



# AL-RAJHI PIPES

## الأنابيب الراجحي



# HDPE

## PIPING SYSTEM

AL-RAJHI  
The Most Trusted  
and Reliable HDPE  
Pipes Supplier

Gas



Fire



Water





# AL-RAJHI **الراجحي**



## INTRODUCTION

Al-Rajhi Pipes is a premier supplier of high-density polyethylene (HDPE) pipes and fittings throughout the Gulf Region. With over 20 years of experience in the industry, we have built a reputation for providing exceptional products and outstanding customer service.

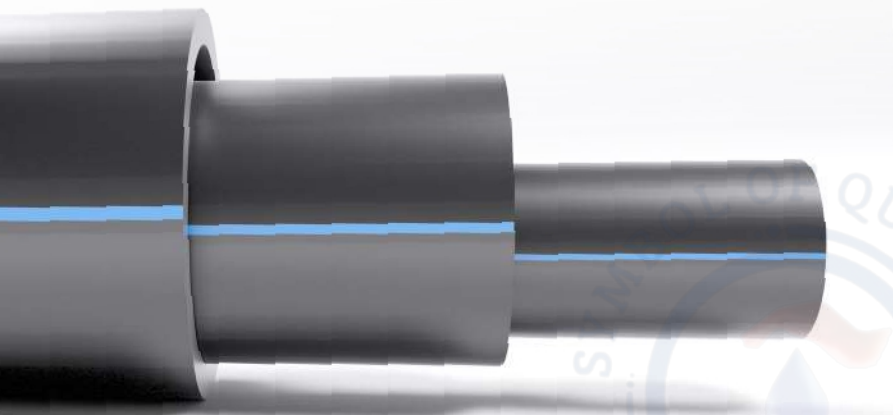
Our state of the art warehousing facility is equipped with the latest technology and machinery, allowing us to supply HDPE pipes and fittings of the highest quality. We use only the finest materials and adhere to strict quality control standards to ensure our products meet or exceed industry standards.

At Al-Rajhi Pipes, we pride ourselves on our commitment to customer satisfaction. Our team of experts is dedicated to providing personalized service and tailored solutions to meet the unique needs of each of our clients. Whether you require a custom order or standard products, we are committed to delivering on-time and on-budget.

We have a broad range of products in our portfolio, including HDPE pipes and fittings, which are suitable for a wide variety of applications. Our pipes are available in various sizes, grades, and pressure ratings, making them suitable for use in everything from residential plumbing to large-scale industrial projects.

We are dedicated to sustainable manufacturing practices and believe in promoting environmentally responsible solutions. Our pipes and fittings are designed to be long-lasting, durable, and recyclable, helping to reduce waste and minimize environmental impact.

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# WHY HDPE PIPES?

الراجحي AL-RAJHI



## EXCELLENT PERFORMANCE

HDPE is characterized by the combination of superior performance for the production of pipes with a good long term strength and long life which makes it the best for transportation of water and gaseous fuels.



## RESIST TO ENVIRONMENTAL VARIATIONS

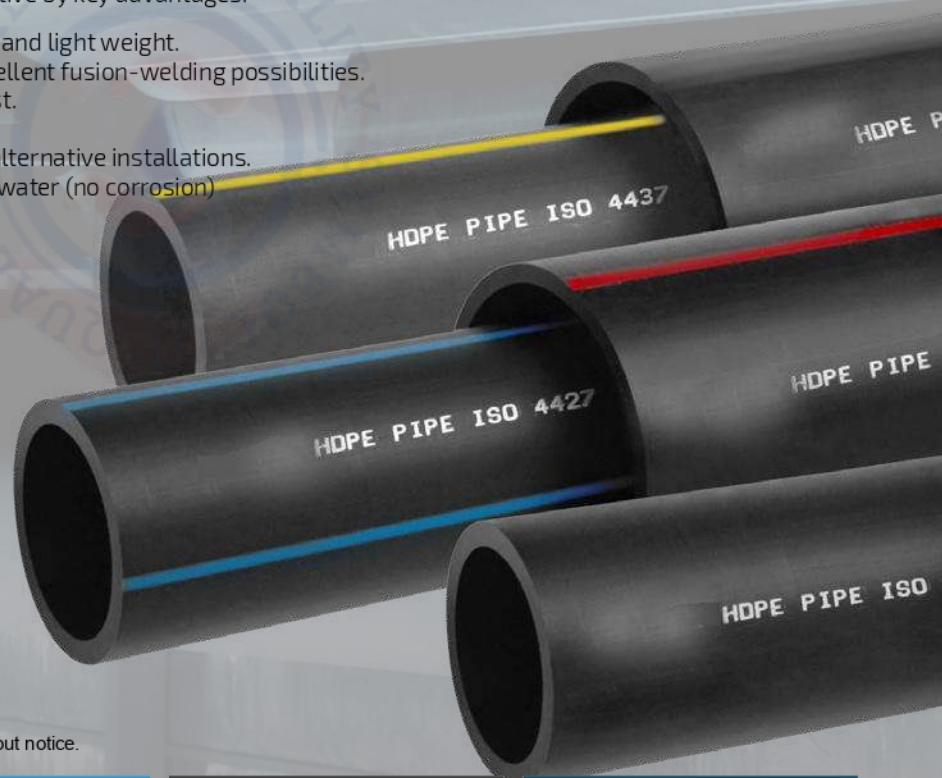
This property is one of the most important properties of HDPE, for this it can be used safely to transport drinking water without any side effects, corrosion is one of the most dangerous phenomenon accompanied with transportation of water in steel pipes, but in the case of HDPE Pipes this phenomenon disappear. Another property in the field of environmental variations is the soil movement, because the great flexibility of HDPE Pipes it resist the soil movement.



## HDPE PIPES IS A COMPETITIVE PIPES

HDPE Pipes is a competitive pipe because it is characterize by light, stable, weather-resistant, water proof and easy to handle. HDPE Pipe installations are the most competitive by key advantages.

- Ease of handling due to flexibility and light weight.
- Leak-tight installation due to excellent fusion-welding possibilities.
- Long life with low operational cost.
- Capability for relining pipelines.
- Possibility for on-site extrusion, alternative installations.
- No limitations to pH-value of the water (no corrosion)
- Taste and odor neutral
- Bacteriologically neutral
- Chemical resistance



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### Material

- ▶ High Density Polyethylene

### Standards

- ▶ ISO
- ▶ AWWA

### Sizes

- ▶ 20 mm - 2000 mm
- ▶ 4" - 42"

### Applications

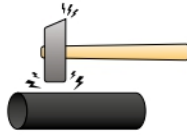
- ▶ Fire Fighting (Underground)
- ▶ Irrigation
- ▶ Potable Water
- ▶ Drainage
- ▶ Gas
- ▶ Insulation/Sleeves/Jacket
- ▶ Directional Drilling/Marine

## Characteristics of PE:

The figure summarizes many of the key characteristics of the HDPE like:

1

Impact Resistant



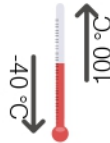
2

Elastic



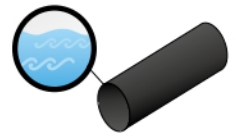
3

Thermal Resistant



4

Smooth Internal Wall



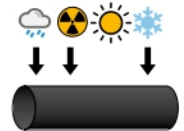
5

Wear Resistant



6

Weather-resistant / UV Resistant



7

Poor Heat Conductivity



8

Non-toxic



PE-HD

9

Insulating



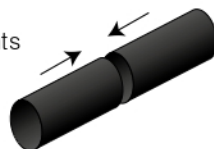
10

Highly Suitable for Welding



11

Homogeneous Welded Joints



12

Prefabrication



13

Light Weight



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NOTE: Drawings are for illustration purpose only.

## Characteristics

We recommend AL-RAJHI PIPES HDPE piping solution due to its renowned following characteristics:



### High Impact Resistance:

(Also referred to as toughness)  
This might be one of the most important properties needed in transferring fluids. It is mainly about how strongly this material can withstand a sudden internal or external hit (normally for a buried pipe, a sudden pressure wave inside pipe). This property report the amount of energy this material is capable of absorbing before deforming.



### Elasticity:

Despite being very rigid, HDPE stays a polymer material, and this means high degree of elasticity and flexibility. The implications of this are high impact resistance, flexibility and minimum possibility of damaging HDPE material because of rough trench conditions or reduction of massive number of bends. This characteristic also implies that using these flexible pipes is safer especially in applications that need seismic protection.



### Thermal Resistance:

The operational safe temperature range of HDPE starts in the cold side from  $-40^{\circ}\text{C}$  and ends in the hot side at about  $100^{\circ}\text{C}$ , and this range includes most of applications except the heating applications.



### Smooth Internal Wall:

The PE pipe interior is very smooth and guarantees decent flow. Not only this, the smoothness lifetime is much larger than that of steel or ductile iron because PE doesn't rust or rot. The free flow eliminates the possibility of internal deposits which make the inner diameter smaller.



### Wear Resistance:

High yield strength, high toughness, and high tensile stress the HDPE resists hard ambience. Even if the bedding used for this type of pipes contains large granules of rock and sand, this material can withstand up to granule diameter size of 65 mm which is really superb.



### Weather Resistance:

This property is an extension of thermal resistance and wear resistance properties, which means it can be left in any weather no matter how hard it is and nothing will happen to it. AL-RAJHI PIPES HDPE products are UV stabilised carbon black protected.



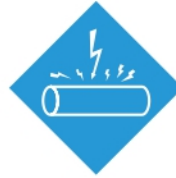
# HDPE

## Characteristics



### Poor Heat Conductivity:

This is one of the most useful properties of HDPE that make it suitable for the applications where it necessary to secure absence of heat leakage either in or out, like HVAC applications.



### Insulation/Sleeve:

This is another property that assures it is always very safe to use HDPE pipes even close to the areas where electric wires may pass or cross. HDPE is bad conductor for electric current.



### Non-Toxic:

This property is inherent from the fact that the HDPE material is inert so the water inside will always be clean and safe. This is a big advantage when HDPE is compared to metal pipes for conveyance of potable drinking water.

## Characteristics



### Homogeneous Welded Joints:

Many technicians always complain that the welding remains a critical process for the metal pipes, because, the rigidity of metal prevents the full homogeneity of the welding area. While with HDPE, welding is more powerful especially in butt welding, that makes the Joints share same properties of the pipe, and even are stronger.



### Highly Suitable for Welding:

The main process used for manufacturing HDPE pipes is extrusion which is a hot forming process, that ensures high homogeneity for the end product, which leads to homogeneous formation of the molten material at the time of welding.



### Pre-Fabrication:

The HDPE is friendly for pre-fabrication to make customised products, for example segmented fittings can be pre-fabricated from the pipes of same SDR.



### Lightweight:

The light weight nature of HDPE pipes and fittings makes it easy for handling and installation in comparison to other materials.

NOTE: Drawings are for illustration purpose only.

# FIELDS OF APPLICATION

## AL-RAJHI HDPE PIPES



Non toxic HDPE pipes will not affect the taste, color or smell of drinking water.



HDPE pipes shows superior resistance to most chemicals which qualify it to used for transporting fuels at elevated pressures.



HDPE pipes are ideal for agricultural irrigation and sprinkler systems.



HDPE pipes are used for underground drainage systems, waste discharge systems, drainage soil.



## MANUFACTURING STANDARDS

**DIN 8074**

Polyethylene (PE) - Pipes PE 80, PE 100  
- Dimensions

Polyethylene (PE) - Pipes PE 80, PE 100  
- general quality requirements, testing

**DIN 8075**

**ISO 4427**

Plastic piping systems - Polyethylene (PE) pipes and fittings for water supply

Plastic piping systems for the supply of gaseous fuels  
- Polyethylene (PE)

**ISO 4437**

**AWWA  
C906**

Polyethylene (PE) Pressure Pipe and Fittings, 4 In. thru 65 In. (100 mm Through 1650 mm), for Waterworks

Plastics piping systems for water supply, and for drainage and sewerage under pressure. Polyethylene (PE)

**EN 122101**

**SASO ISO  
4427**

Plastics piping systems - Polyethylene (PE) pipes and fittings for water supply

## RAW MATERIAL

### Material Data Sheet

Material Data Sheet of High Density Polyethylen

Property	PE 100	PE 80	Unit	Test Method
Density (Compound)	959	956	Kg/m <sup>3</sup>	ISO 1183
Melt Flow Rate (MFR) 190 °C / 2.16 kg	< 0.1	< 0.1	g/10 min	ISO 1133
Melt Flow Rate (MFR) 190 °C / 5.0 kg	0.25	0.3	g/10 min	ISO 1133
Tensile Stress at Yield 50mm/min	25	22	Mpa	ISO 527-2
Elongation at Break	>600	>600	%	ISO 527-2
Tensile Modulus 50mm/min	900	800	Mpa	ISO 527-2
Charpy Impact Notched at (0 °C)	16	14	Kj/m <sup>2</sup>	ISO 179/1eA
Hardness, Shore D	60	59	-	ISO 868
Carbon Black Content	2 - 2.5	2 - 2.5	%	ASTM D 1603
Carbon Black Dispersion	≤ Grade 3	≤ Grade 3	-	ISO 18553
Brittleness Temperature	< - 70	< - 70	°C	ASTM D 746
ESCR (10% Lgepal), F50	>10000	>10000	h	ASTM D 1693-A
Thermal Stability (210 °C)	>20	>20	min	EN 728
Total Volatiles	≤ 350	≤ 350	mg/kg	EN 12009
Water Content	≤ 300	≤ 300	mg/kg	EN 12118
Coeffecient of Linear Thermal Expansion	2.0 x 10 <sup>-4</sup>	2.0 x 10 <sup>-4</sup>	mm/mm/°C	ASTM D 696
Thermal Conductivity	0.41	0.41	W/km	DIN 52612

### MINIMUM REQUIRED STRENGTH: MRS

Material Designation	MRS Mpa
PE 100	10.0
PE 80	8.0
PE 63	6.3

### WATER QUALITY

Our HDPE pipes are suitable for drinking water. Due to the high quality of our HDPE pipes. It has no effect on water taste, odor, appearance of water and growth of aquatic micro-organisms.

### UV RESISTANCE

HDPE 80 and HDPE 100 materials are compounded with special additional including UV stabilizers, which protect the pipe from degradation caused by intensive ultra violet light. For specific applications, such as pipework above the ground, where it is known that the pipe will be subjected to UV light, the material can be compounded with carbon black which provides additional long-term protection.

## CHEMICAL RESISTANCE:

Our HDPE pipes are generally resistant to the chemicals commonly used for water treatment and disinfection. Our HDPE pipes have excellent resistance to naturally occurring chemicals found in the soil. For industrial purposes our HDPE 100 pipes have excellent resistance to different media.

*Maximum Operating Temperature for PE 100 in different media:*

Medium		Maximum operating temperature °C PE 100
<b>Sulphuric Acid</b>	<b>30%</b>	<b>60</b>
<b>Hydrochloric Acid</b>	<b>20%</b>	<b>60</b>
<b>Phosphoric Acid</b>	<b>85%</b>	<b>60</b>
<b>Nitric Acid</b>	<b>30%</b>	<b>40</b>
<b>Chromic Acid</b>	<b>20%</b>	<b>20</b>
<b>Hydrofluoric Acid</b>	<b>40%</b>	<b>40</b>
<b>Formic Acid</b>	<b>50%</b>	<b>40</b>
<b>Caustic Soda Solution</b>	<b>30%</b>	<b>60</b>
<b>Acetone</b>	<b>Technical Grade</b>	<b>40</b>
<b>Ethanol</b>	<b>96%</b>	<b>60</b>

## DESIGN

### LIFETIME:

HDPE Material has a 50 year life time at 20 °C, but for example PE 100 has actual strength greater than the design strength and hence the expected resulting service lifetimes are greatly in excess of the nominal 50-year requirement when the pipe is operating within its design envelope.

*Allowable Working Pressure for Pipes Made of PE 100, Conveying water*

Temperature °C	Years of service	Pipe series (S)						
		20	12.5	8.3	8	6.3	5	4
		Standard dimension ratio (SDR)						
		41	26	17.6	17	13.6	11	9
		Allowable working pressure (Bar)						
10	5	5.0	7.9	11.9	12.5	15.8	19.9	25.1
	10	4.9	7.7	11.7	12.3	15.5	19.5	24.6
	25	4.8	7.6	11.5	12.0	15.2	19.1	24.1
	50	4.7	7.5	11.3	11.9	15.0	18.9	23.8
	100	4.6	7.3	11.1	11.7	14.7	18.5	23.3
20	5	4.2	6.6	10.0	10.5	13.3	16.7	21.0
	10	4.1	6.5	9.9	10.4	13.1	16.5	20.8
	25	4.0	6.4	9.7	10.1	12.8	16.1	20.3
	50	4.0	6.3	9.6	10.0	12.5	16.0	20.0
	100	3.9	6.1	9.4	9.8	12.3	15.5	19.5
30	5	3.5	5.6	8.5	8.9	11.2	14.1	17.8
	10	3.5	5.5	8.3	8.8	11.0	13.9	17.5
	25	3.4	5.4	8.2	8.6	10.9	13.7	17.3
	50	3.4	5.4	8.1	8.5	10.7	13.5	17.0
	100	3.3	5.3	8.0	8.4	10.6	13.4	16.8
40	5	3.0	4.8	7.3	7.6	9.6	12.1	15.3
	10	3.0	4.7	7.1	7.5	9.5	11.9	15.0
	25	2.9	4.6	7.0	7.4	9.3	11.7	14.8
	50	2.9	4.6	6.9	7.3	9.1	11.5	14.5
	100	2.8	4.5	6.8	7.2	9.0	11.4	14.3
50	5	2.6	4.2	6.3	6.6	8.3	10.5	13.3
	10	2.6	4.1	6.2	6.5	8.2	10.3	13.0
	15	2.6	4.1	6.2	6.5	8.2	10.3	13.0
60	5	2.3	3.6	5.5	5.7	7.2	9.1	11.5
70	2	2.1	3.3	5.0	5.2	6.6	8.3	10.5

**Safety factor C = 1.25**  
Reference DIN 8074: 2011-12

Allowable Working Pressure for Pipes Made of PE80, (S) Conveying Water

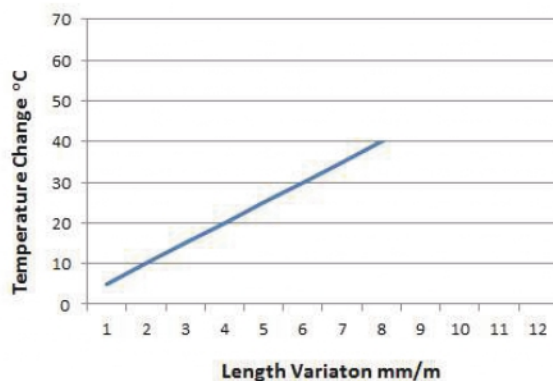
Temperature °C	Years of service	Pipe series (S)										
		25	20	16	12,5	10,5	10	8,3	8	6,3	5	4
		Standar Dimension Ratio (SDR)										
		51	41	33	26	22	21	17,6	17	13,6	11	9
Allowable Working Pressure (bar)												
10	5	3.2	4.0	5.1	6.4	7.7	8.1	9.7	10.1	12.8	16.1	20.3
	10	3.1	4.0	5.0	6.3	7.6	8.0	9.5	10.0	12.6	15.9	20.0
	25	3.1	3.9	4.9	6.1	7.4	7.8	9.3	9.8	12.3	15.5	19.5
	50	3.0	3.8	4.7	6.0	7.2	7.6	9.1	9.5	12.0	15.1	19.0
	100	2.9	3.7	4.7	5.9	7.2	7.5	8.9	9.4	11.8	14.9	18.8
20	5	2.7	3.4	4.2	5.4	6.5	6.8	8.1	8.5	10.7	13.5	17.0
	10	2.6	3.3	4.1	5.2	6.3	6.6	7.9	8.3	10.4	13.1	16.5
	25	2.5	3.2	4.1	5.1	6.2	6.5	7.7	8.1	10.3	12.9	16.3
	50	2.5	3.2	4.0	5.0	6.0	6.4	7.4	8.0	10.0	12.5	16.0
	100	2.4	3.1	3.9	4.9	5.9	6.2	7.4	7.8	9.8	12.3	15.5
30	5	2.2	2.8	3.5	4.5	5.4	5.7	6.8	7.1	9.0	11.3	14.3
	10	2.2	2.8	3.5	4.4	5.3	5.6	6.7	7.0	8.8	11.1	14.0
	25	2.1	2.7	3.4	4.3	5.2	5.5	6.5	6.9	8.7	10.9	13.8
	50	2.1	2.7	3.4	4.2	5.1	5.4	6.4	6.7	8.5	10.7	13.5
40	5	1.9	2.4	3.0	3.8	4.7	4.9	5.8	6.1	7.7	9.7	12.3
	10	1.9	2.4	3.0	3.8	4.6	4.8	5.7	6.0	7.6	9.5	12.0
	25	1.8	2.3	2.9	3.7	4.5	4.7	5.6	5.9	7.4	9.3	11.8
	50	1.8	2.3	2.9	3.6	4.4	4.6	5.5	5.7	7.2	9.1	11.5
50	5	1.6	2.1	2.6	3.3	4.0	4.2	5.0	5.2	6.6	8.3	10.5
	10	1.6	2.0	2.5	3.2	3.9	4.1	4.9	5.1	6.4	8.1	10.2
	15	1.6	2.0	2.5	3.2	3.9	4.1	4.9	5.1	6.4	8.1	10.2
60	5	1.4	1.8	2.3	2.9	3.5	3.7	4.4	4.6	5.8	7.3	9.2
70	2	1.3	1.6	2.0	2.6	3.1	3.3	3.9	4.1	5.2	6.5	8.2

Safety factor C = 1.25  
Reference DIN 8074: 2011-12

### HDPE pipe length variation due to temperature change (°C)

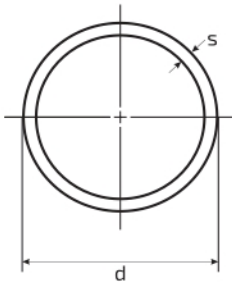
Temperature Change (°C)	Length Variation mm/meter
5	1
10	2
15	3
20	4
25	5
30	6
35	7
40	8

mm/m/ °C 0.2 = Coefficient of thermal expansion



## PRESSURE

Maximum Sustained Temperature, (°C)	Multiply working pressure at (20 °C) by these factors
<b>20</b>	<b>1</b>
<b>25</b>	<b>0.92</b>
<b>30</b>	<b>0.84</b>
<b>35</b>	<b>0.78</b>
<b>40</b>	<b>0.72</b>



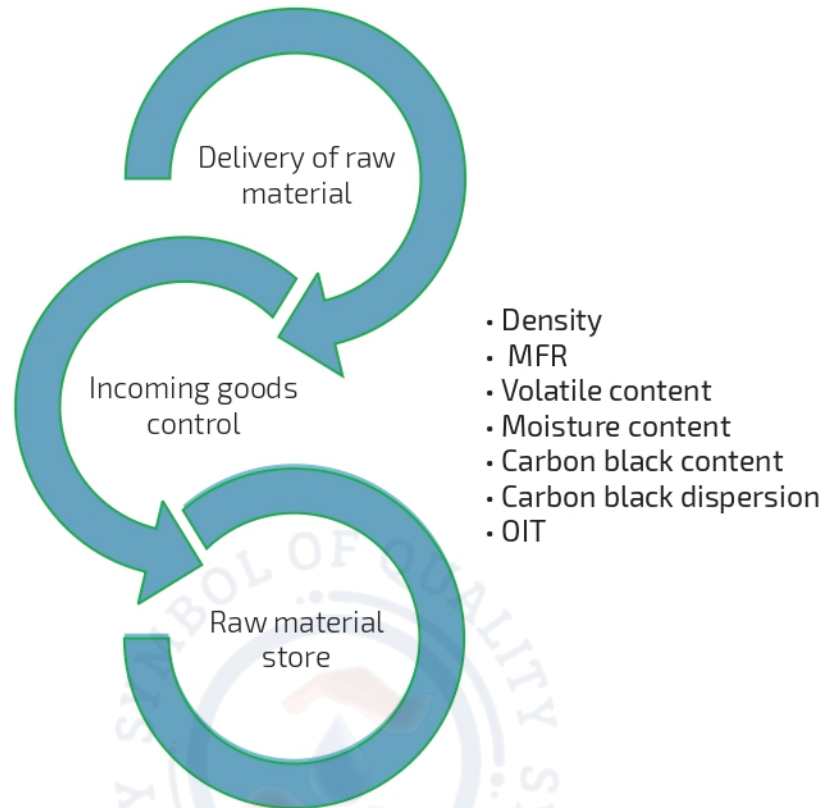
Maximum operating pressure (MOP) =  $\frac{20 \times MRS}{C \times (SDR-1)}$  where C is design safety factor

## STANDARD DIMENSION: SDR

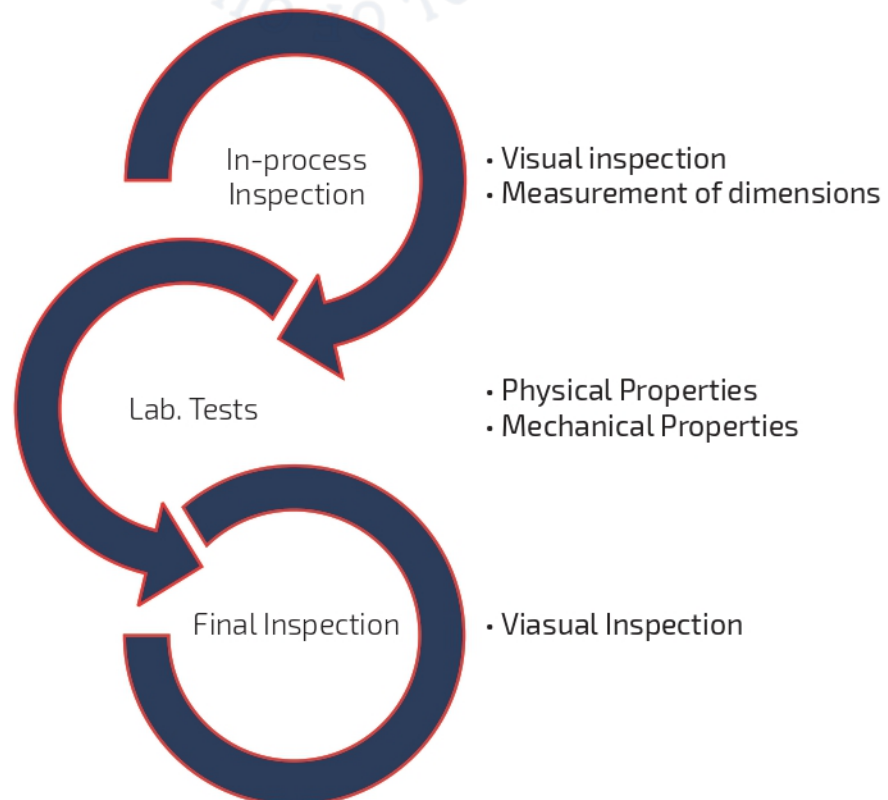
Relationship between the admissible nominal pressure PN, SDR and Performance classes PE 80, PE 100 (for water 20 °C, 50 years service Life and C = 1.25).

Nominal Pressure PN (Bar)	SDR PE 80	SDR PE 100
<b>3.2</b>	<b>41</b>	-
<b>4</b>	<b>33</b>	<b>41</b>
<b>5</b>	<b>26</b>	<b>33</b>
<b>6</b>	<b>22</b>	-
<b>6.3</b>	<b>21</b>	<b>26</b>
<b>8</b>	<b>17</b>	<b>21</b>
<b>10</b>	<b>13.6</b>	<b>17</b>
<b>12.5</b>	<b>11</b>	<b>13.6</b>
<b>16</b>	<b>9</b>	<b>11</b>
<b>20</b>	<b>7.4</b>	<b>9</b>
<b>25</b>	<b>6</b>	<b>7.4</b>

## Raw Material Inspection Process



## Final Product Inspection Process





**Quality Control:**



AL-RAJHI PIPES facilities are equipped with latest tools and technologies which can handle all the related processes of strict quality control which are routinely conducted throughout the production process from the inspection of raw materials to the finished goods. Rigorous quality control procedures are carried throughout the manufacturing process from bringing in the raw material to the delivery & storage of finish products.

Apart from the manufacturing process, AL-RAJHI PIPES also provides on-site engineering, technical and installation assistance.

**Quality Control Procedure:**



- 1 Raw Materials
- 2 Production
- 3 In-process Inspection
- 4 Final Inspection
- 5 Storage, Packaging & Dispatch

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Quality Control:



HYDROSTATIC STRENGTH TEST



DENSITY/ SPECIFIC GRAVITY



VICAT SOFTENING TEMPERATURE



DISPERSION OF CARBON BLACK



MELT MASS FLOW RATE TEST



LONGITUDINAL REVERSION / EFFECTS OF HEATING



Quality Control:



THERMAL STABILITY OIT TEST



IMPACT STRENGTH



WALL THICKNESS / OUTSIDE  
DIA MEASUREMENT



TENSILE STRENGTH



## Physical Properties of HDPE:

Characteristics	Units	PE 80	PE 100	Test Standards
Density	gm/cm <sup>3</sup>	≥ 0.93	≥ 0.95	BS EN ISO 1183
Minimum Required Strength (MRS)	MPa	8	10	BS EN ISO 1167
Design Stress	MPa	6.4	8	BS EN ISO 1167
Tensile Strength At Yield	N/mm <sup>2</sup>	18 - 23	23 - 25	BS EN ISO 527
Flexural Modulus (Bend Creep)	N/mm <sup>2</sup>	650 - 850	1000 - 1200	BS EN ISO 527
Elongation At Break	%	> 60	> 60	ISO 527
Crystallite Melt Range	°C	128 - 132	128 - 132	DIN 53736
Surface Resistance	Ohm	10 <sup>13</sup>	> 10 <sup>14</sup>	ASTM D 257, DIN IEC 167
Coefficient Of Linear Expansion	mm/m*k	0.2	0.13	DIN 53752
Heat Conductivity At 20 °C	W/m*K	0.43	0.38	BS EN 12664, DIN 52612
Impact Strength At 23 °C	Kj/m <sup>2</sup>	110	83	BS EN ISO 179
Brittleness Temperature	°C	< -70	< -70	ASTM D746
Shore Hardness	D	65	62	ISO 868
Melt Flow Rate (Melt Flow Index - Mfi) g/10min		0.2 - 1.4	0.2 - 1.4	ISO 1133
Water Absorption	%	0.01 - 0.04	0.01 - 0.04	BS EN ISO 62, DIN 53495



### Minimum Required Strength (MRS):

Polyethylene pipes and fittings materials are evaluated on the basis of their Minimum Required Strength.

When PE 100 pipes are hydro-statically tested at 20°C, ISO 1167 specify a Minimum Required Strength at 50 years of 10 Mpa (100bar) - MRS100.

When PE 80 pipes are hydro-statically tested at 20°C, ISO 1167 specify a Minimum Required Strength at 50 years of 8 Mpa (80bar) - MRS80.

The MRS value for PE 100 compound is 10MPa. PE 100 pipe has enhanced toughness, higher permissible design strength and improved resistance to rapid crack propagation in addition to benefits in efficiency and economy. This allows the design engineers to use PE 100 pipes at substantially higher operating pressures than PE 80 pipes with equivalent SDR rating i.e. allows PE 100 pipes to be produced with thinner walls than PE 80 pipes of equivalent SDR rating.

NOTE: Drawings are for illustration purpose only.

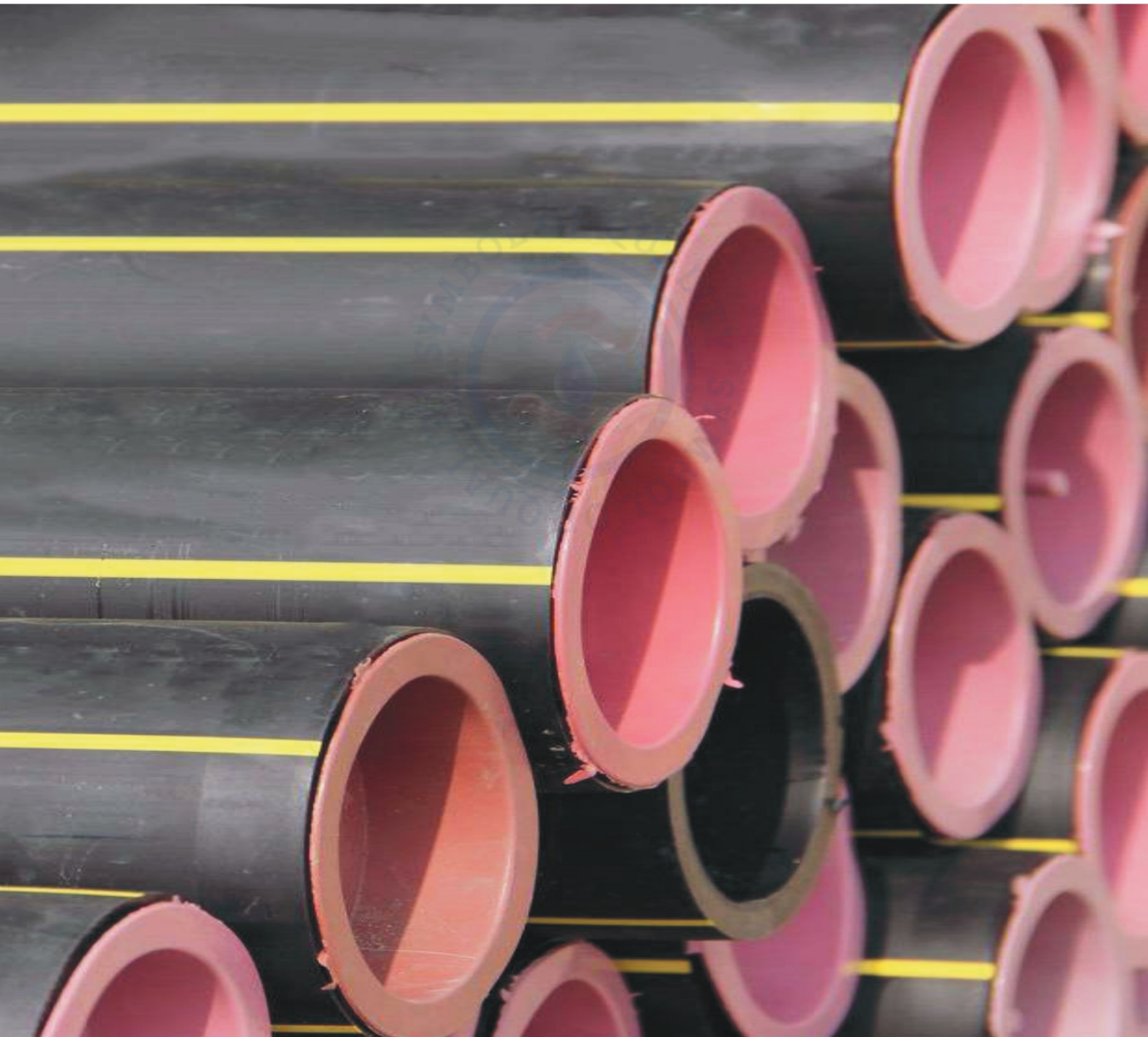
# HDPE Gas Line

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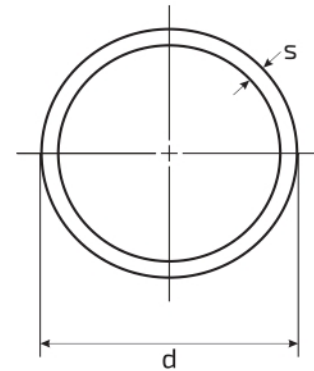
**HDPE PIPES FOR GAS**



## PE 100 and PE 80 pipes for the transportation of GASEOUS FUELS according to ISO 4437

Nominal Outside Diameter (mm)	SDR 17.6 PE 100 PN 6 PE 80 PN 4.8		SDR 11 PE 100 PN 10 PE 80 PN 8	
	Minimum Wall Thickness (mm)	Weight (kg/m)	Minimum Wall Thickness (mm)	Weight (kg/m)
<b>16</b>	<b>2.3</b>	<b>0.10</b>	<b>3.0</b>	<b>0.12</b>
<b>20</b>	<b>2.3</b>	<b>0.13</b>	<b>3.0</b>	<b>0.16</b>
<b>25</b>	<b>2.3</b>	<b>0.17</b>	<b>3.0</b>	<b>0.21</b>
<b>32</b>	<b>2.3</b>	<b>0.22</b>	<b>3.0</b>	<b>0.28</b>
<b>40</b>	<b>2.3</b>	<b>0.36</b>	<b>3.7</b>	<b>0.43</b>
<b>50</b>	<b>2.9</b>	<b>0.46</b>	<b>4.6</b>	<b>0.67</b>
<b>63</b>	<b>3.6</b>	<b>0.69</b>	<b>5.8</b>	<b>1.06</b>
<b>75</b>	<b>4.3</b>	<b>0.98</b>	<b>6.8</b>	<b>1.50</b>
<b>90</b>	<b>5.2</b>	<b>1.40</b>	<b>8.2</b>	<b>2.14</b>
<b>110</b>	<b>6.3</b>	<b>2.09</b>	<b>10.0</b>	<b>3.17</b>
<b>125</b>	<b>7.1</b>	<b>2.68</b>	<b>11.4</b>	<b>4.10</b>
<b>140</b>	<b>8.0</b>	<b>3.36</b>	<b>12.7</b>	<b>5.15</b>
<b>160</b>	<b>9.1</b>	<b>4.38</b>	<b>14.6</b>	<b>6.71</b>
<b>180</b>	<b>10.3</b>	<b>5.51</b>	<b>16.4</b>	<b>8.47</b>
<b>200</b>	<b>11.4</b>	<b>6.83</b>	<b>18.2</b>	<b>10.45</b>
<b>225</b>	<b>12.8</b>	<b>8.60</b>	<b>20.5</b>	<b>13.22</b>
<b>250</b>	<b>14.2</b>	<b>10.62</b>	<b>22.7</b>	<b>16.31</b>
<b>280</b>	<b>15.9</b>	<b>13.27</b>	<b>25.4</b>	<b>20.44</b>
<b>315</b>	<b>17.9</b>	<b>16.80</b>	<b>28.6</b>	<b>25.86</b>
<b>355</b>	<b>20.2</b>	<b>21.29</b>	<b>32.3</b>	<b>32.80</b>
<b>400</b>	<b>22.8</b>	<b>27.03</b>	<b>36.4</b>	<b>41.63</b>
<b>450</b>	<b>25.6</b>	<b>34.16</b>	<b>40.9</b>	<b>52.69</b>
<b>500</b>	<b>28.4</b>	<b>42.12</b>	<b>45.5</b>	<b>64.95</b>
<b>560</b>	<b>31.9</b>	<b>53.10</b>	<b>50.9</b>	<b>81.55</b>
<b>630</b>	<b>35.8</b>	<b>67.20</b>	<b>57.3</b>	<b>102.90</b>

- Material : PE 100
- Minimum required strength : MRS = 10.0 MPa
- Design stress :  $\sigma_s = 5.0$  Mpa
- Design safety factor : C = 2.0 for gas
- Material : PE 80
- Minimum required strength : MRS = 8.0 Mpa
- Design stress :  $\sigma_s = 4.0$  Mpa
- Design safety factor : C = 2.0 for gas
- Color : Black or Yellow
- Length : Sizes from 16mm to 32mm are available in coils of 100, 200 and 300 up to 1500 meters. Sizes from 40mm to 125mm are available in coils of 100 meters. Larger diameters are available in straight lengths of 12 meters. Different lengths can be supplied on request.



$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$

# HDPE Water Line



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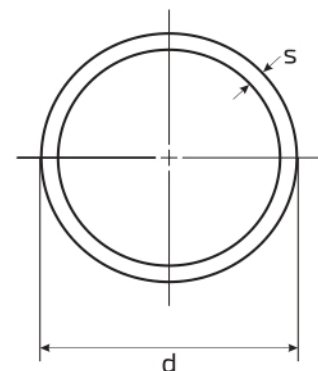
**HDPE PIPES FOR  
WATER**



## PE 100, PE 80 pressure pipes for water supply according to ISO 4427-2

Nominal Outside Diameter (mm)	SDR 41	SDR 26	SDR 17	SDR 13.6	SDR 11	SDR 9
	S 20	S 12.5	S 8	S 6.3	S 5	S 4
	Nominal pressure (PN)					
PE 80	PN 3.2	PN 5	PN 8	PN 10	PN 12.5	PN 16
PE 100	PN 4	PN 6	PN 10	PN 12.5	PN 16	PN 20
Nominal Outside Diameter (mm)	Wall Thickness (mm)	Wall Thickness (mm)	Wall Thickness (mm)	Wall Thickness (mm)	Wall Thickness (mm)	Wall Thickness (mm)
16	-	-	-	-	-	2.0
20	-	-	-	-	2.0	2.3
25	-	-	-	2.0	2.3	3.0
32	-	-	2.0	2.4	3.0	3.6
40	-	-	2.4	3.0	3.7	4.5
50	-	2.0	3.0	3.7	4.6	5.6
63	-	2.5	3.8	4.7	5.8	7.1
75	-	2.9	4.5	5.6	6.8	8.4
90	-	3.5	5.4	6.7	8.2	10.1
110	-	4.2	6.6	8.1	10.0	12.3
125	-	4.8	7.4	9.2	11.4	14.0
140	-	5.4	8.3	10.3	12.7	15.7
160	-	6.2	9.5	11.8	14.6	17.9
180	-	6.9	10.7	13.3	16.4	20.1
200	-	7.7	11.9	14.7	18.2	22.4
225	-	8.6	13.4	16.6	20.5	25.2
250	-	9.6	14.8	18.4	22.7	27.9
280	-	10.7	16.6	20.6	25.4	31.3
315	7.7	12.1	18.7	23.2	28.6	35.2
355	3.5	13.6	21.1	26.1	32.2	39.7
400	9.8	15.3	23.7	29.4	36.3	44.7
450	11.0	17.2	26.7	33.1	40.9	50.3
500	12.3	19.1	29.7	36.8	45.4	55.8
560	13.7	21.4	33.2	41.2	50.8	62.5
630	15.4	24.1	37.4	46.3	57.2	70.3
710	17.4	27.2	42.1	52.2	64.5	79.3
800	19.6	30.6	47.4	58.8	72.6	89.3
900	22.0	34.4	53.3	66.2	81.7	-
1000	24.5	38.2	59.3	72.5	90.2	-
1200	29.4	45.9	67.9	88.2	-	-
1400	34.3	53.5	82.4	102.9	-	-
1600	39.2	61.2	94.1	117.6	-	-

Material	:	PE 100	PE 80
Minimum required strength	:	MRS = 10.0 Mpa	MRS = 8.0 Mpa
Design stress	:	$\sigma_s = 8.0$ Mpa	$\sigma_s = 6.4$ Mpa
Design safety factor	:	C = 1.25 for water	C = 1.25 for water
Color	:	Black	Black
Length	:	sizes from 16mm to 32mm are available in coils of 100, 200 and 300 up to 1500 meters. Sizes from 40mm to 160mm are available in coils of 100 meters. larger diameters are available in straight lengths of 12 meters. Different lengths can be supplied on request.	



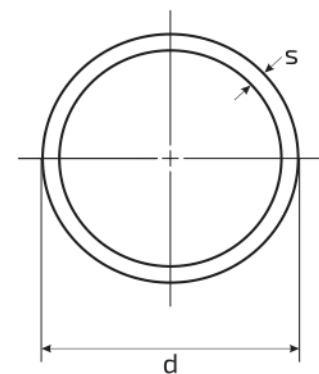
$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$



PE 100 pressure pipes for water supply according to DIN 8074/8075

Nominal Outside Diameter (mm)	SDR 41 S 20 PN 4		SDR 26 S 12.5 PN 6.3		SDR 17 S 8 PN 10		SDR 13.6 S 6.3 PN 12.5		SDR 11 S 5 PN 16		SDR 9 S 4 PN 20	
	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m
16	-	-	-	-	-	-	-	-	-	-	2.0	0.092
20	-	-	-	-	-	-	-	-	2.0	0.118	2.3	0.134
25	-	-	-	-	-	-	2.0	0.151	2.3	0.173	3.0	0.202
32	-	-	-	-	2.0	0.198	2.4	0.235	3.0	0.282	3.6	0.331
40	-	-	1.8	0.229	2.4	0.299	3.0	0.360	3.7	0.434	4.5	0.514
50	-	-	2.0	0.317	3.0	0.458	3.7	0.555	4.6	0.673	5.6	0.796
63	1.8	0.368	2.5	0.500	3.8	0.728	4.7	0.883	5.8	1.06	7.1	1.27
75	1.9	0.462	2.9	0.683	4.5	1.03	5.6	1.25	6.8	1.48	8.4	1.78
90	2.2	0.647	3.5	0.988	5.4	1.47	6.7	1.79	8.2	2.14	10.1	2.57
110	2.7	0.952	4.2	1.45	6.6	2.19	8.1	2.64	10.0	3.18	12.3	3.82
125	3.1	1.25	4.8	1.86	7.4	2.79	9.2	3.40	11.4	4.12	14.0	4.92
140	3.5	1.56	5.4	2.35	8.3	3.50	10.3	4.26	12.7	5.13	15.7	6.18
160	4.0	2.02	6.2	3.08	9.5	4.57	11.8	5.56	14.6	6.74	17.9	8.04
180	4.4	2.51	6.9	3.83	10.7	5.77	13.3	7.05	16.4	8.51	20.1	10.2
200	4.9	3.08	7.7	4.74	11.9	7.12	14.7	8.65	18.2	10.5	22.4	12.6
225	5.5	3.90	8.6	5.96	13.4	9.03	16.6	11.0	20.5	13.3	25.2	15.9
250	6.2	4.88	9.6	7.38	14.8	11.1	18.4	13.5	22.7	16.3	27.9	19.6
280	6.9	6.04	10.7	9.20	16.6	13.9	20.6	16.9	25.4	20.5	31.3	24.6
315	7.7	7.59	12.1	11.7	18.7	17.6	23.2	21.5	28.6	25.9	35.2	31.1
355	8.7	9.65	13.6	14.8	21.1	22.4	26.1	27.2	32.2	32.9	39.7	39.5
400	9.8	12.2	15.3	18.8	23.7	28.3	29.4	34.5	36.3	41.7	44.7	50.1
450	11.0	15.4	17.2	23.7	26.7	35.8	33.1	43.7	40.9	52.8	50.3	63.4
500	12.3	19.2	19.1	29.2	29.7	44.2	36.8	53.9	45.4	65.2	55.8	78.1
560	13.7	23.9	21.4	36.6	33.2	55.4	41.2	67.6	50.8	81.7	62.5	98.0
630	15.4	30.2	24.1	46.4	37.4	70.2	46.3	85.5	57.2	103	-	-
710	17.4	38.4	27.2	59.0	42.1	89.0	52.2	109	64.5	131	-	-
800	19.6	48.7	30.6	74.7	47.4	113	58.8	138	-	-	-	-
900	22.0	31.3	34.4	94.4	53.3	143	66.1	174	-	-	-	-
1000	24.5	75.9	38.2	117	59.3	176	-	-	-	-	-	-
1200	29.4	109	45.9	168	-	-	-	-	-	-	-	-
1400	34.3	149	53.5	230	-	-	-	-	-	-	-	-
1600	39.2	194	61.2	298	-	-	-	-	-	-	-	-

- Material : PE 100
- Minimum required strength: : MRS = 10.0 Mpa
- Design stress :  $\sigma_s = 8.0$  Mpa
- Design safety factor : C = 1.25 for water
- Color : Black
- Length : sizes from 16mm to 32mm are available in coils of 100, 200 and 300 up to 1500 meters. Sizes from 40mm to 125mm are available in coils of 100 meters. Larger diameters are available in straight lengths of 12 meters. Different lengths can be supplied on request.



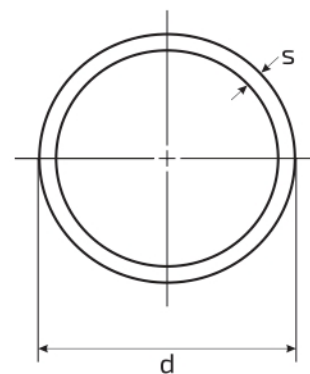
$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$



PE 100 pressure pipes for water supply according to DIN 8074/8075

Nominal Outside Diameter (mm)	SDR 41 S 20 PN 3.2		SDR 33 S 16 PN 4		SDR 13.6 S 6.3 PN 9.9		SDR 11 S 5 PN 12.5		SDR 9 S 4 PN 15.6		SDR 7.4 S 3.2 PN 19.2	
	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m
16	-	-	-	-	-	-	-	-	2.0	0.092	2.3	0.103
20	-	-	-	-	-	-	2.0	0.118	2.3	0.134	3.0	0.164
25	-	-	-	-	2.0	0.151	2.3	0.173	3.0	0.202	3.5	0.243
32	-	-	-	-	2.4	0.235	3.0	0.282	3.6	0.331	4.4	0.390
40	-	-	-	-	3.0	0.360	3.7	0.434	4.5	0.514	5.5	0.607
50	-	-	1.8	0.290	3.7	0.555	4.6	0.673	5.6	0.796	6.9	0.945
63	1.8	0.368	2.0	0.403	4.7	0.883	5.8	1.06	7.1	1.27	8.6	1.49
75	1.9	0.462	2.3	0.557	5.6	1.25	6.8	1.48	8.4	1.78	10.3	2.12
90	2.2	0.647	2.8	0.800	6.7	1.79	8.2	2.14	10.1	2.57	12.3	3.03
110	2.7	0.952	3.4	1.19	8.1	2.64	10.0	3.18	12.3	3.82	15.1	4.54
125	3.1	1.25	3.9	1.53	9.2	3.4	11.4	4.12	14.0	4.92	17.1	5.84
140	3.5	1.56	4.3	1.09	10.3	4.26	12.7	5.13	15.7	6.18	19.2	7.33
160	4.0	2.02	4.9	2.45	11.8	5.56	14.6	6.74	17.9	8.04	21.9	9.54
180	4.4	2.51	5.5	3.10	13.3	7.05	16.4	8.51	20.1	10.2	24.6	12.1
200	4.9	3.08	6.2	3.88	14.7	8.65	18.2	10.5	22.4	12.6	27.4	14.9
225	5.5	3.90	6.9	4.82	16.6	11.0	20.5	13.3	25.2	15.9	30.8	18.8
250	6.2	4.88	7.7	5.98	18.4	13.5	22.7	16.3	27.9	19.6	34.2	23.3
280	6.9	6.04	8.6	7.47	20.6	16.9	25.4	20.5	31.3	24.6	38.3	29.2
315	7.7	7.59	9.7	9.47	23.2	21.5	28.6	25.9	35.2	31.1	43.1	36.9
355	8.7	9.65	10.9	12.0	26.1	27.2	32.2	32.9	39.7	39.5	48.5	46.8
400	9.8	12.2	12.3	15.2	29.4	34.5	36.3	41.7	44.7	50.1	54.7	59.4
450	11.0	15.4	13.8	19.2	33.1	43.7	40.9	52.8	50.3	63.4	61.5	75.2
500	12.3	19.2	15.3	23.6	36.8	53.9	45.4	65.2	55.8	78.1	68.3	92.8
560	13.7	23.9	17.2	29.7	41.2	67.6	50.8	81.7	62.5	89.0	-	-
630	15.4	30.2	19.3	37.5	46.3	85.5	57.2	103	-	-	-	-
710	17.4	38.4	21.8	47.7	52.2	109	64.5	131	-	-	-	-
800	19.6	48.7	24.5	60.4	58.8	138	-	-	-	-	-	-
900	22.0	61.3	27.6	76.4	66.1	174	-	-	-	-	-	-
1000	24.5	75.9	30.6	94.1	-	-	-	-	-	-	-	-
1200	29.4	109	36.7	135	-	-	-	-	-	-	-	-
1400	34.3	149	42.9	184	-	-	-	-	-	-	-	-
1600	39.2	194	49.0	241	-	-	-	-	-	-	-	-

- Material : PE 100
- Minimum required strength : MRS = 10.0 Mpa
- Design stress :  $\sigma_s = 6.25$  Mpas
- Design safety factor : C = 1.6 for water
- Color : Black
- Length : sizes from 16mm to 32mm are available in coils of 100, 200 and 300 up to 1500 meters. Sizes from 40mm to 125mm are available in coils of 100 meters. Larger diameters are available in straight lengths of 12 meters. Different lengths can be supplied on request.



$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$

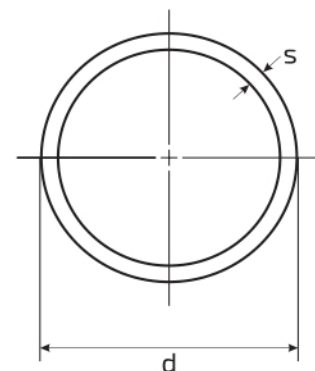




PE 80 pressure pipes for water supply according to DIN 8074/8075

Nominal Outside Diameter (mm)	SDR 41 S 20 PN 4		SDR 33 S 16 PN 4		SDR 22 S 10.5 PN 6		SDR 13.6 S 6.3 PN 10		SDR 11 S 5 PN 12.5		SDR 9 S 4 PN 16	
	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m
16	-	-	-	-	-	-	-	-	-	-	1.8	0.084
20	-	-	-	-	-	-	1.8	0.107	1.9	0.112	2.3	0.133
25	-	-	-	-	-	-	1.9	0.144	2.3	0.171	2.8	0.200
32	-	-	-	-	-	-	2.4	0.232	2.9	0.272	3.6	0.327
40	-	-	-	-	1.9	0.238	3.0	0.356	3.7	0.430	4.5	0.509
50	-	-	1.8	0.287	2.3	0.361	3.7	0.549	4.6	0.666	5.6	0.788
63	1.8	0.364	2.0	0.399	2.9	0.563	4.7	0.873	5.8	1.05	7.1	1.26
75	1.9	0.457	2.3	0.551	3.5	0.807	5.6	1.24	6.8	1.47	8.4	1.76
90	2.2	0.643	2.8	0.791	4.1	1.14	6.7	1.77	8.2	2.12	10.1	2.54
110	2.7	0.943	3.4	1.17	5.0	1.67	8.1	2.62	10.0	3.14	12.3	3.78
125	3.1	1.23	3.9	1.51	5.7	2.16	9.2	3.37	11.4	4.08	14.0	4.87
140	3.5	1.54	4.3	1.88	6.4	2.72	10.3	4.22	12.7	5.08	15.7	6.11
160	4.0	2.0	4.9	2.42	7.3	3.54	11.8	5.50	14.6	6.67	17.9	7.96
180	4.4	2.49	5.5	3.07	8.2	4.47	13.3	6.98	16.4	8.42	20.1	10.1
200	4.9	3.05	6.2	3.84	9.1	5.57	14.7	8.56	18.2	10.4	22.4	12.4
225	5.5	3.86	6.9	4.77	10.3	7.00	16.6	10.9	20.5	13.1	25.2	15.8
250	6.2	4.83	7.7	5.92	11.4	8.59	18.4	13.4	22.7	16.2	27.9	19.4
280	6.9	5.98	8.6	7.40	12.8	10.8	20.6	16.8	25.4	20.3	31.3	24.3
315	7.7	7.52	9.7	9.37	14.4	13.6	23.2	21.2	28.4	25.6	35.2	30.8
355	8.7	9.55	10.9	11.8	16.2	17.3	26.1	26.9	32.2	32.5	39.7	39.1
400	9.8	12.1	12.3	15.1	18.2	21.9	29.4	34.1	36.3	41.3	44.7	49.6
450	11.0	15.3	13.8	19.0	20.5	27.7	33.1	43.2	40.9	52.3	50.3	62.7
500	12.3	19.0	15.3	23.4	22.8	34.2	36.8	53.3	45.4	64.5	55.8	77.3
560	13.7	23.6	17.2	29.4	25.5	42.8	41.2	66.9	50.8	80.8	62.5	97.0
630	15.4	29.9	19.3	37.1	28.7	54.1	46.3	84.6	57.2	102	-	-
710	17.4	38.0	21.8	47.2	32.3	68.7	52.2	107	64.5	130	-	-
800	19.6	48.1	24.5	59.7	36.4	87.2	58.8	136	-	-	-	-
900	22	60.9	27.6	75.6	41	110	66.1	172	-	-	-	-
1000	24.5	75.2	30.6	93.1	45.5	136	-	-	-	-	-	-
1200	29.4	108	36.7	134	54.6	196	-	-	-	-	-	-
1400	34.4	147	42.9	183	63.7	267	-	-	-	-	-	-
1600	39.2	192	49	238	-	-	-	-	-	-	-	-

- Material : PE 80
- Minimum required strength : MRS = 8.0 Mpa
- Design stress :  $\sigma_s = 6.4$  Mpa
- Design safety factor : C = 1.25 for water
- Color : Black
- Length : Sizes from 16mm to 32mm are available in coils of 100, 200 and 300 up to 1500 meters. Sizes from 40mm to 125mm are available in coils of 100 meters. Larger diameters are available in straight lengths of 12 meters. Different lengths can be supplied on request.



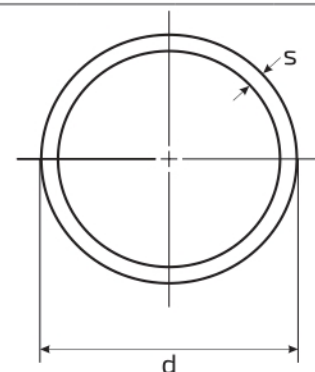
$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$



PE 80 pressure pipes for water supply according to DIN 8074/8075

Nominal Outside Diameter (mm)	SDR 33 S 16 PN 3.1		SDR 26 S 12.5 PN 4		SDR 17.6 S 8.3 PN 6		SDR 11 S 5 PN 10		SDR 9 S 4 PN 12.5		SDR 7.4 S 3.2 PN 15.3	
	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m
16	-	-	-	-	-	-	-	-	1.8	0.084	2.2	0.099
20	-	-	-	-	-	-	1.9	0.112	2.3	0.133	2.8	0.154
25	-	-	-	-	-	-	2.3	0.171	2.8	0.200	3.5	0.240
32	-	-	-	-	1.8	0.179	2.9	0.272	3.6	0.327	4.4	0.386
40	-	-	1.8	0.227	2.3	0.285	3.7	0.430	4.5	0.509	5.5	0.600
50	1.8	0.287	2.0	0.314	2.9	0.440	4.6	0.666	5.6	0.788	6.9	0.936
63	2.0	0.399	2.5	0.494	3.6	0.688	5.8	1.05	7.1	1.26	8.6	1.47
75	2.3	0.551	2.9	0.675	4.3	0.966	6.8	1.47	8.4	1.76	10.3	2.09
90	2.8	0.791	3.5	0.978	5.1	1.39	8.2	2.12	10.1	2.54	12.3	3.0
110	3.4	1.17	4.2	1.43	6.3	2.08	10.0	3.14	12.3	3.78	15.1	4.49
125	3.9	1.51	4.8	1.84	7.1	2.66	11.4	4.08	14.0	4.87	17.1	5.77
140	4.3	1.88	5.4	2.32	8.0	3.34	12.7	5.08	15.7	6.11	19.2	7.25
160	4.9	2.42	6.2	3.04	9.1	4.35	14.6	6.67	17.9	7.96	21.9	9.44
180	5.5	3.07	6.9	3.79	10.2	5.48	16.4	8.42	20.1	10.1	24.6	11.9
200	6.2	3.84	7.7	4.69	11.4	6.79	18.2	10.4	22.4	12.4	27.4	14.8
225	6.9	4.77	8.6	5.89	12.8	8.55	20.5	13.1	25.2	15.8	30.8	18.6
250	7.7	5.92	9.6	7.30	14.2	10.6	22.7	16.2	27.9	19.4	34.2	23.0
280	8.6	7.40	10.7	9.10	15.9	13.2	25.4	20.3	31.3	24.3	38.3	28.9
315	9.7	9.37	12.1	11.6	17.9	16.7	28.6	25.6	35.2	30.8	43.1	36.5
355	10.9	11.8	13.6	14.6	20.1	21.2	32.2	32.5	39.7	39.1	48.5	46.3
400	12.3	15.1	15.3	18.6	22.7	26.9	36.3	41.3	44.7	49.6	54.7	58.8
450	13.8	19.0	17.2	23.5	25.5	34.0	40.9	52.3	50.3	62.7	61.5	74.4
500	15.3	23.4	19.1	28.9	28.4	42.0	45.4	64.5	55.8	77.3	68.3	91.8
560	17.2	29.4	21.4	36.2	31.7	52.5	50.8	80.8	62.5	97.0	-	-
630	19.3	37.1	24.1	45.9	35.7	66.5	57.2	102	-	-	-	-
710	21.8	47.2	27.2	58.4	40.2	84.4	64.5	130	-	-	-	-
800	24.5	59.7	30.6	73.9	45.3	107	-	-	-	-	-	-
900	27.6	75.6	34.4	93.4	51	136	-	-	-	-	-	-
1000	30.6	93.1	38.2	115	56.7	167	-	-	-	-	-	-
1200	36.7	134	45.9	166	68	241	-	-	-	-	-	-
1400	42.9	183	53.5	226	-	-	-	-	-	-	-	-
1600	49	238	61.2	295	-	-	-	-	-	-	-	-

- Material : PE 80
- Minimum required strength : MRS = 8.0 Mpa
- Design stress :  $\sigma_s = 5.0$  Mpa
- Design safety factor : C = 1.6 for water
- Color : Black
- Length : sizes from 16mm to 32mm are available in coils of 100, 200 and 300 up to 1500 meters. Sizes from 40mm to 125mm are available in coils of 100 meters. Larger diameters are available in straight lengths of 12 meters. Different lengths can be supplied on request.

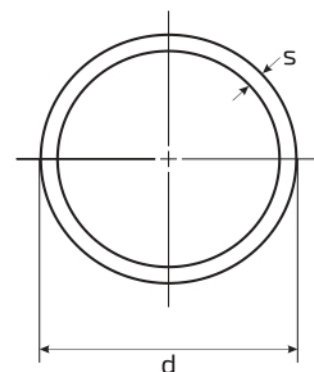


$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$

## PE 63 pressure pipes for water supply according to DIN 8074 8075

Nominal Outside Diameter (mm)	SDR 26 S 12.5 PN 4		SDR 17.6 S 8.3 PN 6		SDR 11 S 5 PN 10		SDR 7.4 S 3.2 PN 15.9	
	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m
16	-	-	-	-	-	-	2.2	0.099
20	-	-	-	-	1.9	0.112	2.8	0.154
25	-	-	-	-	2.3	0.171	3.5	0.240
32	-	-	1.8	0.179	2.9	0.272	4.4	0.386
40	1.8	0.227	2.3	0.285	3.7	0.430	5.5	0.60
50	2.0	0.314	2.9	0.440	4.6	0.666	6.9	0.936
63	2.5	0.494	3.6	0.688	5.8	1.05	8.6	1.47
75	2.9	0.675	4.3	0.976	6.8	1.47	10.3	2.09
90	3.5	0.978	5.1	1.39	8.2	2.12	12.3	3.0
110	4.2	1.43	6.3	2.08	10.0	3.14	15.1	4.49
125	4.8	1.84	7.1	2.66	11.4	4.08	17.1	5.77
140	5.4	2.32	8.0	3.34	12.7	5.08	19.2	7.25
160	6.2	3.04	9.1	4.35	14.6	6.67	21.9	9.44
180	6.9	3.79	10.2	5.48	16.4	8.42	24.6	11.9
200	7.7	4.69	11.4	6.79	18.2	10.4	27.4	14.8
225	8.6	5.89	12.8	8.55	20.5	13.1	30.8	18.6
250	9.6	7.30	14.2	10.6	22.7	16.2	34.2	23.0
280	10.7	9.10	15.9	13.2	25.4	20.3	38.3	28.9
315	12.1	11.6	17.9	16.7	28.6	25.6	43.1	36.5
355	13.6	14.6	20.1	21.2	32.2	32.5	48.5	46.3
400	15.3	18.6	22.7	26.9	36.3	41.3	54.7	58.8
450	17.2	23.5	25.5	34.0	40.9	52.3	61.5	74.4
500	19.1	28.9	28.4	42.0	45.4	64.5	68.3	91.8
560	21.4	36.2	31.7	52.5	50.8	80.8	-	-
630	24.1	45.9	35.7	66.5	57.2	102	-	-
710	27.2	58.4	40.2	84.4	64.5	130	-	-
800	30.6	73.9	45.3	107	-	-	-	-
900	34.4	93.4	51	136	-	-	-	-
1000	38.2	115	56.7	167	-	-	-	-
1200	45.9	166	68	241	-	-	-	-
1400	53.5	226	-	-	-	-	-	-
1600	61.2	295	-	-	-	-	-	-

Material	: PE 63
Minimum required strength	: MRS = 6.3 Mpa
Design stress	: $\sigma_s = 5.04$ Mpa
Design safety factor	: C = 1.25 for water
Color	: Black
Length	: sizes from 16mm to 32mm are available in coils of 100, 200 and 300 up to 1500 meters. Sizes from 40mm to 125mm are available in coils of 100 meters. Larger diameters are available in straight lengths of 12 meters. Different lengths can be supplied on request.



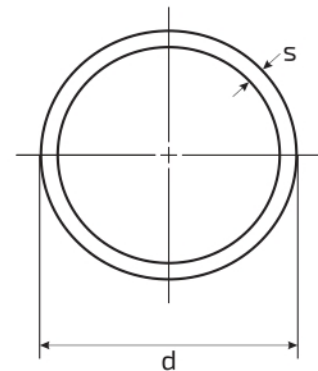
$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$



PE 63 pressure pipes for water supply according to DIN 8074/8075

Nominal Outside Diameter (mm)	SDR 21 S 10 PN 3.9		SDR 13.6 S 6.3 PN 6.2		SDR 9 S 4 PN 9.8		SDR 6 S 2.5 PN 15.7	
	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m
16	-	-	-	-	1.8	0.084	2.7	0.115
20	-	-	1.8	0.107	2.3	0.133	3.4	0.180
25	-	-	1.9	0.144	2.8	0.200	4.2	0.278
32	-	-	2.4	0.232	3.6	0.327	5.4	0.454
40	1.9	0.239	3.0	0.356	4.5	0.509	6.7	0.701
50	2.4	0.374	3.7	0.549	5.6	0.788	8.3	1.09
63	3.0	0.580	4.7	0.873	7.1	1.26	10.5	1.73
75	3.6	0.828	5.6	1.24	8.4	1.76	12.5	2.44
90	4.3	1.18	6.7	1.77	10.1	2.54	15.0	3.51
110	5.3	1.77	8.1	2.62	12.3	3.78	18.3	5.24
125	6.0	2.27	9.2	3.37	14.0	4.87	20.8	6.75
140	6.7	2.83	10.3	4.22	15.7	6.11	23.3	8.47
160	7.7	3.72	11.8	5.50	17.9	7.96	26.6	11.0
180	8.6	4.67	13.3	6.98	20.1	10.1	29.9	14.0
200	9.6	5.78	14.7	8.56	22.4	12.4	33.2	17.2
225	10.8	7.30	16.6	10.9	25.2	15.8	37.4	21.8
250	11.9	8.93	18.4	13.4	27.9	19.4	41.6	27.0
280	13.4	11.3	20.6	16.8	31.3	24.3	46.5	33.8
315	15.0	14.2	23.2	21.2	35.2	30.8	52.3	42.7
355	16.9	18.0	26.1	26.9	39.7	39.1	59.0	54.3
400	19.1	22.9	29.4	34.1	44.7	49.6	66.5	68.9
450	21.5	28.9	33.1	43.2	50.3	62.7	-	-
500	23.9	35.7	36.8	53.3	55.8	77.3	-	-
560	26.7	44.7	41.2	66.9	62.5	97.0	-	-
630	30.0	56.4	46.3	84.6	-	-	-	-
710	33.9	71.8	52.2	107	-	-	-	-
800	38.1	91.1	58.8	136	-	-	-	-
900	42.9	115	66.1	172	-	-	-	-
1000	47.7	142	-	-	-	-	-	-
1200	57.2	205	-	-	-	-	-	-
1400	66.7	278	-	-	-	-	-	-
1600	-	-	-	-	-	-	-	-

- Material : PE 63
- Minimum required strength : MRS = 6.3 Mpa
- Design stress :  $\sigma_s = 3.94$  Mpa
- Design safety factor : C = 1.6 for water
- Color : Black
- Length : sizes from 16mm to 32mm are available in coils of 100, 200 and 300 up to 1500 meters. Sizes from 40mm to 125mm are available in coils of 100 meters. larger diameters are available in straight lengths of 12 meters. Different lengths can be supplied on request.



$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$

## HDPE Pipe Technical Data as per BS EN 1519-1:

What makes AL-RAJHI PIPES HDPE Piping System a great alternative solution?

- ✓ Corrosion & Abrasion resistance
- ✓ Chemical resistance
- ✓ Impact resistance
- ✓ Heat Resistance
- ✓ Low weight, flexible and Easy to install
- ✓ Ideal for prefabrication and recyclable.

### Areas of application

AL-RAJHI PIPES HDPE Drainage Pipe suitable for Laboratories, Factories, Hotels Domestic/Commercial/Industrial buildings.

### Standards

AL-RAJHI PIPES HDPE Drainage pipes are manufactured in accordance with the European standard BS EN 1519-1 which supersedes the German standards DIN 19535-1 and DIN 19535-2.

Dimensions of HDPE drainage pipes according to BS EN 1519-1:

SD-PEPD

Nominal Outside Diameter	Outside Diameter		Wall Thickness S 16		Wall Thickness S 12.5	
	Minimum	Maximum	Minimum	Maximum	Minimum	Maximum
mm	mm	mm	mm	mm	mm	mm
32	32.0	32.0	3.0	3.5	3.0	3.5
40	40.0	40.4	3.0	3.5	3.0	3.5
50	50.0	50.5	3.0	3.5	3.0	3.5
56	56.0	56.5	3.0	3.5	3.0	3.5
63	63.0	63.6	3.0	3.5	3.0	3.5
75	75.0	75.7	3.0	3.5	3.0	3.5
80	80.0	80.9	3.0	3.5	3.1	3.6
90	90.0	90.9	3.0	3.5	3.5	4.1
100	100.0	100.9	3.2	3.8	3.9	4.4
110	110.0	111.0	3.4	4.0	4.2	4.9
125	125.0	126.2	3.9	4.5	4.9	5.5
160	160.0	161.5	4.9	5.6	6.2	7.1
200	200.0	201.8	6.2	7.1	7.7	9.7
250	250.0	252.3	7.7	9.7	9.6	10.8
315	315.0	317.9	9.7	10.9	12.1	13.6



NOTE:

- ▶ Series 16 (S 16) is suitable for application area inside buildings and outside buildings fixed on the wall.
- ▶ Series 12.5 (S 12.5) is suitable for application area under and within 1 metre from the building where the pipes and fittings are buried underground and connected to the soil and waste discharge system of the building.

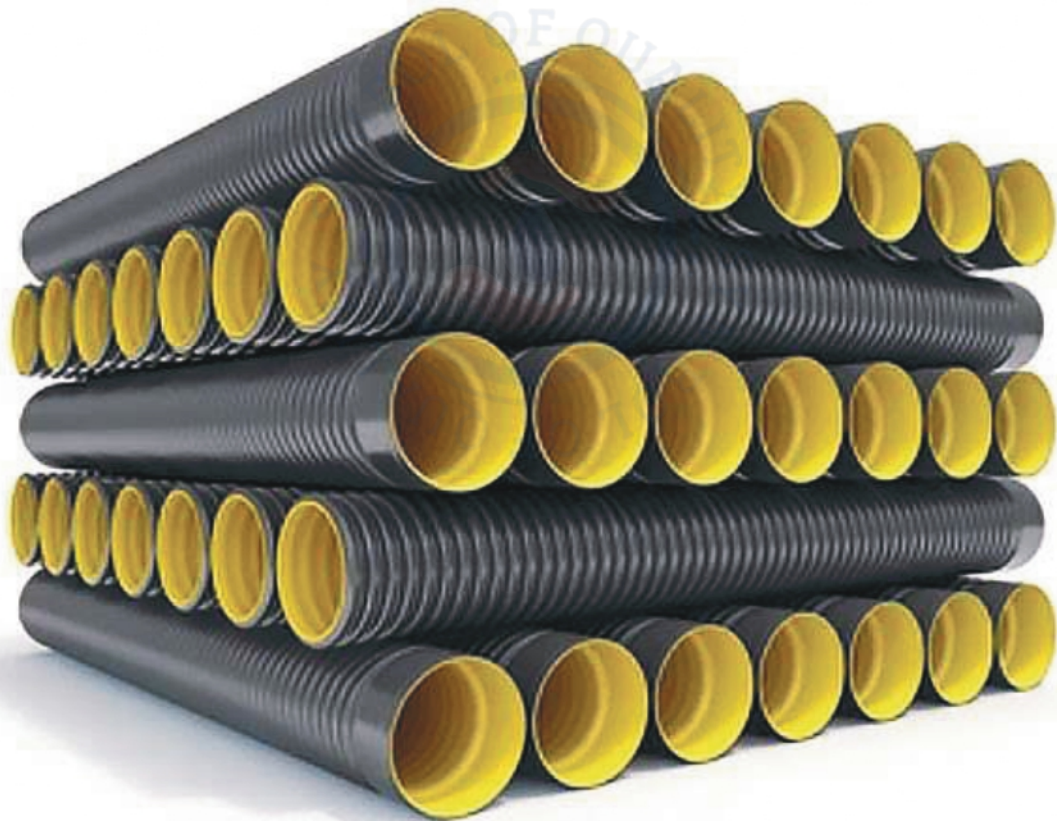
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# HDPE Irrigation Line



الراجحي **AL-RAJHI**

**HDPE PIPES  
FOR IRRIGATION**

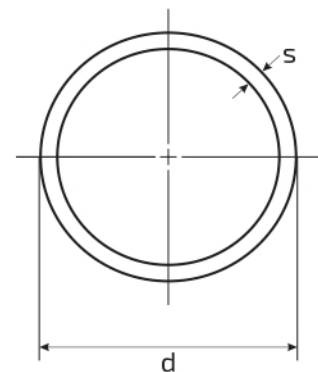




PE 80 pressure pipes irrigation systems according to DIN 8074/8075

Nominal Outside Diameter (mm)	SDR 41 S 20 PN 4		SDR 33 S 16 PN 4		SDR 22 S 10.5 PN 6		SDR 13.6 S 6.3 PN 10		SDR 11 S 5 PN 12.5		SDR 9 S 4 PN 16	
	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m	Wall Thickness (mm)	Weight kg/m
16	-	-	-	-	-	-	-	-	-	-	1.8	0.084
20	-	-	-	-	-	-	1.8	0.107	1.9	0.112	2.3	0.133
25	-	-	-	-	-	-	1.9	0.144	2.3	0.171	2.8	0.200
32	-	-	-	-	-	-	2.4	0.232	2.9	0.272	3.6	0.327
40	-	-	-	-	1.9	0.238	3.0	0.356	3.7	0.430	4.5	0.509
50	-	-	1.8	0.287	2.3	0.361	3.7	0.549	4.6	0.666	5.6	0.788
63	1.8	0.364	2.0	0.399	2.9	0.563	4.7	0.873	5.8	1.05	7.1	1.26
75	1.9	0.457	2.3	0.551	3.5	0.807	5.6	1.24	6.8	1.47	8.4	1.76
90	2.2	0.643	2.8	0.791	4.1	1.14	6.7	1.77	8.2	2.12	10.1	2.54
110	2.7	0.943	3.4	1.17	5.0	1.67	8.1	2.62	10.0	3.14	12.3	3.78
125	3.1	1.23	3.9	1.51	5.7	2.16	9.2	3.37	11.4	4.08	14.0	4.87
140	3.5	1.54	4.3	1.88	6.4	2.72	10.3	4.22	12.7	5.08	15.7	6.11
160	4.0	2.0	4.9	2.42	7.3	3.54	11.8	5.50	14.6	6.67	17.9	7.96
180	4.4	2.49	5.5	3.07	8.2	4.47	13.3	6.98	16.4	8.42	20.1	10.1
200	4.9	3.05	6.2	3.84	9.1	5.57	14.7	8.56	18.2	10.4	22.4	12.4
225	5.5	3.86	6.9	4.77	10.3	7.00	16.6	10.9	20.5	13.1	25.2	15.8
250	6.2	4.83	7.7	5.92	11.4	8.59	18.4	13.4	22.7	16.2	27.9	19.4
280	6.9	5.98	8.6	7.40	12.8	10.8	20.6	16.8	25.4	20.3	31.3	24.3
315	7.7	7.52	9.7	9.37	14.4	13.6	23.2	21.2	28.4	25.6	35.2	30.8
355	8.7	9.55	10.9	11.8	16.2	17.3	26.1	26.9	32.2	32.5	39.7	39.1
400	9.8	12.1	12.3	15.1	18.2	21.9	29.4	34.1	36.3	41.3	44.7	49.6
450	11.0	15.3	13.8	19.0	20.5	27.7	33.1	43.2	40.9	52.3	50.3	62.7
500	12.3	19.0	15.3	23.4	22.8	34.2	36.8	53.3	45.4	64.5	55.8	77.3
560	13.7	23.6	17.2	29.4	25.5	42.8	41.2	66.9	50.8	80.8	62.5	97.0
630	15.4	29.9	19.3	37.1	28.7	54.1	46.3	84.6	57.2	102	-	-
710	17.4	38.0	21.8	47.2	32.3	68.7	52.2	107	64.5	130	-	-
800	19.6	48.1	24.5	59.7	36.4	87.2	58.8	136	-	-	-	-
900	22	60.9	27.6	75.6	41	110	66.1	172	-	-	-	-
1000	24.5	75.2	30.6	93.1	45.5	136	-	-	-	-	-	-
1200	29.4	108	36.7	134	54.6	196	-	-	-	-	-	-
1400	34.4	147	42.9	183	63.7	267	-	-	-	-	-	-
1600	39.2	192	49	238	-	-	-	-	-	-	-	-

- Material : PE 80
- Minimum required strength : MRS = 8.0 Mpa
- Design stress :  $\sigma_s = 6.4$  Mpa
- Design safety factor : C = 1.25 for water
- Color : Black
- Length : Sizes from 16mm to 32mm are available in coils of 100, 200 and 300 up to 1500 meters. Sizes from 40mm to 125mm are available in coils of 100 meters. Larger diameters are available in straight lengths of 12 meters. Different lengths can be supplied on request.



$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$



### HDPE for irrigation systems according to BS 1972

Nominal Size Inch	Outside diameter mm		Wall Thickness mm					
			Class B 6.1 kgf/cm <sup>2</sup>		Class C 9.1 kgf/cm <sup>2</sup>		Class D 12.2 kgf/cm <sup>2</sup>	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
<b>1/2"</b>	<b>21.2</b>	<b>21.5</b>	-	-	<b>2.7</b>	<b>3.0</b>	<b>3.4</b>	<b>3.7</b>
<b>3/4"</b>	<b>26.6</b>	<b>26.9</b>	<b>2.3</b>	<b>2.6</b>	<b>3.4</b>	<b>3.7</b>	<b>4.3</b>	<b>4.7</b>
<b>1"</b>	<b>33.4</b>	<b>33.7</b>	<b>3.0</b>	<b>3.3</b>	<b>4.2</b>	<b>4.6</b>	<b>5.4</b>	<b>5.9</b>
<b>1 1/4"</b>	<b>42.1</b>	<b>42.5</b>	<b>3.7</b>	<b>4.1</b>	<b>5.3</b>	<b>5.8</b>	<b>6.8</b>	<b>7.5</b>
<b>1 1/2"</b>	<b>48.1</b>	<b>48.5</b>	<b>4.3</b>	<b>4.7</b>	<b>6.1</b>	<b>6.7</b>	<b>7.8</b>	<b>8.6</b>
<b>2"</b>	<b>60.1</b>	<b>60.6</b>	<b>5.3</b>	<b>5.8</b>	<b>7.6</b>	<b>8.4</b>	-	-
<b>3"</b>	<b>88.6</b>	<b>89.3</b>	<b>7.8</b>	<b>8.6</b>	<b>11.2</b>	<b>12.3</b>	-	-
<b>4"</b>	<b>113.9</b>	<b>114.7</b>	<b>10.0</b>	<b>11.0</b>	-	-	-	-

Material : LDPE  
 Color : Black  
 Length : sizes from 1/2" to 1" are available in coils of 100, 200 and 300 meters. Sizes from 1 1/4" to 4" are available in coils of 100 meters. Different lengths can be supplied on request.

### HDPE for irrigation systems according to BS 3284

Nominal Size Inch	Outside diameter mm		Wall Thickness mm			
			Class C 9.1 kgf/cm <sup>2</sup>		Class D 12.2 kgf/cm <sup>2</sup>	
	Min.	Max.	Min.	Max.	Min.	Max.
<b>1/2"</b>	<b>21.2</b>	<b>21.5</b>	<b>1.8</b>	<b>2.0</b>	<b>2.3</b>	<b>2.6</b>
<b>3/4"</b>	<b>26.6</b>	<b>26.9</b>	<b>2.3</b>	<b>2.6</b>	<b>2.9</b>	<b>3.2</b>
<b>1"</b>	<b>33.4</b>	<b>33.7</b>	<b>2.8</b>	<b>3.1</b>	<b>3.7</b>	<b>4.1</b>
<b>1 1/4"</b>	<b>42.1</b>	<b>42.5</b>	<b>3.6</b>	<b>4.0</b>	<b>4.6</b>	<b>5.1</b>
<b>1 1/2"</b>	<b>48.1</b>	<b>48.5</b>	<b>4.1</b>	<b>4.5</b>	<b>5.3</b>	<b>5.8</b>
<b>2"</b>	<b>60.1</b>	<b>60.6</b>	<b>5.1</b>	<b>5.6</b>	<b>6.6</b>	<b>7.3</b>
<b>3"</b>	<b>88.6</b>	<b>89.3</b>	<b>7.5</b>	<b>8.2</b>	<b>9.7</b>	<b>10.7</b>
<b>4"</b>	<b>113.9</b>	<b>114.7</b>	<b>9.6</b>	<b>10.6</b>	-	-

Material: : HDPE  
 Color : Black  
 Length : sizes from 1/2" to 1" are available in coils of 100, 200 and 300 meters. Sizes from 1 1/4" to 4" are available in coils of 100 meters. Different lengths can be supplied on request.

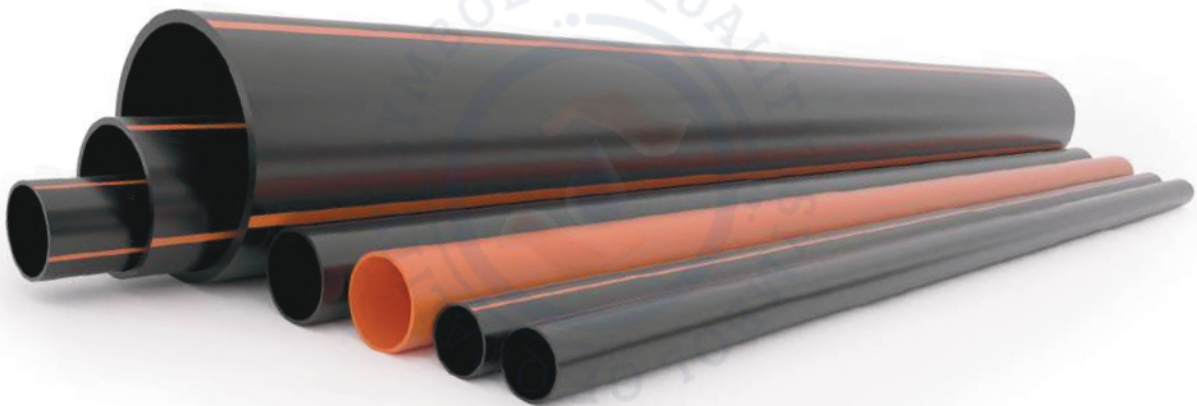


# HDPE TELECOMMUNICATION LINE



الراجحي **AL-RAJHI**

## **AL-RAJHI HDPE TELECOMMUNICATION DUCTS**



HDPE duct solutions for cable management (electrical & telecommunication). A range of ducting products which are available in a variety of materials, diameters and wall construction to offer a 'fit for purpose' product for several ducting applications.

### **Benifits**

- Coloured for easy identification
- Weather durable
- Flexible & Strong
- Easy to install
- Standards Approved
- Products can be manufactured to customers specifications

### **Applications**

Suitable for domestic, commercial and industrial (electrical & telecommunications) installations



## STC HDPE TELECOMMUNICATION DUCT

Nominal Outside Diameter (mm)	Minimum Wall Thickness (mm)	ID (mm)	SDR	Color	Lenght (Mtr)
<b>110</b>	<b>5</b>	<b>100</b>	<b>22</b>	<b>Black with 4 - orange strips</b>	<b>100</b>
<b>50</b>	<b>3</b>	<b>44</b>	<b>17</b>	<b>Black with 4 - orange strips</b>	<b>300 &amp; 500</b>
<b>32</b>	<b>1.9</b>	<b>28.2</b>	<b>17</b>	<b>Black with 4 - orange strips</b>	<b>300 &amp; 500</b>
<b>32</b>	<b>1.9</b>	<b>28.2</b>	<b>17</b>	<b>Full Black</b>	<b>300 &amp; 500</b>
<b>32</b>	<b>1.9</b>	<b>28.2</b>	<b>17</b>	<b>Full orange</b>	<b>300 &amp; 500</b>
<b>20</b>	<b>1.8</b>	<b>16.4</b>	<b>10</b>	<b>Black with 4 - orange strips</b>	<b>600 &amp; 1200</b>
<b>20</b>	<b>1.8</b>	<b>16.4</b>	<b>10</b>	<b>Full Black</b>	<b>600 &amp; 1200</b>

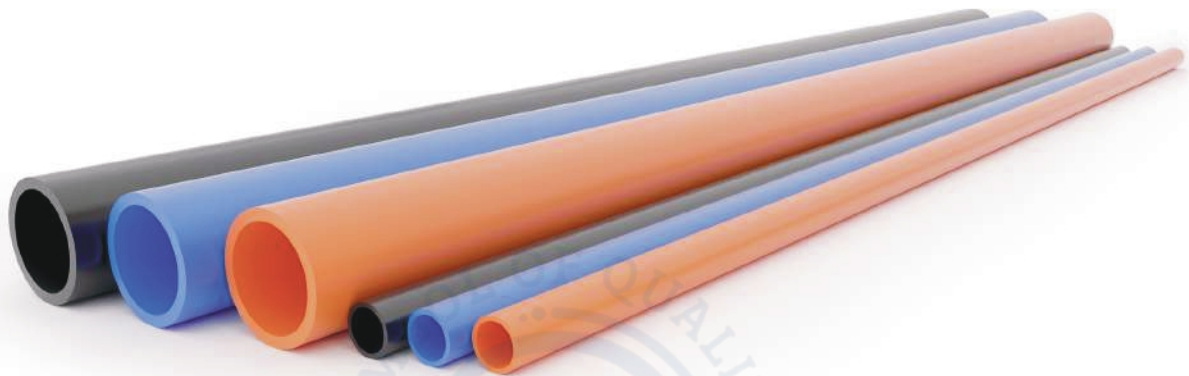
Material : HDPE  
Material Designation : 345440 C/E  
Length : Different lengths can be supplied on request.

## SEC HDPE ELECTRICAL DUCT

Nominal Outside Diameter (mm)	Minimum Wall Thickness (mm)	ID (mm)	SDR	Color	Lenght (Mtr)
<b>50</b>	<b>3</b>	<b>44</b>	<b>17</b>	<b>Black with 4 - green strips</b>	<b>300 &amp; 500</b>

Material : HDPE  
Material Designation : 345440 C/E  
Length : Different lengths can be supplied on request.

## MOBILY / ITC HDPE TELECOMMUNICATION DUCT



Nominal Outside Diameter (mm)	Minimum Wall Thickness (mm)	ID (mm)	SDR	Color	Lenght (Mtr)
<b>50</b>	<b>4.6</b>	<b>40.8</b>	<b>11</b>	<b>Blue</b>	<b>300 &amp; 500</b>
<b>50</b>	<b>4.6</b>	<b>40.8</b>	<b>11</b>	<b>Orange</b>	<b>300 &amp; 500</b>
<b>50</b>	<b>4.6</b>	<b>40.8</b>	<b>11</b>	<b>Black</b>	<b>300 &amp; 500</b>
<b>20</b>	<b>1.9</b>	<b>16.2</b>	<b>11</b>	<b>Blue</b>	<b>600 &amp; 1200</b>
<b>20</b>	<b>1.9</b>	<b>16.2</b>	<b>11</b>	<b>Orange</b>	<b>600 &amp; 1200</b>
<b>20</b>	<b>1.9</b>	<b>16.2</b>	<b>11</b>	<b>Black</b>	<b>600 &amp; 1200</b>

Material : HDPE  
 Material Designation : 345440 C/E  
 Length : Different lengths can be supplied on request.

# HDPE DOUBLE WALL CORRUGATED DUCT

Combination of corrugated exterior and a smooth interior for excellent stiffness in a high-density polyethylene (HDPE Double Wall) duct can be used in a variety electrical and telecommunication applications.

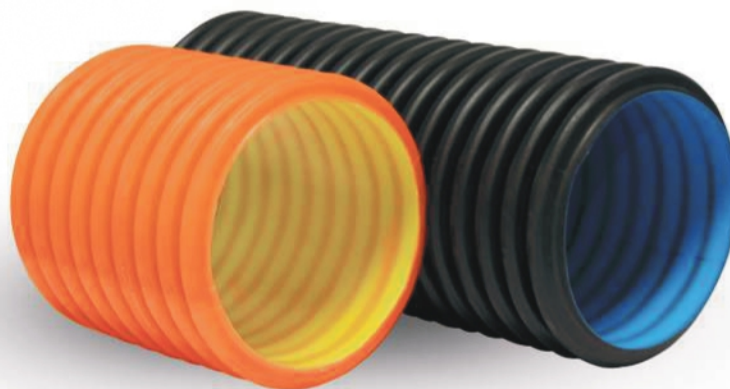
## TECHNICAL FEATURES

- **Construction**  
Corrugated externally and smooth internally.
- **Use**  
Underground protection for telephone and low voltage cables.
- **Minimum Bending Radius**  
8 times the external diameter
- **Packaging**  
Coil of 500 meters with closing cap at both ends of the coil.
- **Accessories**  
Joining coupling already fitted on each coil/bar seals upon request  
Installation In underground trench



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Nominal Outside Diameter (mm)	ID (mm)	Lenght (Mtr)
<b>110</b>	<b>92</b>	<b>500</b>

### Color:

<b>External</b>	Orange	Black	Black	Others
<b>Internal</b>	<b>Yellow</b>	<b>Blue</b>	<b>Green</b>	<b>Others</b>



## HDPE TELECOMMUNICATION CORRUGATED DUCT



Ø 110 mm Empty main duct



Ø 110 mm with 33mm x 5 sub-duct



Ø 110 mm with 42mm x 3 sub-duct

Type	Nominal Outside Diameter (mm)	Minimum Wall Thickness (mm)	ID (mm)	Color	Length (Mtr)
type 1	main duct 110mm	2.5	90	Bright Orange	300 & 500
	5 sub-duct 33mm	2.5	28	4 sub-duct bright orange & 1 sub-duct full black	
type 2	main duct 110mm	2.5	90	Bright Orange	300 & 500
	3 sub-duct 42mm	2.8	36	Bright Orange	
type 3	empty main duct 110mm	2.5	90	Bright Orange	300 & 500

Material : HDPE

Length : Different lengths can be supplied on request.

### DEMANDED BY

- Railways
- PWDs (Protected Wireline Distribution System)
- Telecommunication Companies
- State Electricity Board
- Airport Authorities
- Power Distribution Companies



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# HDPE

fittings complying  
ISO 4427 standards



Product Image	S.No	Description	Size Range	Available
	1	Couplers	20 mm - 400 mm	PE100 Black
	2	90° Elbows	20 mm - 200 mm	PE100 Black
	3	45° Elbows	20 mm - 200 mm	PE100 Black
	4	Tees	20 mm - 200 mm	PE100 Black
	5	Reducers	20 mm - 200 mm	PE100 Black
	6	20/32/40/50/63mm Top Loading Branch Saddle	40 mm - 250 mm	PE100 Black
	7	20/32/40/50/63mm Top Loading Tapping Tees	40 mm - 250 mm	PE100 Black
	8	Under Clamping Tapping Tees - Monobloc version	40 mm - 110 mm	PE100 Black
	9	Branch Saddle - Monobloc version	40 mm - 110 mm	PE100 Black
	10	End Cap	20 mm - 180 mm	PE100 Black
	11	Male Transition Socket	20 mm - 110 mm	PE100 Black
	12	Female Transition Socket	20 mm - 110 mm	PE100 Black

AL-RAJHI PIPES reserves the right to change the contents without notice.

Product Image	S.No	Description	Size Range	Available
	13	Transition Adaptor, PE / Brass, Male BSP Taper	20 mm - 110 mm	PE 100 Black
	14	Transition Adaptor, PE / Brass, Female BSP Taper	20 mm - 110 mm	PE 100 Black
	15	90° Transition Elbow, PE / Brass, Male BSP Taper	20 mm - 110 mm	PE 100 Black
	16	90° Transition Elbow, PE / Brass, Female BSP Taper	20 mm - 110 mm	PE 100 Black
	17	45° Transition Elbow, PE / Brass, Male BSP Taper	20 mm - 110 mm	PE 100 Black
	18	45° Transition Elbow, PE / Brass, Female BSP Taper	20 mm - 110 mm	PE 100 Black
	19	Transition Socket, PE / Brass - Free Nut	20 mm - 63 mm	PE 100 Black
	20	90° Transition Elbow, PE / Brass - Free Nut	20 mm - 63 mm	PE 100 Black
	21	45° Transition Elbow, PE / Brass - Free Nut	32 mm - 63 mm	PE 100 Black
	22	Transition Spigot Saddle, PE / Brass	110 mm - 160 mm	PE 100 Black
	23	Spigot Saddle, PE / Brass - Shut-off Equipment	110 mm - 160 mm	PE 100 Black



HDPE pipes manufactured by ALMUNIF are subjected to the following quality program:

## Lifting and Handling HDPE Pipes and Fittings

- Lifting and handling HDPE pipes and fittings must be done by trained people.
- Safety shoes or boots with impact protection are required any time an employee is engaged in lifting or carrying heavy objects.
- Employers of pipe fitters should routinely consider eye and face protection when working with pipe.
- When lifting equipments used; safety precautions must be followed.

## Loading, Unloading and Transporting HDPE Pipes And Fittings

- Pipe is loaded into flatbed trailers fitted with metal stakes on the side.
- Loose loaded pipe shall be loaded in layers according to specified quantities and patterns.
- When pipe unloaded all safety precautions must be followed.
- Avoid any sharp tools may cause damages to the pipes.

## Pipe And Fitting Storage

- The storage area should provide adequate protection against physical damage to components.
- It should be large enough to accommodate piping components as well as allow handling equipment to move about freely.
- The storage area should have a relatively smooth, level surface free of stones, debris or other materials that could damage the pipe or fittings.

## If the pipes stored off-site, follow the following steps

- Store small pipe in racks according to the length and size of the pipe.
- Block or strap the pipe to prevent it from rolling or falling off the rack.
- Pipe larger than 63mm in diameter should be stacked with spacing strips between each row.
- Arrange and block each row of stacked pipe to prevent it from rolling off the pile.

## If the pipes stored in job-site, follow the following steps

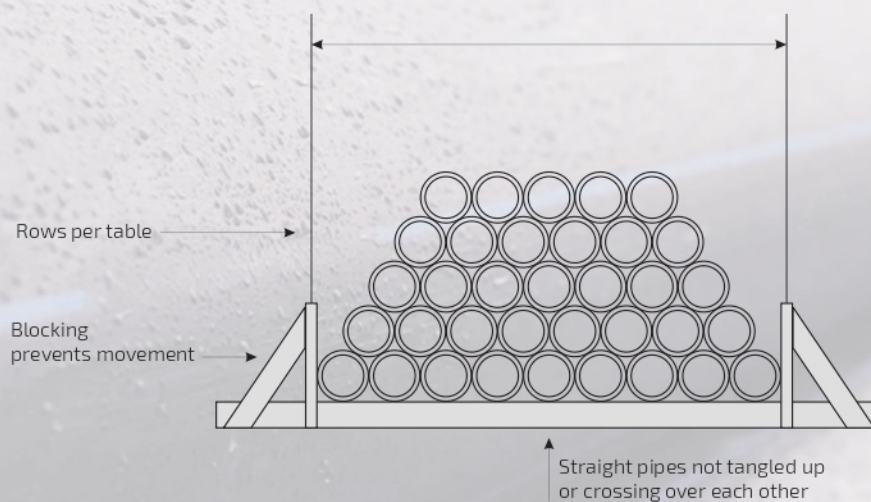
- When pipes of variable wall thickness are received, it is recommended that the pipe be segregated into piles, each pile containing a single size and pressure rating to minimize confusion at a later date.
- The thickest pipe should always be stored at the bottom of the pile.
- The pile should be constructed in a pyramidal, freestanding manner, with each successive layer having one less pipe than the layer below.
- The bottom layer should be braced to prevent movement.
- The maximum allowable stacking heights for polyethylene pipe should not exceed those in Table 1.
- Pipe coils should be stored upright on a level surface.

## Indoor / Outdoor Storage

- AL-Rajhi black HDPE pipe generally contains greater than 2% carbon black, it will resist damage from sunlight.
- Expansion and contraction caused by uneven heating in the sun may cause the pipe to bow if not restrained by racks.

### Suggested Loose Storage Stacking Heights for HDPE pipe

Nominal Diameter (mm)	No. of Rows	
	Above SDR 17	SDR 17 & Below
110	15	12
160	10	8
200	9	7
225	8	6
250	6	5
315	5	4
400	4	3
500	3	3
630	3	2
710	2	2
800	2	2
900	2	1
1000	1	1





## JOINTING METHODS

### Heating Element Butt Welded Joints:

Two pipe end faces are heated together by using heating element until reaching melting temperature, then the pipe ends pressed together to form a uniform permanent bond.

### Butt Fusion Fittings:

Spigot end fittings produced specially for butt fusion to pipe. These must be specified to match both the pressure rating and the SDR of the pipe. The pressure rating of the fittings must be equivalent or higher than that of the pipe.

### Electro-fusion fittings:

Electro-fusion fittings are specified by their pressure rating, such that they are at least rated the same as the pipe pressure rating. The heating energy of this fittings are produced by heating wires.

### Mechanical Fittings:

Electro-fusion fittings are specified by their pressure rating, such that they are at least rated the same as the pipe pressure rating. The heating energy of this fittings are produced by heating wires.





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rajhi@alrajhipipes.com  
info@alrajhipipes.com  
www.alrajhipipes.com