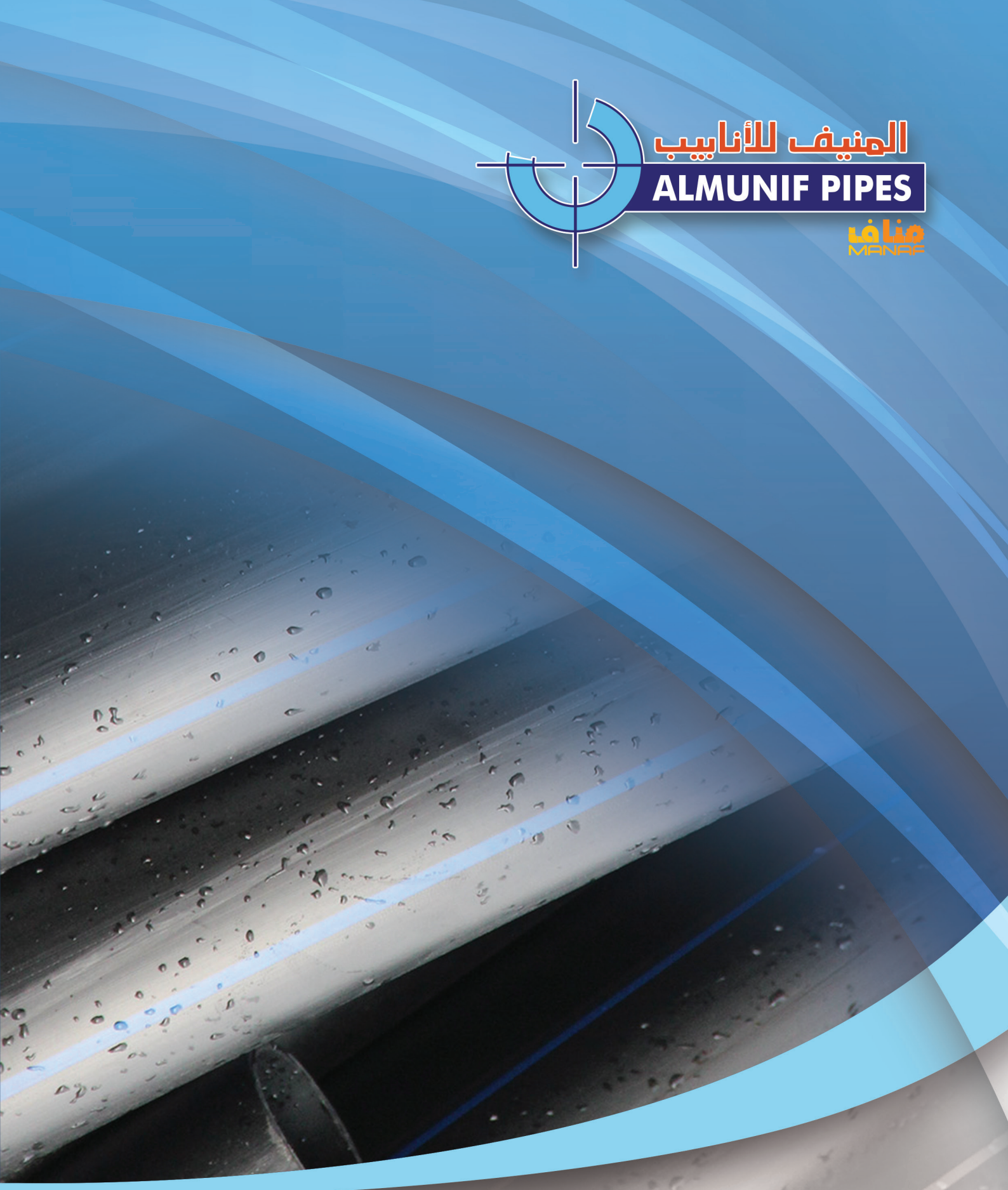
المنيف للأنابيب

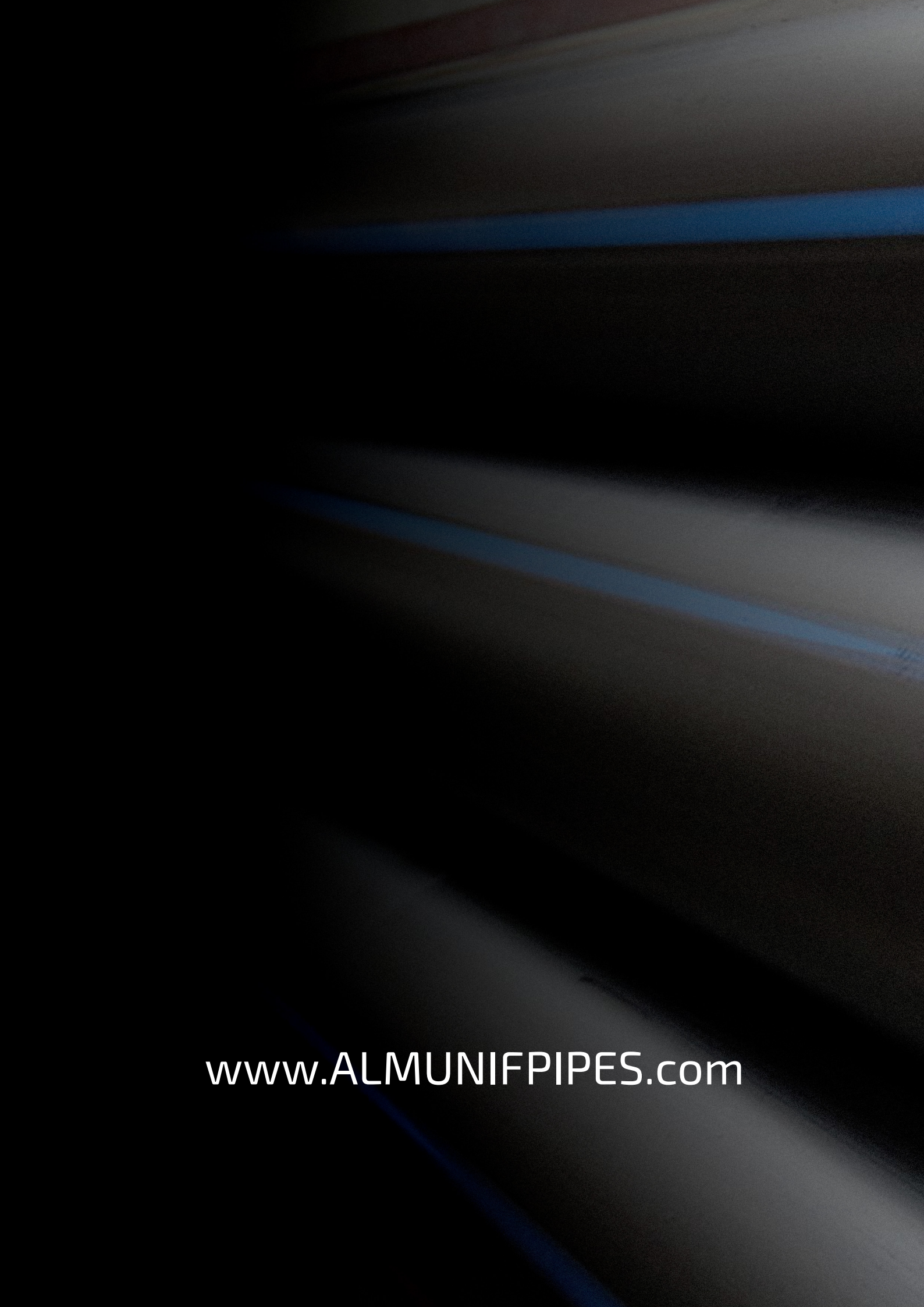
ALMUNIF PIPES

منافMANAF



MMP

HDPE PIPES AND FITTINGS



www.ALMUNIFPIPES.com

COMPANY PROFILE

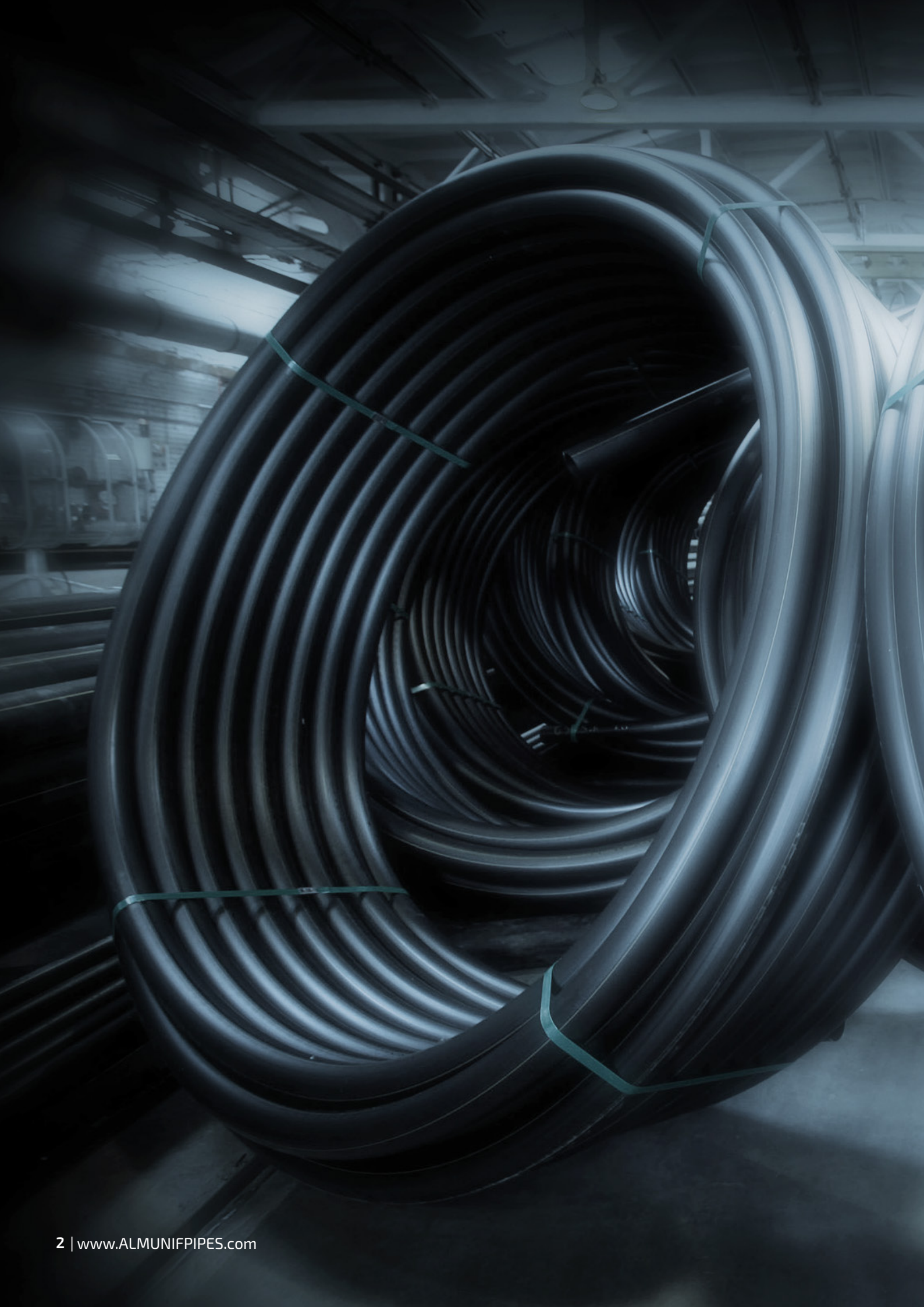
We, Munir Abdullah Al-Munif Factory for Plastic Pipes and Fittings Company, are specialized in producing all types of plastic pipes with all its accessories of fittings. Our company was established 30 years ago.

Al-Munif Factories are located in Riyadh where the solid and flexible polyethylene is being produced as high and low density at diameters starting from 10mm to 1600mm with different lengths and pressure ratings as one of the leading factories in the region in producing such big diameters.

Besides producing Polyethylene Pipes; we are also producing PP-R pipes and Fittings for hot water applications with capacity of about 2000 ton with diameters starting from 20mm up to 160mm. Moreover; we are also producing uPVC and cPVC pipes and fittings for Potable water, drainage and sewerage network, and electrical and telecommunication networks, in addition to GRP pipes and fittings and Rubber products.

Production censorship is done in our laboratories to be sure of specifications compatibility. Our Laboratories has been equipped with all types of necessary systems to do those compatibility tests.

The production capacity is estimated with about 42,000 ton per year which is marketed and sold inside and outside the Kingdom.



CONTENTS

WHY HDPE PIPES?

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

FIELDS OF APPLICATION

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
DIN 8075	Polyethylene (PE) - Pipes PE 80, PE 100 - general quality requirements, testing
ISO 4427	Plastic piping systems - Polyethylene (PE) pipes and fittings for water supply
ISO 4437	Platic piping systems for the supply of gaseuos fuels -Polyethylene (PE)
AWWA C906	Polyethylene (PE) Pressure Pipe and Fittings, 4 In. thru 65 In. (100 mm Through 1650 mm), for Waterworks
EN 122101	Plastics piping systems for water supply, and for drainage and sewerage under pressure. Polyethylene (PE)
SASO ISO 4427	Plastics piping systems - Polyethylene (PE) pipes and fittingd 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^3	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^2	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 10-4	2.0 x 10-4	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 occuring 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
Sulphuric Acid	30%	60
Hydrochloric Acid	20%	60
Phosphoric Acid	85%	60
Nitric Acid	30%	40
Chromic Acid	20%	20
Hydrofluoric Acid	40%	40
Formic Acid	50%	40
Caustic Soda Solution	30%	60
Acetone	Technical Grade	40
Ethanol	96%	60

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
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
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

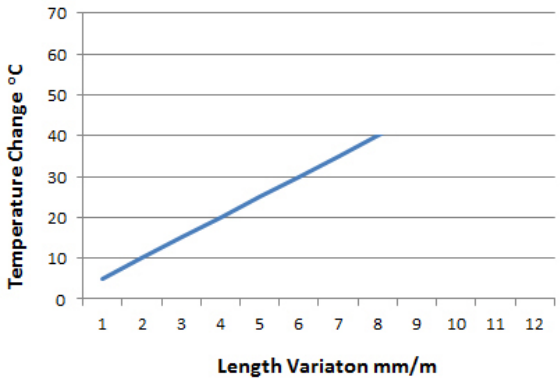
Temperature °C	Years of service	Pipe series (S)										
		25	20	16	12,5	10.5	10	8.3	8	6.3	5	4
		Standar Dimension Ratio (SDR)										
		51	41	33	26	22	21	17.6	17	13.6	11	9
		Allowable Working Pressure (bar)										
10	5	3.2	4.0	5.1	6.4	7.7	8.1	9.7	10.1	12.8	16.1	20.3
	10	3.1	4.0	5.0	6.3	7.6	8.0	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)

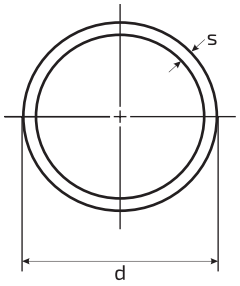
Temperature Change (°C)	Length Variation mm/meter
5	1
10	2
15	3
20	4
25	5
30	6
35	7
40	8

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



PRESSURE

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

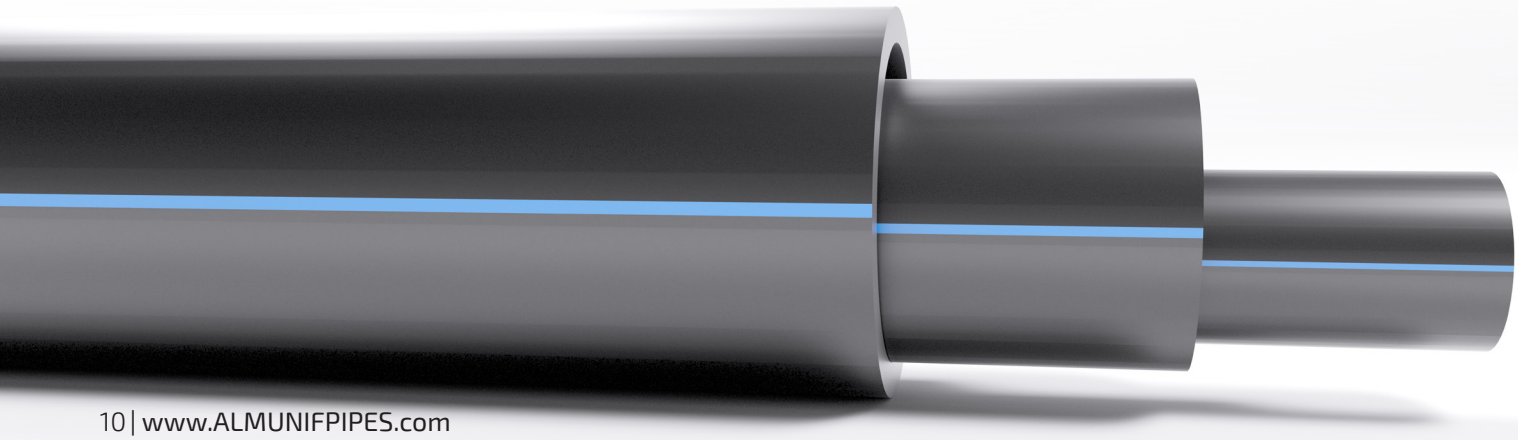


Maximum operating pressure (MOP) = $\frac{20 \times MRS}{C \times (SDR-1)}$ where C is design safety factor

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
3.2	41	-
4	33	41
5	26	33
6	22	-
6.3	21	26
8	17	21
10	13.6	17
12.5	11	13.6
16	9	11
20	7.4	9
25	6	7.4



QUALITY CONTROL

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

RAW MATERIAL INSPECTION

- Density
- Melt Flow Rate (MFR)
- Volatile Content
- Moisture Content
- Carbon Black Content
- Carbon Black Dispersion
- Oxidation Induction Time (OIT)

IN PROCESS INSPECTION

All visual inspection and dimension measurements are conducted during pipe manufacturing.

LABORATORY TESTING

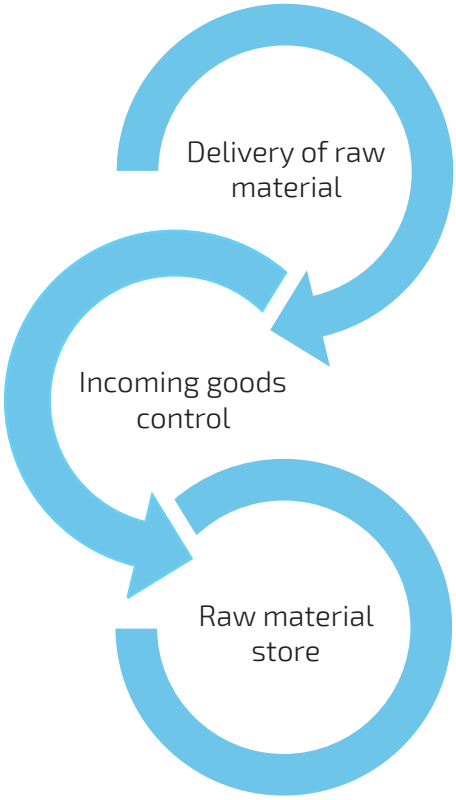
All physical and mechanical properties of product are conducted

- Hydrostatic Strength
- Melt Flow Rate
- Longitudinal Reversion Test
- Tensile Properties
- Oxidation Induction Time

FINAL INSPECTION

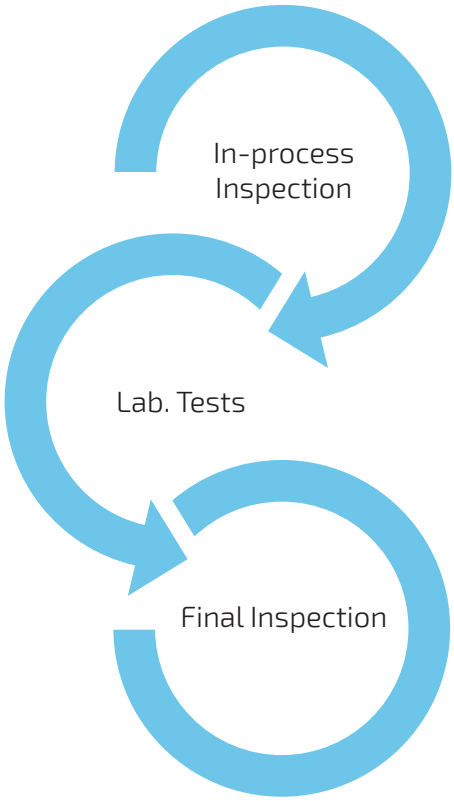
Final inspection conducted to pipes dispatching to the customer to be sure that they are free from visual physical damages:

Raw Material Inspection Process



- Density
- MFR
- Volatile content
- Moisture content
- Carbon black content
- Carbon black dispersion
- OIT

Final Product Inspection Process

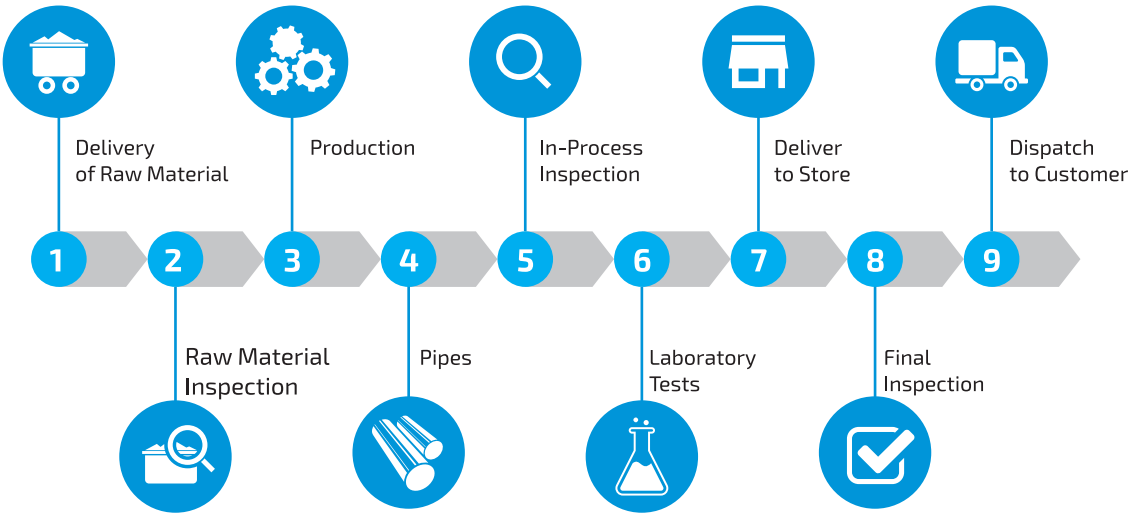


- Visual inspection
- Measurement of dimensions

- Physical Properties
- Mechanical Properties

- Viasual Inspection

PRODUCTION FLOW CHART

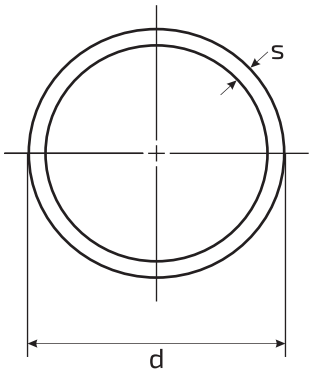


HDPE PIPES FOR GAS APPLICATIONS

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

Material	:	PE 100
Minimum required strength	:	MRS = 10.0 MPa
Design stress	:	σs = 5.0 Mpa
Design safety factor	:	C = 2.0 for gas
Material	:	PE 80
Minimum required strength	:	MRS = 8.0 Mpa
Design stress	:	σs = 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.



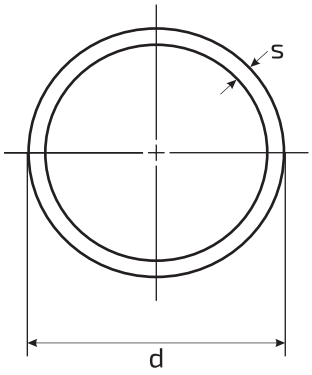
$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$

HDPE PIPES FOR WATER

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

	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	:	σs = 8.0 Mpa	σs = 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.	

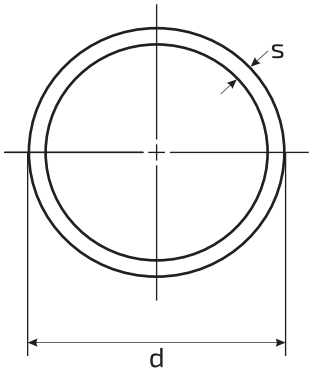


$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$

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	:	σs = 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.

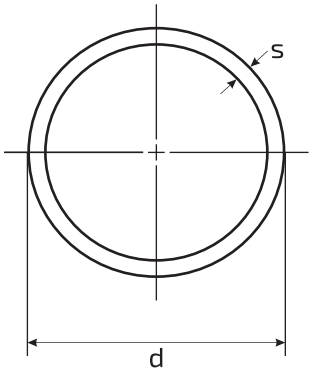


$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$

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	:	σs = 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.

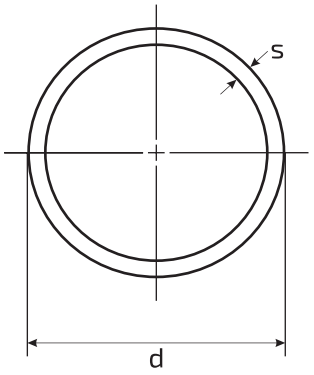


$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$

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 : σs = 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.

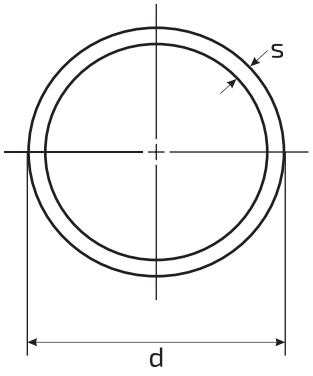


$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$

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	:	σs = 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.

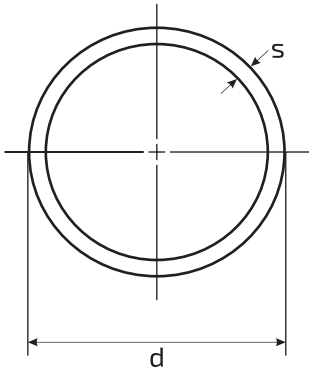


$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$

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	:	σs = 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.

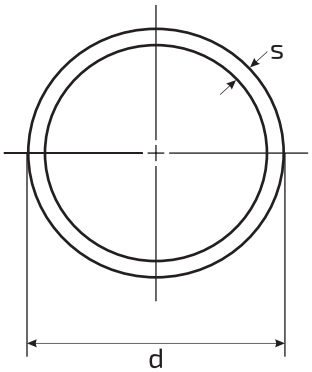


$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$

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	:	σs = 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.



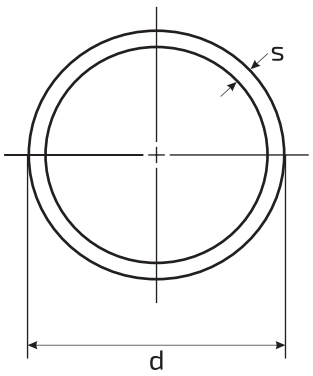
$$PN = \frac{20 \times MRS}{C \times (SDR - 1)}$$

HDPE 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	:	σs = 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/cm²		Class C 9.1 kgf/cm²		Class D 12.2 kgf/cm²	
	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.
1/2"	21.2	21.5	-	-	2.7	3.0	3.4	3.7
3/4"	26.6	26.9	2.3	2.6	3.4	3.7	4.3	4.7
1"	33.4	33.7	3.0	3.3	4.2	4.6	5.4	5.9
1 1/4"	42.1	42.5	3.7	4.1	5.3	5.8	6.8	7.5
1 1/2"	48.1	48.5	4.3	4.7	6.1	6.7	7.8	8.6
2"	60.1	60.6	5.3	5.8	7.6	8.4	-	-
3"	88.6	89.3	7.8	8.6	11.2	12.3	-	-
4"	113.9	114.7	10.0	11.0	-	-	-	-

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/cm²		Class D 12.2 kgf/cm²	
	Min.	Max.	Min.	Max.	Min.	Max.
1/2"	21.2	21.5	1.8	2.0	2.3	2.6
3/4"	26.6	26.9	2.3	2.6	2.9	3.2
1"	33.4	33.7	2.8	3.1	3.7	4.1
1 1/4"	42.1	42.5	3.6	4.0	4.6	5.1
1 1/2"	48.1	48.5	4.1	4.5	5.3	5.8
2"	60.1	60.6	5.1	5.6	6.6	7.3
3"	88.6	89.3	7.5	8.2	9.7	10.7
4"	113.9	114.7	9.6	10.6	-	-

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.

MATERIAL HANDLING GUIDE

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 tomove 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

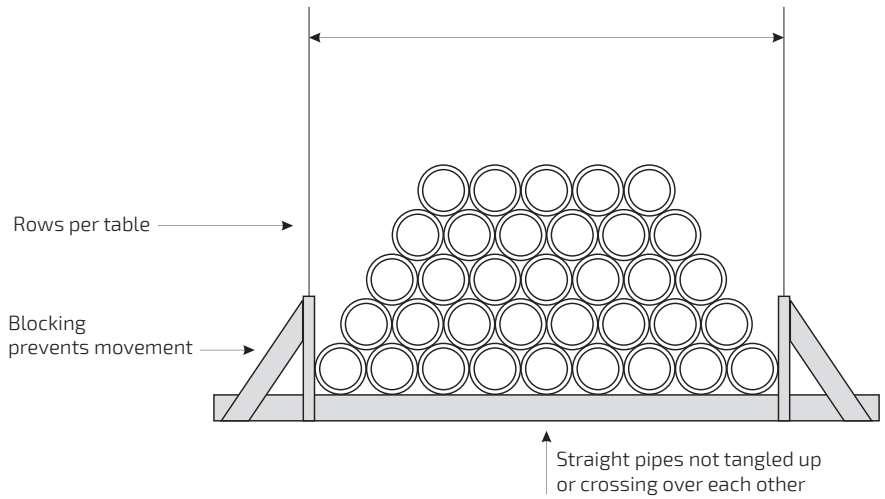
- When pipes of variable wall thickness are received, it is recommended that the pipe be segregated into piles, each pile containing a single size and pressure rating to minimize confusion at a later date.
- The thickest pipe should always be stored at the bottom of the pile.
- The pile should be constructed 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

- MMP 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



ASSEMBLY PROCEDURE

JOINTING AND FITTINGS

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:

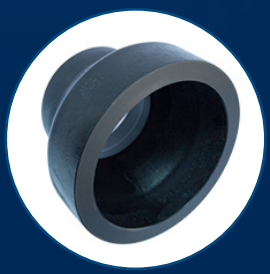
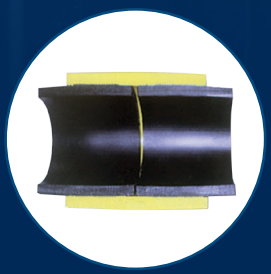
Spigot end fittings produced specially for butt fusion to pipe. These must be specified to match both the pressure rating and the SDR of the pipe. The pressure rating of the fittings must be equivalent or higher than that of the pipe.

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.


BUTT WELDING

Butt welding method used to join two lengths of HDPE pipes together or join HDPE pipe with HDPE fitting.

Butt welding machine

The following conditions should be achieved in a butt welding machine:

- Aligning the pipe ends
- Clamping the pipes
- Facing the pipe ends parallel and square to the centerline
- Heating the pipe ends
- Applying the proper fusion force

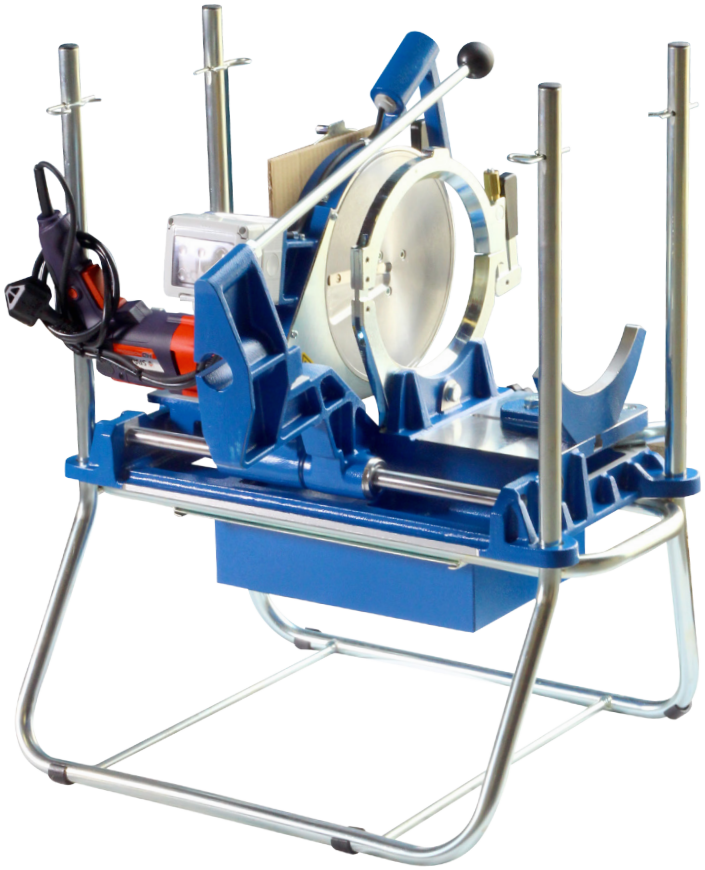
Butt welding steps

The following steps should be implemented to make perfect butt welding:

- Clean, clamp and align the pipe ends to be joined.
- Face the pipe ends to establish clean, parallel surfaces, perpendicular to the center line.
- Align the pipe ends.
- Melt the pipe interfaces.
- Join the two pipe ends together by applying the proper fusion force.
- Hold under pressure until the joint is cool.

Butt welding machine

CODE	SIZE (MM)
293200000	ø 40-200
293630000	ø 315-630
293800000	ø 800
293160000	ø 1,600



ELECTRO-FUSION

- Electro-fusion welding used to join two lengths of HDPE pipes together by using electro-fusion joint from the same material.
- The electro-fusion joint is heated internally by electric current passes through a coil inside the joint causing fusion.
- The following steps should be implemented when performing electro-fusion joining:

01 - Prepare the pipes (Scrape, Clean)

- Be sure that the pipe ends are cut square when joining using electro-fusion couplings.
- The fusion area must be clean from dirt or contaminants; use 90% isopropyl alcohol.
- The pipe surface in the fusion must be scraped, about 0.2mm layer from the pipe outer surface, must be removed by using special tools (scraper).

02 - Mark the pipes

- Mark the pipe for stab depth of couplings or the proper fusion location of saddles. (Caution should be taken to assure that a non-petroleum marker is used).
- Align and restrain pipe and fitting.
- Place the pipe(s) and fitting in the clamping fixture to prevent movement of the pipe(s) or fitting.
- Give special attention to proper positioning of the fitting on the prepared pipe surfaces.

03 - Apply electric current

- Connect the electro-fusion control box to the fitting and to the power source.
- Apply electric current to the fitting as specified in the manufacturer's instructions.
- Read the barcode which is supplied with the electro-fusion fitting.
- If the control does not do so automatically, turn off the current when the proper time has elapsed to heat the

04 - Cool joints and remove clamps

- Allow the joint to cool for the recommended time.
- If using clamps, premature removal from the clamps and any strain on a joint that has not fully cooled can be detrimental to joint performance.

05 - Documenting Fusion

- The Electro-fusion control box that applies current to the fitting also controls and monitors the
- critical parameters of fusion, (time, temperature, & pressure).
- The control box is a micro- processor capable of storing the specific fusion data for each joint.
- This information can be downloaded to a computer for documentation and inspection of the day's work.

Electro-fusion welding machine

CODE	SIZE (MM)
20258000000	ø 25-800

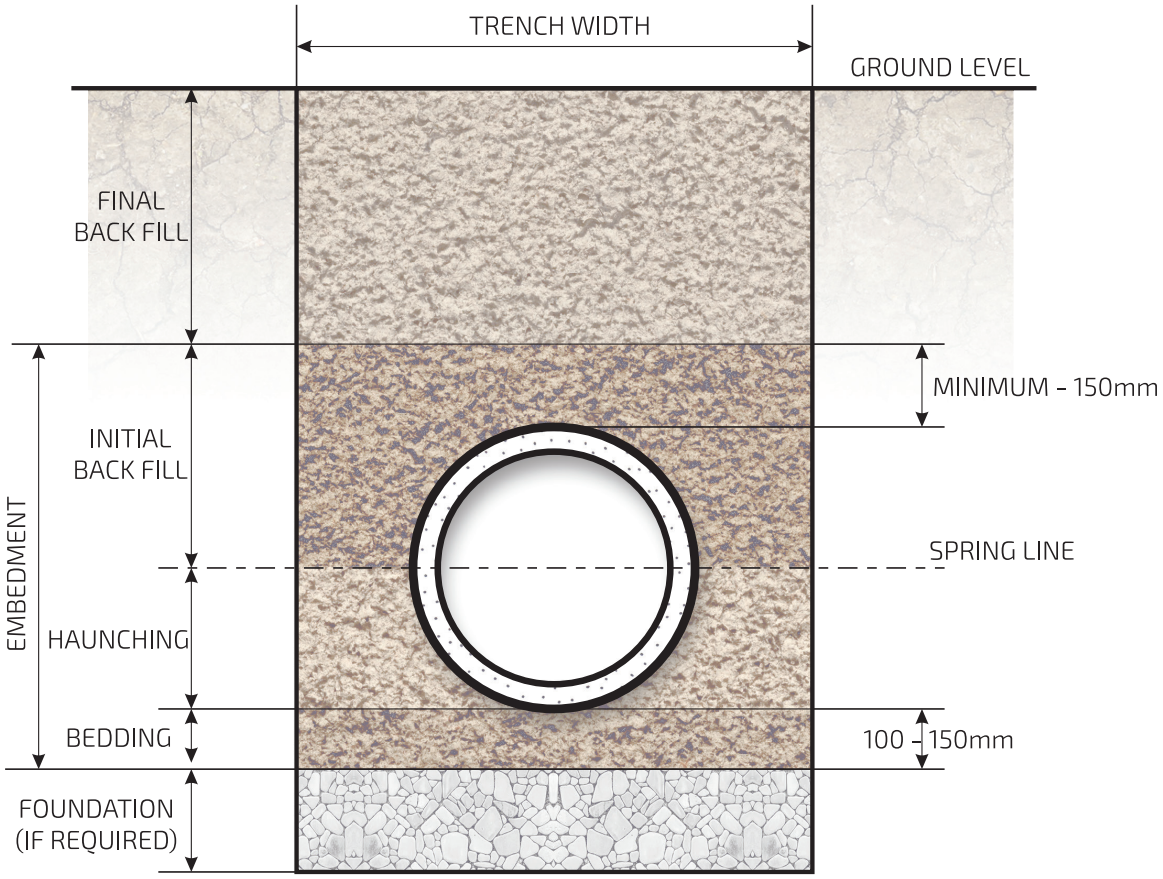
INSTALLATION OF PLASTIC PIPES

TRENCH CONSTRUCTION

General

- Excavate trenches to insure that sides will be stable under all working conditions
- Excavated material should be stockpiled in a manner that will not endanger the work.
- Minimum Trench Width
  The following table shows the relation between Nominal Pipe Size and Minimum Trench Width

Nominal Pipe Size (mm)	Minimum Trench Width (mm)
< 90	300
90-630	Pipe OD. + 300
630 - 1600	Pipe OD. + 600



PIPE TRENCH

Preparation of Trench Bottom

- The trench bottom should be constructed to provide a firm, stable, and uniform support for the full length of the pipe.
- When an unstable sub-grade condition is encountered which will provide inadequate pipe support, additional trench depth should be excavated and refilled with suitable foundation material as specified by the engineer.
- The ground water level in the trench should be kept below the pipe.

Bedding

- Bedding is required primarily to bring the trench bottom up to grade.
- Bedding materials should be placed to provide uniform and adequate longitudinal support under the pipe.
- A compacted depth of 4 to 6 inches (100 to 150 mm) is generally sufficient bedding thickness.
- Bedding material should be free of ridges, hollows and lumps.
- The trench bottom should be smooth and free of rock.
- Bedding should consist of free flowing material such as gravel, sand, salty sand or clayey sand that is free of stones or hard particles larger than 1 ½ inch.

Haunching

- The most important factor affecting pipe performance and deflection is the haunching material and its density.
- Material should be placed and consolidated under the pipe haunch to provide adequate side support to the pipe while avoiding both vertical and lateral displacement of the pipe from proper alignment.
- Where coarse materials with voids have been used for bedding, the same coarse material should also be used for haunching and consideration should be given to native soil migration.
- Haunching is placed up to the pipe spring line.

Initial Backfill

- Initial backfill is that portion of the pipe embedment beginning at the spring line of extending some distance over the pipe and the top of the pipe.
- Since little or no additional side support is gained above the spring line, native soils may be used without special compaction efforts.
- The sole purpose of somewhat careful placement of these native trench materials is to protect the pipe from the dropping of large rocks or other impact loads that may occur during final backfill.
- Minimum cover is recommended to be 6 inch (150mm).

Final Backfill

The material used in the final backfilling operation need not be as carefully selected as was the bedding, haunching, and initial backfill. In the final backfill material, exclude boulders, frozen clumps of dirt, and rubble which could damage the pipe.

Embedment Materials

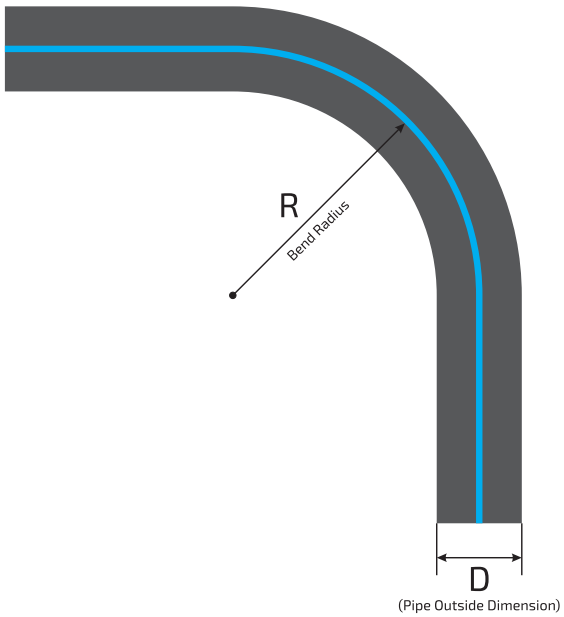
- Embedment material including bedding, hunching and initial backfill material

The following Table shows the maximum particle size for class I and class II materials

Nominal Pipe Size (mm)	Maximum Particle Size (Inch)
≤ 110	1/2
160 - 225	3/4
250 - 355	1
≥ 400	1 1/2

Cold (Field) Bending

Minimum Bend Radius for PE Pipe Installed in Open Cut Trench



Dimensions in (mm)

Dimension Ration, DR	Minimum Cold Bend Radius
7, 7.3, 9	20 x Pipe OD
11, 13.5	25 x Pipe OD
17, 21	27 x Pipe OD
26	34 x Pipe OD
32.5	42 x Pipe OD
41	52 x Pipe OD
Fitting or flange pesent in bend	100 x Pipe OD

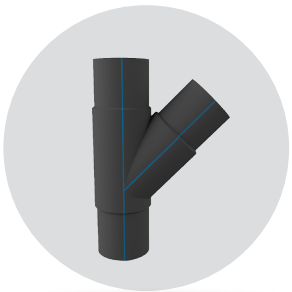
HDPE BUTT WELDING FITTINGS

Elbow 90° PE 100

Code	d (mm)	kg	z (mm)	L (mm)	e (mm)
20102000089	20	-	-	-	-
20102500089	25	-	-	-	-
20103200089	32	-	-	-	-
20104000089	40	-	-	-	-
20105000089	50	-	-	-	-
20106300089	63	0.26125	115	65	5.8
20107500089	75	0.39235	130	72	6.8
20109000089	90	0.6688	150	81	8.2
20111000089	110	1.08775	165	86	10.0
20112500089	125	1.52855	180	93	11.4
20114000089	140	2.160	202	92	12.7
20116000089	160	2.945	210	103	14.6
20118000089	180	4.10305	232	107	16.4
20120000089	200	5.44632	253	117	18.2
20122500089	225	7.391	270	122	20.5
20125000089	250	10.53645	292	130	22.7
20128000089	280	14.5217	320	140	25.4
20131500089	315	20.862	370	150	28.6
20135500089	355	-	-	-	-
20140000089	400	-	-	-	-
20145000089	450	-	-	-	-
20150000089	500	-	-	-	-
20156000089	560	-	-	-	-
20163000089	630	-	-	-	-

Elbow 45° PE 100

Code	d (mm)	kg	z (mm)	L (mm)	e (mm)
20602000089	20				
20602500089	25	-	-	-	-
20603200089	32	-	-	-	-
20604000089	40	-	-	-	-
20605000089	50	-	-	-	-
20606300089	63	0.285	95	65	5.8
20607500089	75	0.3287	105	72	6.8
20609000089	90	0.5491	120	81	8.2
20611000089	110	0.88445	130	86	10.0
20612500089	125	1.2217	140	93	11.4
20614000089	140	1.52	164	92	12.7
20616000089	160	2.33795	162	103	14.6
20618000089	180	3.11885	186	107	16.4
20620000089	200	4.15245	185	117	18.2
20622500089	225	5.71235	200	122	20.5
20625000089	250	8.11395	220	130	22.7
20628000089	280	10.3778	226	140	25.4
20631500089	315	14.0771	246	150	28.6
20635500089	355	-	-	-	-
20640000089	400	-	-	-	-
20645000089	450	-	-	-	-
20650000089	500	-	-	-	-
20656000089	560	-	-	-	-
20663000089	630	-	-	-	-



Tee 45°, Equal PE 100

Code	d (mm)	kg	z (mm)	z1(mm)	L (mm)	e (mm)
28006300089	63	0.475	255	158	63	5.8
28007500089	75	0.76	301	190	70	6.8
28009000089	90	1.235	368	234	79	8.2
28011000089	110	1.71	395	260	82	10.0

Tee 90° PE 100

Code	d (mm)	kg	z (mm)	z1 (mm)	L (mm)	e (mm)
21002000089	20	-	-	-	-	-
21002500089	25	-	-	-	-	-
21003200089	32	-	-	-	-	-
21004000089	40	-	-	-	-	-
21005000089	50	-	-	-	-	-
21006300089	63	0.399	230	115	65	5.8
21007500089	75	0.5738	264	132	72	6.8
21009000089	90	0.97945	300	150	81	8.2
21011000089	110	1.5466	330	165	86	10.0
21012500089	125	1.995	366	183	93	11.4
21014000089	140	3.02	396	196	92	12.7
21016000089	160	4.104	420	210	103	14.6
21018000089	180	5.681	460	230	107	16.4
21020000089	200	8.075	500	250	117	18.2
21022500089	225	10.925	540	270	122	20.5
21025000089	250	13.9726	575	288	130	22.7
21028000089	280	17.7365	615	308	140	25.4
21031500089	315	24.8425	695	346	150	28.6
21035500089	355	37.81	818	410	165	32.3
21040000089	400	40.37025	910	455	180	36.4
21045000089	450	73.435	970	485	195	40.9
21050000089	500	95.95	1060	530	215	45.6

Tee Reducer 90°

PE 100

Code	d x d (mm)	kg	z (mm)	z1 (mm)	L (mm)	L1 (mm)	e (mm)	e1 (mm)
21005002089	50x20	-	-	-	-	-	-	-
21005002589	50x25	-	-	-	-	-	-	-
21005003289	50x32	-	-	-	-	-	-	-
21005004089	50x40	-	-	-	-	-	-	-
21006303289	*63 x 32	0.3591	230	145	65	53	5.8	3.0
21006304089	*63 x 40	0.6811	230	145	65	57	5.8	3.7
21006305089	63 x 50	0.2811	215	103	63	56	5.8	4.6
21007503289	75 x 32	0.4711	256	108	70	46	6.9	3.0
21007504089	75 x 40	0.7361	264	180	72	57	6.8	3.7
21007505089	75 x 50	0.5111	253	108	70	56	6.9	4.6
21007506389	75 x 63	0.5411	255	117	70	63	6.9	5.8
21009005089	90 x 50	0.8011	280	117	79	55	8.2	4.6
21009006389	90 x 63	0.7561	269	136	79	64	8.2	5.8
21009007589	90 x 75	0.7741	272	138	73	70	8.2	6.9
21011006389	110 x 63	1.2481	309	156	84	65	10.0	5.8
21011007589	110 x 75	1.2251	309	151	82	70	10.0	6.9
21011009089	110 x 90	1.2561	321	162	85	79	10.0	8.2
21012506389	125 x 63	2.8311	366	225	92	61	11.4	5.8
21012507589	*125 x 75	2.3701	366	225	92	72	11.4	6.9
21012509089	125 x 90	1.7031	335	170	90	83	11.4	8.2
21012511089	125 x 110	1.8411	341	170	88	82	11.4	10.0
21014007589	140 x 75	4.0311	396	230	92	70	12.7	6.8
21014009089	140 x 90	4.0761	396	235	92	79	12.7	8.2
21014011089	140 x 110	3.5811	396	240	92	82	12.7	10.0
21014012589	140 x 125	4.1511	396	240	92	90	12.7	11.4
21016006389	160 x 63	2.6611	340	176	98	65	14.6	5.8
21016007589	160 x 75	2.8071	340	180	98	74	14.6	6.9
21016009089	160 x 90	3.7561	410	180	98	79	14.6	8.2
21016011089	160 x 110	3.2811	420	265	98	82	14.6	10.0
21016012589	*160 x 125	4.4461	420	265	102	92	14.6	11.4
21016014089	160 x 140	5.8761	420	270	102	96	14.6	12.7
21018009089	180 x 90	4.0811	420	202	136	98	16.4	8.2
21018011089	180 x 110	4.3601	-	-	-	-	16.4	10.0
21018012589	*180 x 125	6.4611	460	285	107	92	16.4	11.4
21018014089	180 x 140	9.0511	460	295	107	110	16.4	12.7
21018016089	180 x 160 4.3601	4.3601	411	205	102	94	16.4	14.6
21020006389	200 x 63	7.2811	500	190	122	63	18.2	5.8
21020009089	200 x 90	9.7111	503	215	120	81	18.2	8.2
21020011089	200 x 110	9.7111	503	218	120	84	18.2	10.0
21020012589	*200 x 125	8.1311	500	295	117	92	18.2	11.4
21020014089	200 x 140	10.5511	500	310	117	110	18.2	12.7
21020016089	200 x 160	9.7111	503	236	120	101	18.2	14.6
21020018089	200 x 180	10.8811	441	310	117	110	18.2	16.4
21022507589	225 x 75	6.4811	441	227	119	75	20.5	6.9
21022509089	225 x 90	9.7111	441	225	119	79	20.5	8.2
21022511089	225 x 110	9.7611	540	237	118	83	20.5	10.0
21022514089	*225 x 125	10.8811	540	320	122	92	20.5	11.4
21022514089	225 x 140	14.5551	540	335	122	110	20.5	12.7
21022516089	225 x 160	10.2011	543	320	120	106	20.5	14.6
21022518089	225 x 180	9.3561	540	277	132	132	20.5	16.4
21022520089	225 x 200	14.9061	586	340	122	117	20.5	18.2
21025011089	250 x 110	9.7111	586	245	132	85	22.7	10.0
21025016089	250 x 160	9.7111	576	264	132	101	22.7	14.6
21025018089	250 x 180	18.8711	576	350	130	105	22.7	16.4
21025020089	250 x 200	18.259	576	360	130	112	22.7	18.2
21025022589	250 x 225	18.7055	576	390	130	120	22.7	20.5
21028020089	280 x 200	23.294	616	410	139	112	25.4	18.2
21028022589	280 x 225	23.51725	616	420	139	120	25.4	20.5
21028025089	280 x 250	23.9495	616	420	139	130	25.4	22.7
21031511089	315 x 110	14.535	695	277	150	82	28.6	10.0
21031516089	315 x 160	15.77	695	296	150	102	28.6	14.6
21031520089	315 x 200	32.2525	690	470	150	134	28.6	18.2
21031522589	315 x 225	19.475	650	335	170	145	28.6	20.5
21031525089	315 x 250	20.9	695	325	150	130	28.6	22.7
21031528089	315 x 280	33.2025	690	480	150	139	28.6	25.4
21035525089	355 x 250	46.455	818	165	130	139	32.3	25.7
21035528089	355 x 280	46.835	818	480	165	139	32.3	25.4
21035531589	355 x 315	47.2055	818	480	165	150	32.3	28.6

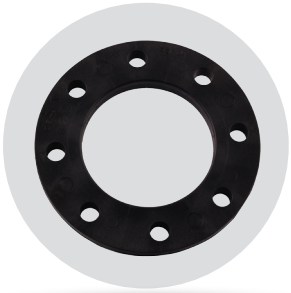
Tee Reducer 90°

PE 100

Code	d x d (mm)	kg	z (mm)	L (mm)	L1 (mm)	e (mm)	e1 (mm)
24003202589	32x25	-	-	-	-	-	-
24004003289	40x32	-	-	-	-	-	-
24005002589	50x25	-	-	-	-	-	-
24005003289	50x32	-	-	-	-	-	-
24005004089	50x40	-	-	-	-	-	-
24006303289	63 x 32	0.10355	150	65	53	5,8	3,0
24006304089	63 x 40	0.1235	150	65	57	5,8	3,7
24006305089	63 x 50	0.1235	150	65	63	5,8	4,6
24007504089	75 x 40	0.1691	170	72	57	6,8	3,7
24007505089	75 x 50	0.18145	170	72	63	6,8	4,6
24007506389	75 x 63	0.1197	170	72	65	6,8	5,8
24009005089	90 x 50	0.27645	190	81	63	8,2	4,6
24009006389	90 x 63	0.30115	190	81	65	8,2	5,8
24009007589	90 x 75	0.33725	190	81	70	8,2	6.8
24011006389	110 x 63	0.44555	205	86	65	10.0	5.8
24011007589	110 x 75	0.47215	205	86	70	10.0	6.8
24011009089	110 x 90	0.52915	205	86	81	10.0	8.2
24012506389	125 x 63	0.55005	200	87	63	11.4	5.8
24012507589	125 x 75	0.627	215	92	72	11.4	6.8
24012509089	125 x 90	0.69825	215	92	81	11.4	8.2
24012511089	125 x 110	0.77805	215	92	86	11.4	10.0
24014007589	140 x 75	0.532	230	110	70	12.7	6.8
24014009089	140 x 90	0.6555	230	110	79	12.7	8.2
24014011089	140 x 110	0.779	230	110	82	12.7	10.0
24014012589	140 x 125	0.9386	235	110	90	12.7	11.4
24016009089	160 x 90	1.007	248	120	79	14.6	8.2
24016011089	160 x 110	1.2331	245	102	86	14.6	10.0
24016012589	160 x 125	1.33285	245	102	92	14.6	11.4
24016014089	160 x 140	1.2825	260	120	110	14.6	12.7
24018009089	180 x 90	1.4535	245	105	79	16.4	8.2
24018012589	180 x 125	1.634	255	107	92	16.4	11.4
24018011089	180 x 110	1.634	270	105	82	16.4	10.0
24018014089	180 x 140	1.881	270	120	110	116.4	12.7
24018016089	180 x 160	1.881	255	107	102	16.4	14.6
24020014089	200 x 140	2.1945	275	120	110	18.2	12.7
24020016089	200 x 160	2.2515	265	117	102	18.2	14.6
24020018089	200 x 180	2.54695	265	117	107	18.2	16.4
24022514089	225 x 140	2.755	295	130	110	20.5	12.7
24022516089	225 x 160	2.9621	280	122	102	20.5	14.6
24022518089	225 x 180	3.11315	280	122	107	20.5	16.4
24022520089	225 x 200	3.3611	280	122	117	20.5	18.2
24025016089	250 x 160	2.26575	290	130	100	22.7	14.6
24025018089	250 x 180	3.8475	295	130	105	22.7	16.4
24025020089	250 x 200	2.26575	302	130	112	22.7	18.2
24025022589	250 x 225	2.26575	332	130	120	22.7	20.5
24028020089	280 x 200	6.5075	333	140	112	25.4	18.2
24028022589	280 x 225	5.7855	335	140	120	25.4	20.5
24028025089	280 x 250	2.26575	340	140	130	25.4	22.7
24031520089	315 x 200	2.26575	380	180	134	28.6	18.2
24031522589	315 x 225	7.4005	365	150	120	28.6	20.5
24031525089	315 x 250	2.26575	365	150	130	28.6	22.7
24031528089	315 x 280	8.36	365	150	139	28.6	25.4
24035525089	355 x 250	8.645	390	165	130	32.3	22.7
24035528089	355 x 280	9.025	390	165	139	32.3	25.4
24035531589	355 x 315	9.405	390	165	150	32.3	28.6
24040028089	400 x 280	9.899	415	180	139	36.4	25.4
24040031589	400 x 315	10.5735	415	180	150	36.4	28.6
24040035589	400 x 355	11.02	420	180	165	36.4	32.3
24045028089	450 x 280	15.39	389	195	139	40.9	25.4
24045031589	450 x 315	15.865	390	195	150	40.9	28.6
24045035589	450 x 355	16.625	393	195	164	40.9	32.3
24045040089	450 x 400	17.575	395	195	179	40.9	36.4
24050031589	500 x 315	20.805	422	212	150	45.5	28.6
24050035589	500 x 355	21.47	424	212	164	45.5	32.3
24050040089	500 x 400	22.42	426	212	179	45.5	36.4
24050045089	500 x 450	23.845	428	212	195	45.5	40.9
24056035589	560 x 355	28.595	459	230	164	50.9	32.3
24056040089	560 x 400	29.45	461	230	179	50.9	36.4
24056045089	560 x 450	30.78	463	230	195	50.9	40.9
24056050089	560 x 500	32.395	466	230	212	50.9	45.5
24063040089	630 x 400	39.805	502	250	179	57.3	36.4
24063045089	630 x 450	40.945	503	250	195	57.3	40.9
24063050089	630 x 500	42.465	506	250	212	57.3	45.5
24063056089	630 x 560	44.46	506	250	230	57.3	50.9

End Cap PE 100

Code	d (mm)	kg	z (mm)	e (mm)
23002000089	20	0.00855	52	3.0
23002500089	25	0.01235	52	3.0
23003200089	32	0.01615	54	3.0
23004000089	40	0.02945	57	3.7
23005000089	50	0.0475	57	3.7
23006300089	63	0.08075	65	5.8
23007500089	75	0.13775	80	6.8
23009000089	90	0.228	90	8.2
23011000089	110	0.36765	98	10.0
23012500089	125	0.5187	105	11.4
23014000089	140	0.79325	136	12.7
23016000089	160	0.9747	192	14.6
23018000089	180	1.30055	120	16.4
23020000089	200	1.74705	60	18.2
23022500089	225	2.375	60	20.5
23025000089	250	3.73065	32	22.7
23028000089	280	5.0768	16	25.4
23031500089	315	6.8172	16	28.6

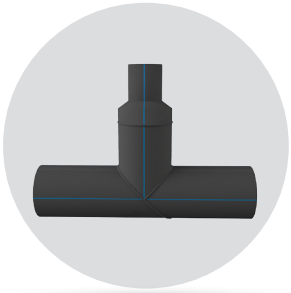


Backing Flange PP-V for Butt Fusion Systems Metric

Code	d (mm)	kg	inch	DN (mm)	PN
29106300089	63	0.361	-	65	16
29107500089	75	0.456	-	72	16
29109000089	90	0.494	-	81	16
29111000089	110	0.646	-	86	16
29112500089	125	0.722	-	93	16
29114000089	140	0.76	-	92	16
29116000089	160	1.14	6	103	16
29118000089	180	1.14	-	107	16
29120000089	200	1.33	8	117	16
29122500089	225	1.33	9	122	16
29125000089	250	1.615	-	130	16
29128000089	280	1.615	-	140	16
29131500089	315	2.28	-	150	16

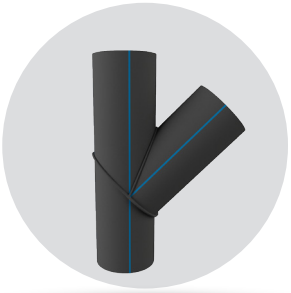
Flange Adaptor LS, PE 100 Combined Jointing Face: Flat and Serrated

Code	DN (mm)	d (mm)	kg	d1 (mm)	d2 (mm)	d3 (mm)	d4 (mm)	L (mm)	L1 (mm)	L2 (mm)	e (mm)
23504000089	40	-	-	-	-	-	-	-	-	-	-
29006300089	50	63	0.1653	75	102	-	51	98	69	14	5.8
29007500089	65	*75	0.285	89	122	66	61	125	89	16	6.8
29009000089	80	*90	0.418	105	138	78	73	140	103	17	8.2
29011000089	100	*110	0.65075	125	158	100	90	160	117	18	10.0
29012500089	100	*125	0.7942	132	158	114	102	170	125	25	11.4
29014000089	125	*140	1.23025	155	188	127	114	200	147	25	12.7
29016000089	150	*160	1.5618	175	212	158	130	200	147	25	14.6
29018000089	150	*180	1.77935	180	212	158	147	200	170	30	16.4
29020000089	200	*200	2.6201	232	268	203	163	200	128	32	18.2
29022500089	200	*225	2.8234	235	268	210	184	200	138	32	20.5
29025000089	250	*250	4.30825	285	320	245	204	219	138	35	22.7
29028000089	250	*280	4.67875	291	320	265	229	231	144	35	25.4
29031500089	300	*315	6.07335	335	370	300	257	239	158	35	28.6
23540000089	-	*400	-	-	-	-	-	-	-	-	-
23563000089	-	*630	-	-	-	-	-	-	-	-	-



Segmented Reduced Tee 90°

Code	DE	H (mm)	z (mm)
21616000089	160	150	460
21618000089	180	200	580
21620000089	200	200	600
21622500089	225	200	625
21625000089	250	200	650
21628000089	280	200	680
21631500089	315	300	915
21635500089	355	300	955
21640000089	400	300	1000
21650000089	500	300	1100
21656000089	560	350	1260
21663000089	630	350	1330
21671000089	710	400	1510
21680000089	800	400	1600
21690000089	900	400	1700
21610000089	1000	400	1800

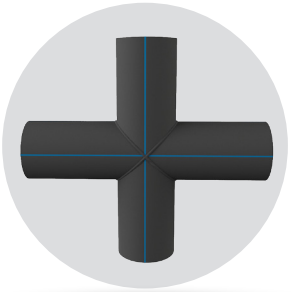


Segmented Tee 45°

Code	DE	H (mm)	z (mm)
21911000089	110	400	535
21912500089	125	400	520
21914000089	140	400	553
21916000089	160	400	613
21918000089	180	400	675
21920000089	200	400	683
21922500089	225	450	743
21925000089	250	550	853
21928000089	280	550	865
21931500089	315	600	1030
21935500089	355	600	1047
21940000089	400	800	1265
21945000089	450	800	1065
21950000089	500	1000	1487
21956000089	560	1000	1582
21963000089	630	1200	1810

Segmented Bend 90°

Code	DE	H (mm)	z (mm)
20211000089	110	-	-
20212500089	125	-	-
20214000089	140	-	-
20216000089	160	150	427
20218000089	180	200	473
20220000089	200	200	467
20222500089	225	200	490
20225000089	250	200	507
20228000089	280	200	545
20231500089	315	300	688
20235500089	355	300	737
20240000089	400	300	790
20245000089	450	300	1139
20250000089	500	300	1164
20256000089	560	350	1258
20263000089	630	350	1293
20271000089	710	400	1397
20280000089	800	400	1442
20290000089	900	400	1505
20210000089	1000	400	1555



Segmented Cross

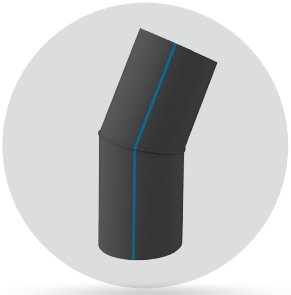
Code	DE	H (mm)	z (mm)
21211000089	110	92	338
21212500089	125	90	355
21214000089	140	96	390
21216000089	160	104	427
21218000089	180	107	450
21220000089	200	115	500
21222500089	225	120	540
21225000089	250	132	610
21228000089	280	140	680
21231500089	315	152	707
21235500089	355	230	1000
21240000089	400	230	960
21245000089	450	230	1040
21250000089	500	230	1060
21256000089	560	350	1260
21263000089	630	350	1330

Segmented Bend 60°

Code	DE	H (mm)	z (mm)
20311000089	110	-	-
20312500089	125	-	-
20314000089	140	-	-
20316000089	160	150	279
20318000089	180	200	279
20320000089	200	200	328
20322500089	225	200	339
20325000089	250	200	345
20328000089	280	200	355
20331500089	315	300	478
20335500089	355	300	477
20340000089	400	300	511
20345000089	450	300	689
20350000089	500	300	704
20356000089	560	350	777
20363000089	630	350	797
20371000089	710	400	876
20380000089	800	400	902
20390000089	900	400	937
20310000089	1000	400	965

Segmented Bend 45°

Code	DE	H (mm)	z (mm)
20706300089	63	-	
20707500089	75	-	-
20709000089	90	-	-
20711000089	110	-	-
20712500089	125	-	-
20714000089	140	-	-
20716000089	160	150	273
20718000089	180	200	323
20720000089	200	200	322
20722500089	225	200	333
20725000089	250	200	338
20728000089	280	200	349
20731500089	315	300	470
20735500089	355	300	470
20740000089	400	300	502
20745000089	450	300	636
20750000089	500	300	647
20756000089	560	350	715
20763000089	630	350	729
20771000089	710	400	801
20780000089	800	400	820
20790000089	900	400	846
20710000089	1000	400	866



Segmented Bend 30°

Code	DE	H (mm)	z (mm)
20806300089	63	-	
20807500089	75	-	-
20809000089	90	-	-
20811000089	110	-	-
20812500089	125	-	-
20814000089	140	-	-
20816000089	160	150	171
20818000089	180	200	224
20820000089	200	200	226
20822500089	225	200	230
20825000089	250	200	233
20828000089	280	200	237
20831500089	315	300	3242
20835500089	355	300	347
20840000089	400	300	353
20845000089	450	300	360
20850000089	500	300	367
20856000089	560	350	425
20863000089	630	350	434
20871000089	710	400	495
20880000089	800	400	507
20890000089	900	400	520
20810000089	1000	400	534

HDPE ELECTRO-FUSION FITTINGS

Elbow 90°

Code	Size (mm)
20102000091	20
20102500091	25
20103200091	32
20104000091	40
20105000091	50
20106300091	63
20107500091	75
20109000091	90
20111000091	110
20112500091	125
20116000091	160
20118000091	180
20120000091	200
20122500091	225
20125000091	250
20131500091	315

Elbow 45°

Code	Size (mm)
20602000091	20
20602500091	25
20603200091	32
20604000091	40
20605000091	50
20606300091	63
20607500091	75
20609000091	90
20611000091	110
20612500091	125
20616000091	160
20618000091	180
20620000091	200
20622500091	225
20625000091	250
20631500091	315

Tee 90°

Code	Size (mm)
21002000091	20
21002500091	25
21003200091	32
21004000091	40
21005000091	50
21006300091	63
21007500091	75
21009000091	90
21011000091	110
21012500091	125
21016000091	160
21018000091	180
21020000091	200
21022500091	225
21025000091	250
21031500091	315

Reducer

Code	Size (mm)
24002502091	25x20
24003202091	32x20
24003202591	32x25
24004002091	40x20
24004002591	40x25
24004003291	40x32
24005002591	50x25
24005003291	50x32
24005004091	50x40
24006303291	63x32
24006304091	63x40
24006305091	63x50
24007505091	75x50
24007506391	75x63
24009005091	90x50
24009006391	90x63
24011006391	110x63
24011009091	110x90
24012502591	125x25
24012509091	125x90
24012511091	125x110
24016009091	160x90
24016011091	160x110
24016012591	160x125
24022516091	225x160

Coupler

Code	Size (mm)
21502000091	20
21502500091	25
21503200091	32
21504000091	40
21505000091	50
21506300091	63
21507500091	75
21509000091	90
21511000091	110
21512500091	125
21514000091	140
21516000091	160
21518000091	180
21520000091	200
21522500091	225
21525000091	250
21528000091	280
21531500091	315
21535500091	355
21540000091	400
21545000091	450
21550000091	500
21556000091	560
21563000091	630

Tee Reducer 90°

Code	Size (mm)
21003202591	32x25
21005003291	50x32
21006303291	63x32
21006305091	63x50
21016011091	160x110
21018012591	180x125

Cap

Code	Size (mm)
219033000	33
23002000091	20
23002500091	25
23003200091	32
23004000091	40
23005000091	50
23006300091	63
23007500091	75
23009000091	90
23011000091	110
23012500091	125
23014000091	140
23016000091	160
23018000091	180
23020000091	200
23022500091	225
23025000091	250
23028000091	280
23031500091	315

Female Adaptor

Code	Size (mm)
25003201291	32x1"
25005001891	50x11/2"

Male Adaptor

Code	Size (mm)
25503200991	32x3/4"
25503201291	32x1"
25503210091	32x1"
25505001891	50x11/2"
25506302491	63x2"

HDPE
TELECOMMUNICATION DUCT

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.

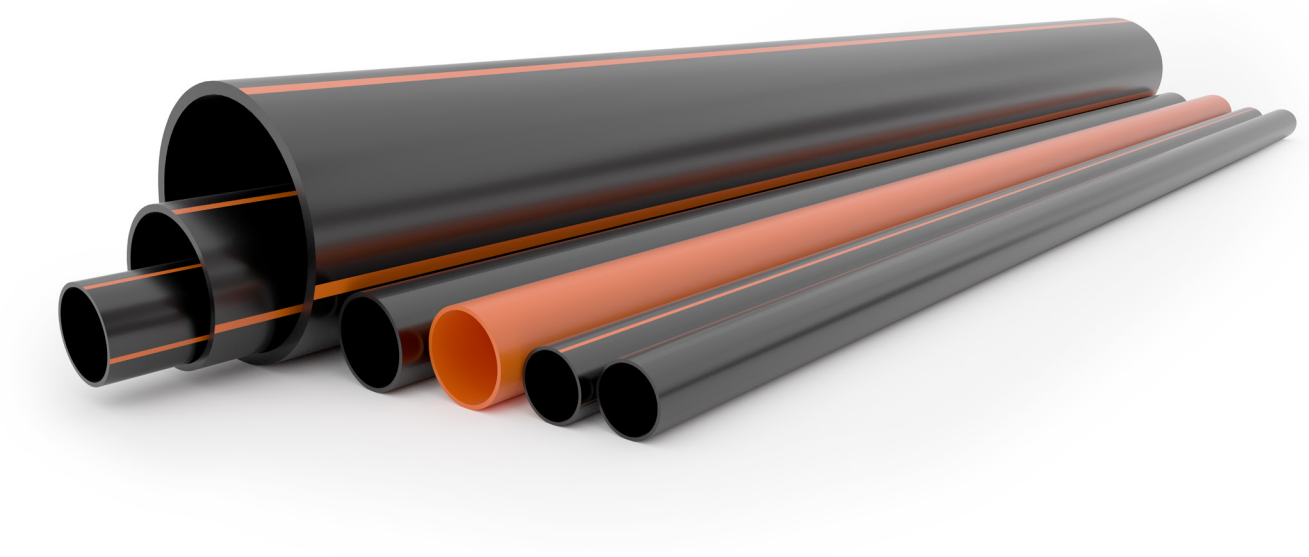
Benifits

- 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

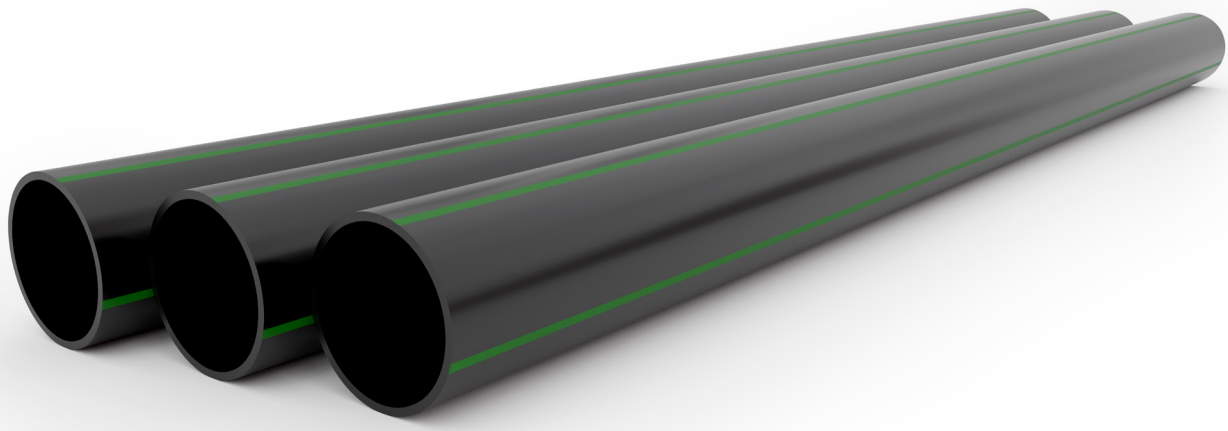
STC HDPE TELECOMMUNICATION DUCT



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

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

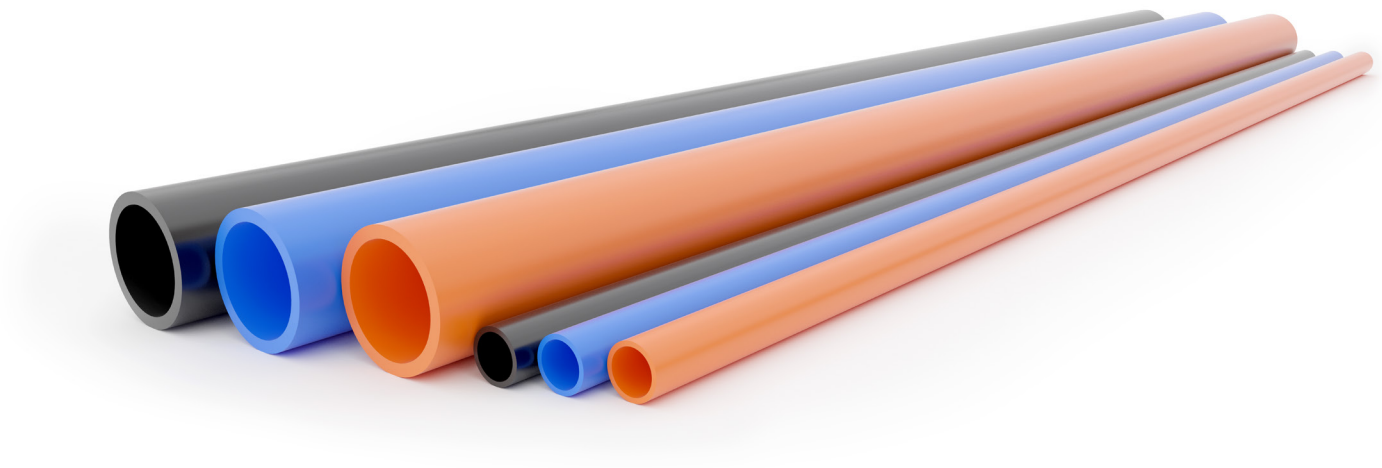
SEC HDPE ELECTRICAL DUCT



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

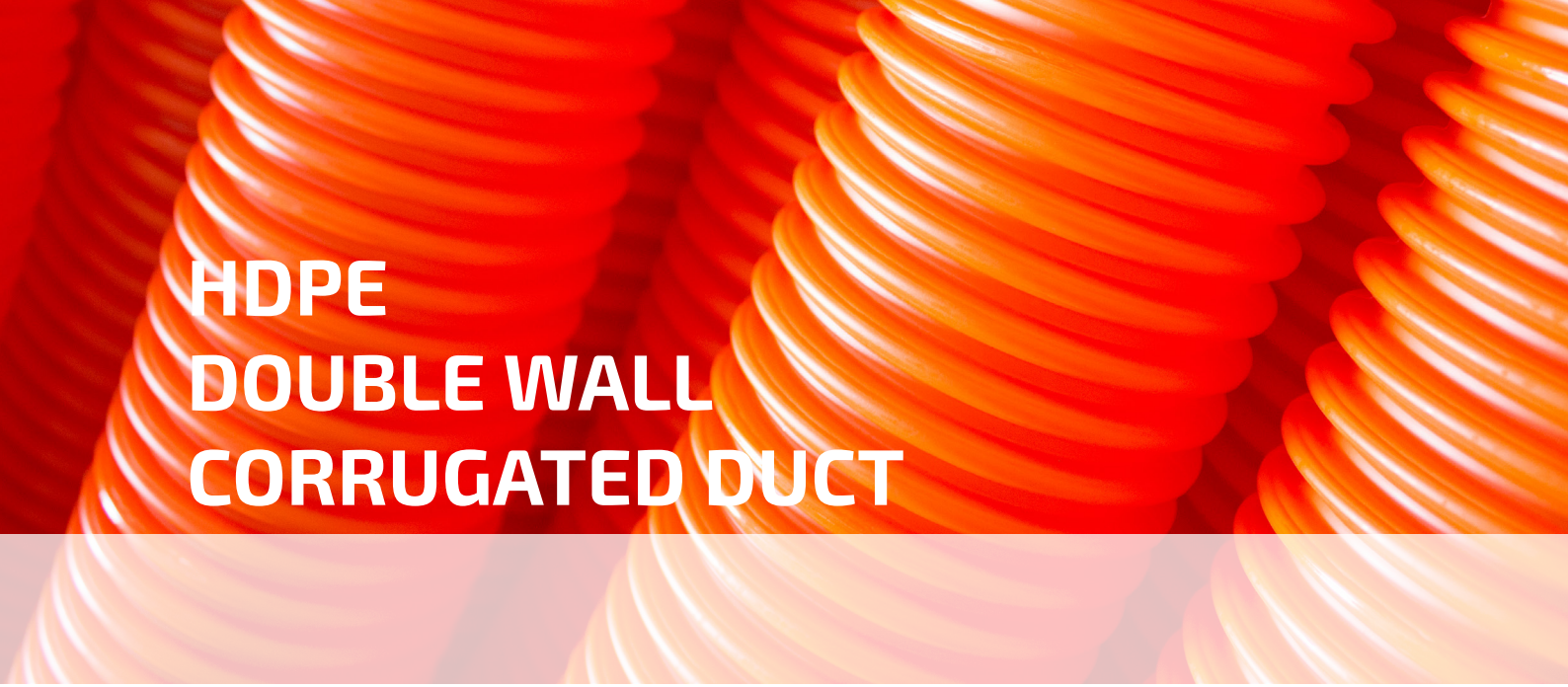
Material : HDPE
Material Designation : 345440 C/E
Length : Different lengths can be supplied on request.

MOBILY / ITC HDPE TELECOMMUNICATION DUCT



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

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
  Jointing coupling already fitted on each coil/bar seals upon request
  Installation In underground trench

Nominal Outside Diameter (mm)	ID (mm)	Lenght (Mtr)
110	92	500

Color:

External	Orange	Black	Black	Others
Internal	Yellow	Blue	Green	Others

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	Lenght (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

TÜV NORD

CERTIFICATE

Management system as per
EN ISO 9001 : 2008

In accordance with TÜV NORD CERT procedures, it is hereby certified that

MMP Group — المصنع للأنابيب ALMUNIF PIPE

Munir Abdullah Al Munif Factory for Plastic Pipes & Fittings Co.
Riyadh 3rd Industrial City, P. O. Box 355342
11383 Riyadh
Kingdom of Saudi Arabia

applies a management system in line with the above standard for the following scope

Manufacturing, Marketing and Sales of (uPVC, CPVC, PP-R, PE, GRP) Pipes & Fittings, PVC & CPVC Compounds

Certificate Registration No.: 04 100 000727
Audit Report No.: 5700 1712

Valid from: 2016-11-28
Valid until: 2018-09-14
(until 2016-11-27 in case of upgrade to ISO 9001:2015)
Initial certification 2000

Certification Body
at TÜV NORD CERT GmbH

Dammam, 2016-11-28

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits.

TÜV NORD CERT GmbH | Langemarckstraße 20 | 45141 Essen | www.tuev-nord-cert.com

IAF — DAkkS Deutsche Akkreditierungsstelle D-ZM-10001-01-01

CERTIFICATE TÜV NORD

Management system as per
DIN EN ISO 9001 : 2008

In accordance with TÜV NORD CERT procedures, it is hereby certified that

MMP Group — المصنع للأنابيب ALMUNIF PIPE

Munir Munif Plastic Pipe and Fitting Factory
Second Industrial City, P. O. Box 355342
Riyadh 11383
Saudi Arabia

applies a management system in line with the above standard for the following scope

Manufacturing, Sales & Marketing of PVC Compounds, uPVC & CPVC Pipes, PP Pipes & Fittings, GRP Pipes & Fittings, PVC Flexible Hoses, HDPE & LLDPE Hoses, PVC and CPVC Fittings

Certificate Registration No.: 04 100 000727
Audit Report No.: 5700 0124

Valid until 2019-11-27
Initial certification 2000

Certification Body
at TÜV NORD CERT GmbH

Dammam, 2019-12-31

This certification was conducted in accordance with the TÜV NORD CERT auditing and certification procedures and is subject to regular surveillance audits.

TÜV NORD CERT GmbH | Langemarckstraße 20 | 45141 Essen | www.tuev-nord-cert.com

IAF

National Organization
For Potable Water & Sanitary Drainage
Administration of Testing & Industry Supervision

الهيئـــة القومـــية
لمياه الشرب والصرف الصحي
إدارة الاختبارات والرقابة على الصناعة

شهادة اعتماد منشأة للتلحيم

(مواسير بلاستيك)

اسم المنشأة : الشركة السعودية لصناعة المواسير والراتنج (الحوف الكائنه)
عنوان الإقامة : ال10 الدائرة، شهيدين الجزء
عنوان المصنع : المنطقة الصناعية رقم ٢ الأراضي التابعة لقطعة 7-GSCO7 تكون
السجل التجاري: ٤٥٥٢ مكتبه مسجل تجاري : شاهد الدائرة محافظة : الدائرة
بموجب رقم تسجيل الضريبي : ٣٠٠١٠٧٨٢٨٢٠٠٣ مأمور وقم الأشتر محافظة : الدائرة
سجل صناعي رقم : ٢٠٠١٠٧٨٢٨٢٠٠٣ بتاريخ الإصدار : ٢٠١٥ نوع الصناعة : الدائرة
رخصة : [ ] مستغل رقم : ٢٣ (زمنية) [ ] الكترى محافظة : الجزء
من قائمة تعدين فيها : الدائرة
رقم القرار : التاريخ :

أهم المنتجات المعتمدة في الهيئة :
المواسير البلاستيك U-PVC للمياه والصرف حتى قطر ٣٠٠مم بضغوط تشغيل حتى ١٦ بار

- طبقا للمواصفات القياسية السعودية و الخليجية و القرار الوزاري رقم ٢٦٤ لسنة ٢٠١٥
- يتم الالتزام بالتعليمات الادارة و الموضحة خلفة وفي حالة مخالفتها يعتبر لاغي
- شهادة الاعتماد لا يعمل بها فيما عن شهادات الاختبار التي تصدر للأمر فوريه على حده

المعتمد العام

معتمد من

Saudi Standards, Metrology and Quality Org.

شهادة ترخيص باستعمال علامة الجودة
Quality Mark License Of Use

License No:
SASO certifies that:
Address :
Is hrt the right to use SASO quality mark on a following product:

After fulfilling the required requirements according to the normative documents:

SASO GSO 2385/2015

Date of issue:
Date of renewal :
Date of expiry :

Governor - SASO

This license are the quality mark is granted in pursuant to the royal decree no. M/10 dated 1392-03-03 H

NSF International
789 N. Dixboro Road, Ann Arbor, MI 48105 USA

RECOGNIZES

Al Munif Pipe
Saudi Arabia

AS COMPLYING WITH NSF/ANSI 14, 61 AND ALL APPLICABLE REQUIREMENTS.
PRODUCTS APPEARING IN THE NSF OFFICIAL LISTING ARE
AUTHORIZED TO BEAR THE NSF MARK.

NSF — ANSI — GRP PIPES

This certificate is the property of NSF International and must be returned upon request. This certificate remains valid as long as this client has products in Listing for the referenced standards. For the most current and complete Listing information, please access NSF's website (www.nsf.org)

November 2, 2015
Certificate# 0000019645 - 03

David Perkins
General Manager, Plumbing

Saudi Standards, Metrology and Quality Org.

شهادة ترخيص باستعمال علامة الجودة
Quality Mark License Of Use

License No:
SASO certifies that:
Address :
Is hrt the right to use SASO quality mark on a following product:

After fulfilling the required requirements according to the normative documents:

SASO GSO 1189/2002

Date of issue:
Date of renewal :
Date of expiry :

Governor - SASO

This license are the quality mark is granted in pursuant to the royal decree no. M/10 dated 1392-03-03 H


SASO
QUALITY MARK
الهيئة السعودية للمواصفات والمقاييس والجودة
Saudi Standards, Metrology and Quality Org.
شهادة ترخيص باستعمال علامة الجودة
License For Use of The Quality Mark
SASO GSO 675/1997
Governor - SASO
www.saso.gov.sa


WRAS
APPROVED MATERIAL
WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL

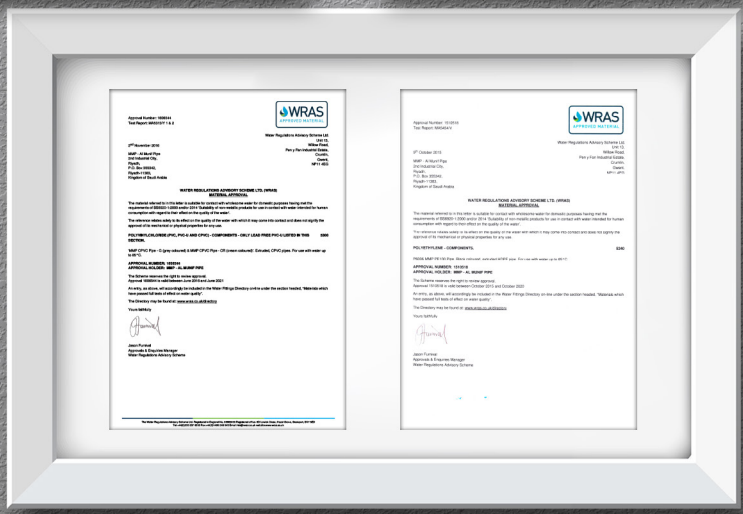

WRAS
APPROVED MATERIAL
WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL


NSF International
789 N. Dixboro Road, Ann Arbor, MI 48105 USA
RECOGNIZES
Al Munif Pipe
Facility: Riyadh, Saudi Arabia
AS COMPLYING WITH NSF/ANSI 14, 61 AND ALL APPLICABLE REQUIREMENTS.
PRODUCTS APPEARING IN THE NSF OFFICIAL LISTING ARE
AUTHORIZED TO BEAR THE NSF MARK.
ALMUNIF HDPE PIPES
November 2, 2018
Certificate# C0009365 - 03
David Purkiss
General Manager, Plumbing

NSF International
789 N. Dixboro Road, Ann Arbor, MI 48105 USA
RECOGNIZES
Al Munif Pipe
Facility: Riyadh, Saudi Arabia
AS COMPLYING WITH NSF/ANSI 61 AND ALL APPLICABLE REQUIREMENTS.
PRODUCTS APPEARING IN THE NSF OFFICIAL LISTING ARE
AUTHORIZED TO BEAR THE NSF MARK.
ALMUNIF UPVC PIPES
November 2, 2018
Certificate# C0010766 - 01
David Purkiss
General Manager, Plumbing


WRAS
APPROVED MATERIAL
WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL


WRAS
APPROVED MATERIAL
WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL


WRAS
APPROVED MATERIAL
WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL
WRAS
APPROVED MATERIAL
WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL


SASO
QUALITY MARK
الهيئة السعودية للمواصفات والمقاييس والجودة
Saudi Standards, Metrology and Quality Org.
شهادة ترخيص باستعمال علامة الجودة
Quality Mark License Of Use
SASO GSO 1123/2002
Governor - SASO
www.saso.gov.sa


Certificate
Standard ISO 9001:2008
Certificate Regist. No. 01 100 151481O
Certificate Holder:
Saudi Company for the Manufacture of Pipes and Fittings S.A.E
Industrial Zone – District NO.3,
North Expansion, The (SLO)7,
6th of October City – Egypt
Scope:
Manufacture of UPVC Pipes and Fittings
Proof has been furnished by means of an audit that the requirements of ISO 9001:2008 are met.
Validity:
The certificate is valid from 2015-07-01 until 2015-06-30.
First certification 2015
2015-07-01
TÜV Rheinland Cert GmbH
Am Grauen Stein - 51105 Köln
DAkkS
TÜVRheinland®
Precisely Right.


NSF International
RECOGNIZES
AL MUNIF PIPE
SAUDI ARABIA
AS COMPLYING WITH NSF/ANSI 14 AND ALL APPLICABLE REQUIREMENTS.
PRODUCTS APPEARING IN THE NSF OFFICIAL LISTING ARE
AUTHORIZED TO BEAR THE NSF MARK.
ALMUNIF PE PIPES
April 16, 2009
Certificate# C0009365 - 01
David Purkiss, General Manager
Water Distribution Systems

KINGDOM OF SAUDI ARABIA

Riyadh 11383 K.S.A P.O. Box 355342
Sales & Customer Service: +966 920000357
Fax: +966 112651845

www.ALMUNIFPIPES.com info@mmppf.com