INDUSTRIAL GROUP

HDPE

piping systems and solutions

SABS APPROVED

SAPPMA

Index

Introduction

- 200 employees
- 30 engineers and scientists
- 2 factories
- 2 on-site laboratories
- 38 Patents & Trademarks
- 2 Presidential Awards

At BT Industrial Group, we pride ourselves on being more than just engineers. We are pioneers dedicated to shaping the future. As industry leaders in HDPE pipe and accessories manufacturing, pipe system design, and engineering, we provide durable solutions that are built to last.

We hold SAPPMA certification, and we take pride in our Quality Management Systems, which have received accreditation from DEKRA ISO 9001. Our product line-up consists of HDPE pipes that adhere to the SABS SANS 4427-2 standards, as well as a range of complementary items like stub ends, flanges, Y and T-pieces, valves, nuts, and bolts, all tailored to cater to our clients' unique requirements.

We are your strategic partner, expertly navigating the balance between reducing **Total Cost of Ownership (TCO)** and maximising **Return on Investment (ROI)**, ensuring your investments work smarter, not harder.

100 + Projects completed	871 k km HDPE pipelines produced and implemented	25 mil kg Weight of products produced to date	4 Continents covered

Why HDPE Pipes?

Significant advantages over other pipe forms

Cost Effectiveness

HDPE pipes, known for their lightweight design, are easy to handle and install. They exhibit exceptional resistance against corrosion, abrasion, erosion, and biological threats. These pipes are engineered to withstand challenging conditions, external loads, internal pressure, extreme temperatures, and deep burial, presenting a cost-effective and durable solution. With the potential to last up to 100 years in favorable environments, they lead to reduced operational expenses. Moreover, the thermally fused HDPE pipe lengths create a leakproof connection that surpasses the strength of the pipe itself.

Versatility

HDPE pipes are known for their safe and leakproof installations, which are effective above and below ground as well as underwater. These versatile pipes can be utilized for transporting a wide range of substances, including drinking water, mining slurries, chemicals, oil, gas, and extremely hazardous waste materials. They are suitable for various installation methods such as direct burial, slip lining, oversized lining, pipe bursting, and directional drilling.

Super Flow Characteristics

The use of HDPE pipes offers significant advantages over new commercial steel. HDPE is approximately 30 times smoother, resulting in improved flow characteristics and reduced resistance, which ultimately lowers operating costs. Unlike other materials, HDPE retains its flow capacity over time, eliminating the need for compensative oversizing due to deteriorating capacity.

Design Guidelines

Physical	Units	HDPE
Density	kg/m	0.965 x 10
Coefficient of linear expansion	mm/m/°C	0.2
Thermal conductivity at 20ºC	W/m/K	0.5
Specific heat	J/kg/K	2.3 x 10
Softening point (Vicat)	°C	67

Mechanical	Units	HDPE
Tensile strength at yield	MPa	26
Elongation at yield	%	10
Modulus of elasticity	MPa	900
Rockwell hardness (Shore)	-	61
Dielectric strength	kV/mm	70

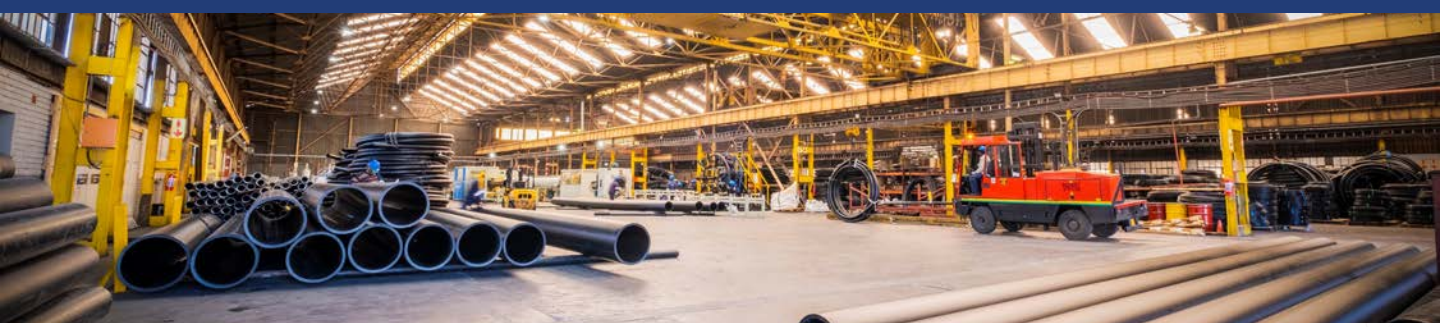
Temperature – Pressure Derating

Physical and Mechanical Properties

The rated working pressure of an HDPE water pipe is determined at 20ºC. Where the operating temperature of the fluid in the pipe exceeds 20ºC, the pressure rating of the pipe has to be derated in order to maintain the designed safety of the pipe

Temperature of Fluid in The Pipe ºC	Derating Factor Apply to Maximum Working Pressure
0-20	1
20-25	0.9
25-30	0.8
30-35	0.7
35-40	0.6
40-45	0.5
45-50	0.4

HDPE pipe is not recommended in applications where the fluid temperature exceeds 60ºC



HDPE Material

High-Density Polyethylene (HDPE) pipes have several advantages over steel, PVC, and concrete pipes:

- Corrosion Resistance: HDPE pipes are highly resistant to corrosion, making them ideal for carrying various fluids, especially in corrosive environments. Steel pipes can corrode over time, requiring costly maintenance.
- Lightweight: HDPE pipes are much lighter than steel, making transportation and installation easier and more cost-effective. Concrete pipes are heavy and cumbersome to handle.
- Flexibility: HDPE pipes are flexible and can accommodate ground movement and settlement without breaking. This flexibility is lacking in rigid materials like steel and concrete.
- Longevity: HDPE pipes have a long service life, often exceeding 50 years, without significant degradation. Steel pipes may rust, while concrete pipes can deteriorate over time.
- Leak Resistance: HDPE pipes are joined using heat fusion techniques, creating seamless, leak-resistant connections. PVC and concrete pipes may require additional sealants or gaskets, which can be prone to leaks.
- Chemical Resistance: HDPE pipes are resistant to a wide range of chemicals, making them suitable for conveying various types of fluids. PVC and concrete pipes may not be as chemically resistant.
- Smooth Interior: HDPE pipes have a smooth interior surface, reducing friction and minimizing the risk of clogs or scaling. Concrete pipes, in contrast, may accumulate deposits over time.
- Low Maintenance: HDPE pipes require minimal maintenance over their lifespan, reducing ongoing costs compared to steel or concrete pipes, which may need frequent inspection and repairs.
- Energy Efficiency: The smooth interior of HDPE pipes results in lower frictional losses during fluid flow, potentially saving energy in pumping systems compared to rougher interior surfaces of steel and concrete pipes.
- Environmental Impact: HDPE pipes are recyclable and have a lower carbon footprint compared to steel and concrete pipes, making them a more environmentally friendly choice.

While HDPE pipes offer numerous advantages, the choice of material depends on specific project requirements, such as the type of fluid to be conveyed, environmental conditions, and budget constraints. Each material has its own strengths and weaknesses that should be considered during the selection process.

Specification

BT Industrial's HDPE water pipes are manufactured to SABS SANS 4427-2 while HDPE Gas pipes to be manufactured to SABS SANS 4437. PE100 is the grade for HDPE polymer used in both types above while both PE63 and PE80 have been discontinued

Chemical Resistance

HDPE pipes are resistant to a wide range of chemicals and industrial solvents. Please refer to our technical department for detailed information

Product Range – PE 100

Outside Diameter	20mm – 630mm
Pressure Classes	8 – 25 bar
Design Stress	As per ISO 4427, the minimum design safety factor or overall service (design) coefficient is considered as 1.25. Allowable structural stress or design stress for PE100 pipe is σ = MRS Factor of Safety = 8 MPa.
Pipe Ends/Jointing	Plain-ended joined with either compression, electrofusion or buttweld fittings. Alternatively with Tak-stubs, Victaulic-stubs, or Stub-flange.

Standard Products	
Outside Diameter	**Length**
20mm – 63mm	100m & 50m coils
75mm – 110mm	6m straight length, 12m straight length or 50m coils
125mm – 630mm	6m straight length, 12m straight length or **bespoke lengths on request**
Specialised Small Bore Products (Coils)	
Outside Diameter	**Length**
110mm, 125mm, 140mm, 160mm	100m coils

Jointing System

Compression Fittings	
Size	20mm - 110mm (160mm couplers only
Pressure	PN 16 (SDR 11)
Range	Complete range of elbows, couplings and adaptors

Tak-stubs	
Size	40mm-315mm
Pressure	PN 10 (SDR 17)
Range	Fitted to either coils or straight lengths

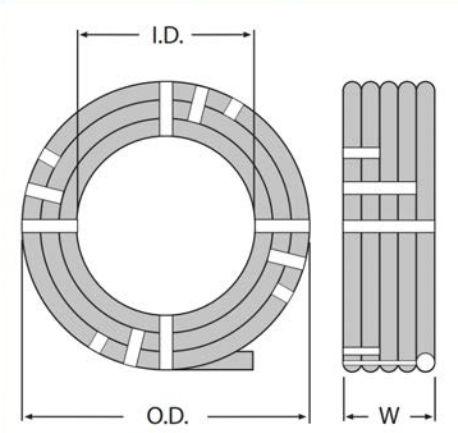
Victaulic-stubs	
Size	50mm - 280mm
Pressure	PN 16 (SDR 11)

Electrofusion Fittings	
Size	20mm - 100mm
Pressure	PN 10 (SDR 17) and 16 (SDR 11)
Range	Complete range of couplings, elbows, junctions, adaptors and offtakes

Buttweld Fittings	
Size	40mm - 1000mm
Pressure	8 (SDR 21) - 25 (SDR 7.4)
Range	Complete range of elbows, junctions and adaptors

Stub-flange And Backing Ring	
Size	40mm-630mm
Drilling	Table 10 / 16 / TB / 25

Coil Dimensions



Coil Dimensions			ID	Approximate OD				Weight			
			mm	mm	mm	mm	mm	kg	kg	kg	kg
Dia	PN	kg/m	m	50m	75m	100m	150m	50m	75m	100m	150m
90	16	2.137	1820	2240	2240	2460	2460	107	160	214	321
110	12.5	2.634	1800	2240	2240	2460	2460	133	198	263	396
110	16	3.169	1800	2240	2240	2460	2460	160	238	317	477
125	12.5	3.394	1800	2300	2550	2550	N/A	170	256	341	N/A
125	16	4.111	1800	2300	2550	2550	N/A	206	310	413	N/A
140	12.5	4.250	2000	2560	2560	N/A	N/A	211	320	N/A	N/A
140	16	5.124	1800	2360	2640	2640	N/A	256	387	512	N/A
160	12.5	5.547	2000	2640	2640	N/A	N/A	279	418	N/A	N/A
160	16	6.725	1700	2340	2660	2660	N/A	334	506	672	N/A
160	20	8.036	1800	2340	2660	2660	N/A	402	603	804	N/A
180	16	8.500	1700	2420	2420	N/A	N/A	422	638	N/A	N/A

Codes of Practice

Jointing

For compression fittings: Follow manufacture's instructions.

Note: Overheating may cause the assembly to leak. Buttweld and electrical fittings: Have a separate set of jointing instructions. Ensure that you obtain and follow the specific information when you purchase them.

Cutting

Carefully cut the pipe ends square using a fine-toothed hand saw. Remove burrs and cutting debris.

Storage

Pipes should be stored on level flat ground, free of stones or sharp protrusions. The height of the stacked pipe should not exceed 5 coils. Normal exposure to direct sunlight during the contract will not harm the pipe.

Handling

Pipes manufactured in HDPE are strong, durable and easy to handle. In common with most construction materials, they should nevertheless be handled with care to avoid causing damage.

HDPE Pipe – SANS 4427-2

The rated working pressure of an HDPE water pipe is determined at 20ºC. Where the operating temperature of the fluid in the pipe exceeds 20ºC, the pressure rating of the pipe has to be derated in order to maintain the designed safety of the pipe

Code	Description	Wall thickness in mm		Mass kg/m	Typical length per pipe (meters)		Typical pipe weight (Kg)	
PE 100 - PN 8 SDR 21	SDR 21	Min	Max	KG/M			Kg	Kg
BTI / HDPE Pipe	110mm x 6m	5.30	5.65	1.78	6.00	12.00	10.68	21.36
BTI / HDPE Pipe	125mm x 6m	6.00	6.35	2.28	6.00	12.00	13.68	27.36
BTI / HDPE Pipe	140mm x 6m	6.70	7.10	2.85	6.00	12.00	17.10	34.20
BTI / HDPE Pipe	160mm x 6m	7.70	8.15	3.74	6.00	12.00	22.44	44.88
BTI / HDPE Pipe	180mm x 6m	8.60	9.10	4.70	6.00	12.00	28.20	56.40
BTI / HDPE Pipe	200mm x 6m	9.60	10.15	5.82	6.00	12.00	34.92	69.84
BTI / HDPE Pipe	225mm x 6m	10.80	11.40	7.35	6.00	12.00	44.10	88.20
BTI / HDPE Pipe	250mm x 6m	11.90	12.55	9.00	6.00	12.00	54.00	108.00
BTI / HDPE Pipe	280mm x 6m	13.40	14.15	11.36	6.00	12.00	68.16	136.32
BTI / HDPE Pipe	315mm x 6m	15.00	15.80	14.27	6.00	12.00	85.62	171.24
BTI / HDPE Pipe	355mm x 6m	16.90	17.80	18.12	6.00	12.00	108.72	217.44
BTI / HDPE Pipe	400mm x 6m	19.10	20.15	23.11	6.00	12.00	138.66	277.32
BTI / HDPE Pipe	450mm x 6m	21.50	22.65	29.22	6.00	12.00	175.32	350.64
BTI / HDPE Pipe	500mm x 6m	23.90	25.15	36.06	6.00	12.00	216.36	432.72
BTI / HDPE Pipe	560mm x 6m	26.70	28.10	45.13	6.00	12.00	270.78	541.56
BTI / HDPE Pipe	630mm x 6m	30.00	31.55	57.01	6.00	12.00	342.06	684.12
PE 100 - PN 10 SDR 17	SDR 17	Min	Max	KG/M				
BTI / HDPE Pipe	110mm x 6m	6.60	7.00	2.18	6.00	12.00	13.08	26.16
BTI / HDPE Pipe	125mm x 6m	7.40	7.85	2.78	6.00	12.00	16.68	33.36
BTI / HDPE Pipe	140mm x 6m	8.30	8.80	3.49	6.00	12.00	20.94	41.88
BTI / HDPE Pipe	160mm x 6m	9.50	10.05	4.55	6.00	12.00	27.30	54.60
BTI / HDPE Pipe	180mm x 6m	10.70	11.30	5.76	6.00	12.00	34.56	69.12
BTI / HDPE Pipe	200mm x 6m	11.90	12.55	7.10	6.00	12.00	42.60	85.20
BTI / HDPE Pipe	225mm x 6m	13.40	14.15	9.01	6.00	12.00	54.06	108.12
BTI / HDPE Pipe	250mm x 6m	14.80	15.60	11.04	6.00	12.00	66.24	132.48
BTI / HDPE Pipe	280mm x 6m	16.60	17.50	13.87	6.00	12.00	83.22	166.44
BTI / HDPE Pipe	315mm x 6m	18.70	19.70	17.56	6.00	12.00	105.36	210.72
BTI / HDPE Pipe	355mm x 6m	21.10	22.25	22.36	6.00	12.00	134.16	268.32
BTI / HDPE Pipe	400mm x 6m	23.70	24.95	28.25	6.00	12.00	169.50	339.00
BTI / HDPE Pipe	450mm x 6m	26.70	28.10	35.79	6.00	12.00	214.74	429.48
BTI / HDPE Pipe	500mm x 6m	29.70	31.25	44.23	6.00	12.00	265.38	530.76
BTI / HDPE Pipe	560mm x 6m	33.20	34.95	55.41	6.00	12.00	332.46	664.92
BTI / HDPE Pipe	630mm x 6m	37.40	39.35	70.18	6.00	12.00	421.08	842.16

Note: Ovality and internal Coil Diameter is based on SANS 4427-2; Kg/m or mass is nominal

HDPE Pipe – SANS 4427-2

Code	Description	Wall thickness in mm		Mass kg/m	Typical length per pipe (meters)		Typical pipe weight (Kg)	
PE 100 - PN 12.5 SDR 13.6	SDR 13.6	Min	Max	KG/M				
BTI / HDPE Pipe	110mm x 6m	8.10	8.60	2.63	6.00	12.00	15.78	31.56
BTI / HDPE Pipe	125mm x 6m	9.20	9.75	3.39	6.00	12.00	20.34	40.68
BTI / HDPE Pipe	140mm x 6m	10.30	10.90	4.25	6.00	12.00	25.50	51.00
BTI / HDPE Pipe	160mm x 6m	11.80	12.45	5.55	6.00	12.00	33.30	66.60
BTI / HDPE Pipe	180mm x 6m	13.30	14.05	7.04	6.00	12.00	42.24	84.48
BTI / HDPE Pipe	200mm x 6m	14.70	15.50	8.63	6.00	12.00	51.78	103.56
BTI / HDPE Pipe	225mm x 6m	16.60	17.50	10.97	6.00	12.00	65.82	131.64
BTI / HDPE Pipe	250mm x 6m	18.40	19.40	13.51	6.00	12.00	81.06	162.12
BTI / HDPE Pipe	280mm x 6m	20.60	21.70	16.92	6.00	12.00	101.52	203.04
BTI / HDPE Pipe	315mm x 6m	23.20	24.45	21.45	6.00	12.00	128.70	257.40
BTI / HDPE Pipe	355mm x 6m	26.10	27.50	27.20	6.00	12.00	163.20	326.40
BTI / HDPE Pipe	400mm x 6m	29.40	30.95	34.49	6.00	12.00	206.94	413.88
BTI / HDPE Pipe	450mm x 6m	33.10	34.85	43.69	6.00	12.00	262.14	524.28
BTI / HDPE Pipe	500mm x 6m	36.80	38.70	53.90	6.00	12.00	323.40	646.80
BTI / HDPE Pipe	560mm x 6m	41.20	43.35	67.63	6.00	12.00	405.78	811.56
BTI / HDPE Pipe	630mm x 6m	46.30	48.70	85.48	6.00	12.00	512.88	1,025.76
PE 100 - PN 16 SDR 11	SDR 11	Min	Max	KG/M				
BTI / HDPE Pipe	110mm x 6m	10.00	10.55	3.17	6.00	12.00	19.02	38.04
BTI / HDPE Pipe	125mm x 6m	11.40	12.05	4.11	6.00	12.00	24.66	49.32
BTI / HDPE Pipe	140mm x 6m	12.70	13.40	5.12	6.00	12.00	30.72	61.44
BTI / HDPE Pipe	160mm x 6m	14.60	15.40	6.73	6.00	12.00	40.38	80.76
BTI / HDPE Pipe	180mm x 6m	16.40	17.30	8.50	6.00	12.00	51.00	102.00
BTI / HDPE Pipe	200mm x 6m	18.20	19.20	10.48	6.00	12.00	62.88	125.76
BTI / HDPE Pipe	225mm x 6m	20.50	21.60	13.27	6.00	12.00	79.62	159.24
BTI / HDPE Pipe	250mm x 6m	22.70	23.90	16.32	6.00	12.00	97.92	195.84
BTI / HDPE Pipe	280mm x 6m	25.40	26.75	20.46	6.00	12.00	122.76	245.52
BTI / HDPE Pipe	315mm x 6m	28.60	30.10	25.90	6.00	12.00	155.40	310.80
BTI / HDPE Pipe	355mm x 6m	32.20	33.90	32.87	6.00	12.00	197.22	394.44
BTI / HDPE Pipe	400mm x 6m	36.30	38.20	41.73	6.00	12.00	250.38	500.76
BTI / HDPE Pipe	450mm x 6m	40.90	43.00	52.85	6.00	12.00	317.10	634.20
BTI / HDPE Pipe	500mm x 6m	45.40	47.75	65.21	6.00	12.00	391.26	782.52
BTI / HDPE Pipe	560mm x 6m	50.80	53.40	81.69	6.00	12.00	490.14	980.28
BTI / HDPE Pipe	630mm x 6m	57.20	60.15	103.50	6.00	12.00	621.00	1,242.00

Note: For coiled pipe and for straight lengths with diameter 630, the maximum out-of-roundness shall be agreed between manufacturer and purchaser; Kg/m or mass is nominal

HDPE Pipe – SANS 4427-2

Code	Description	Wall thickness in mm		Mass kg/m	Typical length per pipe (meters)		Typical pipe weight (Kg)	
PE 100 - PN 20 SDR 9	SDR 9	Min	Max	KG/M				
BTI / HDPE Pipe	110mm x 6m	12.30	13.00	3.81	6.00	12.00	22.86	45.72
BTI / HDPE Pipe	125mm x 6m	14.00	14.80	4.93	6.00	12.00	29.58	59.16
BTI / HDPE Pipe	140mm x 6m	15.70	16.55	6.17	6.00	12.00	37.02	74.04
BTI / HDPE Pipe	160mm x 6m	17.90	18.85	8.04	6.00	12.00	48.24	96.48
BTI / HDPE Pipe	180mm x 6m	20.10	21.20	10.17	6.00	12.00	61.02	122.04
BTI / HDPE Pipe	200mm x 6m	22.40	23.60	12.57	6.00	12.00	75.42	150.84
BTI / HDPE Pipe	225mm x 6m	25.20	26.55	15.91	6.00	12.00	95.46	190.92
BTI / HDPE Pipe	250mm x 6m	27.90	29.35	19.56	6.00	12.00	117.36	234.72
BTI / HDPE Pipe	280mm x 6m	31.30	32.95	24.58	6.00	12.00	147.48	294.96
BTI / HDPE Pipe	315mm x 6m	35.20	37.05	31.10	6.00	12.00	186.60	373.20
BTI / HDPE Pipe	355mm x 6m	39.70	41.75	39.50	6.00	12.00	237.00	474.00
BTI / HDPE Pipe	400mm x 6m	44.70	47.00	50.10	6.00	12.00	300.60	601.20
BTI / HDPE Pipe	450mm x 6m	50.30	52.90	63.44	6.00	12.00	380.64	761.28
BTI / HDPE Pipe	500mm x 6m	55.80	58.65	78.17	6.00	12.00	469.02	938.04
BTI / HDPE Pipe	560mm x 6m	62.50	65.70	98.08	6.00	12.00	588.48	1,176.96
BTI / HDPE Pipe	630mm x 6m	70.30	73.90	124.11	6.00	12.00	744.66	1,489.32
PE 100 - PN 25 SDR7.4	SDR 7.4	Min	Max	KG/M				
BTI / HDPE Pipe	110mm x 6m	15.10	15.95	4.53	6.00	12.00	27.18	54.36
BTI / HDPE Pipe	125mm x 6m	17.10	18.05	5.83	6.00	12.00	34.98	69.96
BTI / HDPE Pipe	140mm x 6m	19.20	20.25	7.33	6.00	12.00	43.98	87.96
BTI / HDPE Pipe	160mm x 6m	21.90	23.05	9.54	6.00	12.00	57.24	114.48
BTI / HDPE Pipe	180mm x 6m	24.60	25.90	12.05	6.00	12.00	72.30	144.60
BTI / HDPE Pipe	200mm x 6m	27.40	28.85	14.91	6.00	12.00	89.46	178.92
BTI / HDPE Pipe	225mm x 6m	30.80	32.40	18.85	6.00	12.00	113.10	226.20
BTI / HDPE Pipe	250mm x 6m	34.20	36.00	23.27	6.00	12.00	139.62	279.24
BTI / HDPE Pipe	280mm x 6m	38.30	40.30	29.18	6.00	12.00	175.08	350.16
BTI / HDPE Pipe	315mm x 6m	43.10	45.35	36.93	6.00	12.00	221.58	443.16
BTI / HDPE Pipe	355mm x 6m	48.50	51.00	46.83	6.00	12.00	280.98	561.96
BTI / HDPE Pipe	400mm x 6m	54.70	57.50	59.48	6.00	12.00	356.88	713.76
BTI / HDPE Pipe	450mm x 6m	61.50	64.65	75.24	6.00	12.00	451.44	902.88

Flanges

Flange Dimensions									Fasteners PSA Recommendations		
Size	OD	ID	THK	PCD	No.	Holes	e x 45	KG/PC	D2	P-P	P-s
BS T/D											
25mm	101.6	38	10	73	4	14.3	4	0.50	M12	75	55
32mm	114.3	45	10	82.6	4	14.3	4	0.63	M12	75	55
40mm	120.7	51	10	87.3	4	14.3	4	0.69	M12	75	55
50mm	133.4	63	10	98.4	4	14.3	4	0.80	M12	75	55
63mm	152.4	78	10	114.3	4	17.5	4	0.98	M12	80	60
75mm	165.1	92	10	127	4	17.5	4	1.09	M16	80	60
90mm	184.1	110	10	146	4	17.5	4	1.27	M16	100	70
110mm	215.9	136	10	177.8	4	17.5	4	1.66	M16	110	75
125mm	215.9	136	10	177.8	4	17.5	4	1.66	M16	110	75
140mm	254	158	12	209.6	8	17.5	6	2.75	M16	110	80
160mm	279.4	190	12	235	8	17.5	6	2.93	M16	130	90
180mm	279.4	190	12	235	8	17.5	6	2.93	M16	130	90
200mm	336.3	237	12	292.1	8	17.5	6	4.04	M16	130	90
225mm	336.3	237	12	292.1	8	17.5	6	4.04	M16	150	100
250mm	406.4	279	16	355.6	8	22.2	8	8.23	M20	160	110
280mm	406.4	292	16	355.6	8	22.2	8	7.51	M20	160	110
315mm	457.2	330	19	406.4	12	22.2	8	11.10	M20	190	120
355mm	527.1	376	22	469.9	12	25.4	8	17.50	M24	210	140
400mm	577.9	430	22	520.7	12	25.4	8	19.20	M24	220	130
450mm	641.4	476	25	584.2	12	25.4	8	27.30	M24	230	150
500mm	704.9	533	28	641.4	16	25.4	8	35.00	M24	250	160
560mm	762	592	28	698	16	28.6	8	37.50	M24	250	160
630mm	825.5	645	30	755.7	16	28.6	8	46.80	M24	260	170

Flanges

Flange Dimensions									Fasteners PSA Recommendations		
Size	OD	ID	THK	PCD	No.	Holes	e x 45	KG/PC	D2	P-P	P-s
SANS 1 123 – T1000											
50mm	150	63	10	110	4	18	4	1.07	M16	80	60
63mm	165	78	10	125	4	18	4	1.23	M16	80	60
75mm	185	92	12	145	4	18	4	1.82	M16	85	65
90mm	200	110	12	160	8	18	4	1.88	M16	100	70
110mm	220	136	12	180	8	18	4	2.03	M16	110	80
125mm	220	136	12	180	8	18	4	2.03	M16	110	80
140mm	250	158	14	210	8	18	6	3.02	M16	120	80
160mm	285	190	16	240	8	22	6	4.08	M20	140	100
180mm	285	190	16	240	8	22	6	4.08	M20	140	100
200mm	340	237	18	295	8	22	6	6.17	M20	150	100
225mm	340	237	18	295	8	22	6	6.17	M20	170	110
250mm	395	279	20	350	12	22	8	8.93	M20	170	120
280mm	395	292	20	350	12	22	8	8.02	M20	170	120
315mm	445	330	22	400	12	22	8	11.30	M20	200	130
355mm	505	379	25	460	16	22	8	16.40	M20	210	150
400mm	565	430	25	515	16	26	8	19.10	M24	230	150
450mm	615	476	30	565	20	26	8	25.60	M24	240	160
500mm	670	533	30	620	20	26	8	28.10	M24	250	170
560mm	730	592	35	675	20	26	8	36.50	M24	260	180
630mm	780	645	36	725	20	26	8	39.80	M24	260	180
630mm	835	662	36	780	20	26	8	54.60	M24	260	180
710mm	895	737	40	840	24	26	8	59.70	M24	270	190
800mm	1015	840	45	950	24	33	8	82.90	M30	290	200
900mm	1115	942	50	1050	28	33	8	100.40	M30	300	210
1000mm	1230	1045	55	1160	28	33	8	132.50	M30	300	220
SANS 1 123 – T1600											
25mm	105	38	10	75	4	14	4	0.55	M12	75	55
32mm	115	45	10	85	4	14	4	0.65	M12	75	55
40mm	140	51	10	100	4	18	4	0.97	M16	75	55
50mm	150	63	10	110	4	18	4	1.07	M16	80	60
63mm	165	78	12	125	4	18	4	1.47	M16	80	65
75mm	185	92	12	145	4	18	4	1.82	M16	85	65
90mm	200	110	14	160	8	18	4	2.19	M16	100	75
110mm	220	136	14	180	8	18	4	2.36	M16	120	80
125mm	220	136	14	180	8	18	4	2.36	M16	120	80
140mm	250	158	16	210	8	18	6	3.45	M16	120	90
160mm	285	190	18	240	8	22	6	4.59	M20	150	100
180mm	285	190	18	240	8	22	6	4.59	M20	150	100
200mm	340	237	22	295	12	22	6	7.28	M20	150	110
225mm	340	237	22	295	12	22	6	7.28	M20	170	120
250mm	405	279	25	355	12	26	8	12.05	M24	190	130
280mm	405	292	25	355	12	26	8	10.90	M24	190	130
315mm	460	330	28	410	12	26	8	16.40	M24	220	150
355mm	520	376	30	470	16	26	8	21.90	M24	230	160
400mm	580	430	32	525	16	26	8	27.80	M24	240	160
450mm	640	476	35	585	20	26	8	36.60	M24	250	170
500mm	715	533	40	650	20	33	8	50.70	M30	280	190
560mm	775	592	40	710	20	33	8	56.40	M30	280	190
630mm	840	645	50	770	20	33	8	82.70	M30	300	210
710mm	910	737	50	840	24	33	8	79.90	M30	300	210
800mm	1025	840	60	950	24	39	8	114.30	M36	320	240
900mm	1125	910	65	1050	28	39	8	134.70	M36	330	250
1000mm	1255	1045	70	1170	28	39	8	190.30	M36	330	260

Flanges

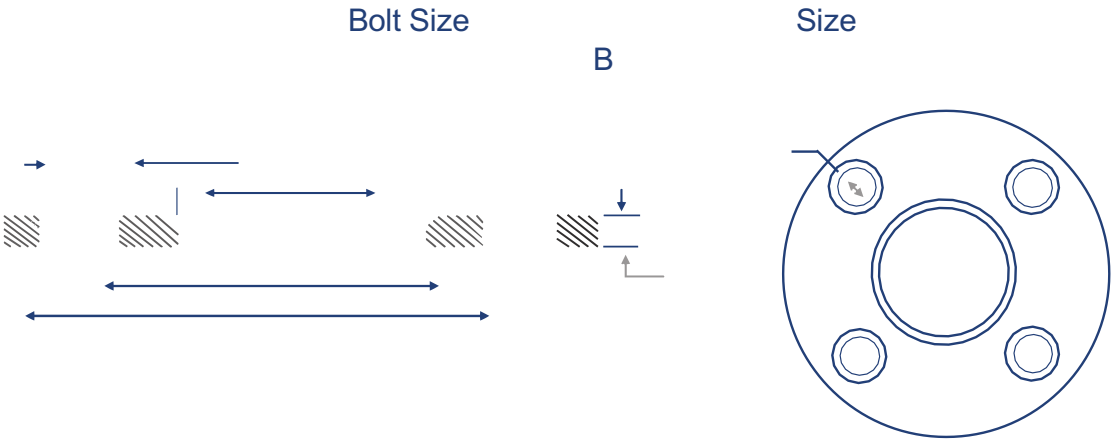
Flange Dimensions									Fasteners PSA Recommendations		
Size	OD	ID	THK	PCD	No.	Holes	e x 45	KG/PC	D2	P-P	P-s
SANS 1 123 – T2500											
90mm	200	103	22	160	8	18	4	3.64	M16	120	90
110mm	235	136	25	190	8	22	4	5.07	M20	140	110
125mm	235	136	25	190	8	22	4	5.07	M20	140	110
140mm	270	158	28	220	8	26	4	7.35	M24	160	120
160mm	300	190	30	250	8	26	6	8.98	M24	180	130
180mm	300	190	30	250	8	26	6	8.98	M24	180	130
200mm	360	237	28	310	12	26	6	11.30	M24	170	130
225mm	360	237	28	310	12	26	6	11.30	M24	190	140
250mm	425	279	30	370	12	26	8	17.60	M24	200	140
280mm	425	292	30	370	12	26	8	16.20	M24	200	140
315mm	485	330	32	430	16	26	8	22.80	M24	220	160
355mm	555	376	35	490	16	33	8	32.30	M30	250	170
400mm	620	430	40	550	16	33	8	45.00	M30	270	190
450mm	670	476	45	600	20	33	8	55.70	M30	280	200
500mm	730	533	50	660	20	33	8	70.10	M30	300	210
ASA 150#											
32mm	107.9	45	10	79.4	4	15.9	4	0.53	M12	75	55
40mm	117.5	51	10	88.9	4	15.9	4	0.63	M12	75	65
50mm	127	63	10	98.4	4	15.9	4	0.69	M16	80	60
63mm	152.4	78	12	120.6	4	19	4	1.16	M16	80	65
75mm	177.8	92	12	139.7	4	19	4	1.61	M16	85	65
90mm	190.5	103	12	152.4	4	19	4	1.80	M16	100	70
110mm	228.6	136	15	190.5	8	19	4	2.86	M16	120	80
125mm	228.6	136	15	190.5	8	19	4	2.86	M16	120	80
140mm	254	158	16	215.9	8	22.2	6	3.52	M20	130	90
160mm	279.4	190	20	241.3	8	22.2	6	4.69	M20	150	110
180mm	279.4	190	20	241.3	8	22.2	6	4.69	M20	150	110
200mm	342.9	237	20	298.4	8	22.2	6	7.10	M20	150	110
225mm	342.9	237	20	298.4	8	22.2	6	7.10	M20	170	120
250mm	406.4	279	25	361.9	12	25.4	8	12.30	M24	190	130
280mm	406.4	292	25	361.9	12	25.4	8	11.20	M24	190	130
315mm	482.6	330	28	431.8	12	25.4	8	20.10	M24	220	150
355mm	533.4	376	30	476.2	12	28.6	8	24.70	M24	230	160
400mm	596.9	430	30	539.8	16	28.6	8	29.30	M24	240	160
450mm	635	476	35	577.8	16	31.9	8	34.70	M30	260	180
500mm	698.5	533	38	635	20	31.9	8	43.10	M30	270	190
560mm	812.8	592	40	749.3	20	34.9	8	70.60	M32	280	190
630mm	812.8	645	40	749.3	20	34.9	8	54.40	M32	280	190

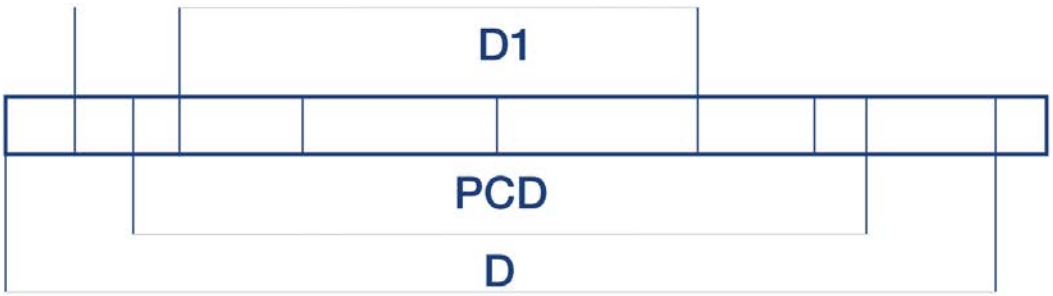
Flanges

Flange Dimensions							Fasteners	
Size	OD	THK	PCD	No.	Holes	KG/PC	D2	P-s
SANS 1 123 – T1000 Blank								
63mm	165	12	125	4	18	1.92	M16	80
75mm	185	12	145	4	18	2.44	M16	80
90mm	200	14	160	8	18	3.23	M16	90
110mm	225	14	180	8	18	3.96	M16	100
125mm	225	14	180	8	18	3.96	M16	100
140mm	250	16	210	8	18	5.92	M16	100
160mm	285	18	240	8	22	8.59	M20	110
180mm	285	18	240	8	22	8.59	M20	110
200mm	340	18	295	8	22	12.41	M20	110
225mm	340	18	295	8	22	12.41	M20	120
250mm	395	20	350	12	22	18.60	M20	130
280mm	395	20	350	12	22	18.60	M20	120
315mm	445	22	400	12	22	26.10	M20	140
355mm	505	25	460	16	22	38.20	M20	150
400mm	565	25	515	16	26	47.60	M24	160
450mm	615	30	565	20	26	67.50	M24	170
500mm	670	32	620	20	26	86.00	M24	180
560mm	730	35	675	20	26	112.20	M24	190
630mm	780	38	725	20	26	139.50	M24	190
630mm	835	38	780	20	26	160.30	M24	190
SANS 1 123 – T1600 Blank								
50mm	150	10	110	4	18	1.31	M16	75
63mm	165	12	125	4	18	1.92	M16	80
75mm	185	12	145	4	18	2.44	M16	80
90mm	200	14	160	8	18	3.23	M16	90
110mm	220	14	180	8	18	3.60	M16	100
125mm	220	14	180	8	18	3.60	M16	100
140mm	250	16	210	8	18	5.92	M16	100
160mm	285	18	240	8	22	8.60	M20	110
180mm	285	18	240	8	22	8.60	M20	110
200mm	340	22	295	12	22	14.90	M20	120
225mm	340	22	295	12	22	14.90	M20	130
250mm	405	25	355	12	26	24.10	M24	140
280mm	405	25	355	12	26	24.10	M24	140
315mm	460	28	410	12	26	35.20	M24	160
355mm	520	30	470	16	26	48.10	M24	170
400mm	580	35	525	16	26	70.40	M24	180
450mm	640	40	585	20	26	97.80	M24	190
500mm	715	40	650	20	33	120.80	M30	200
560mm	775	40	710	20	33	142.90	M30	200
630mm	840	50	770	20	33	211.00	M30	220

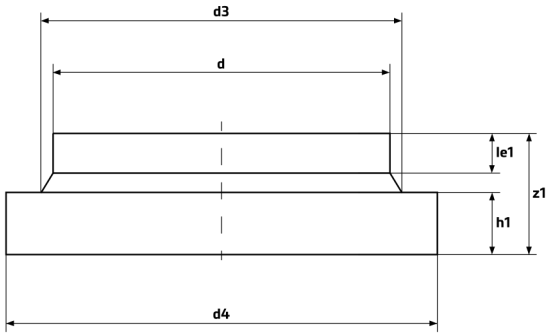
HDPE Backing Flange

Dimensions





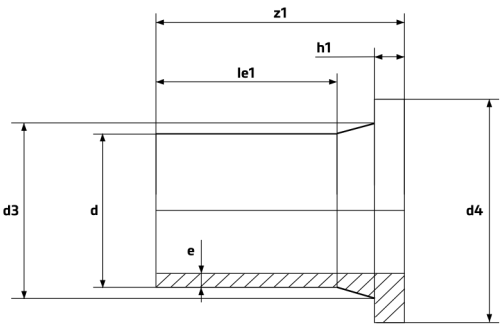
Stub Ends



Butt Weld/ Short Spiggot HDPE Stub Dimensions					
d	d3	d4	le1	h1	z1
mm	mm	mm	mm	mm	mm
110	127	158	18	27	60
125	133	158	18	27	60
140	157	188	18	27	60
160	177	217	15	35	65
180	188	217	20	35	70
200	217	270	20	35	70
225	233	270	20	45	80
250	267	320	30	45	90
280	288	320	30	45	90
315	330	370	30	55	100
355	373	430	30	60	110
400	419	482	30	65	110
450	474	540	30	65	110
500	530	585	30	70	115
560	592	645	30	70	115
630*	642	685	30	70	115
630**	642	725	30	70	115
710	737	800	30	70	115
800	840	905	30	70	115
900	942	1005	30	70	120

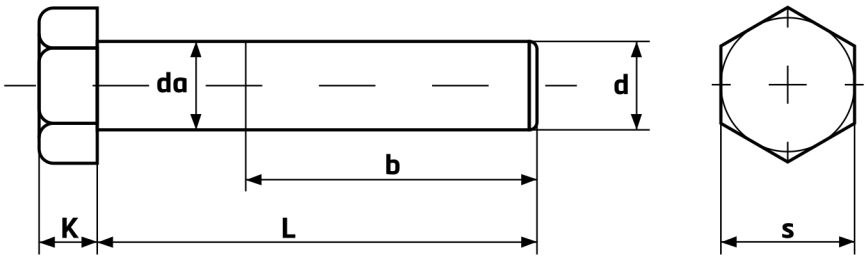
* 630 HDPE STUB: FLANGES: SANS1123–T1000 (725 PCD); ASA 150#
** 630 HDPE STUB: FLANGES: B/S T/D; SANS1123–T1000 (780 PCD); SANS1123–T1600; SANS1123–T2500

Stub Ends



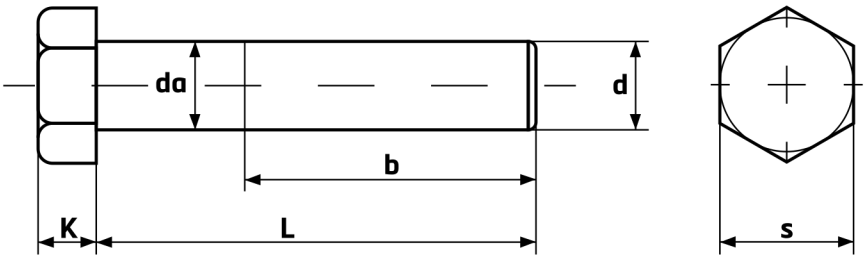
Elongated/Electrofusion HDPE Stub Dimensions							
d	SDR	e	d3	d4	le1	z1	h1
mm	mm	mm	mm	mm	mm	mm	mm
110	17	6.6	125	158	113	158	18
125	17	7.4	132	158	122	170	18
140	17	8.3	153	188	130	173	18
160	17	9.5	175	212	160	208	18
180	17	10.7	186	212	140	200	20
200	17	11.9	232	268	133	199	24
225	17	13.4	235	268	135	201	24
250	17	14.8	277	320	148	220	25
280	17	16.6	291	320	154	230	25
315	17	18.7	328	370	166	242	25
110	11	10	125	158	113	160	18
125	11	11.4	132	158	116	170	25
140	11	12.7	155	188	128	182	25
160	11	14.6	175	212	155	208	25
180	11	16.4	186	212	168	202	30
200	11	18.2	232	268	140	206	32
225	11	20.5	235	268	135	201	32
250	11	22.7	277	320	138	219	35
280	11	25.4	291	320	152	231	35
125	11	28.6	328	370	158	239	35

Fasteners



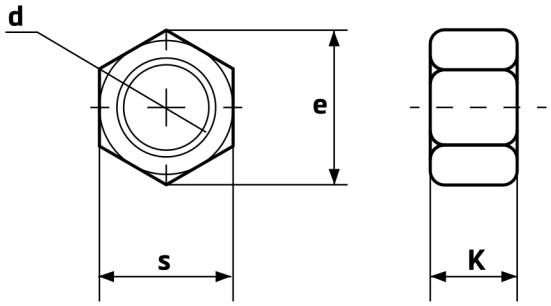
Hex Bolt DIN91						
Size	d	b	da	K	L	s
M12						
M12 x 65mm	11.7-11.96	30	11.73-12	7.32-7.68	64.4-65.6	18.67-19
M12 x 75mm	11.7-11.96	30	11.73-12	7.32-7.68	74.4-75.6	18.67-19
M16						
M16 x 60mm	15.68-15.96	38	15.73-16	9.82-10.18	59.4-60.6	23.67-24
M16 x 65mm	15.68-15.96	38	15.73-16	9.82-10.18	64.4-65.6	23.67-24
M16 x 70mm	15.68-15.96	38	15.73-16	9.82-10.18	69.4-70.6	23.67-24
M16 x 75mm	15.68-15.96	38	15.73-16	9.82-10.18	74.4-75.6	23.67-24
M16 x 80mm	15.68-15.96	38	15.73-16	9.82-10.18	79.4-80.6	23.67-24
M16 x 85mm	15.68-15.96	38	15.73-16	9.82-10.18	84.3-85.7	23.67-24
M16 x 90mm	15.68-15.96	38	15.73-16	9.82-10.18	89.3-90.7	23.67-24
M16 x 100mm	15.68-15.96	38	15.73-16	9.82-10.18	99.3-100.7	23.67-24
M16 x 110mm	15.68-15.96	38	15.73-16	9.82-10.18	109.3-110.7	23.67-24
M16 x 120mm	15.68-15.96	38	15.73-16	9.82-10.18	119.3-120.7	23.67-24
M16 x 130mm	15.68-15.96	44	15.73-16	9.82-10.18	129.2-130.8	23.67-24
M16 x 140mm	15.68-15.96	44	15.73-16	9.82-10.18	139.2-140.8	23.67-24
M20						
M20 x 110mm	19.62-19.96	46	19.67-20	12.28-12.72	109.3-110.7	29.67-30
M20 x 120mm	19.62-19.96	46	19.67-20	12.28-12.72	119.3-120.7	29.67-30
M20 x 130mm	19.62-19.96	52	19.67-20	12.28-12.72	129.2-130.8	29.67-30
M20 x 140mm	19.62-19.96	52	19.67-20	12.28-12.72	139.2-140.8	29.67-30
M20 x 150mm	19.62-19.96	52	19.67-20	12.28-12.72	149.2-150.8	29.67-30
M20 x 160mm	19.62-19.96	52	19.67-20	12.28-12.72	159.2-160.8	29.67-30
M20 x 170mm	19.62-19.96	52	19.67-20	12.28-12.72	159.2-170.8	29.67-30
M20 x 180mm	19.62-19.96	52	19.67-20	12.28-12.72	172.2-180.8	29.67-30
M20 x 190mm	19.62-19.96	52	19.67-20	12.28-12.72	189.08-190.92	29.67-30
M20 x 200mm	19.62-19.96	52	19.67-20	12.28-12.72	199.08-200.92	29.67-30

Fasteners

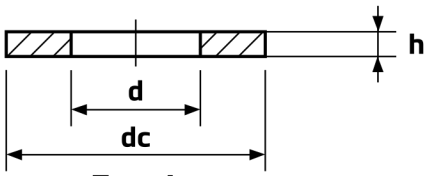


Hex Bolt DIN91						
Size	d	b	da	K	L	s
M24						
M24 x 130mm	23.58-23.95	60	14.78-15.22	129.2-130.8	129.2-130.8	35-36
M24 x 140mm	23.58-23.95	60	14.78-15.22	139.2-140.8	139.2-140.8	35-36
M24 x 150mm	23.58-23.95	60	14.78-15.22	149.2-150.8	149.2-150.8	35-36
M24 x 160mm	23.58-23.95	60	14.78-15.22	158-162	158-165	35-36
M24 x 170mm	23.58-23.95	60	14.78-15.22	168-172	168-172	35-36
M24 x 180mm	23.58-23.95	60	14.78-15.22	178-182	178-182	35-36
M24 x 190mm	23.58-23.95	60	14.78-15.22	187.7-192.3	187.-192.3	35-36
M24 x 200mm	23.58-23.95	60	14.78-15.22	197.7-202.3	197.7-202.3	35-36
M24 x 210mm	23.58-23.95	73	14.78-15.22	207.7-212.3	207.7-212.3	35-36
M24 x 220mm	23.58-23.95	73	14.78-15.22	217.7-222.3	217.7-222.3	35-36
M24 x 230mm	23.58-23.95	73	14.78-15.22	227.7-232.3	227.7-232.3	35-36
M24 x 240mm	23.58-23.95	73	14.78-15.22	237.7-242.3	237.7-242.3	35-36
M24 x 250mm	23.58-23.95	73	14.78-15.22	247.7-252.3	247.7-252.3	35-36
M24 x 260mm	23.58-23.95	73	14.78-15.22	257.4-262.6	257.4-262.6	35-36
M24 x 280mm	23.58-23.95	73	14.78-15.22	277.4-282.6	277.4-262.6	35-36
M30						
M30 x 190mm	29.52-29.95	72	18.28-19.12	187.7-192.3	187.7-192.3	45-46
M30 x 200mm	29.52-29.95	72	18.28-19.12	197.7-202.3	197.7-202.3	45-46
M30 x 220mm	29.52-29.95	85	18.28-19.12	217.7-222.3	217.7-222.3	45-46
M30 x 240mm	29.52-29.95	85	18.28-19.12	237.7-242.3	237.7-242.3	45-46
M30 x 250mm	29.52-29.95	85	18.28-19.12	247.3-252.3	247.3-252.3	45-46
M30 x 260mm	29.52-29.95	85	18.28-19.12	257.4-262.6	257.4-262.6	45-46
M30 x 270mm	29.52-29.95	85	18.28-19.12	267.4-272.6	267.4-272.6	45-46
M30 x 280mm	29.52-29.95	85	18.28-19.12	277.4-282.6	277.4-282.6	45-46
M30 x 290mm	29.52-29.95	85	18.28-19.12	287.4-292.6	287.4-292.6	45-46
M30 x 300mm	29.52-29.95	85	18.28-19.12	297.4-302.6	297.4-302.6	45-46
M36						
M36 x 270mm	35.46-35.94	97	22.08-22.92	267.4-272.6	267.4-272.6	53.8-55
M36 x 290mm	35.46-35.94	97	22.08-22.92	287.4-292.6	287.4-292.6	53.8-55
M36 x 310mm	35.46-35.94	97	22.08-22.92	307.4-312.6	307.4-312.6	53.8-55

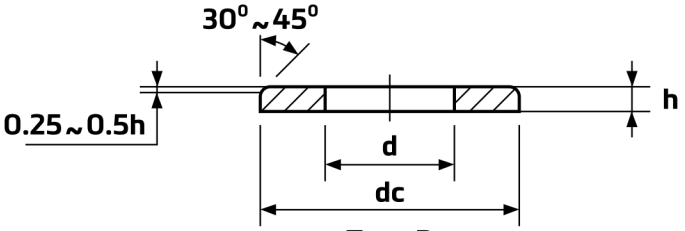
Fasteners



Hex Nut DIN 934					
d	S		K		e
	Min	Max	Min	Max	Min
M12	18.67	19	9.64	10	21.1
M16	23.67	24	12.3	13	26.75
M20	29.16	30	14.9	16	32.95
M24	35	36	14.9	16	32.95
M30	45	46	22.7	24	50.85
M36	53.8	55	27.4	29	60.79



Type A
1.7 - 37mm



Type B
5.3 - 165mm

Flat Washers DIN125A						
Size	d		dc		h	
	Min	Max	Min	Max	Min	Max
M12	13	13.27	23.48	24	2.3	2.7
M16	17	17.27	29.48	30	2.7	3.3
M20	21	21.33	36.38	37	2.7	3.3
M24	25	25.33	43.38	44	3.7	4.3
M30	31	31.39	55.28	56	3.7	4.3
M36	37	37.62	64.8	66	4.4	5.6

Segmented T-pieces

Fabricated Fittings (PE-HD & PP)

Pipe fittings such as Segmented T-pieces, laterals and seamless bends can be manufactured from pipe in a wide variety of sizes and pressure classes, but mostly from 75mm OD upwards and class 6 or higher. Permissible working pressure is 505 of class of pipe used to fabricate fitting, e.g. 1000kPa produces a 500kPa fabricated fitting.

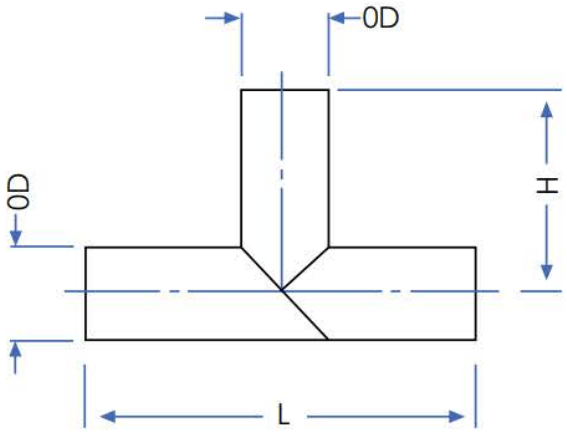


Table: Segmented T-Pieces dimensions

OD	H	L
50	150	300
63	150	300
75	400	800
90	400	800
110	400	800
125	400	800
140	400	800
160	400	800
200	450	900
225	450	900
250	450	900
280	450	900
315	650	1300
355	650	1300
400	650	1300
450	850	1700
500	850	1700
560	900	1800
630	900	1800
710	1150	2300
800	1150	2300
900	1150	2300
1000	1150	2300

Segmented Laterals

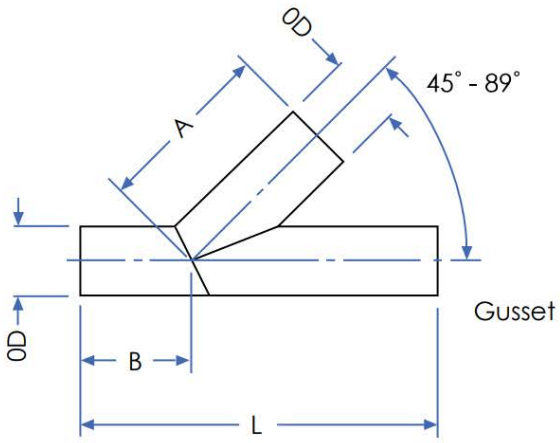


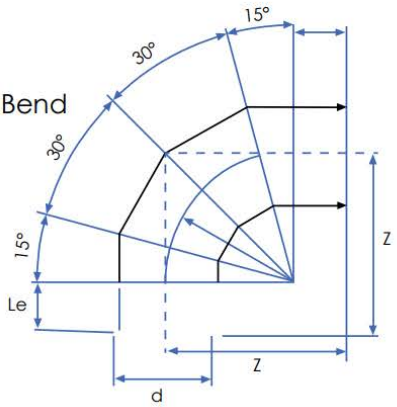
Table: Segmented laterals dimensions

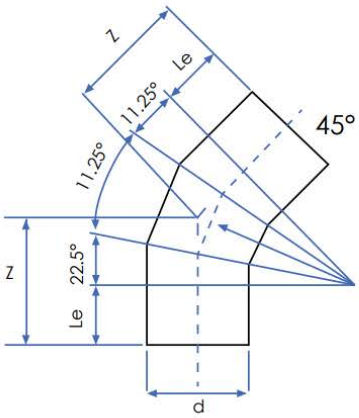
OD	A	B	L
50	200	150	400
63	200	150	400
75	475	370	950
90	475	370	950
110	475	370	950
125	475	370	950
140	475	370	950
160	475	370	950
180	875	530	1350
200	875	530	1350
225	875	530	1350
250	875	530	1350
280	900	700	1800
315	900	700	1800
355	900	700	1800
400	900	700	1800
450	1100	870	2200
500	1100	870	2200
560	1200	950	2400
630	1200	950	2400
710	1500	1200	3000
800	1500	1200	3000
900	2000	1600	4000
1000	2000	1600	4000

Add permissible working pressure

Segmented Bends

90° Segmented Bend





45° Segmented Bend

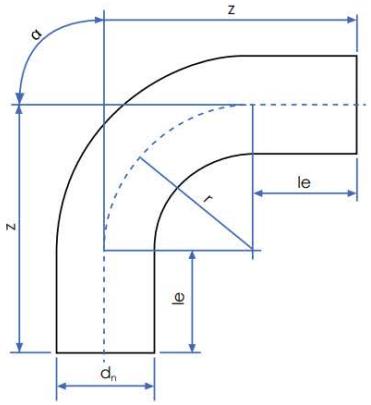
Table: Segmented bends dimensions

diameter (d)	radius (r)	PLAIN ENDED	
		90°	45°
		Z	Z
50	75	220	220
63	95	280	280
75	113	330	330
90	135	400	400
110	165	370	370
125	188	400	400
140	210	430	430
160	240	470	470
180	270	510	510
200	300	550	550
225	338	600	600
250	375	650	650
280	420	710	710
315	472	620	620
355	532	680	680
400	600	760	760
450	675	1300	900
500	750	1400	900
560	840	1150	950
630	945	1300	1100
710	1065	1450	1250
800	1200	1500	1300
900	1350	1700	1500
1000	1500	1800	1600

Table: Derating factors for segmented bends

Cut angle β	Derating factor f_B
≤7.5°	1.0
7.5°< β≤15°	0.8

Seamless Bends



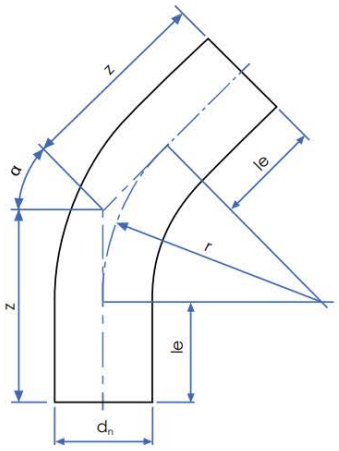
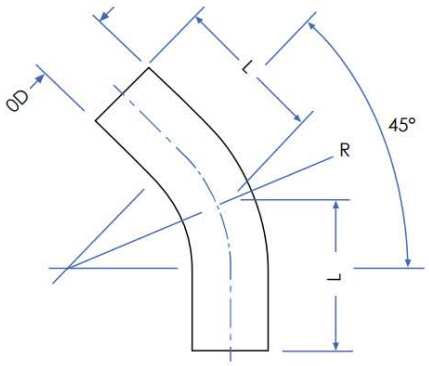


Table: Seamless bends dimensions (in millimeters)

Nominal outside diameter d_n	Minimal tubular I_e, min	Nominal bend radius r	Nominal branch length z	Nominal angle of fitting a
90	150	Declared by the fitting manufacturer e.g 1,5 x d 2 x d 2.5 x d 3 x d	Declared by the fitting manufacturer	Declared by the fitting manufacturer With a tolerance of +- 2° The maximum tolerance for pipe bends shall be +- 5°
110	150			
125	150			
140	150			
160	150			
180	150			
200	150			
225	150			
250	250			
280	250			
315	300			
355	300			
400	300			
450	300			
500	350			
560	350			
630	350			
710	350			
800	350			
900	400			

Seamless LR Bends PE

Radius: 3 x OD of pipe



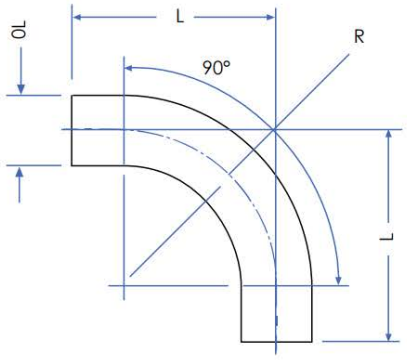


Table: Seamless long radius bends plain ended dimensions

OD	Radius	L	L
110	330	345	535
125	375	360	580
140	420	380	625
160	480	405	685
180	540	430	745
200	600	455	805
225	675	485	880
250	750	515	955
280	840	555	1045
315	945	585	1150
355	1065	645	1270
400	1200	705	1405
450	1350	765	1555
500	1500	830	1705

The minimum wall thickness of the pipe bend after bending shall be in accordance with ISO 4427-2. Destructive techniques may be used to demonstrate consistency of the manufacturing process. For bends fabricated out of pipes, usually no derating factor applies.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