.27	4.19	3.40	9.27	7.11	9.27	7.11	12.70	10.97	15.09	10.97	177.80
10×8	273.05	219.08	4.19	3.76	9.27	8.18	9.27	8.18	12.70	12.70	15.09	12.70	177.80
12×6	323.85	168.27	4.57	3.40	9.53	7.11	10.31	7.11	12.70	10.97	17.48	10.97	203.20
12×8	323.85	219.08	4.57	3.76	9.53	8.18	10.31	8.18	12.70	12.70	17.48	12.70	203.20
12×10	323.85	273.05	4.57	4.19	9.53	9.27	10.31	9.27	12.70	12.70	17.48	15.09	203.20
14×6	355.6	168.27	6.35	3.40	9.53	7.11	11.13	7.11	12.70	10.97	19.05	10.97	330.20
14×8	355.6	219.08	6.35	3.76	9.53	8.18	11.13	8.18	12.70	12.70	19.05	12.70	330.20
14×10	355.6	273.05	6.35	4.19	9.53	9.27	11.13	9.27	12.70	12.70	19.05	15.09	330.20
14×12	355.6	323.85	6.35	4.57	9.53	9.53	11.13	10.31	12.70	12.70	19.05	17.48	330.20
16×6	406.4	168.27	6.35	3.40	9.53	7.11	12.7	7.11	12.7	10.97	21.474	10.97	355.60
16×8	406.4	219.08	6.35	3.76	9.53	8.18	12.7	8.18	12.7	12.70	21.474	12.70	355.60
16×10	406.4	273.05	6.35	4.19	9.53	9.27	12.7	9.27	12.7	12.70	21.474	15.09	355.60
16×12	406.4	323.85	6.35	4.57	9.53	9.53	12.7	10.31	12.7	12.70	21.474	17.48	355.60
16×14	406.4	355.6	6.35	6.35	9.53	9.53	12.7	11.13	12.7	12.70	21.474	19.05	355.60

(ASTM A234 / A234M)

PE/PP PIPES & FITTINGS





Overview

Polyethylene pipes provide a cost effective solution for a wide range of piping applications such as water supply, drainage and sewerage, gas distribution and agricultural irrigation.

One of the major factors that contributes to the growth of polyethylene as a piping material is the cost savings in installation. Polyethylene pipes are tough and durable , whilst retaining their flexibility and leak proof characteristics, which ensure lower maintenance costs and increased service life in comparison to traditional piping materials

Future Iron Pipes (FIP) ; a pioneer leading manufacturer and supplier of piping systems. with more than 20 years of experience in the field, FIP provides a full range of coated steel pipes, fittings, PE/PP pipes. Moreover, FIP is holding many international and local accreditations such as ISO 9001:2015, UL-NSF 61 certificate, PS076 - PS126 & PS136 quality marks.

FIP produces (in addition to its wide range of piping products) PE pipes.

The size range begins with 16mm and ends up to 160mm.

Pipes are coiled up to 400m for the whole size range. In addition to the coils, they are also offered as straight pipes.

Experience, know-how, technology and state-of-the-art equipment, these are the cornerstones for our high quality products.

Fulfilling the customers' demands and satisfaction is our top priority. Technical support and consultation, training, after sales service, supplying the proper and compatible fittings and welding machines are all important aspects that can assure you smooth implementation and progress of your project.

In this technical catalogue, you can find a full description of the ranges, materials, standards and other related technical data

Our goal is a long term business with you.

نبذة عامة

انابيب البولي ايثيلين تمثل حلا اقتصاديا للعديد من أنظمة خطوط تزويد المياه و الصرف الصحي و توزيع الغاز الطبيعي بالإضافة الى خطوط الزراعة.

حيث تعد مادة البولي ايثيلين من المواد المفضلة لصناعة الانابيب البلاستيكية اضافة الى مزاياها الاخرى المتمثلة في متانتها و مرونتها. ان دمج هذه الخصائص معا في صناعة الانبوب يساهم في التقليل من التسريبات في خطوط المياه و بالتالي التقليل من فاقد المياه و الحاجة للصيانة.

شركة المستقبل لأنابيب البنية التحتية تعد الشركة الرائدة في مجال تصنيع الانابيب الخاصة بخطوط المياه و الصرف الصحي و الغاز الطبيعي بالإضافة الى خطوط الزراعة، حيث تقدم الشركة حلولاً لكافة التطبيقات بخبرة تزيد عن 20 عاما في هذا المجال.

انابيب البولي ايثيلين التي تنتجها الشركة تكون على شكل رولات أو أنابيب مستقيمة ضمن الاقطار من 16 مم و حتى 160 مم. هذه الانابيب يمكن ربطها معا على شكل رول بطول يصل الى 400 متر او على شكل انابيب مستقيمة

بدمج الخبرة و المعرفة و التكنولوجيا تضمن شركة المستقبل تحقيق متطلباتكم الخاصة بشبكات المياه. فتميزنا يتمثل بالدعم المستمر لكم من خلال خدمة ما بعد البيع و تقديم الدعم الفني و التدريب بالإضافة الى الاستشارات الفنية.

يمكنكم التعرف اكثر على خصائص المنتجات المقدمة من خلال هذا الكتيب و الذي يبين كافة التفاصيل المتعلقة بالمنتج بالإضافة الى القطع و الوصلات المستخدمة مع الانابيب.



Products

Fip pipes are produced for different applications including water, waste water, gas and agricultural irrigation. The production standards are

PS196

ISO 4427 / EN 12201

ISO 4437 / EN 1555

ISO 8779

The below table summarizes the products range.

المنتجات

بالإضافة إلى الأنابيب المعدنية، فإن شركة المستقبل تنتج أنابيب البولي إيثيلين الخاصة بشبكات مياه الشرب و المياه العادمة و الغاز و الشبكات الزراعية. حيث يتم تصنيع هذه الأنابيب ضمن متطلبات المواصفات المحلية و الدولية و التي تشمل

م.ف 196

ISO 4427 / EN 12201

ISO 4437 / EN 1555

ISO 8779

في الجدول أدناه ملخص منتجات الأنابيب البلاستيكية

Material امكانية اعادة الربط	Pipes are produced from high quality pure raw materials PE100+, PE100, PE80, PE63, LDPE	
Size Range الأقطار	16mm-160mm	
length range الاطوال	3m – 12 m for straight pipes 50m-400m for coiled pipes.	12m - 3m للأنابيب المستقيمة 400m - 50m للأنابيب المربوطة حسب القطر
Thickness السماكات	SDR 26 – SDR 7.4	
Applications الاستخدامات	HDPE pipes for drinking water applications (PS196 / ISO 4427 / EN12201) مياه الشرب	
	HDPE pipes for Gas applications (ISO 4437 / EN 1555) الغاز الطبيعي	
	HDPE pipes for waste water applications (EN 12201) الصرف الصحي	
	LDPE pipes for agricultural applications (ISO 8779) للتطبيقات الزراعية	



Overview

FIP is not only a brand name, it is a synonym for quality, high performance and durability. Combining high quality pure PE material and strict quality tests with the latest advances and technologies in PE extrusion, assures high end PE pipes.

FIP represents the perfect solution for your piping system. it comes with many advantages including but not limited to:

- High Flexibility
- Corrosion free
- High chemical resistant
- Light weight
- Flexible lengths (less joints)
- Easy installation
- Leakage free
- Several jointing technologies
- Excellent impact resistance
- Low friction losses

لماذا أنابيب المستقبل الخيار الأفضل؟

المستقبل ليست مجرد اسم تجاري و إنما هي مرادفة للجودة و الاداء العالي و قدرة التحمل. مزيج من المواد عالية الجودة و فحوصات الجودة الدقيقة و اخر تكنولوجيا في مجال صناعة الانابيب يضمن منتجات عالية الجودة و المواصفات.

انابيب المستقبل تمثل حلا كاملا لانظمة الانابيب حيث تتلخص هذه المميزات بما يلي:

- قيمتها المناسبة والريضة
- المرونة حتى في درجات الحرارة المنخفضة
- لا تتعرض للتآكل والتاكل
- سهولة حملها لخفة وزنها
- تنتج في نظام المتريك بأقطار متنوعة وأطوال مختلفة حسب الرغبة وبشكل دائري
- سهولة التركيب ووصل الأنابيب ببعضها
- ضد الكسر والشعر مقابل الضغط عليها من الخارج
- عازلة للحرارة
- المقاومة ضد المواد الكيميائية
- العمر الطويل مقارنة بالأنابيب الأخرى



Fip PE Pipes Technical Data

الخصائص الفنية Fip لانايب

Dimensions and pressure classification

Fip PE pipes are produced in accordance to ISO 4427, EN12201, PS 196, ISO 4437, EN1555 and ISO 8779. These standards present the requirements to produce these pipes for water, waste water, gas and agricultural applications.

The pressure classes of these pipes are categorized based on the standard dimension ratio (SDR) which represents the ratio between the outside diameter and wall thickness of the pipe.

The higher the SDR, the lower the pressure that can be handled by the pipe.

It is represented mathematically as per below equation

Where:

SDR: is the standard dimension ratio

OD: Outside Diameter

e: Wall thickness

$$SDR=OD/e$$

الابعاد و تصنيف الضغط

يتم انتاج انايب المستقبل حسب متطلبات المواصفات
م.ف 196

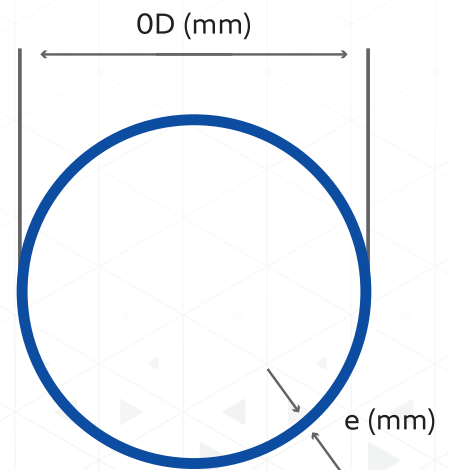
ISO 4427 / EN 12201

ISO 4437 / EN 1555

ISO 8779

هذه المواصفات تمثل متطلبات انتاج الانابيب الخاصة بمياه الشرب
و الصرف الصحي و الغاز الطبيعي و الانابيب الزراعية
يتم تصنيف الانابيب حسب الضغوط بناء على النسبة بين القطر
الخارجي و سماكة الانبوب SDR. و كلما كانت هذه القيمة اكبر
كلما كان الضغط الذي يتحمله الانبوب اقل.

يمكن تمثيل هذه النسبة رياضيا بالمعادلة التالية





PE pipes applications

Due to its many advantages and ease of usage, PE pipes are widely used in many applications and water systems. The applications include but not limited to the following:

HDPE (PE100 +) High density polyethylene pipes

Diameters: 16 mm – 160 mm
Color: black with blue stripes
Nominal Pressure (PN): 8, 10, 12.5, 16 and 25 bar
SDR range: 7.4, 11, 13.6, 17 and 21
Fields of Applications: Water and Sewage

HDPE (PE100 +) High density polyethylen pipes fo Gas

Diameters: 32 mm – 160 mm
Color: black with yellow stripes
Nominal Pressure (PN): 4-10 bar
SDR range: 17 & 11
Fields of Applications: Gas transportation

LDPE low density polyethylene pipes for Agricultural applications

Diameters: 16 mm – 63 mm
Color: black
Nominal Pressure (PN): 2.5, 4 and 6 bar
SDR range: 11, 17 and 26
Fields of Applications: Agricultural pipes.

HDPE Material Specs.

HDPE has several grades that are used to produce pipes. These grades differ in terms of their minimum required strengths (MRS). The below table shows an example of these variations
The higher the MRS the better the pressure endurance.

Designation of Material	MRS @ 50 years and 20 °C
PE 80	8 MPa
PE 100/ PE 100 +	10 MPa

استخدامات انابيب البولي ايثيلين

بسبب ميزاتها العديدة و سهولة تركيبها, فان انابيب البولي ايثيلين يتم استخدامها للعديد من التطبيقات في شبكات المياه.

PE100+ انابيب بولي ايثيلين عالي الكثافة

الاقطار: 16مم – 160مم
اللون: اسود مع خطوط زرقاء
الضغط الاسمي (بار): 8, 10, 12.5, 16 و 25 بار
SDR: 7.4, 11, 13.6, 17 و 21
الاستخدام: المياه و الصرف الصحي

انابيب بولي ايثيلين عالي الكثافة PE100⁺ للغاز الطبيعي

الاقطار: 32مم – 160مم
اللون: اسود مع خطوط صفراء
الضغط الاسمي (بار): 4-10 بار
SDR: 11, 17
الاستخدام: الغاز الطبيعي

انابيب بولي ايثيلين منخفض الكثافة للاستخدامات الزراعية

الاقطار: 16مم – 63مم
اللون: اسود
الضغط الاسمي (بار): 2.5, 4, 6 بار
SDR: 11, 17 و 26
الاستخدام: الشبكات الزراعية

خصائص البولي ايثيلين

يتم تصنيف البولي ايثيلين الى عدة درجات بناء على الحد الأدنى لقوة المادة و الجدول التالي يبين امثلة على هذا التصنيف. كلما زاد الحد الأدنى لقوة المادة زادت قدرتها على تحمل الضغط.



PE100 plus

In addition to the available grades of HDPE raw material in the market. Fip is also produced using PE100+ raw material.

This grade has the same advantages of the normal PE100 except that it has enhanced creep rupture strength, stress crack resistance and arrest of rapid crack propagation.

with these enhanced characteristics the pipe will withstand more harsh working environment and will have much better performance over time.

you can have more information about this special grade following the PEplus association website www.pe100plus.com

Material Physical Properties

Producing high quality products always begins from choosing high quality raw materials. The characteristics of the raw material in addition to the production technologies used, highly affect the final product.

The below table provides a general overview of the physical properties about the raw material.

الخصائص الفيزيائية لمادة البولي إيثيلين

يعد استخدام البولي إيثيلين عالي الجودة أحد أهم العوامل التي تساهم في جودة المنتج النهائي للأنابيب. إن المواد المستخدمة في إنتاج أنابيب **المستقبل** هي مواد خام نقية و مصنعة حسب أعلى المعايير.

الجدول التالي يبين خصائص المادة الفيزيائية



Pipe Dimensions Tables

Nominal Dia. (mm)	Wall thickness (mm)	SDR	pressure (Bar)	Material	Application			Standard	Weight kg/m
16	1	SDR 17	PN 4	LDPE	Agricultural			ISO 8779	0,05
16	1.5	SDR 11	PN 6	LDPE	Agricultural			ISO 8779	0,07
16	2.3	SDR 7.4	PN 25	HDPE	Potable Water			EN12201	0,10
20	1.2	SDR 17	PN 4	LDPE	Agricultural			ISO 8779	0,08
20	1.9	SDR 11	PN 6	LDPE	Agricultural			ISO 8779	0,11
20	2	SDR 11	PN 16	HDPE	Potable Water			EN12201	0,12
20	3	SDR 7.4	PN 25	HDPE	Potable Water			EN12201	0,15
25	1	SDR 26	PN 2.5	LDPE	Agricultural			ISO 8779	0,08
25	1.5	SDR 17	PN 4	LDPE	Agricultural			ISO 8779	0,12
25	2	SDR 13.6	PN12.5	HDPE	Potable Water			EN12201	0,15
25	2.3	SDR 11	PN 6	LDPE	Agricultural			ISO 8779	0,16
25	2.3	SDR 11	PN 16	HDPE	Potable Water			EN12201	0,17
25	3.5	SDR 7.4	PN 25	HDPE	Potable Water			EN12201	0,24
32	1.3	SDR 26	PN 2.5	LDPE	Agricultural			ISO 8779	0,13
32	1.9	SDR 17	PN 4	LDPE	Agricultural			ISO 8779	0,18
32	2	SDR 17	PN 10	HDPE	Potable Water	Waste Water		EN12201	0,20
32	2.4	SDR 13.6	PN12.5	HDPE	Potable Water	Waste Water		EN12201	0,23
32	2.9	SDR 11	PN 6	LDPE	Agricultural			ISO 8779	0,26
32	3	SDR 11	PN 16 PN 10	HDPE	Potable Water		Gas	EN12201 / EN 1555	0,28
32	4.4	SDR 7.4	PN 25	HDPE	Potable Water			EN12201	0,38
40	1.6	SDR 26	PN 2.5	LDPE	Agricultural			ISO 8779	0,20
40	2	SDR 21	PN 8	HDPE	Potable Water			EN12201	0,25
40	2.4	SDR 17	PN 4	LDPE	Agricultural			ISO 8779	0,28
40	2.4	SDR 17	PN 10	HDPE	Potable Water	Waste Water		EN12201	0,29
40	3	SDR 13.6	PN12.5	HDPE	Potable Water	Waste Water		EN12201	0,36
40	3.7	SDR 11	PN 6	LDPE	Agricultural			ISO 8779	0,42
40	3.7	SDR 11	PN 16 PN 10	HDPE	Potable Water		Gas	EN12201 / EN 1555	0,43
40	5.5	SDR 7.4	PN 25	HDPE	Potable Water			EN12201	0,60



Nominal Dia. (mm)	Wall thickness (mm)	SDR	pressure (Bar)	Material	Application			Standard	Weight kg/m
50	2,00	SDR 26	PN 2.5	LDPE	Agricultural			ISO 8779	0,31
50	2,40	SDR 21	PN 8	HDPE	Potable Water			EN12201	0,37
50	3,00	SDR 17	PN 4	LDPE	Agricultural			ISO 8779	0,45
50	3,00	SDR 17	PN 10	HDPE	Potable Water	Waste Water		EN12201	0,46
50	3,70	SDR 13.6	PN12.5	HDPE	Potable Water	Waste Water		EN12201	0,55
50	4,60	SDR 11	PN 6	LDPE	Agricultural			ISO 8779	0,64
50	4,60	SDR 11	PN 16 PN 10	HDPE	Potable Water		Gas	EN12201 / EN 1555	0,66
50	6,90	SDR 7.4	PN 25	HDPE	Potable Water			EN12201	0,93

63	2,50	SDR 26	PN 2.5	LDPE	Agricultural			ISO 8779	0,47
63	3,00	SDR 21	PN 8	HDPE	Potable Water			EN12201	0,59
63	3,80	SDR 17	PN 4	LDPE	Agricultural			ISO 8779	0,70
63	3,80	SDR 17	PN 10	HDPE	Potable Water	Waste Water		EN12201	0,72
63	4,70	SDR 13.6	PN12.5	HDPE	Potable Water	Waste Water		EN12201	0,86
63	5,80	SDR 11	PN 6	LDPE	Agricultural			ISO 8779	1,02
63	5,80	SDR 11	PN 16 PN 10	HDPE	Potable Water		Gas	EN12201 / EN 1555	1,05
63	8,60	SDR 7.4	PN 25	HDPE	Potable Water			EN12201	1,46

75	3,60	SDR 21	PN 8	HDPE	Potable Water			EN12201	0,83
75	4,50	SDR 17	PN 10	HDPE	Potable Water	Waste Water		EN12201	1,00
75	5,60	SDR 13.6	PN12.5	HDPE	Potable Water	Waste Water		EN12201	1,23
75	6,80	SDR 11	PN 16 PN 10	HDPE	Potable Water		Gas	EN12201 / EN 1555	1,45
75	10,30	SDR 7.4	PN 25	HDPE	Potable Water			EN12201	2,08

90	4,30	SDR 21	PN 8	HDPE	Potable Water			EN12201	1,17
90	5,40	SDR 17	PN 10	HDPE	Potable Water	Waste Water		EN12201	1,45
90	6,70	SDR 13.6	PN12.5	HDPE	Potable Water	Waste Water		EN12201	1,75
90	8,20	SDR 11	PN 16 PN 10	HDPE	Potable Water		Gas	EN12201 / EN 1555	2,11
90	12,30	SDR 7.4	PN 25	HDPE	Potable Water			EN12201	2,98

110	5,30	SDR 21	PN 8	HDPE	Potable Water			EN12201	1,77
110	6,60	SDR 17	PN 10 PN 4	HDPE	Potable Water	Waste Water		EN12201 / EN 1555	2,14
110	8,10	SDR 13.6	PN12.5	HDPE	Potable Water	Waste Water		EN12201	2,59
110	10,00	SDR 11	PN 16 PN 10	HDPE	Potable Water		Gas	EN12201 / EN 1555	3,13
110	15,10	SDR 7.4	PN 25	HDPE	Potable Water			EN12201	4,47



Nominal Dia. (mm)	Wall thickness (mm)	SDR	pressure (Bar)	Material	Application			Standard	Weight kg/m
125	6,00	SDR 21	PN 8	HDPE	Potable Water			EN12201	2,26
125	7,40	SDR 17	PN 10 PN 4	HDPE	Potable Water	Waste Water	Gas	EN12201 / EN 1555	2,75
125	9,20	SDR 13.6	PN12.5	HDPE	Potable Water	Waste Water		EN12201	3,36
125	11,40	SDR 11	PN 16 PN 10	HDPE	Potable Water		Gas	EN12201 / EN 1555	4,06
125	17,10	SDR 7.4	PN 25	HDPE	Potable Water			EN12201	5,76

140	6,70	SDR 21	PN 8	HDPE	Potable Water			EN12201	2,81
140	8,30	SDR 17	PN 10 PN 4	HDPE	Potable Water	Waste Water	Gas	EN12201 / EN 1555	3,43
140	10,30	SDR 13.6	PN12.5	HDPE	Potable Water	Waste Water		EN12201	4,18
140	12,70	SDR 11	PN 16 PN 10	HDPE	Potable Water		Gas	EN12201 / EN 1555	5,04
140	19,20	SDR 7.4	PN 25	HDPE	Potable Water			EN12201	7,23

160	7,70	SDR 21	PN 8	HDPE	Potable Water			EN12201	3,70
160	9,50	SDR 17	PN 10 PN 4	HDPE	Potable Water	Waste Water	Gas	EN12201 / EN 1555	4,50
160	11,80	SDR 13.6	PN 12.5	HDPE	Potable Water	Waste Water		EN12201	5,48
160	14,60	SDR 11	PN 16 PN 10	HDPE	Potable Water		Gas	EN12201 EN 1555	6,62
160	21.9	SDR 7.4	PN 25	HDPE	Potable Water			EN12201	



PE Pipes Jointing Technology

A professionally installed piping system does not only depend on the quality of the system components, it depends also on choosing the proper way to connect the pipes. In PE piping systems there are two major ways to connect the pipes. The jointing methods are classified as:

Thermal jointing

Mechanical jointing

تكنولوجيا ربط الانابيب

استخدام و تركيب خطوط الانابيب لا يعتمد فقط على جودة مكونات الخط , بل و كذلك على وسائل ربطها معا. في أنظمة انابيب البولي ايثيلين , يمكن ربط الانابيب البلاستيكية من خلال استخدام احد الوسائل التالية:

الربط الحراري

الربط الميكانيكي

Both categories achieve the same purpose but the choice of the best jointing technology depends on the application. In the table below a summarized comparison between both methods is described

هذه الطرق تؤدي نفس الوظيفة في ربط الانابيب و لكن اختيار الطريقة الامثل يعتمد على الاستخدام و ظروف العمل. الجدول المبين ادناه يوضح اهم الفروقات بين الطريقتين هذه الطرق تؤدي نفس الوظيفة في ربط الانابيب و لكن اختيار الطريقة الامثل يعتمد على الاستخدام و ظروف العمل. الجدول المبين ادناه يوضح اهم الفروقات بين الطريقتين

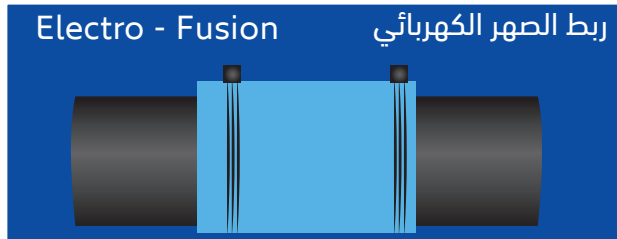
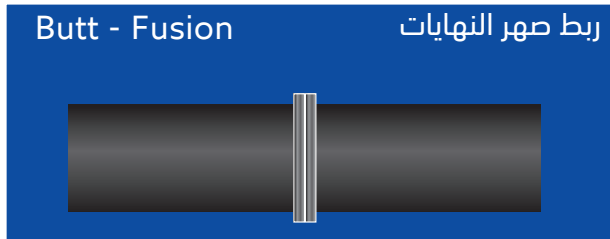
Property	الخاصية	Mechanical	الربط الميكانيكي	Thermal	الربط الحراري
Permanence	امكانية اعادة الربط	Non-Permanent	يمكن اعادة الربط	Permanent	الربط دائم
Tools / Machines requirements	الحاجة لاستخدام ادوات او اجهزة خاصة	Requires only simple tools	بحاجة الى ادوات بسيطة	Requires welding machines and tools	بحاجة الى ادوات خاصة و اجهزة لحام
Fittings	الحاجة للقطع	Requires fittings	بحاجة الى قطع	Depends on the welding procedure	يعتمد على عملية اللحام
Fittings reuse	اعادة استخدام القطع	Reusable	قابل لاعادة الاستخدام	One use only	استخدام لمرة واحدة

Thermal Jointing

The process of thermal jointing involves heating the polyethylene either for the pipes or the fittings and allow them to fuse together. With this process both pipes ends or the pipe and the fitting will become one connected unit. It is considered the best way to connect the pipes without any concern regarding leakage.

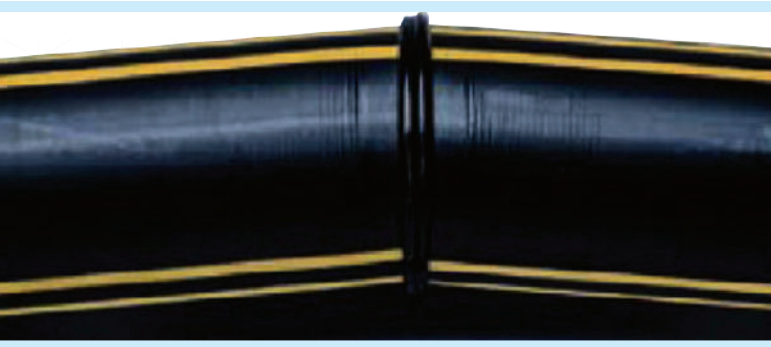
الربط الحراري

تتضمن عملية الربط الحراري تسخين البولي ايثيلين اما للانابيب او القطع و الوصلات و دمجها معا لتصبح وحدة واحدة. يتم تقسيم الربط الحراري الى نوعين اساسيين



Butt-Fusion Principle

Butt-fusion jointing is a thermo fusion process which involves the simultaneous heating of the ends of two components which are to be joined until a melt state is attained on each contact surface. The two surfaces are then brought



together under controlled pressure for a specific cooling time and homogeneous fusion is formed upon cooling. The resultant joint is resistant to end thrust and has comparable performance under pressure to the pipe.

ربط صهر النهايات

عملية صهر نهايات الانابيب تتضمن التسخين الحراري لنهايتي الانابيب التي سيتم لحامهما معا و ذلك باستخدام قرص حراري حيث تتم عملية التسخين للنهايتين في نفس الوقت. و بعد الوصول الى مرحلة الذوبان يتم ازالة القرص ثم يتم تقريب النهايات لبعضها البعض حتى تتلامسا. و بالضغط على النهايتين بشكل منتظم و لمدة محددة يتم دمج الانبوبين ليشكلا انبوبا واحد.

Electro-Fusion Principle

All electro fusion fittings employ the same basic principle. The socket of the fitting incorporates an electrical heating coil. An electro fusion control unit supplies the electrical energy necessary to heat the coil. When the coil is energized the material adjacent to it melts and forms an expanding pool which comes into contact with the surface of the pipe. The continued introduction of heat energy causes the pipe surface to melt and a mixing of pipe melt and fitting melt takes place; this is vital to produce a good weld. Following the termination of the heat cycle, the fitting and pipe are left to cool and the melted material solidifies to form a sound joint.

ربط الصهر الكهربائي



تتضمن عملية الصهر الكهربائي استخدام قطع خاصة تحتوي على اسلاك كهربائية. عند لحام الانابيب معا يتم التوصيل فيما بينها باستخدام هذه القطع، و بعد ذلك يتم وصل اقطاب القطع بماكنات اللحام. و عند تشغيل اللحام تتعرض الاسلاك داخل القطع الى الطاقة الكهربائية و التي بدورها تعمل على تسخين الاسلاك و اذابة السطح الداخلي للقطعة. و بالتالي اندماج القطع مع الانابيب.

Mechanical Jointing

The mechanical jointing of HDPE pipes is done by many methods and ways. The most common ways are either using mechanical compression fittings or using flanges. Both methods show good leakage resistance and the fittings or flanges can be used several times.

الربط الميكانيكي

يتم استخدام نوعين اساسيين في الربط الميكانيكي، اما عن طريق استخدام قطع الضغط الميكانيكي او عن طريق استخدام الفلنجات. توفر هذه الطريقة حماية جيدة من التسريب و امكانية استخدام القطع عدة مرات.



Fittings

This section provides a full insight of the used fittings in joining HDPE pipes. The fittings are provided from our partner Georg Fischer GmbH. The fittings from GF are fully compatible with Fip pipes. this compatibility assures smooth connection and installation of pipes systems. The provided technical data and datasheets are for both Electro-Fusion fittings and Mechanical Compression fittings.

Georg Fischer Electro Fusion Fittings (ELGEF®)

Georg Fischer provides a wide range of Electro-Fusion fittings including sockets, tees, elbows, saddles ...etc. these fittings are produced in accordance to EN12201 for water applications and in accordance to EN1555 for gas applications. They are approved by many international institutes and approval authorities such as DVGW, KIWA, SVGW...etc.

القطع و الوصلات

يوفر هذا القسم نظرة موسعة للقطع و الوصلات التي يتم استخدامها لربط الانابيب معا. هذه القطع و الوصلات توفرها الشركة من شريكها العالمية جورج فيشر. هذه القطع من جورج فيشر تتوافق بشكل كامل مع انابيب Fip بحيث تضمن تطابقا في المواصفات و سهولة في التركيب و الربط اثناء تمديد خطوط الانابيب المعلومات الفنية المبينة خاصة بقطع الصهر الكهربائي و قطع التوصيل الميكانيكي.

قطع و وصلات الصهر الكهربائي من شركة جورج فيشر ELGEF

تقدم جورج فيشر مدى واسعا من قطع الصهر الكهربائي و تشمل الوصلات و الاكواع و السرج و غيرها من القطع. و يتم تصنيع هذه القطع بناء على المواصفات الاوروبية EN12201 لمياه الشرب و الصرف الصحي و المواصفة الاوروبية EN1555 الخاصة بالغاز الطبيعي. هذه القطع و الوصلات حاصلة على العديد من الموافقات من قبل العديد من المؤسسات و المعاهد الدولية مثل DVGW, KIWA, SVGW...الخ



Pressure Testing Outside the Trench

- If specified by the engineer, pressure testing may be conducted prior to pipe installation.
- After the pipe has been joined, fill it with water, carefully bleed off any trapped air.

Subject the pipe to a hydrostatic test pressure that is 1.5 times the system design pressure for a maximum of 3 hours. During this time, add water periodically to maintain the test pressure; this compensates for the initial stretching of the pipe. The line pressure tightness is determined by visual observation; therefore, it is not necessary to measure the make-up water. Examine every fused joint; any leakage must be repaired and then retested.

اختبار الضغط خارج الخندق

- يمكن إجراء اختبار الضغط قبل تركيب الأنابيب.
- بعد ربط الأنابيب يتم ملئها بالماء و بإخراج أي هواء بحدري.

قم بتعريض الأنبوب إلى ضغط اختبار هيدروستاتيكي يعادل 1.5 مرة ضغط تصميم النظام لمدة 3 ساعات كحد أقصى. خلال هذا الوقت ، أضيف الماء بشكل دوري للحفاظ على ضغط الاختبار ، شدة ضغط الخط يتم تحديده من خلال الملاحظة البصرية لذلك ، ليس من الضروري قياس ماء التعويض. افحص كل وصلة؛ يجب إصلاح أي تسرب ثم إعادة اختبارها.



ملاحظة: يجب أن يتحمل المقاول مسؤولية التأكد من مراعاة احتياطات السلامة المناسبة أثناء الاختبار الهيدروستاتيكي فوق سطح الأرض .

NOTE: It shall be the responsibility of the contractor to ensure that appropriate safety precautions are observed during hydrostatic testing above ground

Testing In the Trench

- Fill the pipeline with water after it has been laid; bleed off any trapped air. Subject the lowest element in the system to a test pressure that is 1.5 times the design pressure, and check for any leakage. When, in the opinion of the engineer, local conditions require that the trenches be backfilled immediately after the pipe has been laid, apply the pressure test after backfilling has been completed but not sooner than a time which will allow sufficient curing of any concrete that may have been used. Typical minimum concrete curing times are 36 hours for early strengths and 7 days for normal strengths.
- The test procedures consist of two steps; the initial expansion and the test phase. When test pressure is applied to a water filled pipe, the pipe expands. During the initial expansion of the pipe under test, sufficient make-up water must be added to the system at hourly intervals for 3 hours to maintain the test pressure. After about 4 hours, initial expansion should be complete and the actual test can start.
- When the test is to begin, the pipe is full of water and is subjected to a constant test pressure of 1.5 times the system design pressure. The test phase should not exceed 3 hours, after which time any water deficiency must be replaced and measured.
- An alternate leakage test consists of maintaining the test pressure (described above) over a period of 4 hours and then dropping the pressure by 10 psi (0.69 MPa). If the pressure then remains within 5% of the target value for 1 hour, this indicates there is no leakage in the system.

اختبار الضغط داخل الخندق

- املاً خط الأنابيب بالماء وقم باخراج أي هواء محاصر داخله.
- قم بإخضاع أدنى عنصر في النظام لضغط اختبار يعادل 1.5 مرة ضغط التصميم ، وتحقق من عدم وجود أي تسرب. عندما تتطلب الظروف المحلية ، حسب رأي المهندس ، قم بردم الخنادق مباشرة بعد وضع الأنبوب ، قم بتطبيق اختبار الضغط بعد اكتمال الردم ولكن بعد مرور وقت يسمح كافي يسمح بمعالجة أي خرسانة قد تم استعمالها.
- الحد الأدنى للوقوات المعالجة النموذجية للخرسانة هو 36 ساعة للقوة المبكرة و 7 أيام للقوة العادية.
- تتكون إجراءات الاختبار من خطوتين : التوسع الأولي ومرحلة الاختبار. عندما يتم تطبيق ضغط الاختبار على أنبوب مملوء بالماء ، يتمدد الأنبوب. أثناء التمدد الأولي للأنبوب قيد الاختبار ، يجب إضافة ماء تعويض كافي إلى النظام كل ساعة لمدة 3 ساعات للحفاظ على ضغط الاختبار. بعد حوالي 4 ساعات ، يجب أن يكتمل التوسع الأولي ويمكن أن يبدأ الاختبار الفعلي.
- عندما يبدأ الاختبار ، يكون الأنبوب ممتلئاً بالماء ويخضع لضغط اختبار ثابت يبلغ 1.5 مرة الضغط التصميمي للنظام. يجب ألا تتجاوز مرحلة الاختبار 3 ساعات ، وبعد ذلك يجب تعويض وقياس أي نقص في المياه.
- يتضمن اختبار التسرب البديل الحفاظ على ضغط الاختبار (الموصوف أعلاه) على مدى 4 ساعات ثم خفض الضغط بمقدار 10 رطل / بوصة مربعة (0.69 ميجا باسكال). إذا ظل الضغط في حدود 5% من القيمة المستهدفة لمدة ساعة واحدة ، فهذا يشير إلى عدم وجود تسرب في النظام.

NOTES

Under no circumstances shall the total time under test exceed 8 hours at 1.5 times the system pressure rating. If the test is not complete within this time limit (due to leakage, equipment failure, etc.), the test section shall be permitted to "relax" for 8 hours prior to the next test sequence.

ملاحظة

لا يجوز تحت أي ظرف من الظروف أن يتجاوز الوقت الإجمالي للاختبار تحت 1.5 ضعف معدل ضغط النظام ال 8 ساعات. إذا لم يكتمل الاختبار خلال هذا الحد الزمني (بسبب التسرب ، أو فشل المعدات ، وما إلى ذلك) ، فيسمح لقسم الاختبار بـ "الاسترخاء" لمدة 8 ساعات قبل تسلسل الاختبار التالي.

Certificate of Approval

This is to certify that the Management System of:

Future Iron Pipes

Dahria Main Road, Dora, Hebron, Palestine

has been approved by LRQA to the following standards:

ISO 9001:2015, ISO 14001:2015, ISO 45001:2018

Approval number(s): ISO 9001 – 0046885, ISO 14001 – 00051826, ISO 45001 – 00051827

This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

The scope of this approval is applicable to:

Coating of steel pipes with external three- layers of polyethylene and internal lining with cement, pipes are used for drinking water, wastewater and gas.



Luis Cunha

Area Operations Manager - North Asia & SAMEA

Issued by: LRQA Limited



0001

Certificate Schedule

Location	Activities
Dahria Main Road, Dora, Hebron, Palestine	ISO 9001:2015 Coating of steel pipes with external three- layers of polyethylene and internal lining with cement, pipes are used for drinking water, wastewater and gas.
Dura Dahria main road, Al Hadab - Hebron, Westbank, Palestine	ISO 14001:2015 Coating of steel pipes with external three- layers of polyethylene and internal lining with cement, pipes are used for drinking water, wastewater and gas.
	ISO 45001:2018 Coating of steel pipes with external three- layers of polyethylene and internal lining with cement, pipes are used for drinking water, wastewater and gas.



مؤسسة المواصفات والمقاييس الفلسطينية Palestine Standards Institution



شهادة جودة

الرقم: PS-76

شركة المستقبل للأنايب المعدنية - دورا/ الخليل

تشهد مؤسسة المواصفات والمقاييس الفلسطينية أن المصنع المذكور أعلاه
مصنع مؤهل لإنتاج:

أنايب فولاذية ذات تغطية واقية:

-تغطية السطح الداخلي بالملاط الاسمنتي
للأقطار التالية: القطر 3" و المجموعة الأولى (من 4" حتى 10")
والأقطار: 12"، 16" و 20" من المجموعة الثانية

- تغطية السطح الخارجي بالبولي إيثيلين/ ثلاث طبقات
للأقطار المجموعة الأولى (حتى 4") والمجموعة الثانية (أكبر من 4" وحتى 10") والقطر 12"
وفق متطلبات المواصفات الفلسطينية:

م.ف (2018-1:325) ، م.ف (2013-6:325)

منحت علامة الجودة بعد إجراء عمليات التدقيق اللازمة وفق متطلبات المواصفة
الفلسطينية:

م.ف (1997-15)

سارية حتى تاريخ

2027/06/2

صدرت بتاريخ

2026/07/07

تاريخ المنح الأول

2010/03/11

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دائرة الجودة والتأهيل

مؤسسة المعايير والمقاييس الفلسطينية Palestine Standards Institution



Quality Certificate

NO: PS-76

Future Iron Pipes – Dura- Hebron

This is to certify by Palestine Standards Institution that the above named is producing:

Steel pipes with protective coatings:

- Internal coating by cement mortar
for the following diameters: 3" and the first group (from 4" to 10"), and for the diameters 12", 16", 20" from the second group

- External Extruded polyethylene coating-Three-layers coating
for the following diameters: First group (up to 4")
Second group (more than 4" up to 10") and 12"
according to the requirements of Palestinian Standards:

PS (325:1-2018), PS (325:6-2013)

Have complied with Quality Mark Requirement according to
Palestinian Standard:

PS (15-1997)

Initial Certification

11/03/2010

Issued on

07/07/2026

Valid to

02/06/2027

Taghreed Shéhadeh

Quality and Cert. Dep. Dir



Haidar Hajjeh

Director General

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