

# Glass-Reinforced Polyester Pipes and Fittings

**FIBERSTRONG®**





# Glass-Reinforced Polyester

Glass Reinforced Polyester is an advanced composite material made by blending glass fibers with polyester resins. This material offers excellent corrosion resistance and strong mechanical properties, making it ideal for a variety of demanding applications. Its lightweight nature and ease of installation help to minimize operational downtime, while its durability ensures long-term reliability in environments such as water treatment facilities.



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# Who We Are and What We Do



## Connecting Life. Delivering a Sustainable Future.

At Future Pipe Industries, we're pioneers in composite pipe solutions. We offer an unmatched range across diverse sectors, using advanced glass fiber technology for superior durability, corrosion resistance, and a reduced carbon footprint.

With 40+ years of global expertise, we're the trusted partner for complex projects across industries. We're not just meeting standards - we're shaping the future with innovative, sustainable solutions.

At Future Pipe Industries, we maintain the highest standards for quality and safety in composite pipe solutions. Serving a wide range of sectors such as Water & Infrastructure, Energy & Power, Chemical & Industrial, and Marine & Offshore, we provide tailored solutions that meet evolving industry needs.

Our legacy is built on excellence, and we're shaping a future where composites lead the way in sustainability and innovation.

# Our Global Presence

## Middle East

**5 factories:**  
UAE (Dubai, Abu Dhabi),  
Oman, KSA, Qatar

**9 sales offices:**  
2 in UAE (Dubai, Abu  
Dhabi), Qatar,  
3 in KSA (Dammam,  
Jeddah & Riyadh),  
Oman, Turkey, Lebanon

## Europe

**1 factory:**  
The Netherlands

**6 sales offices:**  
France, United Kingdom,  
Italy, Germany, Spain,  
The Netherlands

## Africa

**2 factories:**  
Egypt, Morocco

**3 sales offices:**  
Egypt, Morocco, Algeria

## North America

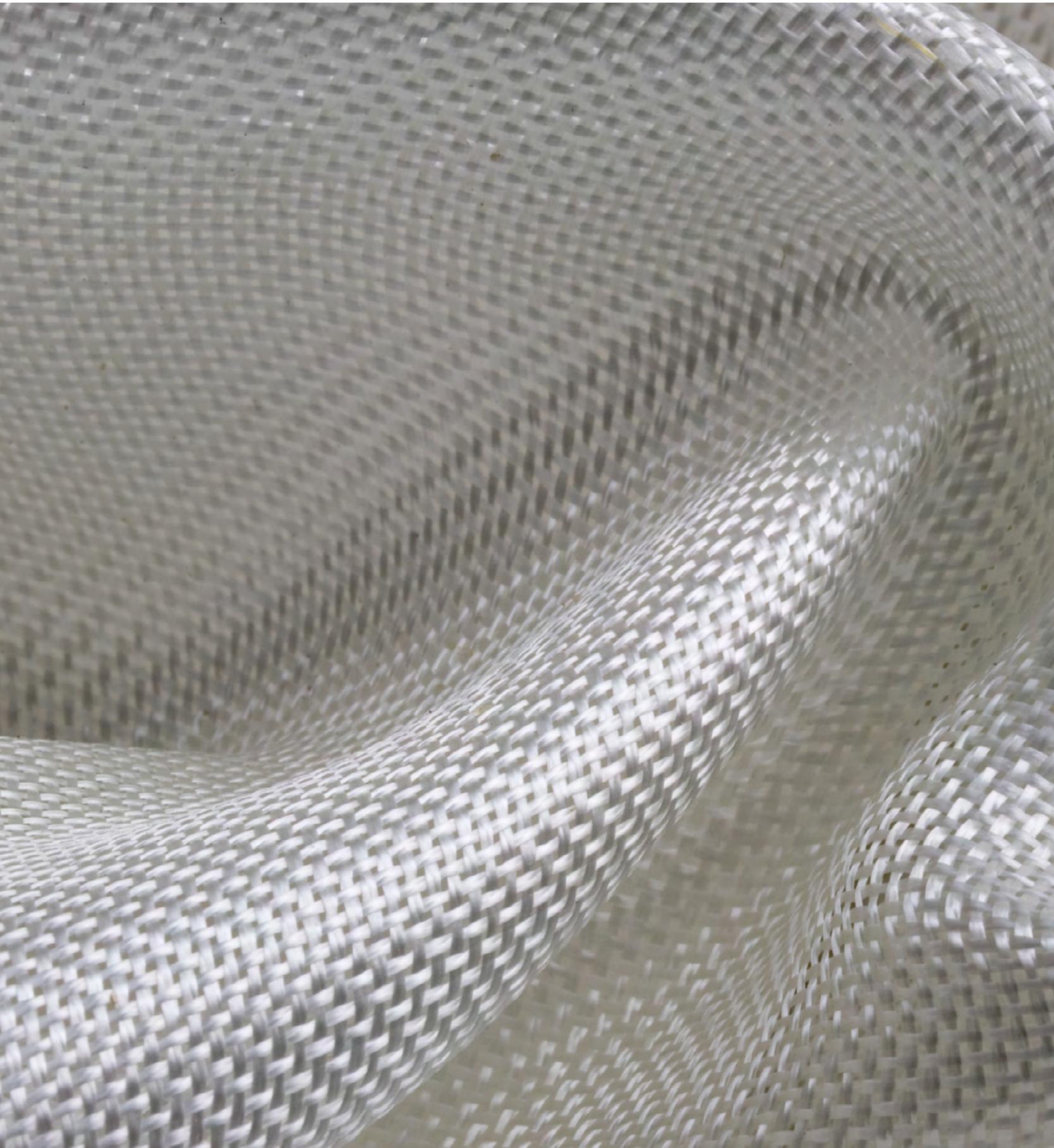
**2 factories:**  
US (Texas, Louisiana)

**2 sales offices:**  
US (Texas, Louisiana)

## Asia

**1 factory:**  
Indonesia

**5 sales offices:**  
Indonesia, India,  
Singapore, South Korea,  
Malaysia



# Why Composites?



## **Durable & lightweight**

Our composite pipes feature a high strength-to-weight ratio, reducing transportation and installation costs compared to traditional steel or concrete solutions



## **Anti-corrosive & resistant**

Exceptionally resistant to harsh environments, our composites withstand corrosion from soils, saltwater, H<sub>2</sub>S, and chemicals, ensuring a longer-lasting pipeline



## **Longer lifecycle**

Built for longevity, our composite pipes offer over 50 years of durability, providing a cost-effective solution with extended system lifecycles far beyond traditional materials.



## **Versatile & accomodating**

Our solutions easily handle high pressures, temperatures, and loads, offering flexible assembly options for complex configurations while maintaining chemical resistance.



## **Cost effective & efficient**

Surpassing other traditional materials in hydraulic performance, our solutions drastically reduce operating expenses. Plus, with shorter lead times and streamlined supply chains, they offer unmatched cost-effectiveness.



## **Sustainable**

Our composite solutions offer a significant reduction in carbon emissions compared to metal-based pipe. Due to the lighter weight of composite products, we demonstrate tangible reductions in each product's carbon footprint. This translates to lower Scope 3 emissions for our customers, aiding them in meeting their climate objectives.

Manufacturing Process

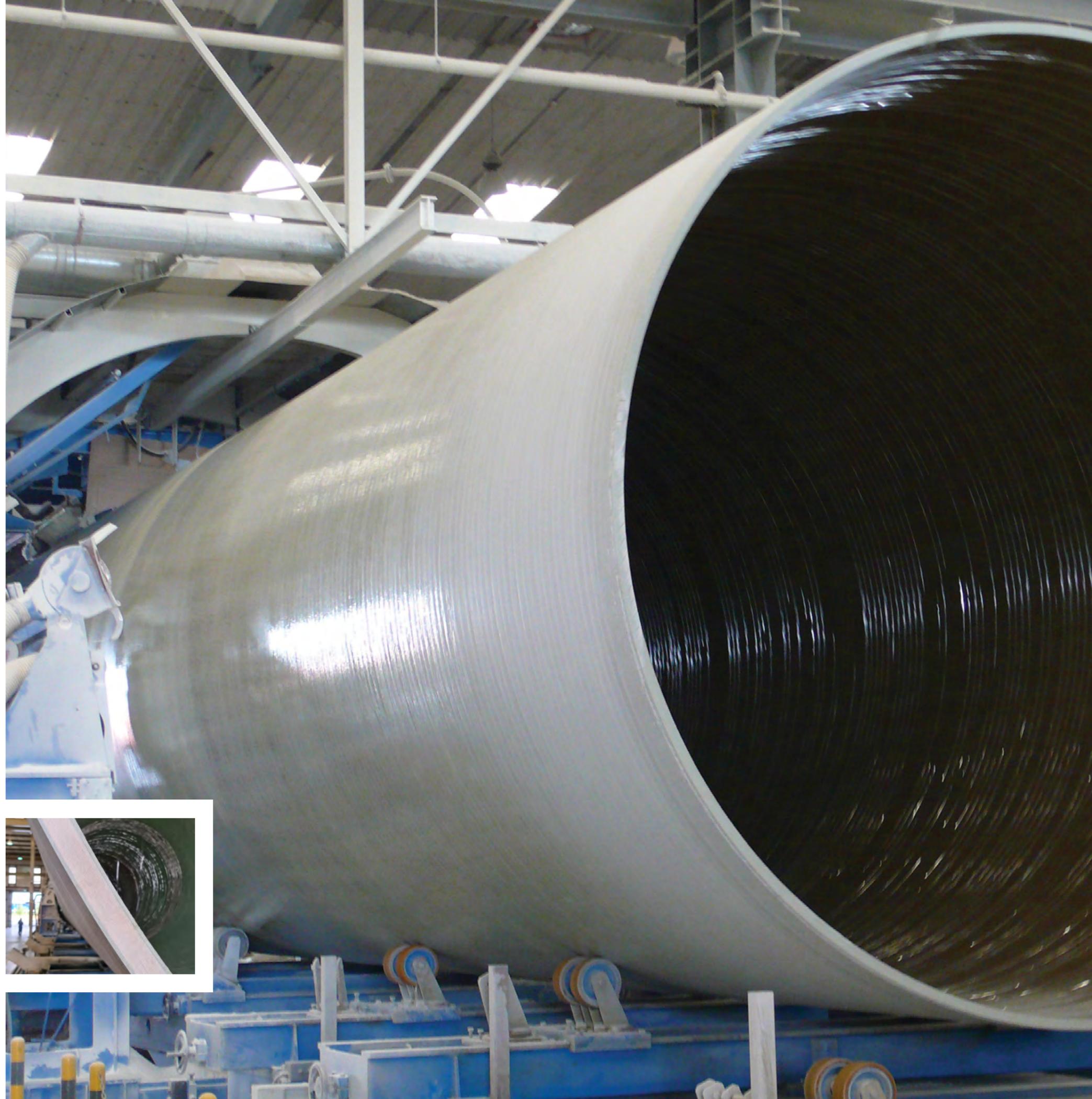
# Continuous Filament Winding

Fiberstrong® is a continuous-wound fiberglass reinforced polymer mortar pipe (FRP). For sewerage applications, Fiberstrong® pipe is manufactured per ASTM D3262, Type 1, Liner 1 and Grade 1 which meets most project specifications. Typical field connections are made using FRP sleeve couplings using EPDM elastomeric gaskets as sealing mechanism which meet the joint qualification testing per ASTM D4161.

At Future Pipe Industries, we're pioneers in composite pipe solutions. We offer an unmatched range across diverse sectors, using advanced glass fiber technology for superior durability, corrosion resistance, and a reduced carbon footprint.

With 40+ years of global expertise, we're the trusted partner for complex projects across industries. We're not just meeting standards - we're shaping the future with innovative, sustainable solutions.

Our legacy is built on excellence, and we're shaping a future where composites lead the way in sustainability and innovation.



# Glass-Reinforced Polyester Applications



Fiberstrong® Glass-Reinforced Polyester pipe is Suitable for underground use in potable water, raw water, seawater and corrosive environments including sanitary sewage, and many industrial effluents with a temperature range of -40 °C (-40 °F) to +50 °C (+122 °F). All industrial pipe applications must be approved by Future Pipe Industries.

# Pressure and Loading Guidelines

## Pressure Classes

Pipe manufactured per this specification will have the following pressure capabilities regardless of pipe stiffness.

### Metric

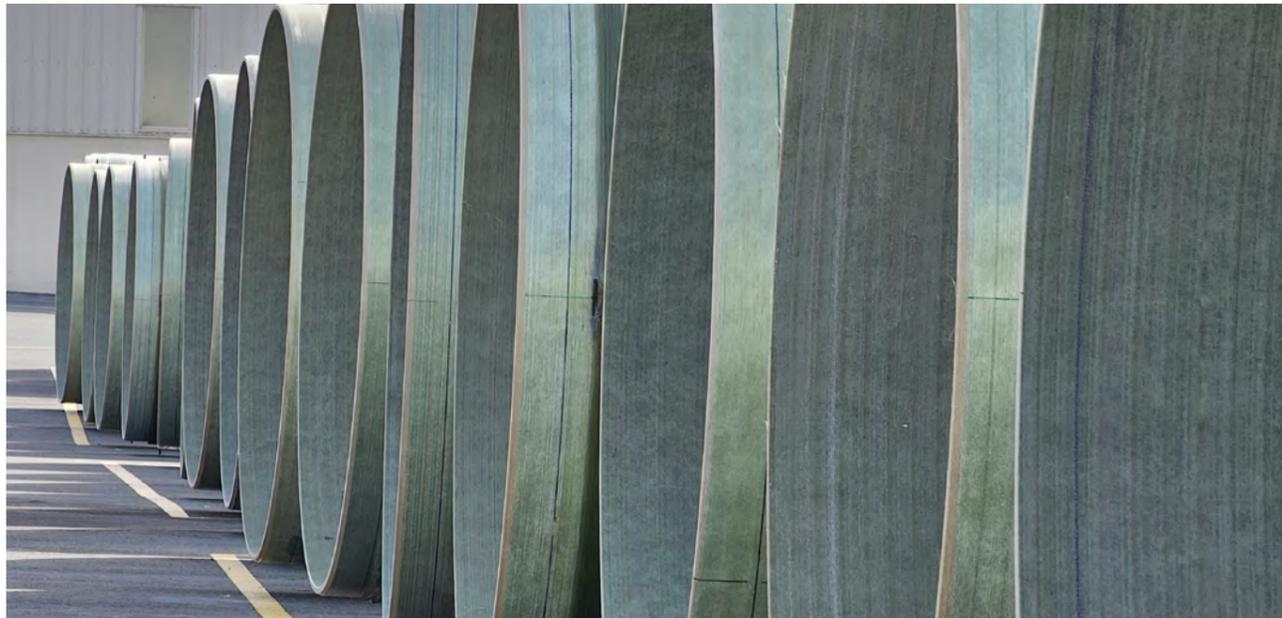
Pressure Class (bar)	PN 1-3	PN 6	PN 10	PN 12	PN 16	PN 20	PN 25	PN 32
Maximum operating pressure	1 - 3	6	10	12	16	20	25	32
Maximum surge pressure	1.4 - 4.2	8.4	14	16.8	22.4	28	35	44.8
Maximum field test pressure	1.5 - 4.5	9	15	18	24	30	37.5	48
Maximum factory test pressure	2 - 6	12	20	24	32	40	50	64

Note: Other custom-made pressure classes, may also be provided based on project requirements. Contact FPI for more information. High pressure classes i.e. 25-32 bar, might be subject to shop/field pressure test limitations. Contact FPI for more information.

### Imperial

Pressure Class (psig)	PN 50	PN 100	PN 150	PN 200	PN 250	PN 300	PN 350	PN 400-450
Maximum operating pressure	50	100	150	200	250	300	350	400-450
Maximum surge pressure	70	140	210	280	350	420	490	560-630
Maximum field test pressure	75	150	225	300	375	450	525	600-675
Maximum factory test pressure	100	200	300	400	500	600	700	800-900

Note: Other custom-made pressure classes, may also be provided based on project requirements. Contact FPI for more information. High pressure classes i.e. 350-450 psi, might be subject to shop/field pressure test limitations. Contact FPI for more information.



## Stiffness Classes

Glass-Reinforced Polyester pipes shall have the following characteristics regardless of pressure class.

Stiffness Class	Metric	Imperial
	Pa	PSI
2,500	18	
5,000	36	
6,400	46	
10,000	72	
12,500	90	

(1) Higher stiffness classes up to 20,000 Pa (144 psi), or other custom-made stiffness classes, may also be provided based on project requirements. Contact FPI for more information.

(2) Maximum vacuum and burial depth levels can vary depending on the type of installation, soil, backfill, compaction and other parameters. Refer to Future Pipe Industries Fiberstrong® Installation Guide or contact FPI for more information.

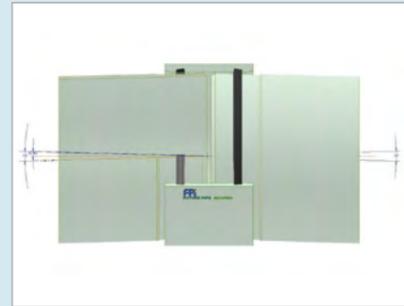
# Joints



Double Bell Couplers



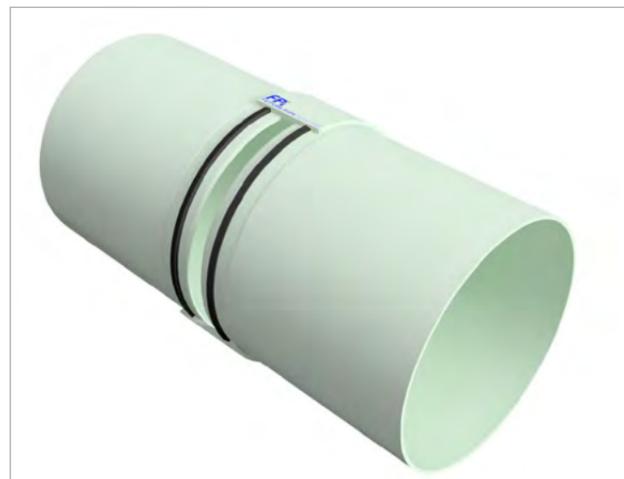
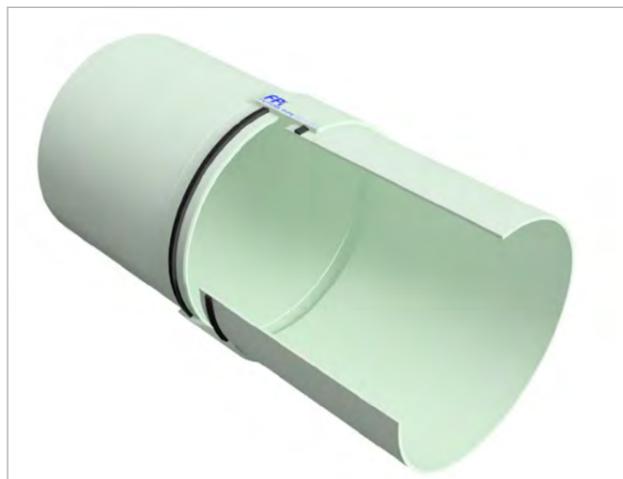
Testable Double Bell Coupler



3° Angularly Deflected Double Bell Coupler

## Double Bell Couplers

Fiberstrong® pipes and fittings are securely connected using Double Bell Couplers, a reliable and efficient method designed to ensure robust joint integrity. The coupling system features two bells at either end of the pipe or fitting, which are joined together to form a tight connection. The sealing of the joints is achieved through the compression of two specially designed rubber gaskets based placed within the coupling. When the joint is assembled, the gaskets are compressed, creating a watertight seal that prevents leaks and enhances the overall durability of the system. This coupling technology is widely recognized for its ease of installation, resistance to pressure, and ability to accommodate slight misalignments, making it ideal for a range of applications.



Center registers can be provided upon request.

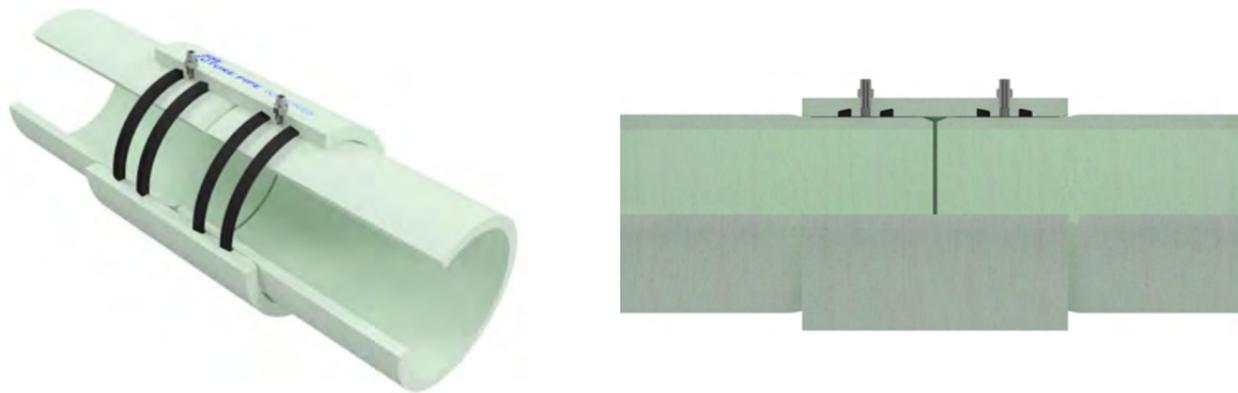


## Other types of Double Bell Couplers

### A- Testable Double Bell Coupler

The Testable Double Bell Coupler joints are designed to eliminate the need for hydrotesting the entire pipeline on-site. Instead, the joint assembly can be tested externally, allowing for quick and easy leak detection at the joint area without filling the pipe. By focusing solely on the joint, this solution enables faster installation and testing, significantly reducing water usage.

This approach is both economical and efficient, ensuring the leak-tightness of each installed joint with minimal effort and time, without requiring expensive testing equipment. The coupler's design resembles the standard Double Bell Coupler (DBC) but incorporates minor modifications to enable this functionality.



### B- 3° Angularly Deflected Double Bell Coupler

This joint allows for initial installation between two standard pipe sections at a maximum angular deflection of 3°. The 3° angular deflection is applicable to both gravity and pressure piping systems, with design pressures of up to 16 bar. The deflection joint eliminates the need for small-angle elbows while increasing the feasibility of using large-angle elbows. By removing the associated civil work and accessories from the pipeline, it reduces the overall project cost and minimizes the risk of indirect rework in coupling joint piping system installations.



## Product Range

Standard Outside Diameter (OD) Series Pipe

Nominal Diameter (DN)		Pressure Class (bar)							
		PN 1-3	PN 6	PN 10	PN 12	PN 16	PN 20	PN 25	PN 32
Metric (mm)	Imperial (in)	Pressure Class (psi)							
		PN 50	PN 100	PN 150	PN 200	PN 250	PN 300	PN 350	PN 400-450
300	12	✓	✓	✓	✓	✓	✓	✓	✓
350	14	✓	✓	✓	✓	✓	✓	✓	✓
400	16	✓	✓	✓	✓	✓	✓	✓	✓
450	18	✓	✓	✓	✓	✓	✓	✓	✓
500	20	✓	✓	✓	✓	✓	✓	✓	✓
600	24	✓	✓	✓	✓	✓	✓	✓	✓
700	27	✓	✓	✓	✓	✓	✓	✓	✓
800	30	✓	✓	✓	✓	✓	✓	✓	✓
900	36	✓	✓	✓	✓	✓	✓	✓	✓
1,000	39	✓	✓	✓	✓	✓	✓	✓	✓
1,200	48	✓	✓	✓	✓	✓	✓	✓	✓
1,400	54	✓	✓	✓	✓	✓	✓	✓	✓
1,600	63	✓	✓	✓	✓	✓	✓	✓	✓
1,800	72	✓	✓	✓	✓	✓	✓	✓	✓
2,000	78	✓	✓	✓	✓	✓	✓	✓	✓
2,200	84	✓	✓	✓	✓	✓	✓	✓	✓
2,400	96	✓	✓	✓	✓	✓	✓	✓	✓
2,600	102	✓	✓	✓	✓	✓	✓	✓	✓
2,800	108	✓	✓	✓	✓	✓	✓	✓	✓
3,000	120	✓	✓	✓	✓	✓	✓	✓	✓
3,200	126	✓	✓	✓	✓	✓	✓	✓	✓
3,400	132	✓	✓	✓	✓	✓	✓	✓	✓
3,600	144	✓	✓	✓	✓	✓	✓	✓	✓
3,800	150	✓	✓	✓	✓	✓	✓	✓	✓
4,000	156	✓	✓	✓	✓	✓	✓	✓	✓

Cast Iron (Ductile-Iron) Pipe Equivalent (OD) Series Pipe

Nominal Diameter (DN)		Pressure Class (bar)							
		PN 1-3	PN 6	PN 10	PN 12	PN 16	PN 20	PN 25	PN 32
Metric (mm)	Imperial (in)	Pressure Class (psi)							
		PN 50	PN 100	PN 150	PN 200	PN 250	PN 300	PN 350	PN 400-450
300	12	✓	✓	✓	✓	✓	✓	✓	✓
350	14	✓	✓	✓	✓	✓	✓	✓	✓
400	16	✓	✓	✓	✓	✓	✓	✓	✓
450	18	✓	✓	✓	✓	✓	✓	✓	✓
500	20	✓	✓	✓	✓	✓	✓	✓	✓
600	24	✓	✓	✓	✓	✓	✓	✓	✓
800	30	✓	✓	✓	✓	✓	✓	✓	✓
900	36	✓	✓	✓	✓	✓	✓	✓	✓
1,100	42	✓	✓	✓	✓	✓	✓	✓	✓
1,200	48	✓	✓	✓	✓	✓	✓	✓	✓
1,400	54	✓	✓	✓	✓	✓	✓	✓	✓
1,500	60	✓	✓	✓	✓	✓	✓	✓	✓

The Product Range is Conforming to:

Standards		
Metric Standard Pipe OD	Imperial Standard/Ductile Iron Pipe OD	Australia Special Sizes*
AWWA C950-20 (Tables 5), ASTM D3262, D3517, D3754 (Table 3), ISO 23856 (Table 5), AS 3571.1, 3571.2 (Table 5, Series B1)	AWWA C950-20 (Tables 4, 5), ASTM D3262, D3517, D3754 (Table 3)	AS 3571.1, 3571.2 (Appendix ZZ)

\*Australian special sizes are available upon request. Contact FPI for more information.



# Fittings



Elbow



Reducers



Tees



Flange



Custom Designed Fittings

Future Pipe Industries has established a standardized line of Glass-Reinforced Polyester fittings. The most common fittings are (Elbows, Reducers, Tees, Wyes and Flanges) and can be supplied either as standard pieces or custom designed spools making it easier for the erection contractor to install.

Fittings are jointed to Glass-Reinforced Polyester pipes with standard double bell couplings and require thrust blocks for pressure systems. Please refer to "Fiberstrong® Installation Guide for Underground Pipe System" for further details on proper construction of thrust blocks.

The method of fabrication of all Glass-Reinforced Polyester fittings is essentially the same. Pipes, after plant hydro-testing, are cut to the required dimensions. Pipe sections are then jointed together by lamination. The thickness and width of the lamination is designed to exceed the pipe performance.

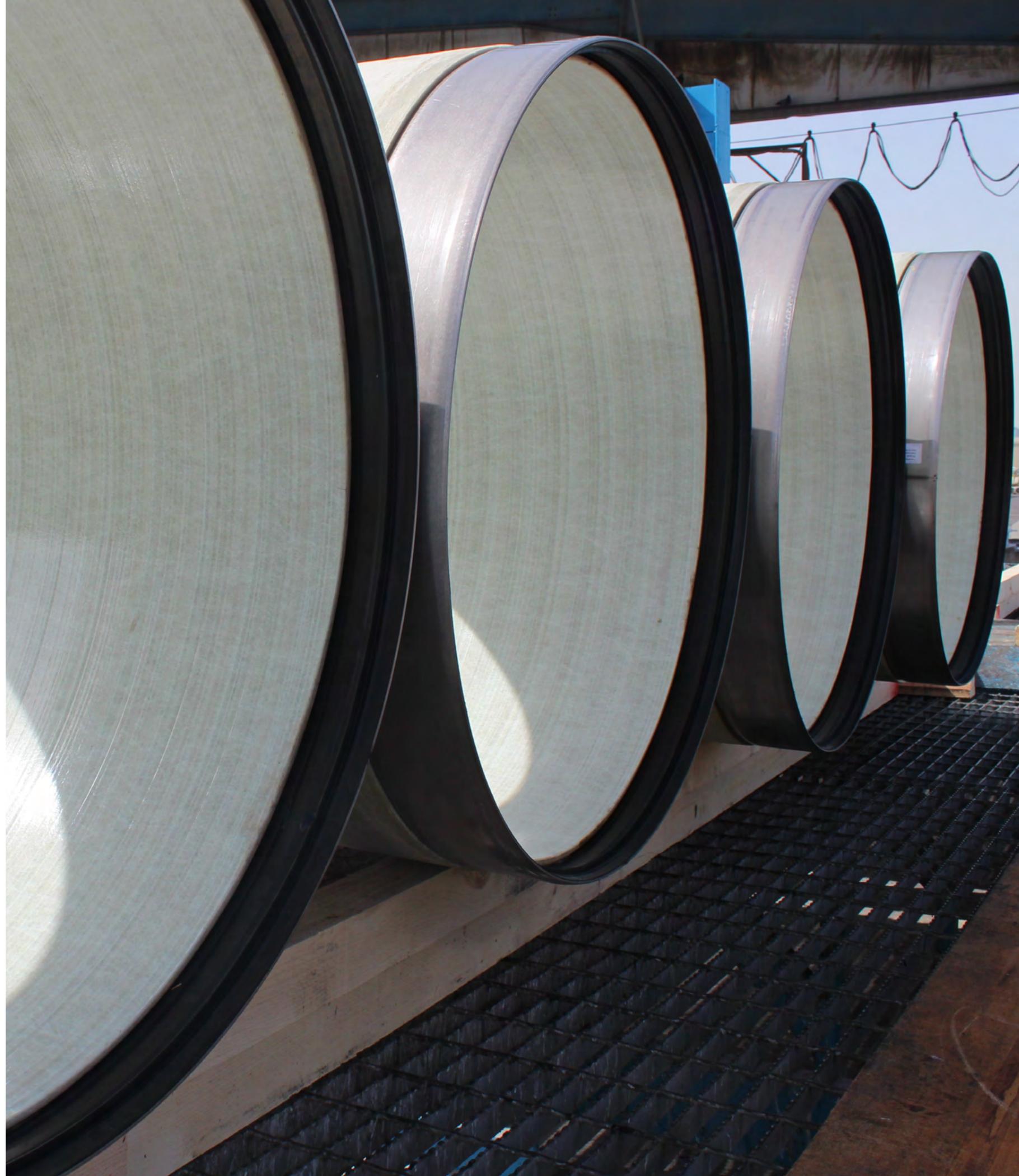
For fitting dimensions please refer to Appendix section.



# Fiberstrong Jacking Pipes

Glass-Reinforced Polyester jacking pipes are an effective and advanced solution for modern pipeline projects, providing a reliable, efficient, and less disruptive option for installing essential infrastructure. The process of installing jacking pipes is known as pipe jacking or micro tunnelling. This method involves the use of hydraulic jacks or other mechanical means to push the pipes through the ground, often beneath existing structures or other obstacles.

For Jacking product data and dimensions please refer to Appendix section.

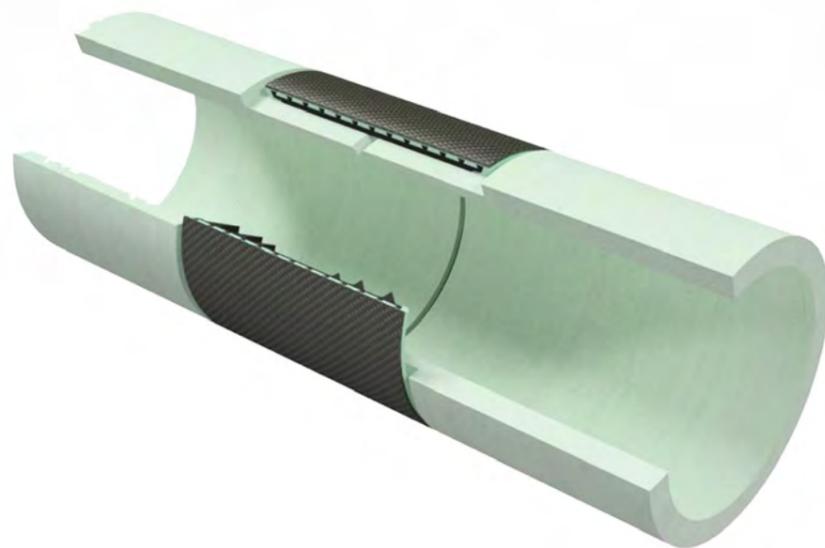


## A. Jacking Pipes with Glass-Reinforced Polyester-CF Hybrid Coupler & Integrated Rubber

Fiberstrong® Glass-Reinforced Polyester Conventional Jacking pipes offer a modern, efficient, and less disruptive solution for pipeline installations, utilizing pipe jacking or micro tunnelling methods to push pipes through the ground.

Fiberstrong® Glass-Reinforced Polyester Conventional Jacking pipes represent a significant innovation in pressure jacking by integrating Carbon Fiber with Glass Fiber, to form a Full-Face Integrated Rubber flexible joint, which provides with a 'Full-Composite' solution in Jacking applications.

GRP-CF Hybrid coupler also eliminates the need for traditional Stainless-Steel couplers and addresses the main challenges of higher costs and its delivery time. GRP-CF Hybrid couplers are designed for diameters from DN350-DN3000 (14"-120"), stiffness classes from 20,000 Pa to 1,000,000 Pa (144 PSI to 7200 PSI) and pressure classes up to PN10. Fiberstrong® Glass-Reinforced Polyester conventional Jacking pipe laminate composition boasts of an improved compressive strength of 110MPa compared to 90MPa of Centrifugal Casting (CC) or Filament Wound (FW) pipes in the market, which increases the permissible jacking forces and improved jacking lengths, reducing the need for multiple Intermediate Jacking Stations (IJS).



### Product Range

Nominal Diameter (DN)		Stiffness (Pa)												
		20000	32000	40000	50000	64000	80000	100000	128000	160000	200000	320000	640000	1,000,000
(mm)	(in)	Stiffness (psi)												
		144	230	288	360	461	576	720	922	1,152	1,440	2,304	4,608	7,200
350	14	-	-	-	-	-	-	-	-	-	-	-	-	√
400	16	-	-	-	-	-	-	-	-	-	-	-	√	√
425	17	-	-	-	-	-	-	-	-	-	-	-	√	√
450	18	-	-	-	-	-	-	-	-	-	-	√	√	√
500	20	-	-	-	-	-	-	-	-	-	-	√	-	-
550	22	-	-	-	-	-	-	-	-	-	-	√	-	-
600	24	-	-	-	-	-	-	-	-	-	√	√	-	-
650	26	-	-	-	-	-	-	-	-	√	√	√	-	-
700	27	-	-	-	-	-	-	-	√	√	√	√	-	-
750	28	-	-	-	-	-	-	√	√	√	√	√	-	-
800	30	-	-	-	-	-	√	√	√	√	√	√	-	-
850	34	-	-	-	-	-	√	√	√	√	√	√	-	-
900	36	-	-	-	-	√	√	√	√	√	√	√	-	-
950	38	-	-	-	-	√	√	√	√	√	√	√	-	-
1,000	39	-	-	-	√	√	√	√	√	√	√	√	-	-
1,100	41	-	-	-	√	√	√	√	√	√	√	√	-	-
1,150	42	-	-	√	√	√	√	√	√	√	√	√	-	-
1,200	48	-	-	√	√	√	√	√	√	√	√	√	-	-
1,250	50	-	√	√	√	√	√	√	√	√	√	√	-	-
1,300	52	-	√	√	√	√	√	√	√	√	√	√	-	-
1,400	54	-	√	√	√	√	√	√	√	√	√	-	-	-
1,450	56	-	√	√	√	√	√	√	√	√	√	-	-	-
1,500	58	-	√	√	√	√	√	√	√	√	√	-	-	-
1,550	60	-	√	√	√	√	√	√	√	√	√	-	-	-
1,600	63	√	√	√	√	√	√	√	√	√	-	-	-	-
1,700	66	√	√	√	√	√	√	√	√	-	-	-	-	-
1,800	72	√	√	√	√	√	√	√	-	-	-	-	-	-
1,900	76	√	√	√	√	√	√	√	-	-	-	-	-	-
2,000	78	√	√	√	√	√	√	-	-	-	-	-	-	-
2,100	82	√	√	√	√	√	-	-	-	-	-	-	-	-
2,200	84	√	√	√	√	-	-	-	-	-	-	-	-	-
2,300	90	√	√	√	√	-	-	-	-	-	-	-	-	-
2,400	96	√	√	√	-	-	-	-	-	-	-	-	-	-
2,500	100	√	√	√	-	-	-	-	-	-	-	-	-	-
2,600	102	√	√	-	-	-	-	-	-	-	-	-	-	-
2,700	106	√	√	-	-	-	-	-	-	-	-	-	-	-
2,800	108	√	-	-	-	-	-	-	-	-	-	-	-	-
2,900	114	√	-	-	-	-	-	-	-	-	-	-	-	-
3,000	118	√	-	-	-	-	-	-	-	-	-	-	-	-

## B. Glass-Reinforced Polyester Jacking Pipes with Stainless Steel Sleeve & Integrated Rubber Up to PN6

### Product Range

Nominal Diameter (DN)		Stiffness (Pa)												
		20000	32000	40000	50000	64000	80000	100000	128000	160000	200000	320000	640000	1000000
(mm)	(in)	Stiffness (psi)												
		144	230	288	360	461	576	720	922	1,152	1,440	2,304	4,608	7,200
300	12	-	-	-	-	-	-	-	-	-	√	√	√	√
350	14	-	-	-	-	-	-	-	√	√	√	√	√	√
400	16	-	-	-	-	-	√	√	√	√	√	√	√	√
425	17	-	-	-	-	√	√	√	√	√	√	√	√	√
450	18	-	-	-	√	√	√	√	√	√	√	√	-	-
500	20	-	-	√	√	√	√	√	√	√	√	√	-	-
550	22	-	-	√	√	√	√	√	√	√	√	√	-	-
600	24	-	√	√	√	√	√	√	√	√	√	√	-	-
650	26	-	√	√	√	√	√	√	√	√	√	√	-	-
700	27	-	√	√	√	√	√	√	√	√	√	√	-	-
750	28	√	√	√	√	√	√	√	√	√	√	√	-	-
800	30	√	√	√	√	√	√	√	√	√	√	√	-	-
850	34	√	√	√	√	√	√	√	√	√	√	√	-	-
900	36	√	√	√	√	√	√	√	√	√	√	√	-	-
950	38	√	√	√	√	√	√	√	√	√	√	√	-	-
1000	39	√	√	√	√	√	√	√	√	√	√	√	-	-
1100	41	√	√	√	√	√	√	√	√	√	√	√	-	-
1150	42	√	√	√	√	√	√	√	√	√	√	√	-	-
1200	48	√	√	√	√	√	√	√	√	√	√	√	-	-
1250	50	√	√	√	√	√	√	√	√	√	√	√	-	-
1300	52	√	√	√	√	√	√	√	√	√	√	√	-	-
1400	54	√	√	√	√	√	√	√	√	√	√	√	-	-
1450	56	√	√	√	√	√	√	√	√	√	√	√	-	-
1500	58	√	√	√	√	√	√	√	√	√	√	√	-	-
1550	60	√	√	√	√	√	√	√	√	√	√	√	-	-
1600	63	√	√	√	√	√	√	√	√	√	√	√	-	-
1700	66	√	√	√	√	√	√	√	√	-	-	-	-	-
1800	72	√	√	√	√	√	√	√	√	-	-	-	-	-
1900	76	√	√	√	√	√	√	√	√	-	-	-	-	-
2000	78	√	√	√	√	√	√	√	√	-	-	-	-	-
2100	82	√	√	√	√	√	√	√	√	-	-	-	-	-
2200	84	√	√	√	√	-	-	-	-	-	-	-	-	-
2300	90	√	√	√	√	-	-	-	-	-	-	-	-	-
2400	96	√	√	√	-	-	-	-	-	-	-	-	-	-
2500	100	√	√	√	-	-	-	-	-	-	-	-	-	-
2600	102	√	√	-	-	-	-	-	-	-	-	-	-	-
2700	106	√	√	-	-	-	-	-	-	-	-	-	-	-
2800	108	√	-	-	-	-	-	-	-	-	-	-	-	-

## C. Glass-Reinforced Polyester Jacking Pipes with Stainless Steel Sleeve & Integrated Rubber (PN10)

### Product Range

Nominal Diameter (DN)		Stiffness (Pa)												
		20000	32000	40000	50000	64000	80000	100000	128000	160000	200000	320000	640000	1000000
(mm)	(in)	Stiffness (psi)												
		144	230	288	360	461	576	720	922	1,152	1,440	2,304	4,608	7,200
350	14	-	-	-	-	-	-	-	-	-	-	-	-	√
400	16	-	-	-	-	-	-	-	-	-	-	-	√	√
425	17	-	-	-	-	-	-	-	-	-	-	√	√	√
450	18	-	-	-	-	-	-	-	-	-	-	√	-	-
500	20	-	-	-	-	-	-	-	-	-	-	√	-	-
550	22	-	-	-	-	-	-	-	-	-	-	√	√	-
600	24	-	-	-	-	-	-	-	-	√	√	√	√	-
650	26	-	-	-	-	-	-	-	√	√	√	√	√	-
700	27	-	-	-	-	-	-	√	√	√	√	√	√	-
750	28	-	-	-	-	-	√	√	√	√	√	√	√	-
800	30	-	-	-	-	√	√	√	√	√	√	√	√	-
850	34	-	-	-	√	√	√	√	√	√	√	√	√	-
900	36	-	-	√	√	√	√	√	√	√	√	√	√	-
950	38	-	-	√	√	√	√	√	√	√	√	√	√	-
1,000	39	-	√	√	√	√	√	√	√	√	√	√	√	-
1,100	41	-	√	√	√	√	√	√	√	√	√	√	√	-
1,150	42	√	√	√	√	√	√	√	√	√	√	√	√	-
1,200	48	√	√	√	√	√	√	√	√	√	√	√	√	-
1,250	50	√	√	√	√	√	√	√	√	√	√	√	√	-
1,300	52	√	√	√	√	√	√	√	√	√	√	√	√	-
1,400	54	√	√	√	√	√	√	√	√	√	√	√	√	-
1,450	56	√	√	√	√	√	√	√	√	√	√	√	√	-
1,500	58	√	√	√	√	√	√	√	√	√	√	√	√	-



# Fiberstrong Sliplining

Slip-lining is an efficient method for rehabilitating aging and deteriorating pipelines without requiring complete replacement. This technique extends the infrastructure's service life with little to no disruption in operations. Compared to traditional pipe replacement methods, slip-lining is often more cost-effective. It eliminates the need for extensive excavation, reducing labor, material, restoration, and repair costs.

Fiberstrong Glass-Reinforced Polyester standard product range shall be supplied for Sliplining applications with buildup for coupler protection.

Please contact FPI for any custom product designs.



Sliplining Build-Up Spigot with Standard Glass-Reinforced Polyester DBC Coupler & REKA rings





# Product Qualifications

Fiberstrong® Pipes have been tested and qualified for the following tests:

ASTM D 3681:	Chemical resistance of "Fiberglass" (Fiber Reinforced Thermosetting - Resin) pipe in deflected condition (Strain corrosion performance).
ASTM D 4161:	Standard specification for "Fiberglass" (Fiber Reinforced Thermosetting - Resin) pipe joint using flexible elastomeric seals.
ASTM D 1599	Short time Hydraulic failure pressure of pipes, fittings and prefabricated spools
ASTM D 2992:	Standard practice for obtaining hydrostatic or pressure design basis for "Fiberglass" (Fiber Reinforced Thermosetting - Resin) pipe and fittings. (Hydrostatic Design Basic (HDB)).
ASTM D5365:	Long Term Ring Bending (Sb) Standard Test Method for Long-Term Ring-Bending Strain of "Fiberglass" (Glass- Fiber-Reinforced Thermosetting-Resin) Pipe
ISO 25780	Plastics Piping Systems for Pressure and Non-Pressure Water Supply, Irrigation, Drainage or Sewerage — Glass-Reinforced Thermosetting Plastics (GRP) Systems Based on Unsaturated Polyester (UP) Resin — Pipes with Flexible Joints Intended to be Installed using Jacking Techniques
ISO 23856	Plastics piping systems for pressure and non-pressure water supply, drainage or sewerage — Glass-reinforced thermosetting plastics (GRP) systems based on unsaturated polyester (UP) resin
ISO 8639	Glass-reinforced thermosetting plastics (GRP) pipes and fittings — Test methods for leak-tightness and proof of structural design of flexible joints
ISO 8483	Plastics piping systems for pressure and non-pressure drainage and sewerage — Glassreinforced thermosetting plastics (GRP) systems based on unsaturated polyester (UP) resin — Test methods to prove the design of bolted flange joints

# Quality Control

Quality Control testing includes thorough checks for all incoming raw materials and finished products against Future Pipe Industries strict written standards. The following physical and dimensional checks are made:

Type of Test	Each Pipe	Once per LOT*	Standard Reference
Visual Inspection	x		FPI
Wall Thickness	x		FPI
Spigot end Outside diameter	x		FPI
Length	x		FPI
Hydrostatic Pressure**	x		FPI
Barcol Hardness	x		ASTM D 2583
Stiffness		x	ASTM D 2412
Constituents by Wt % (LOI)		x	ASTM D 2584
Axial Tensile Strength		x	ASTM D 638/ BS 5480
Circumferential Tensile Strength		x	ASTM D2290/D638/ BS5480
Impact Resistance		x	BS 5480 Ap. J
Deflection to crack		x	ASTM D 2412

Records of all testing on pipe sections will be maintained by Future Pipe Industries and provided upon request.

\* 1 in 100 pipes or as required by the project specifications

\*\* As per AWWA C950 section 5.1.2.1

## Dimensions:

Metric

Dimensions	Specifications	Tolerances
Standard Pipe Length (L)	Standard Lengths 12m*. Random Length or factory jointed lengths supplied shall not exceed 10% of the order.	±25mm
End Squareness/ End Planeness	Ends shall be square to both axes of the pipe plane, as specified in the FPI manufacturing tolerances.	Not to exceed $2+0.005D$ (mm) where D is the nominal diameter of the pipe or 10mm, whichever is smaller.
Straightness	Pipes shall be straight.	Not to exceed 0.3% of the effective length of the pipe or 15mm, whichever is smaller.
Thickness	As per FPI design values.	Single point 87.5% of minimum average.
Roundness Deviation *	Pipes shall be round.	±1%

Imperial

Dimensions	Specifications	Tolerances
Standard Pipe Length (L)	Standard Lengths 40 ft*. Random Length or factory jointed lengths supplied shall not exceed 10% of the order.	±0.08 ft
End Squareness/ End Planeness	Ends shall be square to both axes of the pipe plane, as specified in the FPI manufacturing tolerances.	Not to exceed $0.08+0.005D$ (in) where D is the nominal diameter of the pipe or 0.4 in, whichever is smaller.
Straightness	Pipes shall be straight.	Not to exceed 0.3% of the effective length of the pipe or 0.6 in, whichever is smaller.
Thickness	As per FPI design values.	Single point 87.5% of minimum average.
Roundness Deviation*	Pipes shall be round.	±1%

\* Longer pipe lengths up to 60 ft may also be provided based on project requirements, contact FPI for more information.

# Appendix

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# Appendix A - Pipe Spigot OD Dimensions

## Product Dimensions

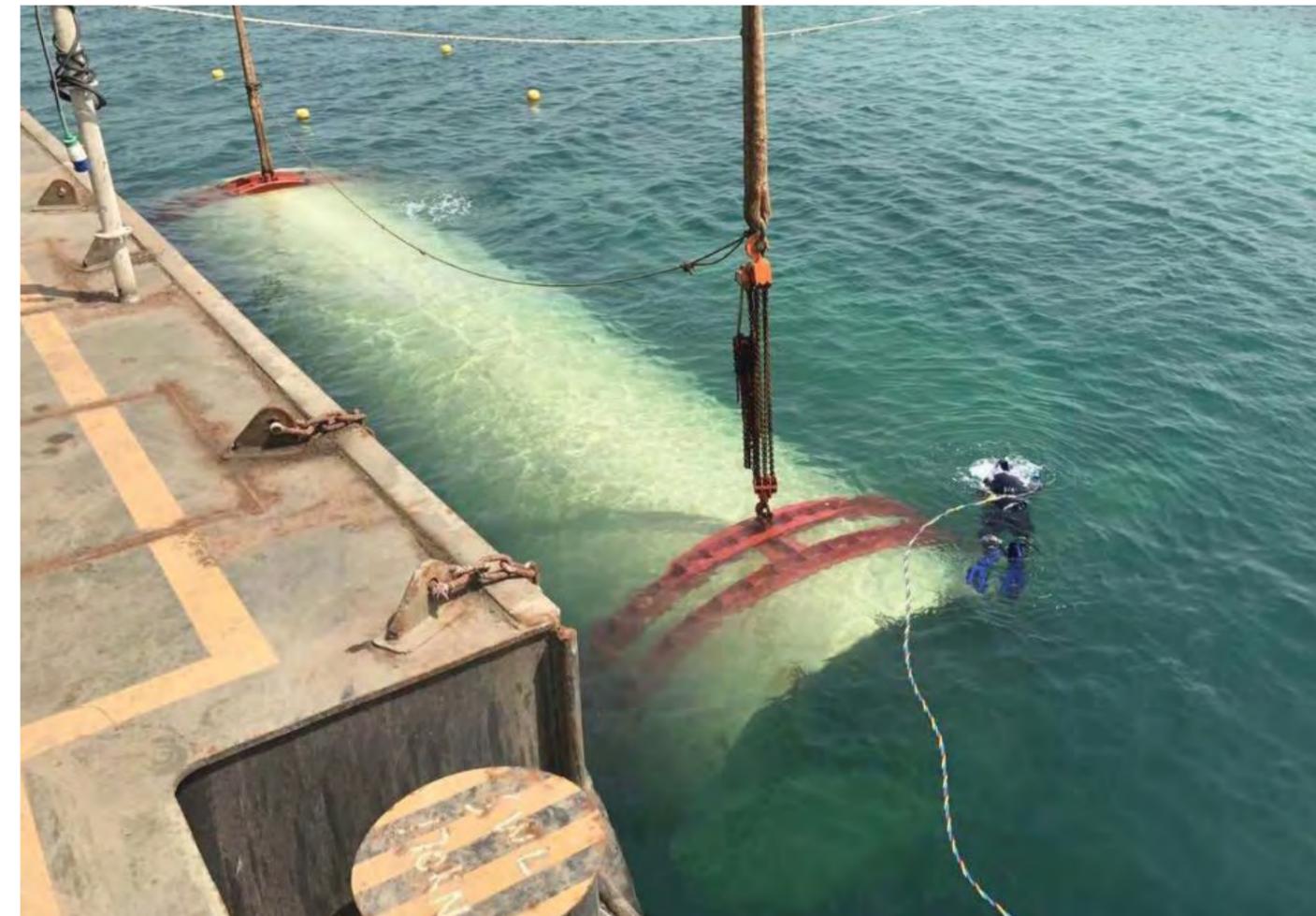
Standard Outside Diameter (OD) Series Pipe

Nominal Diameter (DN)		Nominal Spigot Outer Diameter (DOS <sub>nom.</sub> )	
Metric (mm)	Imperial (in)	Metric (mm)	Imperial (in)
300	12	310.5	12.22
300	12	314.0*	12.36*
350	14	361.5	14.23
350	14	366.0*	14.41*
400	16	412.5	16.24
450	18	463.5	18.25
500	20	514.5	20.26
600	24	616.5	24.27
700	27	718.5	28.29
800	30	820.5	32.30
900	36	922.5	36.32
1,000	39	1,024.5	40.33
1,200	48	1,228.5	48.37
1,400	54	1,432.5	56.40
1,600	63	1,636.5	64.43
1,800	72	1,840.5	72.46
2,000	78	2,044.5	80.49
2,200	84	2,248.5	88.52
2,400	96	2,452.5	96.56
2,600	102	2,656.5	104.59
2,800	108	2,860.5	112.62
3,000	120	3,064.5	120.65
3,200	126	3,268.5	128.68
3,400	132	3,472.5	136.71
3,600	144	3,676.5	144.74
3,800	150	3,880.5	152.78
4,000	156	4,084.5	160.81

\* Special

Cast Iron (Ductile-Iron) Pipe Equivalent (OD) Series Pipe

Nominal Diameter (DN)		Nominal Spigot Outer Diameter (DOS <sub>nom.</sub> )	
Metric (mm)	Imperial (in)	Metric (mm)	Imperial (in)
300	12	335.5	13.21
350	14	388.5	15.30
400	16	441.5	17.38
450	18	494.5	19.47
500	20	548.5	21.59
600	24	654.5	25.77
800	30	812.5	31.99
900	36	972.5	38.29
1,100	42	1,129.5	44.47
1,200	48	1,289.5	50.77
1,400	54	1,461.5	57.54
1,500	60	1,564.5	61.59



## Appendix B - Approximate Pipe and Joint Weights for Handling Purposes

### Standard Outside Diameter (OD) Series Pipe<sup>(1)</sup> - Metric

Nominal Diameter (DN)	PN 1-6 (bar)						PN 10 (bar)					
	SN 5,000		SN 6,400		SN 10,000		SN 5,000		SN 6,400		SN 10,000	
(mm)	Pipe (kg/m)	Coupling (kg)	Pipe (kg/m)	Coupling (kg)	Pipe (kg/m)	Coupling (kg)	Pipe (kg/m)	Coupling (kg)	Pipe (kg/m)	Coupling (kg)	Pipe (kg/m)	Coupling (kg)
300	9	11	10	11	12	11	9	11	10	11	12	11
350	13	12	14	12	16	12	12	13	13	13	16	13
400	16	14	17	14	20	14	15	14	17	14	20	14
450	20	16	22	16	25	16	19	16	21	16	25	16
500	24	17	26	17	30	17	24	18	26	18	30	18
600	35	29	37	29	43	29	33	30	37	30	43	30
700	47	33	50	33	58	33	45	35	49	35	58	35
800	61	38	65	38	75	38	59	41	64	41	75	41
900	76	43	82	43	95	43	74	48	81	48	95	48
1000	93	49	101	49	115	49	91	54	100	54	115	54
1200	132	60	143	60	164	60	131	67	143	67	164	67
1400	180	71	193	71	223	71	177	81	193	81	223	81
1600	234	83	251	83	291	83	230	95	251	95	291	95
1800	295	95	319	95	366	95	290	109	319	109	366	109
2000	363	107	395	107	452	107	358	127	394	127	452	127
2200	441	119	471	119	546	119	432	146	471	146	546	146
2400	518	132	564	132	643	132	512	165	564	165	643	165
2600	606	223	655	223	758	223	599	252	655	252	758	252
2800	701	244	764	244	880	244	696	275	764	275	880	275
3000	806	265	874	265	1,009	265	799	299	874	299	1,009	299
3200	919	301	991	301	1,140	301	908	339	991	339	1,140	339
3400	1,026	324	1,120	324	1,294	324	1,022	367	1,120	367	1,294	367
3600	1,157	346	1,254	346	1,450	346	1,147	402	1,254	402	1,450	402
3800	1,283	368	1,397	368	1,498	368	1,277	434	1,397	434	1,498	434
4000	1,420	391	1,500	391	1,497	391	1,414	466	1,500	466	1,497	466

Notes:

(1) The tabulated values represent approximate weights of common PN and SN classes. Contact FPI for information on the approximate weights of other PN and SN classes.

### Standard Outside Diameter (OD) Series Pipe<sup>(1)</sup> - Imperial

Nominal Diameter (DN)	PN 50 - 100 (psi)						PN 150 (psi)					
	SN 36		SN 46		SN 72		SN 36		SN 46		SN 72	
(in)	Pipe (lb/ft)	Coupling (lb)	Pipe (lb/ft)	Coupling (lb)	Pipe (lb/ft)	Coupling (lb)	Pipe (lb/ft)	Coupling (lb)	Pipe (lb/ft)	Coupling (lb)	Pipe (lb/ft)	Coupling (lb)
12	6	88	7	88	8	88	6	24	7	24	8	24
14	8	101	9	101	11	101	8	28	9	28	11	28
16	11	113	12	113	13	113	10	32	11	32	13	32
18	13	127	15	127	17	127	13	36	14	36	17	36
20	16	140	18	140	20	140	16	39	17	39	20	39
24	24	195	25	195	29	195	22	67	25	67	29	67
27	32	224	34	224	39	224	30	78	33	78	39	78
30	41	253	44	253	50	253	40	91	43	91	50	91
36	51	290	55	290	64	290	50	106	55	106	64	106
39	62	328	68	328	77	328	61	120	67	120	77	120
48	89	403	96	403	110	403	88	149	96	149	110	149
54	121	477	130	477	150	477	119	178	130	178	150	178
63	157	554	168	554	195	554	155	209	168	209	195	209
72	198	632	215	632	246	632	195	240	215	240	246	240
78	244	712	265	712	304	712	240	281	265	281	304	281
84	297	795	316	795	367	795	290	323	316	323	367	323
96	348	879	379	879	432	879	344	365	379	365	432	365
102	407	1,330	440	1,330	510	1,330	403	557	440	557	510	557
108	471	1,453	513	1,453	591	1,453	467	607	513	607	591	607
120	542	1,577	587	1,577	678	1,577	537	658	587	658	678	658
126	618	1,703	666	1,703	766	1,703	610	748	666	748	766	748
132	690	1,829	753	1,829	870	1,829	687	809	753	809	870	809
144	777	1,956	843	1,956	974	1,956	771	886	843	886	974	886
150	862	2,083	939	2,083	1,007	2,083	858	956	939	956	1,007	956
156	954	2,211	1,008	2,211	1,006	2,211	950	1,028	1,008	1,028	1,006	1,028

Notes:

(1) The tabulated values represent approximate weights of common PN and SN classes. Contact FPI for information on the approximate weights of other PN and SN classes.

### Cast Iron (Ductile-Iron) Pipe Equivalent (OD) Series Pipe<sup>(1)</sup> - Metric

Nominal Diameter (DN)	PN 1-6 (bar)						PN 10 (bar)					
	SN 5,000		SN 6,400		SN 10,000		SN 5,000		SN 6,400		SN 10,000	
(mm)	Pipe (kg/m)	Coupling (kg)	Pipe (kg/m)	Coupling (kg)	Pipe (kg/m)	Coupling (kg)	Pipe (kg/m)	Coupling (kg)	Pipe (kg/m)	Coupling (kg)	Pipe (kg/m)	Coupling (kg)
300	10	12	11	12	13	12	10	12	11	12	13	12
350	14	14	16	14	18	14	14	14	15	14	18	14
400	18	15	20	15	22	15	17	16	19	16	22	16
450	23	17	24	17	28	17	22	18	24	18	28	18
500	28	19	30	19	34	19	27	20	29	20	34	20
600	38	32	42	32	48	32	37	33	41	33	48	33
800	59	38	64	38	73	38	57	41	63	41	73	41
900	84	48	91	48	104	48	82	52	90	52	104	52
1100	113	56	120	56	139	56	109	61	120	61	139	61
1200	146	66	158	66	181	66	142	73	156	73	181	73
1400	186	76	202	76	233	76	182	84	200	84	233	84
1500	213	82	232	82	265	82	208	91	228	91	265	91

Notes:

(1) The tabulated values represent approximate weights of common PN and SN classes. Contact FPI for information on the approximate weights of other PN and SN classes.

### Cast Iron (Ductile-Iron) Pipe Equivalent (OD) Series Pipe<sup>(1)</sup> - Imperial

Nominal Diameter (DN)	PN 50 - 100 (psi)						PN 150 (psi)					
	SN 36		SN 46		SN 72		SN 36		SN 46		SN 72	
(in)	Pipe (lb/ft)	Coupling (lb)	Pipe (lb/ft)	Coupling (lb)	Pipe (lb/ft)	Coupling (lb)	Pipe (lb/ft)	Coupling (lb)	Pipe (lb/ft)	Coupling (lb)	Pipe (lb/ft)	Coupling (lb)
12	7	26	8	26	9	26	7	27	7	27	9	27
14	10	30	10	30	12	30	9	31	10	31	12	31
16	12	34	13	34	15	34	12	35	13	35	15	35
18	15	38	16	38	19	38	15	39	16	39	19	39
20	19	42	20	42	23	42	18	43	20	43	23	43
24	26	70	28	70	33	70	25	72	27	72	33	72
30	40	85	43	85	49	85	38	91	42	91	49	91
36	57	105	61	105	70	105	55	114	60	114	70	114
42	76	124	81	124	94	124	74	135	81	135	94	135
48	98	146	106	146	121	146	96	160	105	160	121	160
54	125	167	136	167	157	167	122	185	134	185	157	185
60	143	180	156	180	178	180	140	200	154	200	178	200

Notes:

(1) The tabulated values represent approximate weights of common PN and SN classes. Contact FPI for information on the approximate weights of other PN and SN classes.



## Appendix C - Jacking Pipe Product Data

### Jacking Pipes with Glass-Reinforced Polyester-CF Hybrid Coupler & Integrated Rubber

DN		OD		ID		t		Weight		Fmax					
mm	in	mm	in	mm	in	mm	in	Kg/m	lb/ft	KN			US Tons		
										FS=2.5	FS=3.0	FS=3.5	FS=2.5	FS=3.0	FS=3.5
350	14	376	14.8	304.6	12.0	35.2	1.39	70	46.9	808	673	577	91	76	65
400	16	427	16.8	346.4	13.6	39.8	1.57	90	60.2	1,159	966	828	130	109	93
425	17	478	18.8	388.2	15.3	44.4	1.75	112	75.2	1,570	1,308	1,121	176	147	126
450	18	501	19.7	407.2	16.0	46.4	1.83	123	82.4	1,770	1,475	1,265	199	166	142
500	20	530	20.9	458.8	18.1	35.1	1.38	101	67.8	1,183	986	845	133	111	95
550	22	550	21.7	476.2	18.7	36.4	1.43	109	73	1,319	1,099	942	148	124	106
600	24	616	24.3	533.8	21.0	40.6	1.60	136	91.2	1,808	1,507	1,291	203	169	145
650	26	650	25.6	563.4	22.2	42.8	1.69	151	101.5	2,091	1,742	1,493	235	196	168
700	27	718	28.3	622.8	24.5	47.1	1.85	184	123.4	2,705	2,254	1,932	304	253	217
750	28	752	29.6	652.4	25.7	49.3	1.94	201	135.3	3,046	2,538	2,175	342	285	245
800	30	820	32.3	711.8	28.0	53.6	2.11	239	160.4	3,774	3,145	2,696	424	354	303
850	34	860	33.9	746.8	29.4	56.1	2.21	262	176.1	4,121	3,434	2,944	463	386	331
900	36	924	36.4	802.6	31.6	60.2	2.37	302	203.1	4,853	4,044	3,467	546	455	390
950	38	960	37.8	834	32.8	62.5	2.46	326	219.1	5,326	4,439	3,805	599	499	428
1000	39	1,026	40.4	891.6	35.1	66.7	2.63	372	249.9	6,247	5,206	4,462	702	585	502
1100	41	1,099	43.3	955.2	37.6	71.4	2.81	426	286.5	7,063	5,886	5,045	794	662	567
1150	42	1,130	44.5	982.2	38.7	73.4	2.89	451	302.9	7,553	6,294	5,395	849	708	606
1200	48	1,229	48.4	1,068.6	42.1	79.7	3.14	532	357.7	9,212	7,677	6,580	1,036	863	740
1250	50	1,280	50.4	1,113.2	43.8	82.9	3.26	577	387.6	10,123	8,436	7,231	1,138	948	813
1300	52	1,348	53.1	1,172.6	46.2	87.2	3.43	639	429.4	11,409	9,507	8,149	1,282	1,069	916
1400	54	1,434	56.5	1,272.4	50.1	80.3	3.16	632	424.5	10,796	8,997	7,712	1,214	1,011	867
1450	56	1,450	57.1	1,286.6	50.7	81.2	3.20	646	434.1	11,086	9,238	7,919	1,246	1,038	890
1500	58	1,499	59.0	1,330.2	52.4	83.9	3.30	690	463.7	11,887	9,906	8,491	1,336	1,113	954
1550	60	1,535	60.4	1,362.2	53.6	85.9	3.38	723	486.1	12,468	10,390	8,906	1,402	1,168	1,001
1600	63	1,638	64.5	1,466.2	57.7	85.4	3.36	771	517.8	13,266	11,055	9,476	1,491	1,243	1,065
1700	66	1,720	67.7	1,551.6	61.1	83.7	3.30	796	534.9	13,380	11,150	9,557	1,504	1,253	1,074
1800	72	1,842	72.5	1,675.2	66	82.9	3.26	848	569.5	14,205	11,838	10,147	1,597	1,331	1,141
1900	76	1,937	76.3	1,761.8	69.4	87.1	3.43	936	629.3	15,748	13,123	11,248	1,770	1,475	1,264
2000	78	2,047	80.6	1,874.4	73.8	85.8	3.38	978	657.2	16,358	13,632	11,685	1,839	1,532	1,313
2100	82	2,160	85.0	1,990.4	78.4	84.3	3.32	1,017	683.4	16,607	13,839	11,862	1,867	1,556	1,333
2200	84	2,250	88.6	2,086.6	82.1	81.2	3.20	1,024	687.8	16,442	13,701	11,744	1,848	1,540	1,320
2300	90	2,400	94.5	2,226	87.6	86.5	3.41	1,163	781.5	18,903	15,753	13,502	2,125	1,771	1,518
2400	96	2,453	96.6	2,287.2	90.0	82.4	3.24	1,135	762.9	18,045	15,038	12,890	2,028	1,690	1,449
2500	100	2,555	100.6	2,382.6	93.8	85.7	3.37	1,230	826.5	19,920	16,600	14,228	2,239	1,866	1,599
2600	102	2,658	104.6	2,490.8	98.1	83.1	3.27	1,244	835.7	19,504	16,253	13,931	2,192	1,827	1,566
2700	106	2,758	108.6	2,584.8	101.8	86.1	3.39	1,337	898.5	21,343	17,786	15,245	2,399	1,999	1,714
2800	108	2,858	112.5	2,703.4	106.4	76.8	3.02	1,241	834.2	18,682	15,569	13,345	2,100	1,750	1,500
2900	114	2,962	116.6	2,801.8	110.3	79.6	3.13	1,333	896.1	20,072	16,727	14,337	2,256	1,880	1,612
3000	118	2,999	118.1	2,837	111.7	80.5	3.17	1,365	917.5	20,686	17,238	14,776	2,325	1,938	1,661

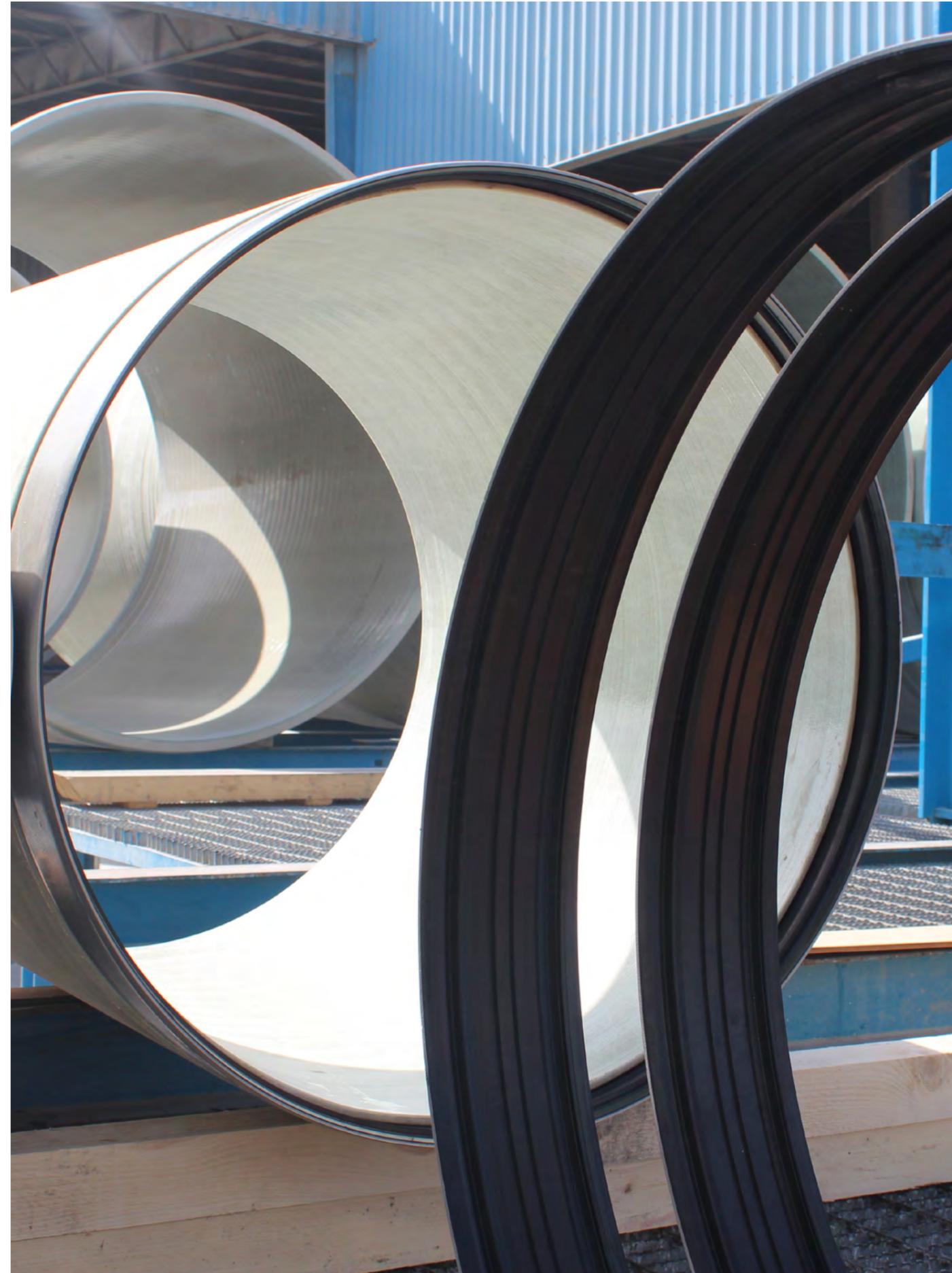
### Glass-Reinforced Polyester Jacking Pipes with Stainless Steel Sleeve & Integrated Rubber Up to PN6

DN		OD		ID		t		Weight		Fmax					
mm	in	mm	in	mm	in	mm	in	Kg/m	lb/ft	KN			US Tons		
										FS=2.5	FS=3.0	FS=3.5	FS=2.5	FS=3.0	FS=3.5
300	12	324	12.8	262	10.3	30.5	1.20	52	35.0	784	653	560	88	73	63
350	14	376	14.8	304.6	12.0	35.2	1.39	70	46.9	1,130	941	807	127	106	91
400	16	427	16.8	346.4	13.6	39.8	1.57	90	60.2	1,528	1,273	1,092	172	143	123
425	17	478	18.8	388.2	15.3	44.4	1.75	112	75.2	1,986	1,655	1,418	223	186	159
450	18	501	19.7	433.4	17.1	33.3	1.31	91	60.8	1,441	1,200	1,029	162	135	116
500	20	530	20.9	458.8	18.1	35.1	1.38	101	67.8	1,647	1,372	1,176	185	154	132
550	22	550	21.7	476.2	18.7	36.4	1.43	109	73.0	1,801	1,501	1,286	202	169	145
600	24	616	24.3	533.8	21.0	40.6	1.60	136	91.2	2,350	1,959	1,679	264	220	189
650	26	650	25.6	563.4	22.2	42.8	1.69	151	101.5	2,664	2,220	1,903	299	250	214
700	27	718	28.3	622.8	24.5	47.1	1.85	184	123.4	3,245	2,704	2,318	365	304	261
750	28	752	29.6	652.4	25.7	49.3	1.94	201	135.3	3,612	3,010	2,580	406	338	290
800	30	820	32.3	711.8	28.0	53.6	2.11	239	160.4	4,394	3,661	3,138	494	412	353
850	34	860	33.9	746.8	29.4	56.1	2.21	262	176.1	4,886	4,072	3,490	549	458	392
900	36	924	36.4	802.6	31.6	60.2	2.37	302	203.1	5,552	4,626	3,965	624	520	446
950	38	960	37.8	834.0	32.8	62.5	2.46	326	219.1	6,053	5,044	4,323	680	567	486
1,000	39	1,026	40.4	891.6	35.1	66.7	2.63	372	249.9	7,025	5,854	5,018	790	658	564
1,100	41	1,099	43.3	955.2	37.6	71.4	2.81	426	286.5	8,192	6,826	5,851	921	767	658
1,150	42	1,130	44.5	982.2	38.7	73.4	2.89	451	303	8,715	7,262	6,225	980	816	700
1,200	48	1,229	48.4	1,068.6	42.1	79.7	3.14	532	357.7	10,478	8,732	7,485	1,178	982	841
1,250	50	1,280	50.4	1,113.2	43.8	82.9	3.26	577	387.6	11,443	9,536	8,174	1,286	1,072	919
1,300	52	1,348	53.1	1,172.6	46.2	87.2	3.43	639	429.4	12,800	10,667	9,143	1,439	1,199	1,028
1,400	54	1,434	56.5	1,272.4	50.1	80.3	3.16	632	424.5	12,471	10,393	8,908	1,402	1,168	1,001
1,450	56	1,450	57.1	1,286.6	50.7	81.2	3.20	646	434	12,781	10,651	9,129	1,437	1,197	1,026
1,500	58	1,499	59.0	1,330.2	52.4	83.9	3.30	690	463.7	13,567	11,306	9,691	1,525	1,271	1,089
1,550	60	1,535	60.4	1,362.2	53.6	85.9	3.38	723	486.1	13,814	11,512	9,867	1,553	1,294	1,109
1,600	63	1,638	64.5	1,466.2	57.7	85.4	3.36	771	517.8	14,704	12,254	10,503	1,653	1,377	1,181
1,700	66	1,720	67.7	1,551.6	61.1	83.7	3.30	796	534.9	15,123	12,603	10,802	1,700	1,417	1,214
1,800	72	1,842	72.5	1,675.2	66.0	82.9	3.26	848	569.5	16,075	13,396	11,482	1,807	1,506	1,291
1,900	76	1,937	76.3	1,761.8	69.4	87.1	3.43	936	629.3	17,978	14,981	12,841	2,021	1,684	1,443
2,000	78	2,047	80.6	1,874.4	73.8	85.8	3.38	978	657.2	18,718	15,598	13,370	2,104	1,753	1,503
2,100	82	2,160	85.0	1,990.4	78.4	84.3	3.32	1,017	683.4	19,391	16,159	13,851	2,180	1,816	1,557
2,200	84	2,250	88.6	2,086.6	82.1	81.2	3.20	1,024	687.8	19,344	16,120	13,817	2,174	1,812	1,553
2,300	90	2,400	94.5	2,226.0	87.6	86.5	3.41	1,163	781.5	21,869	18,224	15,621	2,458	2,048	1,756
2,400	96	2,453	96.6	2,287.2	90.0	82.4	3.24	1,135	762.9	21,078	17,565	15,056	2,369	1,974	1,692
2,500	100	2,555	100.6	2,382.6	93.8	85.7	3.37	1,230	826.5	23,080	19,234	16,486	2,594	2,162	1,853
2,600	102	2,658	104.6	2,490.8	98.1	83.1	3.27	1,244	835.7	23,154	19,295	16,539	2,603	2,169	1,859
2,700	106	2,758	108.6	2,584.8</											

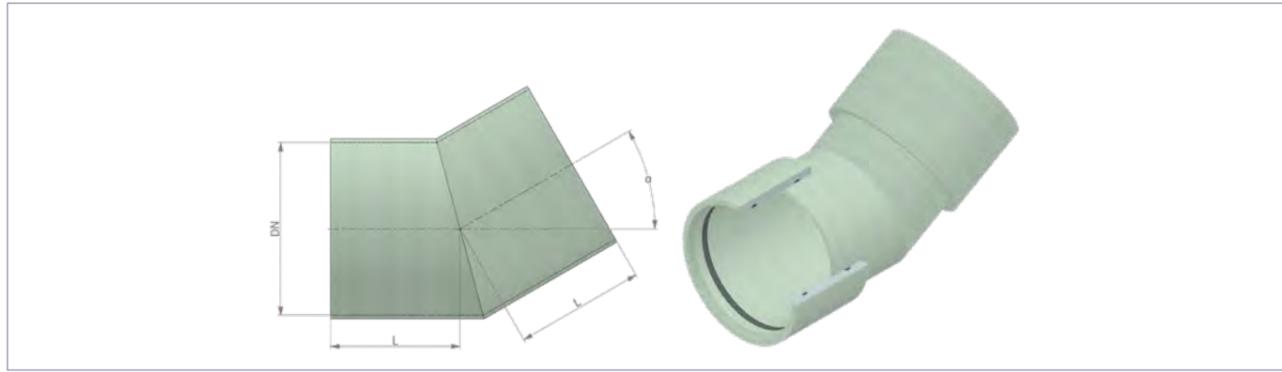
**Glass-Reinforced Polyester Jacking Pipes with Stainless Steel Sleeve & Integrated Rubber (PN10)**

DN		OD		ID		t		Weight		Fmax					
mm	in	mm	in	mm	in	mm	in	Kg/m	lb/ft	KN			US Tons		
										FS=2.5	FS=3.0	FS=3.5	FS=2.5	FS=3.0	FS=3.5
350	14	376	14.8	304.6	12.0	35.2	1.39	70	46.9	853	711	609	96	80	68
400	16	427	16.8	346.4	13.6	39.8	1.57	90	60.2	1,211	1,009	865	136	113	97
425	17	478	18.8	388.2	15.3	44.4	1.75	112	75.2	1,629	1,357	1,163	183	153	131
450	18	501	19.7	433.4	17.1	33.3	1.31	91	60.8	1,065	888	761	120	100	86
500	20	530	20.9	458.8	18.1	35.1	1.38	101	67.8	1,249	1,041	892	140	117	100
550	22	550	21.7	476.2	18.7	36.4	1.43	109	73.0	1,387	1,156	991	156	130	111
600	24	616	24.3	533.8	21.0	40.6	1.60	136	91.2	1,885	1,571	1,346	212	177	151
650	26	650	25.6	563.4	22.2	42.8	1.69	151	101.5	2,172	1,810	1,551	244	203	174
700	27	718	28.3	622.8	24.5	47.1	1.85	184	123.4	2,795	2,330	1,997	314	262	224
750	28	752	29.6	652.4	25.7	49.3	1.94	201	135.3	3,140	2,617	2,243	353	294	252
800	30	820	32.3	711.8	28.0	53.6	2.11	239	160.4	3,878	3,232	2,770	436	363	311
850	34	860	33.9	746.8	29.4	56.1	2.21	262	176.1	4,344	3,620	3,103	488	407	349
900	36	924	36.4	802.6	31.6	60.2	2.37	302	203.1	5,093	4,244	3,638	573	477	409
950	38	960	37.8	834.0	32.8	62.5	2.46	326	219.1	5,576	4,647	3,983	627	522	448
1,000	39	1,026	40.4	891.6	35.1	66.7	2.63	372	249.9	6,515	5,429	4,653	732	610	523
1,100	41	1,099	43.3	955.2	37.6	71.4	2.81	426	286.5	7,644	6,370	5,460	859	716	614
1,150	42	1,130	44.5	982.2	38.7	73.4	2.89	451	303	8,151	6,792	5,822	916	763	654
1,200	48	1,229	48.4	1,068.6	42.1	79.7	3.14	532	357.7	9,864	8,220	7,046	1,109	924	792
1,250	50	1,280	50.4	1,113.2	43.8	82.9	3.26	577	387.6	10,803	9,002	7,716	1,214	1,012	867
1,300	52	1,348	53.1	1,172.6	46.2	87.2	3.43	639	429.4	12,125	10,104	8,661	1,363	1,136	974
1,400	54	1,434	56.5	1,272.4	50.1	80.3	3.16	632	424.5	11,752	9,794	8,395	1,321	1,101	944
1,450	56	1,450	57.1	1,286.6	50.7	81.2	3.20	646	434	12,053	10,044	8,610	1,355	1,129	968
1,500	58	1,499	59.0	1,330.2	52.4	83.9	3.30	690	463.7	12,816	10,680	9,154	1,441	1,200	1,029

Fiberstrong Glass-Reinforced Polyester controlled OD pipes with SS & integrated full-face rubber may also be supplied for Sliplining applications where flushed OD is mandatory.



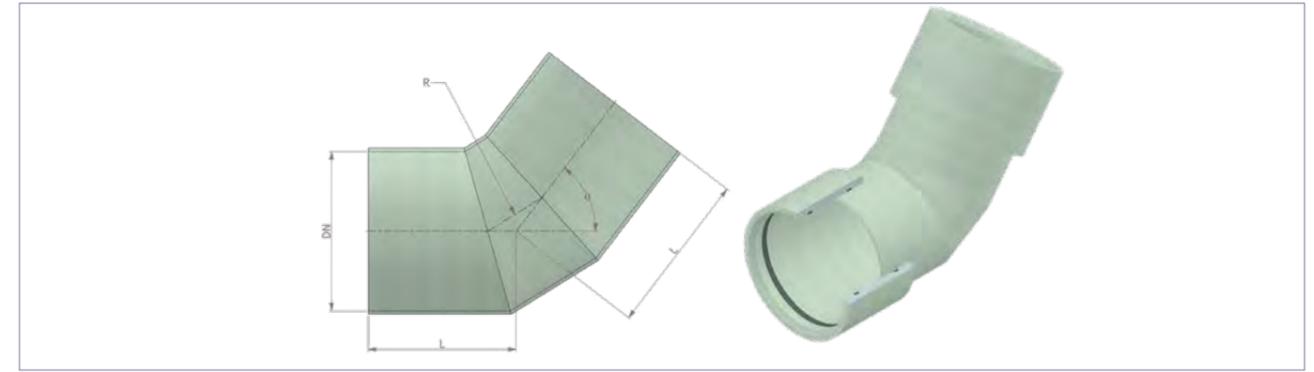
## Appendix D - Elbow Dimensions



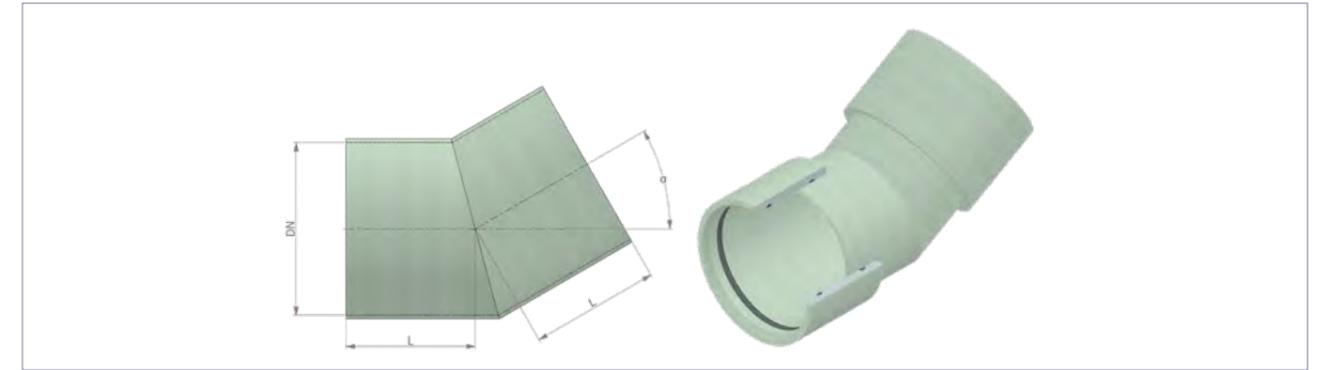
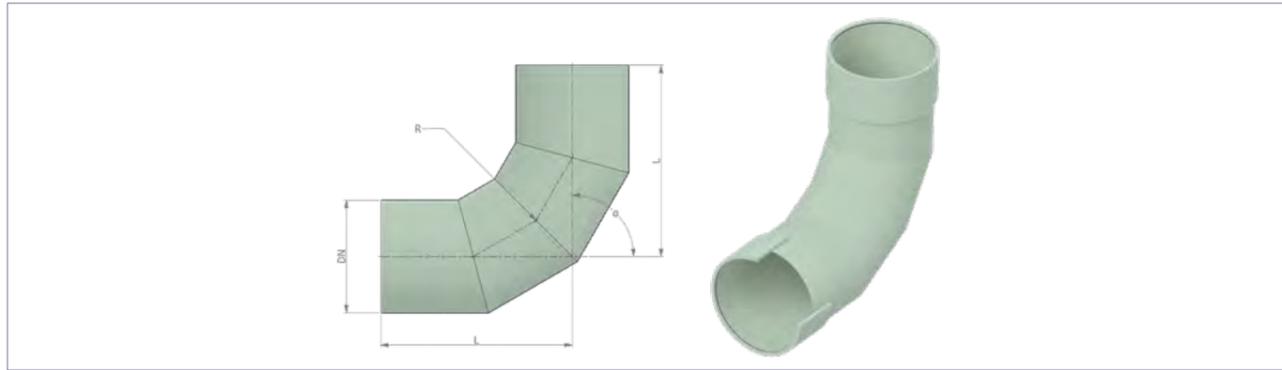
The below dimensions are valid for all pressure classes

### Standard Outside Diameter (OD) Series Pipe

Nominal Diameter		ELBOW 1-15				ELBOW 15-30			
		PN 1-6 bar (PN 50-100 psi)		PN 10 bar (PN 150 psi)		PN 1-6 bar (PN 50-100 psi)		PN 10 bar (PN 150 psi)	
		Offered Laying Length							
ND		L							
mm	Inch	mm	Feet	mm	Feet	mm	Feet	mm	Feet
300	12"	375	1.23	375	1.23	425	1.39	425	1.39
350	14"	400	1.31	400	1.31	450	1.48	450	1.48
400	16"	425	1.39	425	1.39	475	1.56	475	1.56
450	18"	450	1.48	450	1.48	525	1.72	525	1.72
500	20"	450	1.48	450	1.48	525	1.72	525	1.72
600	24"	425	1.39	425	1.39	475	1.56	475	1.56
700	27"	475	1.56	475	1.56	525	1.72	525	1.72
800	30"	500	1.64	500	1.64	575	1.89	575	1.89
900	36"	550	1.80	550	1.80	625	2.05	625	2.05
1000	39"	600	1.97	600	1.97	650	2.13	650	2.13
1200	48"	675	2.21	675	2.21	750	2.46	750	2.46
1400	54"	750	2.46	750	2.46	850	2.79	850	2.79
1600	63"	625	2.05	625	2.05	800	2.62	800	2.62
1800	72"	700	2.30	700	2.30	850	2.79	850	2.79
2000	78"	750	2.46	750	2.46	900	2.95	900	2.95
2200	84"	800	2.62	800	2.62	950	3.12	950	3.12
2400	96"	850	2.79	850	2.79	1025	3.36	1025	3.36
2600	102"	850	2.79	850	2.79	1125	3.69	1125	3.69
2800	108"	900	2.95	900	2.95	1175	3.85	1175	3.85
3000	120"	850	2.79	950	3.12	1250	4.10	1250	4.10
3200	126"	875	2.87	1000	3.28	1100	3.61	1225	4.02
3400	132"	925	3.03	1050	3.44	1150	3.77	1275	4.18
3600	144"	975	3.20	1100	3.61	1225	4.02	1350	4.43
3800	150"	1000	3.28	1125	3.69	1275	4.18	1400	4.59
4000	156"	1050	3.44	1175	3.85	1325	4.35	1475	4.84



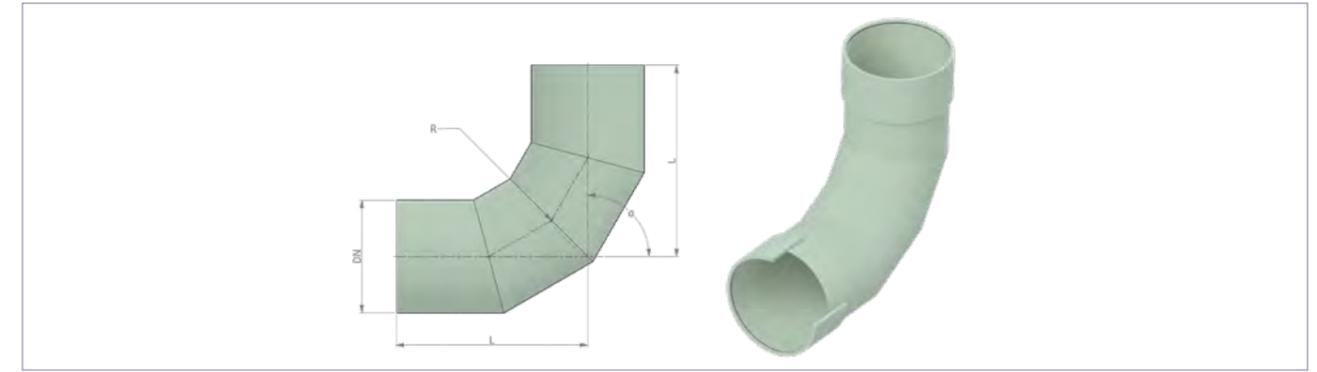
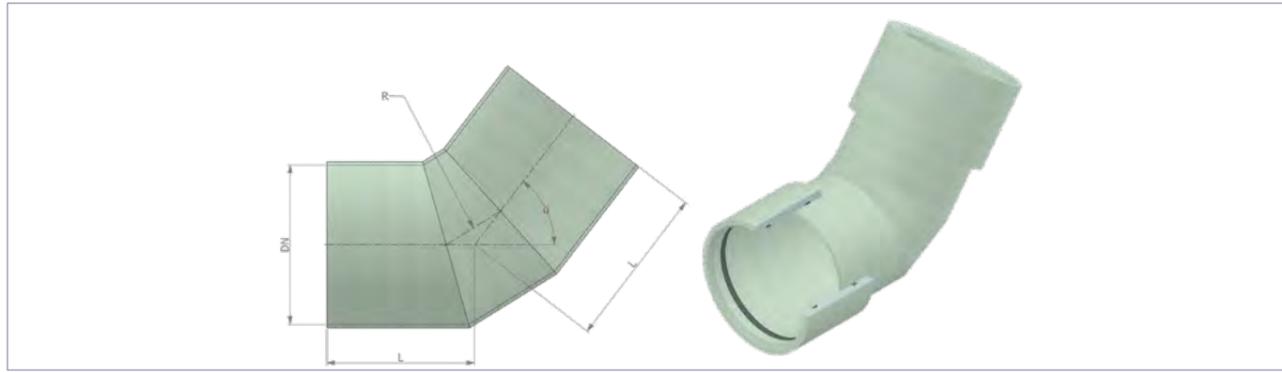
Nominal Diameter		Elbow Radius Ratio		ELBOW 31-45°				ELBOW 46-60°			
				PN 1-6 bar (PN 50-100 psi)		PN 10 bar (PN 150 psi)		PN 1-6 bar (PN 50-100 psi)		PN 10 bar (PN 150 psi)	
		Offered Laying Length									
ND		R		L							
mm	Inch	mm	Inch	mm	Feet	mm	Feet	mm	Feet	mm	Feet
300	12"	450	17.7	500	1.64	500	1.64	550	1.80	550	1.80
350	14"	525	20.7	525	1.72	525	1.72	600	1.97	600	1.97
400	16"	600	23.6	575	1.89	575	1.89	625	2.05	625	2.05
450	18"	675	26.6	600	1.97	600	1.97	700	2.30	700	2.30
500	20"	750	29.5	625	2.05	625	2.05	700	2.30	700	2.30
600	24"	900	35.4	650	2.13	650	2.13	750	2.46	750	2.46
700	27"	1050	41.3	725	2.38	725	2.38	850	2.79	850	2.79
800	30"	1200	47.2	800	2.62	800	2.62	950	3.12	950	3.12
900	36"	1350	53.1	875	2.87	875	2.87	1025	3.36	1025	3.36
1000	39"	1500	59.1	950	3.12	950	3.12	1125	3.69	1125	3.69
1200	48"	1800	70.9	1100	3.61	1100	3.61	1300	4.27	1300	4.27
1400	54"	2100	82.7	1250	4.10	1250	4.10	1500	4.92	1500	4.92
1600	63"	2400	94.5	1200	3.94	1200	3.94	1500	4.92	1500	4.92
1800	72"	2700	106.3	1325	4.35	1325	4.35	1650	5.41	1650	5.41
2000	78"	3000	118.1	1450	4.76	1450	4.76	1825	5.99	1825	5.99
2200	84"	3300	129.9	1575	5.17	1575	5.17	1975	6.48	1975	6.48
2400	96"	3600	141.7	1700	5.58	1700	5.58	2125	6.97	2125	6.97
2600	102"	3900	153.5	1800	5.91	1800	5.91	2250	7.38	2250	7.38
2800	108"	4200	165.4	1900	6.23	1900	6.23	2400	7.87	2400	7.87
3000	120"	4500	177.2	1900	6.23	2025	6.64	2450	8.04	2550	8.37
3200	126"	4800	189.0	2025	6.64	2150	7.05	2600	8.53	2700	8.86
3400	132"	5100	200.8	2125	6.97	2250	7.38	2750	9.02	2875	9.43
3600	144"	5400	212.6	2250	7.38	2375	7.79	2900	9.51	3025	9.92
3800	150"	5700	224.4	2375	7.79	2500	8.20	3025	9.92	3175	10.42
4000	156"	6000	236.2	2475	8.12	2625	8.61	3175	10.42	3325	10.91



Nominal Diameter		Elbow Radius Ratio		ELBOW 61-90°			
				PN 1-6 bar (PN 50-100 psi)		PN 10 bar (PN 150 psi)	
ND		R		Offered Laying Length			
mm		Inch		mm		Feet	
300	12"	450	17.7	725	2.38	725	2.38
350	14"	525	20.7	825	2.71	825	2.71
400	16"	600	23.6	900	2.95	900	2.95
450	18"	675	26.6	975	3.20	975	3.20
500	20"	750	29.5	1025	3.36	1025	3.36
600	24"	900	35.4	1125	3.69	1125	3.69
700	27"	1050	41.3	1300	4.27	1300	4.27
800	30"	1200	47.2	1450	4.76	1450	4.76
900	36"	1350	53.1	1600	5.25	1600	5.25
1,000	39"	1500	59.1	1750	5.74	1750	5.74
1,200	48"	1800	70.9	2075	6.81	2075	6.81
1,400	54"	2100	82.7	2375	7.79	2375	7.79
1,600	63"	2400	94.5	2500	8.20	2500	8.20
1,800	72"	2700	106.3	2800	9.19	2800	9.19
2,000	78"	3000	118.1	3075	10.09	3075	10.09
2,200	84"	3300	129.9	3375	11.07	3375	11.07
2,400	96"	3600	141.7	3650	11.98	3650	11.98
2,600	102"	3900	153.5	3900	12.80	3900	12.80
2,800	108"	4200	165.4	4175	13.70	4175	13.70
3,000	120"	4500	177.2	4350	14.27	4450	14.60
3,200	126"	4800	189.0	4625	15.17	4725	15.50
3,400	132"	5100	200.8	4900	16.08	5025	16.49
3,600	144"	5400	212.6	5175	16.98	5300	17.39
3,800	150"	5700	224.4	5450	17.88	5575	18.29
4,000	156"	6000	236.2	5725	18.78	5850	19.19

### Ductile-Iron Equivalent OD series Pipe

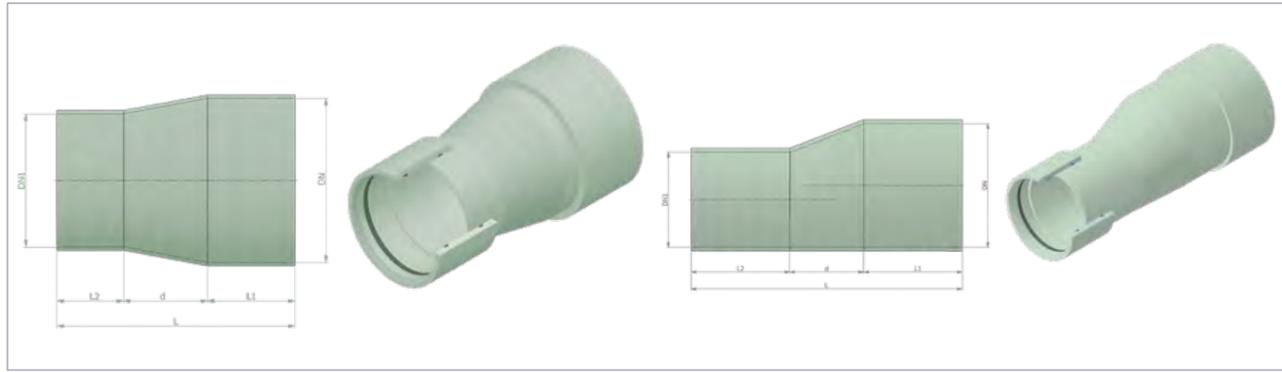
Nominal Diameter		Nominal Spigot Outer Diameter		Elbow Radius Ratio		ELBOW 1-15				ELBOW 15-30					
						PN 1-6 bar (PN 50-100 psi)		PN 10 bar (PN 150 psi)		PN 1-6 (PN 50-100 psi)		PN 10 (PN 150 psi)			
ND		SPOD		R		Offered Laying Length									
mm		Inch		mm		Inch		mm		Feet		mm		Feet	
300	12"	335.5	13.21"	450	17.7	375	1.23	375	1.23	425	1.39	425	1.39		
350	14"	388.5	15.3"	525	20.7	400	1.31	400	1.31	450	1.48	450	1.48		
400	16"	441.5	17.38"	600	23.6	425	1.39	425	1.39	475	1.56	475	1.56		
450	18"	494.5	19.47"	675	26.6	450	1.48	450	1.48	525	1.72	525	1.72		
500	20"	548.5	21.59"	750	29.5	450	1.48	450	1.48	525	1.72	525	1.72		
600	24"	654.5	25.77"	900	35.4	425	1.39	425	1.39	475	1.56	475	1.56		
800	30"	812.5	31.99"	1,200	47.2	500	1.64	500	1.64	575	1.89	575	1.89		
900	36"	972.5	38.29"	1,350	53.1	550	1.80	550	1.80	625	2.05	625	2.05		
1,100	42"	1,129.5	44.47"	1,650	65.0	625	2.05	625	2.05	700	2.30	700	2.30		
1,200	48"	1,289.5	50.77"	1,800	70.9	675	2.21	675	2.21	750	2.46	750	2.46		
1,400	54"	1,461.5	57.54"	2,100	82.7	750	2.46	750	2.46	850	2.79	850	2.79		
1,500	60"	1,564.5	61.59"	2,250	88.6	600	1.97	600	1.97	775	2.54	775	2.54		



Nominal Diameter		Nominal Spigot Outer Diameter		Elbow Radius Ratio		ELBOW 31-45°				ELBOW 46-60°			
						PN 1-6 bar (PN 50-100 psi)		PN 10 bar (PN 150 psi)		PN 1-6 bar (PN 50-100 psi)		PN 10 bar (PN 150 psi)	
Offered Laying Length													
ND		SPOD		R		L							
mm	Inch	mm	Inch	mm	Inch	mm	Feet	mm	Feet	mm	Feet	mm	Feet
300	12"	335.5	13.21"	450	17.7	500	1.64	500	1.64	550	1.80	550	1.80
350	14"	388.5	15.3"	525	20.7	525	1.72	525	1.72	600	1.97	600	1.97
400	16"	441.5	17.38"	600	23.6	575	1.89	575	1.89	625	2.05	625	2.05
450	18"	494.5	19.47"	675	26.6	600	1.97	600	1.97	700	2.30	700	2.30
500	20"	548.5	21.59"	750	29.5	625	2.05	625	2.05	700	2.30	700	2.30
600	24"	654.5	25.77"	900	35.4	650	2.13	650	2.13	750	2.46	750	2.46
800	30"	812.5	31.99"	1,200	47.2	800	2.62	800	2.62	950	3.12	950	3.12
900	36"	972.5	38.29"	1,350	53.1	875	2.87	875	2.87	1,025	3.36	1,025	3.36
1,100	39"	1,129.5	44.47"	1,650	65.0	1,025	3.36	1,025	3.36	1,225	4.02	1,225	4.02
1,200	48"	1,289.5	50.77"	1,800	70.9	1,100	3.61	1,100	3.61	1,300	4.27	1,300	4.27
1,400	54"	1,461.5	57.54"	2,100	82.7	1,250	4.10	1,250	4.10	1,500	4.92	1,500	4.92
1,500	63"	1,564.5	61.59"	2,250	88.6	1,150	3.77	1,150	3.77	1,400	4.59	1,400	4.59

Nominal Diameter		Nominal Spigot Outer Diameter		Elbow Radius Ratio		ELBOW 61-90°			
						PN 1-6 bar (PN 50-100 psi)		PN 10 bar (PN 150 psi)	
Offered Laying Length									
ND		SPOD		R		L			
mm	Inch	mm	Inch	mm	Inch	mm	Feet	mm	Feet
300	12"	336	13.21"	450	17.7	725	2.38	725	2.38
350	14"	389	15.3"	525	20.7	825	2.71	825	2.71
400	16"	442	17.38"	600	23.6	900	2.95	900	2.95
450	18"	495	19.47"	675	26.6	975	3.20	975	3.20
500	20"	549	21.59"	750	29.5	1,025	3.36	1,025	3.36
600	24"	655	25.77"	900	35.4	1,125	3.69	1,125	3.69
800	30"	813	31.99"	1,200	47.2	1,450	4.76	1,450	4.76
900	36"	973	38.29"	1,350	53.1	1,600	5.25	1,600	5.25
1,100	39"	1,130	44.47"	1,650	65.0	1,925	6.32	1,925	6.32
1,200	48"	1,290	50.77"	1,800	70.9	2,075	6.81	2,075	6.81
1,400	54"	1,462	57.54"	2,100	82.7	2,375	7.79	2,375	7.79
1,500	63"	1,565	61.59"	2,250	88.6	2,350	7.71	2,350	7.71

# Appendix E - Reducer Dimensions



The below dimensions are valid for all pressure classes

## Standard Outside Diameter (OD) Series Pipe

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)								PN 10 bar (PN 150 psi)							
				Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length		Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length	
ND		ND1		L1		d		L2		L		L1		d		L2		L	
mm	Inch	mm	Inch	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet
350	14"	300	12"	400	1.31	125	0.41	300	0.98	825	2.71	400	1.31	125	0.41	300	0.98	825	2.71
400	16"	300	12"	400	1.31	250	0.82	300	0.98	950	3.12	400	1.31	250	0.82	300	0.98	950	3.12
		350	14"	400	1.31	125	0.41	400	1.31	925	3.03	400	1.31	125	0.41	400	1.31	925	3.03
450	18"	300	12"	400	1.31	375	1.23	300	0.98	1075	3.53	400	1.31	375	1.23	300	0.98	1075	3.53
		350	14"	400	1.31	250	0.82	400	1.31	1050	3.44	400	1.31	250	0.82	400	1.31	1050	3.44
		400	16"	400	1.31	125	0.41	400	1.31	925	3.03	400	1.31	125	0.41	400	1.31	925	3.03
500	20"	300	12"	400	1.31	500	1.64	300	0.98	1200	3.94	400	1.31	500	1.64	300	0.98	1200	3.94
		350	14"	400	1.31	375	1.23	400	1.31	1175	3.85	400	1.31	375	1.23	400	1.31	1175	3.85
		400	16"	400	1.31	250	0.82	400	1.31	1050	3.44	400	1.31	250	0.82	400	1.31	1050	3.44
		450	18"	400	1.31	125	0.41	400	1.31	925	3.03	400	1.31	125	0.41	400	1.31	925	3.03
600	24"	300	12"	500	1.64	750	2.46	300	0.98	1550	5.09	500	1.64	750	2.46	300	0.98	1550	5.09
		350	14"	500	1.64	625	2.05	400	1.31	1525	5.00	500	1.64	625	2.05	400	1.31	1525	5.00
		400	16"	500	1.64	500	1.64	400	1.31	1400	4.59	500	1.64	500	1.64	400	1.31	1400	4.59
		450	18"	500	1.64	375	1.23	400	1.31	1275	4.18	500	1.64	375	1.23	400	1.31	1275	4.18
700	27"	300	12"	500	1.64	1000	3.28	300	0.98	1800	5.91	500	1.64	1000	3.28	300	0.98	1800	5.91
		350	14"	500	1.64	875	2.87	400	1.31	1775	5.82	500	1.64	875	2.87	400	1.31	1775	5.82
		400	16"	500	1.64	750	2.46	400	1.31	1650	5.41	500	1.64	750	2.46	400	1.31	1650	5.41
		450	18"	500	1.64	625	2.05	400	1.31	1525	5.00	500	1.64	625	2.05	400	1.31	1525	5.00
		500	20"	500	1.64	500	1.64	400	1.31	1400	4.59	500	1.64	500	1.64	400	1.31	1400	4.59
		600	24"	500	1.64	250	0.82	500	1.64	1250	4.10	500	1.64	250	0.82	500	1.64	1250	4.10
800	30"	300	12"	500	1.64	1250	4.10	300	0.98	2050	6.73	500	1.64	1250	4.10	300	0.98	2050	6.73
		350	14"	500	1.64	1125	3.69	400	1.31	2025	6.64	500	1.64	1125	3.69	400	1.31	2025	6.64
		400	16"	500	1.64	1000	3.28	400	1.31	1900	6.23	500	1.64	1000	3.28	400	1.31	1900	6.23
		450	18"	500	1.64	875	2.87	400	1.31	1775	5.82	500	1.64	875	2.87	400	1.31	1775	5.82
		500	20"	500	1.64	750	2.46	400	1.31	1650	5.41	500	1.64	750	2.46	400	1.31	1650	5.41
		600	24"	500	1.64	500	1.64	500	1.64	1500	4.92	500	1.64	500	1.64	500	1.64	1500	4.92
700	27"	500	1.64	250	0.82	500	1.64	1250	4.10	500	1.64	250	0.82	500	1.64	1250	4.10		

Nominal Diameter	Nominal Diameter 1	PN 1-6 bar (PN 50-100 psi)										PN 10 bar (PN 150 psi)							
		Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length		Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length			
ND		ND1		L1		d		L2		L		L1		d		L2		L	
mm	Inch	mm	Inch	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet
900	36"	300	12"	600	1.97	1,500	4.92	300	0.98	2,400	7.87	600	1.97	1,500	4.92	300	0.98	2,400	7.87
		350	14"	600	1.97	1,375	4.51	400	1.31	2,375	7.79	600	1.97	1,375	4.51	400	1.31	2,375	7.79
		400	16"	600	1.97	1,250	4.10	400	1.31	2,250	7.38	600	1.97	1,250	4.10	400	1.31	2,250	7.38
		450	18"	600	1.97	1,125	3.69	400	1.31	2,125	6.97	600	1.97	1,125	3.69	400	1.31	2,125	6.97
		500	20"	600	1.97	1,000	3.28	400	1.31	2,000	6.56	600	1.97	1,000	3.28	400	1.31	2,000	6.56
		600	24"	600	1.97	750	2.46	500	1.64	1,850	6.07	600	1.97	750	2.46	500	1.64	1,850	6.07
		700	27"	600	1.97	500	1.64	500	1.64	1,600	5.25	600	1.97	500	1.64	500	1.64	1,600	5.25
		800	30"	600	1.97	250	0.82	500	1.64	1,350	4.43	600	1.97	250	0.82	500	1.64	1,350	4.43
1,000	39"	300	12"	600	1.97	1,750	5.74	300	0.98	2,650	8.69	600	1.97	1,750	5.74	300	0.98	2,650	8.69
		350	14"	600	1.97	1,625	5.33	400	1.31	2,625	8.61	600	1.97	1,625	5.33	400	1.31	2,625	8.61
		400	16"	600	1.97	1,500	4.92	400	1.31	2,500	8.20	600	1.97	1,500	4.92	400	1.31	2,500	8.20
		450	18"	600	1.97	1,375	4.51	400	1.31	2,375	7.79	600	1.97	1,375	4.51	400	1.31	2,375	7.79
		500	20"	600	1.97	1,250	4.10	400	1.31	2,250	7.38	600	1.97	1,250	4.10	400	1.31	2,250	7.38
		600	24"	600	1.97	1,000	3.28	500	1.64	2,100	6.89	600	1.97	1,000	3.28	500	1.64	2,100	6.89
		700	27"	600	1.97	750	2.46	500	1.64	1,850	6.07	600	1.97	750	2.46	500	1.64	1,850	6.07
		800	30"	600	1.97	500	1.64	500	1.64	1,600	5.25	600	1.97	500	1.64	500	1.64	1,600	5.25
		900	36"	600	1.97	250	0.82	600	1.97	1,450	4.76	600	1.97	250	0.82	600	1.97	1,450	4.76
		1,000	39"	600	1.97	500	1.64	500	1.64	1,600	5.25	600	1.97	500	1.64	500	1.64	1,600	5.25
1,200	48"	300	12"	650	2.13	2,250	7.38	300	0.98	3,200	10.50	650	2.13	2,250	7.38	315	1.03	3,215	10.55
		350	14"	650	2.13	2,125	6.97	400	1.31	3,175	10.42	650	2.13	2,125	6.97	400	1.31	3,175	10.42
		400	16"	650	2.13	2,000	6.56	400	1.31	3,050	10.01	650	2.13	2,000	6.56	400	1.31	3,050	10.01
		450	18"	650	2.13	1,875	6.15	400	1.31	2,925	9.60	650	2.13	1,875	6.15	400	1.31	2,925	9.60
		500	20"	650	2.13	1,750	5.74	400	1.31	2,800	9.19	650	2.13	1,750	5.74	400	1.31	2,800	9.19
		600	24"	650	2.13	1,500	4.92	500	1.64	2,650	8.69	650	2.13	1,500	4.92	500	1.64	2,650	8.69
		700	27"	650	2.13	1,250	4.10	500	1.64	2,400	7.87	650	2.13	1,250	4.10	500	1.64	2,400	7.87
		800	30"	650	2.13	1,000	3.28	500	1.64	2,150	7.05	650	2.13	1,000	3.28	500	1.64	2,150	7.05
		900	36"	650	2.13	750	2.46	600	1.97	2,000	6.56	650	2.13	750	2.46	600	1.97	2,000	6.56
		1,000	39"	650	2.13	500	1.64	600	1.97	1,750	5.74	650	2.13	500	1.64	600	1.97	1,750	5.74
1,400	54"	300	12"	650	2.13	2,750	9.02	300	0.98	3,700	12.14	650	2.13	2,750	9.02	330	1.08	3,730	12.24
		350	14"	650	2.13	2,625	8.61	400	1.31	3,675	12.06	650	2.13	2,625	8.61	400	1.31	3,675	12.06
		400	16"	650	2.13	2,500	8.20	400	1.31	3,550	11.65	650	2.13	2,500	8.20	400	1.31	3,550	11.65
		450	18"	650	2.13	2,375	7.79	400	1.31	3,425	11.24	650	2.13	2,375	7.79	400	1.31	3,425	11.24
		500	20"	650	2.13	2,250	7.38	400	1.31	3,300	10.83	650	2.13	2,250	7.38	400	1.31	3,300	10.83
		600	24"	650	2.13	2,000	6.56	500	1.64	3,150	10.33	650	2.13	2,000	6.56	500	1.64	3,150	10.33
		700	27"	650	2.13	1,750	5.74	500	1.64	2,900	9.51	650	2.13	1,750	5.74	500	1.64	2,900	9.51
		800	30"	650	2.13	1,500	4.92	500	1.64	2,650	8.69	650	2.13	1,500	4.92	500	1.64	2,650	8.69
		900	36"	650	2.13	1,250	4.10	600	1.97	2,500	8.20	650	2.13	1,250	4.10	600	1.97	2,500	8.20
		1,000	39"	650	2.13	1,000	3.28	600	1.97	2,250	7.38	650	2.13	1,000	3.28	600	1.97	2,250	7.38
1,600	63"	300	12"	650	2.13	3,250	10.66	300	0.98	4,200	13.78	650	2.13	3,250	10.66	350	1.15	4,250	13.94
		350	14"	650	2.13	3,125	10.25	400	1.31	4,175	13.70	650	2.13	3,125	10.25	400	1.31	4,175	13.70
		400	16"	650	2.13														

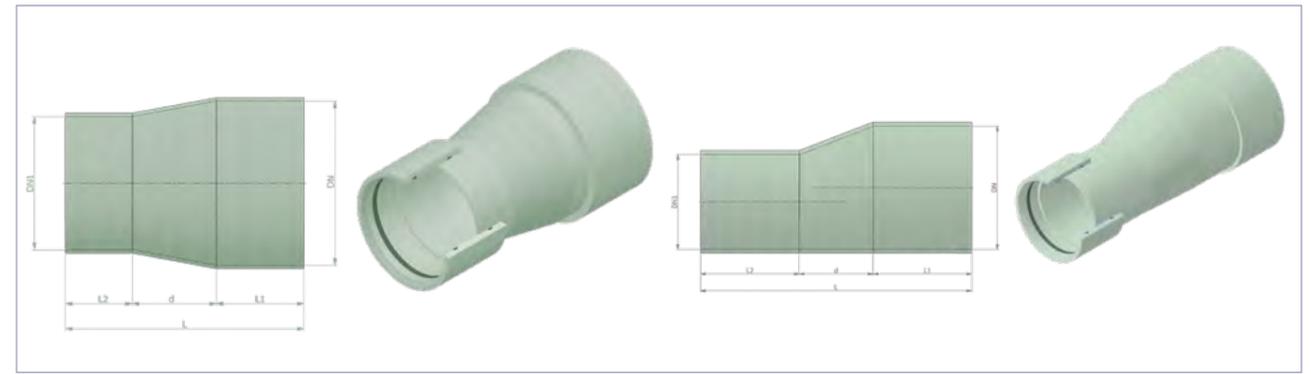
Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)								PN 10 bar (PN 150 psi)							
				Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length		Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length	
ND		ND1		L1		d		L2		L		L1		d		L2		L	
mm	Inch	mm	Inch	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet
1,800	72"	300	12"	650	2.13	3,750	12.30	300	0.98	4,700	15.42	650	2.13	3,750	12.30	365	1.20	4,765	15.63
		350	14"	650	2.13	3,625	11.89	400	1.31	4,675	15.34	650	2.13	3,625	11.89	400	1.31	4,675	15.34
		400	16"	650	2.13	3,500	11.48	400	1.31	4,550	14.93	650	2.13	3,500	11.48	400	1.31	4,550	14.93
		450	18"	650	2.13	3,375	11.07	400	1.31	4,425	14.52	650	2.13	3,375	11.07	400	1.31	4,425	14.52
		500	20"	650	2.13	3,250	10.66	400	1.31	4,300	14.11	650	2.13	3,250	10.66	400	1.31	4,300	14.11
		600	24"	650	2.13	3,000	9.84	500	1.64	4,150	13.62	650	2.13	3,000	9.84	500	1.64	4,150	13.62
		700	27"	650	2.13	2,750	9.02	500	1.64	3,900	12.80	650	2.13	2,750	9.02	500	1.64	3,900	12.80
		800	30"	650	2.13	2,500	8.20	500	1.64	3,650	11.98	650	2.13	2,500	8.20	500	1.64	3,650	11.98
		900	36"	650	2.13	2,250	7.38	600	1.97	3,500	11.48	650	2.13	2,250	7.38	600	1.97	3,500	11.48
		1,000	39"	650	2.13	2,000	6.56	600	1.97	3,250	10.66	650	2.13	2,000	6.56	600	1.97	3,250	10.66
		1,200	48"	650	2.13	1,500	4.92	650	2.13	2,800	9.19	650	2.13	1,500	4.92	650	2.13	2,800	9.19
		1,400	54"	650	2.13	1,000	3.28	650	2.13	2,300	7.55	650	2.13	1,000	3.28	650	2.13	2,300	7.55
		1,600	63"	650	2.13	500	1.64	650	2.13	1,800	5.91	650	2.13	500	1.64	650	2.13	1,800	5.91
		2,000	78"	300	12"	650	2.13	4,250	13.94	305	1.00	5,205	17.08	685	2.25	4,250	13.94	385	1.26
350	14"			650	2.13	4,125	13.53	400	1.31	5,175	16.98	685	2.25	4,125	13.53	415	1.36	5,225	17.14
400	16"			650	2.13	4,000	13.12	400	1.31	5,050	16.57	685	2.25	4,000	13.12	415	1.36	5,100	16.73
450	18"			650	2.13	3,875	12.71	400	1.31	4,925	16.16	685	2.25	3,875	12.71	400	1.31	4,960	16.27
500	20"			650	2.13	3,750	12.30	400	1.31	4,800	15.75	685	2.25	3,750	12.30	400	1.31	4,835	15.86
600	24"			650	2.13	3,500	11.48	500	1.64	4,650	15.26	685	2.25	3,500	11.48	500	1.64	4,685	15.37
700	27"			650	2.13	3,250	10.66	500	1.64	4,400	14.44	685	2.25	3,250	10.66	500	1.64	4,435	14.55
800	30"			650	2.13	3,000	9.84	500	1.64	4,150	13.62	685	2.25	3,000	9.84	500	1.64	4,185	13.73
900	36"			650	2.13	2,750	9.02	600	1.97	4,000	13.12	685	2.25	2,750	9.02	600	1.97	4,035	13.24
1,000	39"			650	2.13	2,500	8.20	600	1.97	3,750	12.30	685	2.25	2,500	8.20	600	1.97	3,785	12.42
1,200	48"			650	2.13	2,000	6.56	650	2.13	3,300	10.83	685	2.25	2,000	6.56	650	2.13	3,335	10.94
1,400	54"			650	2.13	1,500	4.92	650	2.13	2,800	9.19	685	2.25	1,500	4.92	650	2.13	2,835	9.30
1,600	63"			650	2.13	1,000	3.28	650	2.13	2,300	7.55	685	2.25	1,000	3.28	650	2.13	2,335	7.66
1,800	72"			650	2.13	500	1.64	650	2.13	1,800	5.91	685	2.25	500	1.64	650	2.13	1,835	6.02
2,200	84"	300	12"	750	2.46	4,750	15.58	315	1.03	5,815	19.08	750	2.46	4,750	15.58	400	1.31	5,900	19.36
		350	14"	750	2.46	4,625	15.17	400	1.31	5,775	18.95	750	2.46	4,625	15.17	430	1.41	5,805	19.05
		400	16"	750	2.46	4,500	14.76	400	1.31	5,650	18.54	750	2.46	4,500	14.76	430	1.41	5,680	18.64
		450	18"	750	2.46	4,375	14.35	400	1.31	5,525	18.13	750	2.46	4,375	14.35	400	1.31	5,525	18.13
		500	20"	750	2.46	4,250	13.94	400	1.31	5,400	17.72	750	2.46	4,250	13.94	400	1.31	5,400	17.72
		600	24"	750	2.46	4,000	13.12	500	1.64	5,250	17.22	750	2.46	4,000	13.12	500	1.64	5,250	17.22
		700	27"	750	2.46	3,750	12.30	500	1.64	5,000	16.40	750	2.46	3,750	12.30	500	1.64	5,000	16.40
		800	30"	750	2.46	3,500	11.48	500	1.64	4,750	15.58	750	2.46	3,500	11.48	500	1.64	4,750	15.58
		900	36"	750	2.46	3,250	10.66	600	1.97	4,600	15.09	750	2.46	3,250	10.66	600	1.97	4,600	15.09
		1,000	39"	750	2.46	3,000	9.84	600	1.97	4,350	14.27	750	2.46	3,000	9.84	600	1.97	4,350	14.27
		1,200	48"	750	2.46	2,500	8.20	650	2.13	3,900	12.80	750	2.46	2,500	8.20	650	2.13	3,900	12.80
		1,400	54"	750	2.46	2,000	6.56	650	2.13	3,400	11.15	750	2.46	2,000	6.56	650	2.13	3,400	11.15
		1,600	63"	750	2.46	1,500	4.92	650	2.13	2,900	9.51	750	2.46	1,500	4.92	650	2.13	2,900	9.51
		1,800	72"	750	2.46	1,000	3.28	650	2.13	2,400	7.87	750	2.46	1,000	3.28	650	2.13	2,400	7.87
2,000	78"	750	2.46	500	1.64	650	2.13	1,900	6.23	750	2.46	500	1.64	685	2.25	1,935	6.35		

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)								PN 10 bar (PN 150 psi)							
				Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length		Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length	
ND		ND1		L1		d		L2		L		L1		d		L2		L	
mm	Inch	mm	Inch	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet
2,400	96"	300	12"	750	2.46	5,250	17.22	325	1.07	6,325	20.75	750	2.46	5,250	17.22	420	1.38	6,420	21.06
		350	14"	750	2.46	5,125	16.81	400	1.31	6,275	20.59	750	2.46	5,125	16.81	450	1.48	6,325	20.75
		400	16"	750	2.46	5,000	16.40	400	1.31	6,150	20.18	750	2.46	5,000	16.40	450	1.48	6,200	20.34
		450	18"	750	2.46	4,875	15.99	400	1.31	6,025	19.77	750	2.46	4,875	15.99	410	1.35	6,035	19.80
		500	20"	750	2.46	4,750	15.58	400	1.31	5,900	19.36	750	2.46	4,750	15.58	410	1.35	5,910	19.39
		600	24"	750	2.46	4,500	14.76	500	1.64	5,750	18.86	750	2.46	4,500	14.76	500	1.64	5,750	18.86
		700	27"	750	2.46	4,250	13.94	500	1.64	5,500	18.04	750	2.46	4,250	13.94	500	1.64	5,500	18.04
		800	30"	750	2.46	4,000	13.12	500	1.64	5,250	17.22	750	2.46	4,000	13.12	500	1.64	5,250	17.22
		900	36"	750	2.46	3,750	12.30	600	1.97	5,100	16.73	750	2.46	3,750	12.30	600	1.97	5,100	16.73
		1,000	39"	750	2.46	3,500	11.48	600	1.97	4,850	15.91	750	2.46	3,500	11.48	600	1.97	4,850	15.91
		1,200	48"	750	2.46	3,000	9.84	650	2.13	4,400	14.44	750	2.46	3,000	9.84	650	2.13	4,400	14.44
		1,400	54"	750	2.46	2,500	8.20	650	2.13	3,900	12.80	750	2.46	2,500	8.20	650	2.13	3,900	12.80
		1,600	63"	750	2.46	2,000	6.56	650	2.13	3,400	11.15	750	2.46	2,000	6.56	650	2.13	3,400	11.15
		1,800	72"	750	2.46	1,500	4.92	650	2.13	2,900	9.51	750	2.46	1,500	4.92	650	2.13	2,900	9.51
2,600	102"	300	12"	750	2.46	5,750	18.86	335	1.10	6,835	22.42	800	2.62	5,750	18.86	435	1.43	6,985	22.92
		350	14"	750	2.46	5,625	18.45	400	1.31	6,775	22.23	800	2.62	5,625	18.45	465	1.53	6,890	22.60
		400	16"	750	2.46	5,500	18.04	400	1.31	6,650	21.82	800	2.62	5,500	18.04	465	1.53	6,765	22.19
		450	18"	750	2.46	5,375	17.63	400	1.31	6,525	21.41	800	2.62	5,375	17.63	425	1.39	6,600	21.65
		500	20"	750	2.46	5,250	17.22	400	1.31	6,400	21.00	800	2.62	5,250	17.22	425	1.39	6,475	21.24
		600	24"	750	2.46	5,000	16.40	500	1.64	6,250	20.51	800	2.62	5,000	16.40	500	1.64	6,300	20.67
		700	27"	750	2.46	4,750	15.58	500	1.64	6,000	19.69	800	2.62	4,750	15.58	500	1.64	6,050	19.85
		800	30"	750	2.46	4,500	14.76	500	1.64	5,750	18.86	800	2.62	4,500	14.76	500	1.64	5,800	19.03
		900	36"	750	2.46	4,250	13.94	600	1.97	5,600	18.37	800	2.62	4,250	13.94	600	1.97	5,650	18.54
		1,000	39"	750	2.46	4,000	13.12	600	1.97	5,350	17.55	800	2.62	4,000	13.12	600	1.97	5,400	17.72
		1,200	48"	750	2.46	3,500	11.48	650	2.13	4,900	16.08	800	2.62	3,500	11.48	650	2.13	4,950	16.24
		1,400																	

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)								PN 10 bar (PN 150 psi)							
				Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length		Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length	
ND		ND1		L1		d		L2		L		L1		d		L2		L	
mm	Inch	mm	Inch	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet
3,000	120"	300	12"	800	2.62	6,750	22.15	355	1.16	7,905	25.94	865	2.84	6,750	22.15	470	1.54	8,085	26.53
		350	14"	800	2.62	6,625	21.74	400	1.31	7,825	25.67	865	2.84	6,625	21.74	500	1.64	7,990	26.21
		400	16"	800	2.62	6,500	21.33	400	1.31	7,700	25.26	865	2.84	6,500	21.33	500	1.64	7,865	25.80
		450	18"	800	2.62	6,375	20.92	400	1.31	7,575	24.85	865	2.84	6,375	20.92	455	1.49	7,695	25.25
		500	20"	800	2.62	6,250	20.51	400	1.31	7,450	24.44	865	2.84	6,250	20.51	455	1.49	7,570	24.84
		600	24"	800	2.62	6,000	19.69	500	1.64	7,300	23.95	865	2.84	6,000	19.69	500	1.64	7,365	24.16
		700	27"	800	2.62	5,750	18.86	500	1.64	7,050	23.13	865	2.84	5,750	18.86	500	1.64	7,115	23.34
		800	30"	800	2.62	5,500	18.04	500	1.64	6,800	22.31	865	2.84	5,500	18.04	500	1.64	6,865	22.52
		900	36"	800	2.62	5,250	17.22	600	1.97	6,650	21.82	865	2.84	5,250	17.22	600	1.97	6,715	22.03
		1,000	39"	800	2.62	5,000	16.40	600	1.97	6,400	21.00	865	2.84	5,000	16.40	600	1.97	6,465	21.21
		1,200	48"	800	2.62	4,500	14.76	650	2.13	5,950	19.52	865	2.84	4,500	14.76	650	2.13	6,015	19.73
		1,400	54"	800	2.62	4,000	13.12	650	2.13	5,450	17.88	865	2.84	4,000	13.12	650	2.13	5,515	18.09
		1,600	63"	800	2.62	3,500	11.48	650	2.13	4,950	16.24	865	2.84	3,500	11.48	650	2.13	5,015	16.45
		1,800	72"	800	2.62	3,000	9.84	650	2.13	4,450	14.60	865	2.84	3,000	9.84	650	2.13	4,515	14.81
		2,000	78"	800	2.62	2,500	8.20	650	2.13	3,950	12.96	865	2.84	2,500	8.20	685	2.25	4,050	13.29
		2,200	84"	800	2.62	2,000	6.56	750	2.46	3,550	11.65	865	2.84	2,000	6.56	750	2.46	3,615	11.86
		2,400	96"	800	2.62	1,500	4.92	750	2.46	3,050	10.01	865	2.84	1,500	4.92	750	2.46	3,115	10.22
		2,600	102"	800	2.62	1,000	3.28	750	2.46	2,550	8.37	865	2.84	1,000	3.28	800	2.62	2,665	8.74
		2,800	108"	800	2.62	500	1.64	800	2.62	2,100	6.89	865	2.84	500	1.64	830	2.72	2,195	7.20
		3,200	126"	300	12"	900	2.95	7,250	23.79	365	1.20	8,515	27.94	900	2.95	7,250	23.79	490	1.61
350	14"			900	2.95	7,125	23.38	400	1.31	8,425	27.64	900	2.95	7,125	23.38	520	1.71	8,545	28.03
400	16"			900	2.95	7,000	22.97	400	1.31	8,300	27.23	900	2.95	7,000	22.97	520	1.71	8,420	27.62
450	18"			900	2.95	6,875	22.56	400	1.31	8,175	26.82	900	2.95	6,875	22.56	470	1.54	8,245	27.05
500	20"			900	2.95	6,750	22.15	400	1.31	8,050	26.41	900	2.95	6,750	22.15	470	1.54	8,120	26.64
600	24"			900	2.95	6,500	21.33	500	1.64	7,900	25.92	900	2.95	6,500	21.33	500	1.64	7,900	25.92
700	27"			900	2.95	6,250	20.51	500	1.64	7,650	25.10	900	2.95	6,250	20.51	500	1.64	7,650	25.10
800	30"			900	2.95	6,000	19.69	500	1.64	7,400	24.28	900	2.95	6,000	19.69	500	1.64	7,400	24.28
900	36"			900	2.95	5,750	18.86	600	1.97	7,250	23.79	900	2.95	5,750	18.86	600	1.97	7,250	23.79
1,000	39"			900	2.95	5,500	18.04	600	1.97	7,000	22.97	900	2.95	5,500	18.04	600	1.97	7,000	22.97
1,200	48"			900	2.95	5,000	16.40	650	2.13	6,550	21.49	900	2.95	5,000	16.40	650	2.13	6,550	21.49
1,400	54"			900	2.95	4,500	14.76	650	2.13	6,050	19.85	900	2.95	4,500	14.76	650	2.13	6,050	19.85
1,600	63"			900	2.95	4,000	13.12	650	2.13	5,550	18.21	900	2.95	4,000	13.12	650	2.13	5,550	18.21
1,800	72"			900	2.95	3,500	11.48	650	2.13	5,050	16.57	900	2.95	3,500	11.48	650	2.13	5,050	16.57
2,000	78"			900	2.95	3,000	9.84	650	2.13	4,550	14.93	900	2.95	3,000	9.84	685	2.25	4,585	15.04
2,200	84"			900	2.95	2,500	8.20	750	2.46	4,150	13.62	900	2.95	2,500	8.20	750	2.46	4,150	13.62
2,400	96"			900	2.95	2,000	6.56	750	2.46	3,650	11.98	900	2.95	2,000	6.56	750	2.46	3,650	11.98
2,600	102"			900	2.95	1,500	4.92	750	2.46	3,150	10.33	900	2.95	1,500	4.92	800	2.62	3,200	10.50
2,800	108"			900	2.95	1,000	3.28	800	2.62	2,700	8.86	900	2.95	1,000	3.28	830	2.72	2,730	8.96
3,000	120"			900	2.95	500	1.64	800	2.62	2,200	7.22	900	2.95	500	1.64	865	2.84	2,265	7.43

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)								PN 10 bar (PN 150 psi)							
				Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length		Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length	
ND		ND1		L1		d		L2		L		L1		d		L2		L	
mm	Inch	mm	Inch	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet
3,400	132"	300	12"	900	2.95	7,750	25.43	375	1.23	9,025	29.61	930	3.05	7,750	25.43	505	1.66	9,185	30.13
		350	14"	900	2.95	7,625	25.02	405	1.33	8,930	29.30	930	3.05	7,625	25.02	535	1.76	9,090	29.82
		400	16"	900	2.95	7,500	24.61	405	1.33	8,805	28.89	930	3.05	7,500	24.61	535	1.76	8,965	29.41
		450	18"	900	2.95	7,375	24.20	400	1.31	8,675	28.46	930	3.05	7,375	24.20	485	1.59	8,790	28.84
		500	20"	900	2.95	7,250	23.79	400	1.31	8,550	28.05	930	3.05	7,250	23.79	485	1.59	8,665	28.43
		600	24"	900	2.95	7,000	22.97	500	1.64	8,400	27.56	930	3.05	7,000	22.97	515	1.69	8,445	27.71
		700	27"	900	2.95	6,750	22.15	500	1.64	8,150	26.74	930	3.05	6,750	22.15	515	1.69	8,195	26.89
		800	30"	900	2.95	6,500	21.33	500	1.64	7,900	25.92	930	3.05	6,500	21.33	515	1.69	7,945	26.07
		900	36"	900	2.95	6,250	20.51	600	1.97	7,750	25.43	930	3.05	6,250	20.51	600	1.97	7,780	25.52
		1,000	39"	900	2.95	6,000	19.69	600	1.97	7,500	24.61	930	3.05	6,000	19.69	600	1.97	7,530	24.70
		1,200	48"	900	2.95	5,500	18.04	650	2.13	7,050	23.13	930	3.05	5,500	18.04	650	2.13	7,080	23.23
		1,400	54"	900	2.95	5,000	16.40	650	2.13	6,550	21.49	930	3.05	5,000	16.40	650	2.13	6,580	21.59
		1,600	63"	900	2.95	4,500	14.76	650	2.13	6,050	19.85	930	3.05	4,500	14.76	650	2.13	6,080	19.95
		1,800	72"	900	2.95	4,000	13.12	650	2.13	5,550	18.21	930	3.05	4,000	13.12	650	2.13	5,580	18.31
		2,000	78"	900	2.95	3,500	11.48	650	2.13	5,050	16.57	930	3.05	3,500	11.48	685	2.25	5,115	16.78
		2,200	84"	900	2.95	3,000	9.84	750	2.46	4,650	15.26	930	3.05	3,000	9.84	750	2.46	4,680	15.35
		2,400	96"	900	2.95	2,500	8.20	750	2.46	4,150	13.62	930	3.05	2,500	8.20	750	2.46	4,180	13.71
		2,600	102"	900	2.95	2,000	6.56	750	2.46	3,650	11.98	930	3.05	2,000	6.56	800	2.62	3,730	12.24
		2,800	108"	900	2.95	1,500	4.92	800	2.62	3,200	10.50	930	3.05	1,500	4.92	830	2.72	3,260	10.70
		3,000	120"	900	2.95	1,000	3.28	800	2.62	2,700	8.86	930	3.05	1,000	3.28	865	2.84	2,795	9.17
3,200	126"	900	2.95	500	1.64	800	2.62	2,300	7.55	930	3.05	500	1.64	900	2.95	2,330	7.64		
3,600	144"	300	12"	900	2.95	8,250	27.07	385	1.26	9,535	31.28	960	3.15	8,250	27.07	525	1.72	9,735	31.94
		350	14"	900	2.95	8,125	26.66	415	1.36	9,440	30.97	960	3.15	8,125	26.66	555	1.82	9,640	31.63
		400	16"	900	2.95	8,000	26.25	415	1.36	9,315	30.56	960	3.15	8,000	26.25	555	1.82	9,515	31.22
		450	18"	900	2.95	7,875	25.84	400	1.31	9,175	30.10	960	3.15	7,875	25.84	500	1.64	9,335	30.63
		500	20"	900	2.95	7,750	25.43	400	1.31	9,050	29.69	960	3.15	7,750	25.43	500	1.64	9,210	30.22
		600	24"	900	2.95	7,500	24.61	500	1.64	8,900	29.20	960	3.15	7,500	24.61	530	1.74	8,990	29.49
		700	27"	900	2.95	7,250	23.79	500	1.64	8,650	28.38	960	3.15	7,250	23.79	530	1.		

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)								PN 10 bar (PN 150 psi)							
				Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length		Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length	
ND		ND1		L1		d		L2		L		L1		d		L2		L	
mm	Inch	mm	Inch	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet
3,800	150"	300	12"	900	2.95	8,750	28.71	395	1.30	10,045	32.96	990	3.25	8,750	28.71	540	1.77	10,280	33.73
		350	14"	900	2.95	8,625	28.30	425	1.39	9,950	32.64	990	3.25	8,625	28.30	570	1.87	10,185	33.42
		400	16"	900	2.95	8,500	27.89	425	1.39	9,825	32.23	990	3.25	8,500	27.89	570	1.87	10,060	33.01
		450	18"	900	2.95	8,375	27.48	400	1.31	9,675	31.74	990	3.25	8,375	27.48	515	1.69	9,880	32.41
		500	20"	900	2.95	8,250	27.07	400	1.31	9,550	31.33	990	3.25	8,250	27.07	515	1.69	9,755	32.00
		600	24"	900	2.95	8,000	26.25	500	1.64	9,400	30.84	990	3.25	8,000	26.25	545	1.79	9,535	31.28
		700	27"	900	2.95	7,750	25.43	500	1.64	9,150	30.02	990	3.25	7,750	25.43	545	1.79	9,285	30.46
		800	30"	900	2.95	7,500	24.61	500	1.64	8,900	29.20	990	3.25	7,500	24.61	545	1.79	9,035	29.64
		900	36"	900	2.95	7,250	23.79	600	1.97	8,750	28.71	990	3.25	7,250	23.79	600	1.97	8,840	29.00
		1,000	39"	900	2.95	7,000	22.97	600	1.97	8,500	27.89	990	3.25	7,000	22.97	600	1.97	8,590	28.18
		1,200	48"	900	2.95	6,500	21.33	650	2.13	8,050	26.41	990	3.25	6,500	21.33	650	2.13	8,140	26.71
		1,400	54"	900	2.95	6,000	19.69	650	2.13	7,550	24.77	990	3.25	6,000	19.69	650	2.13	7,640	25.07
		1,600	63"	900	2.95	5,500	18.04	650	2.13	7,050	23.13	990	3.25	5,500	18.04	650	2.13	7,140	23.43
		1,800	72"	900	2.95	5,000	16.40	650	2.13	6,550	21.49	990	3.25	5,000	16.40	650	2.13	6,640	21.78
		2,000	78"	900	2.95	4,500	14.76	650	2.13	6,050	19.85	990	3.25	4,500	14.76	685	2.25	6,175	20.26
		2,200	84"	900	2.95	4,000	13.12	750	2.46	5,650	18.54	990	3.25	4,000	13.12	750	2.46	5,740	18.83
		2,400	96"	900	2.95	3,500	11.48	750	2.46	5,150	16.90	990	3.25	3,500	11.48	750	2.46	5,240	17.19
		2,600	102"	900	2.95	3,000	9.84	750	2.46	4,650	15.26	990	3.25	3,000	9.84	800	2.62	4,790	15.72
		2,800	108"	900	2.95	2,500	8.20	800	2.62	4,200	13.78	990	3.25	2,500	8.20	830	2.72	4,320	14.17
		3,000	120"	900	2.95	2,000	6.56	800	2.62	3,700	12.14	990	3.25	2,000	6.56	865	2.84	3,855	12.65
3,200	126"	900	2.95	1,500	4.92	900	2.95	3,300	10.83	990	3.25	1,500	4.92	900	2.95	3,390	11.12		
3,400	132"	900	2.95	1,000	3.28	900	2.95	2,800	9.19	990	3.25	1,000	3.28	930	3.05	2,920	9.58		
3,600	144"	900	2.95	500	1.64	900	2.95	2,300	7.55	990	3.25	500	1.64	960	3.15	2,450	8.04		
4,000	156"	300	12"	900	2.95	9,250	30.35	405	1.33	10,555	34.63	1,025	3.36	9,250	30.35	560	1.84	10,835	35.55
		350	14"	900	2.95	9,125	29.94	435	1.43	10,460	34.32	1,025	3.36	9,125	29.94	590	1.94	10,740	35.24
		400	16"	900	2.95	9,000	29.53	435	1.43	10,335	33.91	1,025	3.36	9,000	29.53	590	1.94	10,615	34.83
		450	18"	900	2.95	8,875	29.12	400	1.31	10,175	33.38	1,025	3.36	8,875	29.12	530	1.74	10,430	34.22
		500	20"	900	2.95	8,750	28.71	400	1.31	10,050	32.97	1,025	3.36	8,750	28.71	530	1.74	10,305	33.81
		600	24"	900	2.95	8,500	27.89	500	1.64	9,900	32.48	1,025	3.36	8,500	27.89	560	1.84	10,085	33.09
		700	27"	900	2.95	8,250	27.07	500	1.64	9,650	31.66	1,025	3.36	8,250	27.07	560	1.84	9,835	32.27
		800	30"	900	2.95	8,000	26.25	500	1.64	9,400	30.84	1,025	3.36	8,000	26.25	560	1.84	9,585	31.45
		900	36"	900	2.95	7,750	25.43	600	1.97	9,250	30.35	1,025	3.36	7,750	25.43	600	1.97	9,375	30.76
		1,000	39"	900	2.95	7,500	24.61	600	1.97	9,000	29.53	1,025	3.36	7,500	24.61	610	2.00	9,135	29.97
		1,200	48"	900	2.95	7,000	22.97	650	2.13	8,550	28.05	1,025	3.36	7,000	22.97	650	2.13	8,675	28.46
		1,400	54"	900	2.95	6,500	21.33	650	2.13	8,050	26.41	1,025	3.36	6,500	21.33	650	2.13	8,175	26.82
		1,600	63"	900	2.95	6,000	19.69	650	2.13	7,550	24.77	1,025	3.36	6,000	19.69	650	2.13	7,675	25.18
		1,800	72"	900	2.95	5,500	18.04	650	2.13	7,050	23.13	1,025	3.36	5,500	18.04	650	2.13	7,175	23.54
		2,000	78"	900	2.95	5,000	16.40	650	2.13	6,550	21.49	1,025	3.36	5,000	16.40	685	2.25	6,710	22.01
		2,200	84"	900	2.95	4,500	14.76	750	2.46	6,150	20.18	1,025	3.36	4,500	14.76	750	2.46	6,275	20.59
		2,400	96"	900	2.95	4,000	13.12	750	2.46	5,650	18.54	1,025	3.36	4,000	13.12	750	2.46	5,775	18.95
		2,600	102"	900	2.95	3,500	11.48	750	2.46	5,150	16.90	1,025	3.36	3,500	11.48	800	2.62	5,325	17.47
		2,800	108"	900	2.95	3,000	9.84	800	2.62	4,700	15.42	1,025	3.36	3,000	9.84	830	2.72	4,855	15.93
		3,000	120"	900	2.95	2,500	8.20	800	2.62	4,200	13.78	1,025	3.36	2,500	8.20	865	2.84	4,390	14.40
3,200	126"	900	2.95	2,000	6.56	900	2.95	3,800	12.47	1,025	3.36	2,000	6.56	900	2.95	3,925	12.88		
3,400	132"	900	2.95	1,500	4.92	900	2.95	3,300	10.83	1,025	3.36	1,500	4.92	930	3.05	3,455	11.34		
3,600	144"	900	2.95	1,000	3.28	900	2.95	2,800	9.19	1,025	3.36	1,000	3.28	960	3.15	2,985	9.79		
3,800	150"	900	2.95	500	1.64	900	2.95	2,300	7.55	1,025	3.36	500	1.64	990	3.25	2,515	8.25		

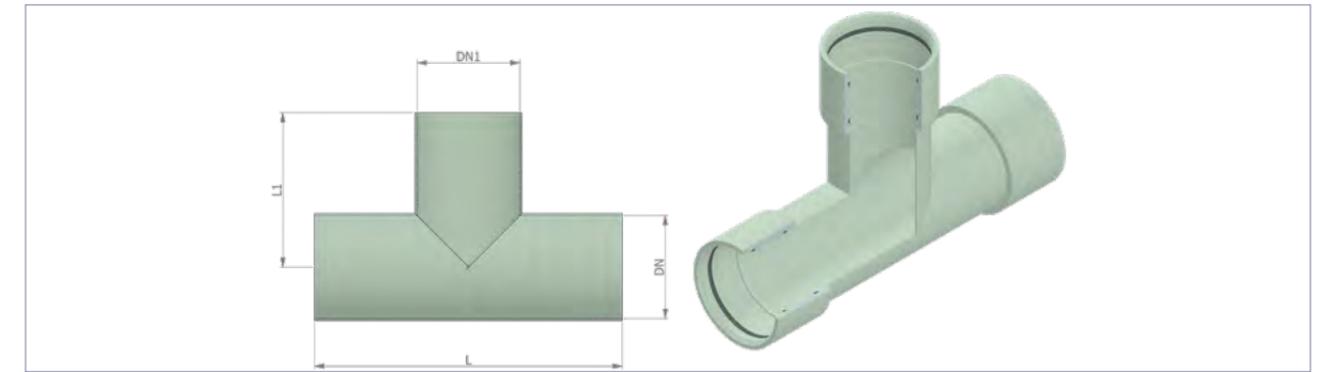


### Ductile-Iron Equivalent OD series Pipe

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)								PN 10 bar (PN 150 psi)								Nominal Spigot Outer Diameter		Nominal Spigot Outer Diameter 1	
				Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length		Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length					
ND		ND1		L1		d		L2		L		L1		d		L2		L		SPOD		SPOD 1	
mm	Inch	mm	Inch	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Inch	mm	Inch
350	14"	300	12"	400	1.31	125	0.41	300	0.98	825	2.71	400	1.31	125	0.41	300	0.98	825	2.71	388.5	15.3"	335.5	13.21"
		400	16"	300	1.2	400	1.31	250	0.82	300	0.98	950	3.12	400	1.31	250	0.82	300	0.98	950	3.12	441.5	17.38"
400	16"	350	14"	400	1.31	125	0.41	400	1.31	925	3.03	400	1.31	125	0.41	400	1.31	925	3.03	441.5	17.38"	388.5	15.3"
		450	18"	300	1.2	400	1.31	375	1.23	300	0.98	1,075	3.53	400	1.31	375	1.23	300	0.98	1,075	3.53	494.5	19.47"
450	18"	350	14"	400	1.31	250	0.82	400	1.31	1,050	3.44	400	1.31	250	0.82	400	1.31	1,050	3.44	494.5	19.47"	388.5	15.3"
		400	16"	400	1.31	125	0.41	400	1.31	925	3.03	400	1.31	125	0.41	400	1.31	925	3.03	494.5	19.47"	441.5	17.38"
500	20"	300	12"	400	1.31	500	1.64	300	0.98	1,200	3.94	400	1.31	500	1.64	300	0.98	1,200	3.94	548.5	21.59"	335.5	13.21"
		350	14"	400	1.31	375	1.23	400	1.31	1,175	3.85	400	1.31	375	1.23	400	1.31	1,175	3.85	548.5	21.59"	388.5	15.3"
		400	16"	400	1.31	250	0.82	400	1.31	1,050	3.44	400	1.31	250	0.82	400	1.31	1,050	3.44	548.5	21.59"	441.5	17.38"
450	18"	450	18"	400	1.31	125	0.41	400	1.31	925	3.03	400	1.31	125	0.41	400	1.31	925	3.03	548.5	21.59"	494.5	19.47"
		300	12"	500	1.64	750	2.46	300	0.98	1,550	5.09	500	1.64	750	2.46	300	0.98	1,550	5.09	654.5	25.77"	335.5	13.21"
		350	14"	500	1.64	625	2.05	400	1.31	1,525	5.00	500	1.64	625	2.05	400	1.31	1,525	5.00	654.5	25.77"	388.5	15.3"
600	24"	400	16"	500	1.64	500	1.64	400	1.31	1,400	4.59	500	1.64	500	1.64	400	1.31	1,400	4.59	654.5	25.77"	441.5	17.38"
		450	18"	500	1.64	375	1.23	400	1.31	1,275	4.18	500	1.64	375	1.23	400	1.31	1,275	4.18	654.5	25.77"	494.5	19.47"
		500	20"	500	1.64	250	0.82	400	1.31	1,150	3.77	500	1.64	250	0.82								

Nominal Diameter	Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)								PN 10 bar (PN 150 psi)								Nominal Spigot Outer Diameter		Nominal Spigot Outer Diameter 1		
			Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length		Laying Length		Reducing Section Length		Laying Length 1		Overall Laying Length						
			L1	d	L2	L	L1	d	L2	L	L1	d	L2	L	L1	d	L2	L					
mm	Inch	mm	Inch	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Feet	mm	Inch	mm	Inch		
1,200	48"	300	12"	650	2.13	2,250	7.38	300	0.98	3,200	10.50	650	2.13	2,250	7.38	315	1.03	3,215	10.55	1,289.5	50.77"	335.5	13.21"
		350	14"	650	2.13	2,125	6.97	400	1.31	3,175	10.42	650	2.13	2,125	6.97	400	1.31	3,175	10.42	1,289.5	50.77"	388.5	15.3"
		400	16"	650	2.13	2,000	6.56	400	1.31	3,050	10.01	650	2.13	2,000	6.56	400	1.31	3,050	10.01	1,289.5	50.77"	441.5	17.38"
		450	18"	650	2.13	1,875	6.15	400	1.31	2,925	9.60	650	2.13	1,875	6.15	400	1.31	2,925	9.60	1,289.5	50.77"	494.5	19.47"
		500	20"	650	2.13	1,750	5.74	400	1.31	2,800	9.19	650	2.13	1,750	5.74	400	1.31	2,800	9.19	1,289.5	50.77"	548.5	21.59"
		600	24"	650	2.13	1,500	4.92	500	1.64	2,650	8.69	650	2.13	1,500	4.92	500	1.64	2,650	8.69	1,289.5	50.77"	654.5	25.77"
		800	30"	650	2.13	1,000	3.28	500	1.64	2,150	7.05	650	2.13	1,000	3.28	500	1.64	2,150	7.05	1,289.5	50.77"	812.5	31.99"
		900	36"	650	2.13	750	2.46	600	1.97	2,000	6.56	650	2.13	750	2.46	600	1.97	2,000	6.56	1,289.5	50.77"	972.5	38.29"
		1,100	42"	650	2.13	250	0.82	600	1.97	1,750	5.74	650	2.13	250	0.82	600	1.97	1,750	5.74	1,289.5	50.77"	1,129.5	44.47"
		1,400	54"	300	12"	650	2.13	2,750	9.02	300	0.98	3,700	12.14	650	2.13	2,750	9.02	330	1.08	3,730	12.24	1,461.5	57.54"
350	14"			650	2.13	2,625	8.61	400	1.31	3,675	12.06	650	2.13	2,625	8.61	400	1.31	3,675	12.06	1,461.5	57.54"	388.5	15.3"
400	16"			650	2.13	2,500	8.20	400	1.31	3,550	11.65	650	2.13	2,500	8.20	400	1.31	3,550	11.65	1,461.5	57.54"	441.5	17.38"
450	18"			650	2.13	2,375	7.79	400	1.31	3,425	11.24	650	2.13	2,375	7.79	400	1.31	3,425	11.24	1,461.5	57.54"	494.5	19.47"
500	20"			650	2.13	2,250	7.38	400	1.31	3,300	10.83	650	2.13	2,250	7.38	400	1.31	3,300	10.83	1,461.5	57.54"	548.5	21.59"
600	24"			650	2.13	2,000	6.56	500	1.64	3,150	10.33	650	2.13	2,000	6.56	500	1.64	3,150	10.33	1,461.5	57.54"	654.5	25.77"
800	30"			650	2.13	1,500	4.92	500	1.64	2,650	8.69	650	2.13	1,500	4.92	500	1.64	2,650	8.69	1,461.5	57.54"	812.5	31.99"
900	36"			650	2.13	1,250	4.10	600	1.97	2,500	8.20	650	2.13	1,250	4.10	600	1.97	2,500	8.20	1,461.5	57.54"	972.5	38.29"
1,100	42"			650	2.13	750	2.46	600	1.97	2,250	7.38	650	2.13	750	2.46	600	1.97	2,250	7.38	1,461.5	57.54"	1,129.5	44.47"
1,200	48"			650	2.13	500	1.64	650	2.13	1,800	5.91	650	2.13	500	1.64	650	2.13	1,800	5.91	1,461.5	57.54"	1,289.5	50.77"
1,500	60"	300	12"	650	2.13	3,000	9.84	300	0.98	3,950	12.96	650	2.13	3,000	9.84	340	1.12	3,990	13.09	1,564.5	61.59"	335.5	13.21"
		350	14"	650	2.13	2,875	9.43	400	1.31	3,925	12.88	650	2.13	2,875	9.43	400	1.31	3,925	12.88	1,564.5	61.59"	388.5	15.3"
		400	16"	650	2.13	2,750	9.02	400	1.31	3,800	12.47	650	2.13	2,750	9.02	400	1.31	3,800	12.47	1,564.5	61.59"	441.5	17.38"
		450	18"	650	2.13	2,625	8.61	400	1.31	3,675	12.06	650	2.13	2,625	8.61	400	1.31	3,675	12.06	1,564.5	61.59"	494.5	19.47"
		500	20"	650	2.13	2,500	8.20	400	1.31	3,550	11.65	650	2.13	2,500	8.20	400	1.31	3,550	11.65	1,564.5	61.59"	548.5	21.59"
		600	24"	650	2.13	2,250	7.38	500	1.64	3,400	11.15	650	2.13	2,250	7.38	500	1.64	3,400	11.15	1,564.5	61.59"	654.5	25.77"
		800	30"	650	2.13	1,750	5.74	500	1.64	2,900	9.51	650	2.13	1,750	5.74	500	1.64	2,900	9.51	1,564.5	61.59"	812.5	31.99"
		900	36"	650	2.13	1,500	4.92	600	1.97	2,750	9.02	650	2.13	1,500	4.92	600	1.97	2,750	9.02	1,564.5	61.59"	972.5	38.29"
		1,100	42"	650	2.13	1,000	3.28	600	1.97	2,250	7.38	650	2.13	1,000	3.28	600	1.97	2,250	7.38	1,564.5	61.59"	1,129.5	44.47"
		1,200	48"	650	2.13	750	2.46	650	2.13	2,050	6.73	650	2.13	750	2.46	650	2.13	1,800	5.91	1,564.5	61.59"	1,289.5	50.77"
1,400	54"	650	2.13	250	0.82	650	2.13	1,550	5.09	650	2.13	250	0.82	650	2.13	1,550	5.09	1,564.5	61.59"	1,461.5	57.54"		

## Appendix F - Tee Dimensions



### Standard Outside Diameter (OD) Series Pipe

Nominal Diameter	Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)				PN 10 bar (PN 150 psi)				
			Laying Length		Laying Length 1		Laying Length		Laying Length 1		
			L	L 1	L	L 1	L	L 1			
mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
300	12"	300	12"	920	3.02	460	1.51	920	3.02	460	1.51
		350	14"	1,060	3.48	490	1.61	1,060	3.48	490	1.61
350	14"	350	14"	1,160	3.81	580	1.90	1,160	3.81	580	1.90
		300	12"	1,060	3.48	510	1.67	1,060	3.48	510	1.67
400	16"	350	14"	1,160	3.81	600	1.97	1,160	3.81	600	1.97
		400	16"	1,200	3.94	600	1.97	1,200	3.94	600	1.97
450	18"	300	12"	1,060	3.48	540	1.77	1,060	3.48	540	1.77
		350	14"	1,160	3.81	630	2.07	1,160	3.81	630	2.07
		400	16"	1,200	3.94	630	2.07	1,200	3.94	630	2.07
		450	18"	1,280	4.20	640	2.10	1,300	4.27	650	2.13
500	20"	300	12"	1,060	3.48	560	1.84	1,060	3.48	560	1.84
		350	14"	1,160	3.81	660	2.17	1,160	3.81	660	2.17
		400	16"	1,200	3.94	660	2.17	1,200	3.94	660	2.17
		450	18"	1,280	4.20	670	2.20	1,300	4.27	670	2.20
500	20"	500	20"	1,380	4.53	690	2.26	1,400	4.59	700	2.30
		300	12"	1,120	3.67	620	2.03	1,120	3.67	620	2.03
600	24"	350	14"	1,220	4.00	710	2.33	1,220	4.00	710	2.33
		400	16"	1,260	4.13	710	2.33	1,260	4.13	710	2.33
		450	18"	1,340	4.40	720	2.36	1,360	4.46	720	2.36
		500	20"	1,440	4.72	740	2.43	1,460	4.79	750	2.46
600	24"	600	24"	1,600	5.25	800	2.62	1,620	5.31	810	2.66
		300	12"	1,120	3.67	670	2.20	1,120	3.67	670	2.20
700	27"	350	14"	1,220	4.00	760	2.49	1,220	4.00	760	2.49
		400	16"	1,260	4.13	760	2.49	1,260	4.13	760	2.49
		450	18"	1,340	4.40	770	2.53	1,360	4.46	780	2.56
		500	20"	1,440	4.72	800	2.62	1,460	4.79	800	2.62
		600	24"	1,600	5.25	850	2.79	1,620	5.31	870	2.85
700	27"	1,700	5.58	850	2.79	1,800	5.91	900	2.95		

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)				PN 10 bar (PN 150 psi)			
				Laying Length		Laying Length 1		Laying Length		Laying Length 1	
ND		ND1		L		L 1		L		L 1	
mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
800	30"	300	12"	1,120	3.67	720	2.36	1,120	3.67	720	2.36
		350	14"	1,000	3.28	700	2.30	1,100	3.61	750	2.46
		400	16"	1,260	4.13	810	2.66	1,260	4.13	810	2.66
		450	18"	1,340	4.40	820	2.69	1,360	4.46	830	2.72
		500	20"	1,440	4.72	850	2.79	1,460	4.79	850	2.79
		600	24"	1,600	5.25	900	2.95	1,620	5.31	920	3.02
		700	27"	1,760	5.77	930	3.05	1,800	5.91	950	3.12
		800	30"	1,920	6.30	960	3.15	1,960	6.43	980	3.22
900	36"	300	12"	1,120	3.67	770	2.53	1,120	3.67	770	2.53
		350	14"	1,000	3.28	750	2.46	1,100	3.61	800	2.62
		400	16"	1,260	4.13	860	2.82	1,260	4.13	860	2.82
		450	18"	1,340	4.40	870	2.85	1,360	4.46	880	2.89
		500	20"	1,440	4.72	900	2.95	1,460	4.79	900	2.95
		600	24"	1,600	5.25	950	3.12	1,620	5.31	970	3.18
		700	27"	1,760	5.77	980	3.22	1,800	5.91	1,000	3.28
		800	30"	1,920	6.30	1,010	3.31	1,960	6.43	1,030	3.38
900	36"	2,140	7.02	1,070	3.51	2,160	7.09	1,080	3.54		
1,000	39"	300	12"	1,040	3.41	730	2.40	1,120	3.67	770	2.53
		350	14"	1,100	3.61	810	2.66	1,200	3.94	860	2.82
		400	16"	1,360	4.46	920	3.02	1,360	4.46	920	3.02
		450	18"	1,440	4.72	930	3.05	1,460	4.79	930	3.05
		500	20"	1,540	5.05	950	3.12	1,560	5.12	960	3.15
		600	24"	1,700	5.58	1,010	3.31	1,720	5.64	1,020	3.35
		700	27"	1,860	6.10	1,040	3.41	1,900	6.23	1,050	3.44
		800	30"	2,020	6.63	1,070	3.51	2,060	6.76	1,080	3.54
		900	36"	2,240	7.35	1,120	3.67	2,260	7.41	1,140	3.74
		1,000	39"	2,400	7.87	1,200	3.94	2,440	8.01	1,220	4.00
1,200	48"	300	12"	1,040	3.41	840	2.76	1,120	3.67	880	2.89
		350	14"	1,100	3.61	910	2.99	1,200	3.94	960	3.15
		400	16"	1,360	4.46	1,020	3.35	1,360	4.46	1,020	3.35
		450	18"	1,440	4.72	1,030	3.38	1,460	4.79	1,040	3.41
		500	20"	1,540	5.05	1,060	3.48	1,560	5.12	1,060	3.48
		600	24"	1,700	5.58	1,110	3.64	1,720	5.64	1,130	3.71
		700	27"	1,860	6.10	1,140	3.74	1,900	6.23	1,160	3.81
		800	30"	2,020	6.63	1,170	3.84	2,060	6.76	1,190	3.90
		900	36"	2,240	7.35	1,230	4.04	2,260	7.41	1,240	4.07
		1,000	39"	2,400	7.87	1,300	4.27	2,440	8.01	1,320	4.33
		1,200	48"	2,720	8.92	1,360	4.46	2,780	9.12	1,390	4.56

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)				PN 10 bar (PN 150 psi)			
				Laying Length		Laying Length 1		Laying Length		Laying Length 1	
ND		ND1		L		L 1		L		L 1	
mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
1,400	54"	300	12"	1,040	3.41	940	3.08	1,120	3.67	980	3.22
		350	14"	1,100	3.61	1,010	3.31	1,200	3.94	1,060	3.48
		400	16"	1,360	4.46	1,120	3.67	1,360	4.46	1,120	3.67
		450	18"	1,440	4.72	1,130	3.71	1,460	4.79	1,140	3.74
		500	20"	1,540	5.05	1,160	3.81	1,560	5.12	1,160	3.81
		600	24"	1,700	5.58	1,210	3.97	1,720	5.64	1,230	4.04
		700	27"	1,860	6.10	1,240	4.07	1,900	6.23	1,260	4.13
		800	30"	2,020	6.63	1,270	4.17	2,060	6.76	1,290	4.23
		900	36"	2,240	7.35	1,330	4.36	2,260	7.41	1,340	4.40
		1,000	39"	2,400	7.87	1,400	4.59	2,440	8.01	1,420	4.66
		1,200	48"	2,720	8.92	1,460	4.79	2,780	9.12	1,490	4.89
		1,400	54"	3,080	10.10	1,540	5.05	3,140	10.30	1,570	5.15
1,600	63"	300	12"	1,040	3.41	1,050	3.44	1,120	3.67	1,090	3.58
		350	14"	1,100	3.61	1,120	3.67	1,200	3.94	1,170	3.84
		400	16"	1,360	4.46	1,230	4.04	1,360	4.46	1,230	4.04
		450	18"	1,440	4.72	1,240	4.07	1,460	4.79	1,240	4.07
		500	20"	1,540	5.05	1,260	4.13	1,560	5.12	1,270	4.17
		600	24"	1,700	5.58	1,320	4.33	1,720	5.64	1,330	4.36
		700	27"	1,860	6.10	1,350	4.43	1,900	6.23	1,360	4.46
		800	30"	2,020	6.63	1,380	4.53	2,060	6.76	1,390	4.56
		900	36"	2,240	7.35	1,430	4.69	2,260	7.41	1,450	4.76
		1,000	39"	2,400	7.87	1,510	4.95	2,440	8.01	1,530	5.02
		1,200	48"	2,720	8.92	1,570	5.15	2,780	9.12	1,590	5.22
		1,400	54"	3,080	10.10	1,650	5.41	3,140	10.30	1,680	5.51
1,600	63"	3,420	11.22	1,710	5.61	3,480	11.42	1,740	5.71		
1,800	72"	300	12"	1,040	3.41	1,150	3.77	1,120	3.67	1,190	3.90
		350	14"	1,100	3.61	1,220	4.00	1,200	3.94	1,270	4.17
		400	16"	1,360	4.46	1,330	4.36	1,360	4.46	1,330	4.36
		450	18"	1,440	4.72	1,340	4.40	1,460	4.79	1,350	4.43
		500	20"	1,540	5.05	1,370	4.49	1,560	5.12	1,370	4.49
		600	24"	1,700	5.58	1,420	4.66	1,720	5.64	1,440	4.72
		700	27"	1,860	6.10	1,450	4.76	1,900	6.23	1,470	4.82
		800	30"	2,020	6.63	1,480	4.86	2,060	6.76	1,500	4.92
		900	36"	2,240	7.35	1,540	5.05	2,260	7.41	1,550	5.09
		1,000	39"	2,400	7.87	1,610	5.28	2,440	8.01	1,630	5.35
		1,200	48"	2,720	8.92	1,670	5.48	2,780	9.12	1,700	5.58
		1,400	54"	3,080	10.10	1,750	5.74	3,140	10.30	1,780	5.84
1,600	63"	3,420	11.22	1,810	5.94	3,480	11.42	1,850	6.07		
1,800	72"	3,780	12.40	1,890	6.20	3,860	12.66	1,930	6.33		

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)				PN 10 bar (PN 150 psi)			
				Laying Length		Laying Length 1		Laying Length		Laying Length 1	
ND		ND1		L		L 1		L		L 1	
mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
2,000	78"	300	12"	1,140	3.74	1,250	4.10	1,220	4.00	1,290	4.23
		350	14"	1,200	3.94	1,330	4.36	1,300	4.27	1,380	4.53
		400	16"	1,460	4.79	1,440	4.72	1,460	4.79	1,440	4.72
		450	18"	1,540	5.05	1,450	4.76	1,560	5.12	1,450	4.76
		500	20"	1,640	5.38	1,470	4.82	1,660	5.45	1,480	4.86
		600	24"	1,800	5.91	1,530	5.02	1,820	5.97	1,540	5.05
		700	27"	1,960	6.43	1,560	5.12	2,000	6.56	1,570	5.15
		800	30"	2,120	6.96	1,590	5.22	2,160	7.09	1,600	5.25
		900	36"	2,340	7.68	1,640	5.38	2,360	7.74	1,660	5.45
		1,000	39"	2,500	8.20	1,720	5.64	2,540	8.33	1,740	5.71
		1,200	48"	2,820	9.25	1,780	5.84	2,880	9.45	1,800	5.91
		1,400	54"	3,180	10.43	1,860	6.10	3,240	10.63	1,890	6.20
		1,600	63"	3,520	11.55	1,920	6.30	3,580	11.75	1,950	6.40
		1,800	72"	3,880	12.73	2,000	6.56	3,960	12.99	2,040	6.69
2,000	78"	4,220	13.85	2,110	6.92	4,300	14.11	2,150	7.05		
2,200	84"	300	12"	1,140	3.74	1,360	4.46	1,220	4.00	1,400	4.59
		350	14"	1,200	3.94	1,430	4.69	1,300	4.27	1,480	4.86
		400	16"	1,460	4.79	1,540	5.05	1,460	4.79	1,540	5.05
		450	18"	1,540	5.05	1,550	5.09	1,560	5.12	1,560	5.12
		500	20"	1,640	5.38	1,580	5.18	1,660	5.45	1,580	5.18
		600	24"	1,800	5.91	1,630	5.35	1,820	5.97	1,650	5.41
		700	27"	1,960	6.43	1,660	5.45	2,000	6.56	1,680	5.51
		800	30"	2,120	6.96	1,690	5.54	2,160	7.09	1,710	5.61
		900	36"	2,340	7.68	1,750	5.74	2,360	7.74	1,760	5.77
		1,000	39"	2,500	8.20	1,820	5.97	2,540	8.33	1,840	6.04
		1,200	48"	2,820	9.25	1,880	6.17	2,880	9.45	1,910	6.27
		1,400	54"	3,180	10.43	1,960	6.43	3,240	10.63	1,990	6.53
		1,600	63"	3,520	11.55	2,020	6.63	3,580	11.75	2,060	6.76
		1,800	72"	3,880	12.73	2,100	6.89	3,960	12.99	2,140	7.02
2,000	78"	4,220	13.85	2,210	7.25	4,300	14.11	2,250	7.38		
2,200	84"	4,580	15.03	2,290	7.51	4,680	15.35	2,340	7.68		

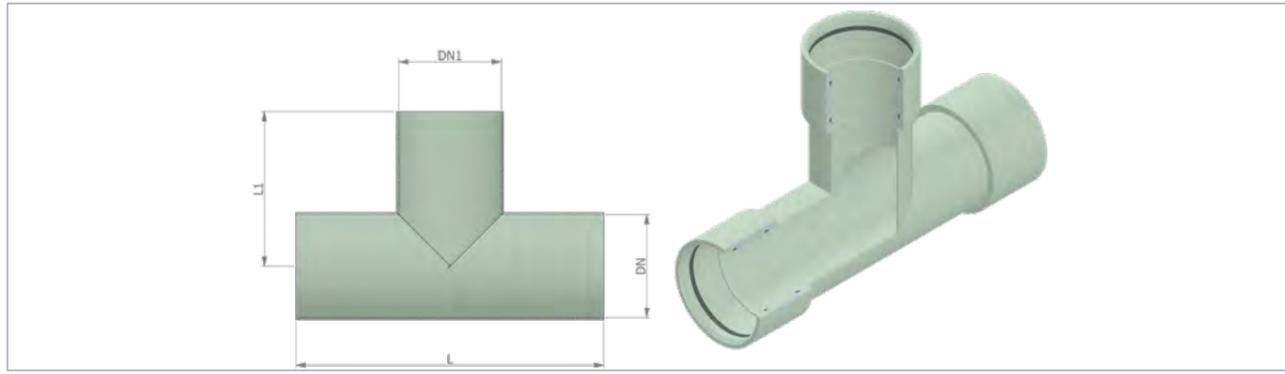
Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)				PN 10 bar (PN 150 psi)			
				Laying Length		Laying Length 1		Laying Length		Laying Length 1	
ND		ND1		L		L 1		L		L 1	
mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
2,400	96"	300	12"	1,140	3.74	1,460	4.79	1,220	4.00	1,500	4.92
		350	14"	1,200	3.94	1,530	5.02	1,300	4.27	1,580	5.18
		400	16"	1,460	4.79	1,640	5.38	1,460	4.79	1,640	5.38
		450	18"	1,540	5.05	1,650	5.41	1,560	5.12	1,660	5.45
		500	20"	1,640	5.38	1,680	5.51	1,660	5.45	1,680	5.51
		600	24"	1,800	5.91	1,730	5.68	1,820	5.97	1,750	5.74
		700	27"	1,960	6.43	1,760	5.77	2,000	6.56	1,780	5.84
		800	30"	2,120	6.96	1,790	5.87	2,160	7.09	1,810	5.94
		900	36"	2,340	7.68	1,850	6.07	2,360	7.74	1,860	6.10
		1,000	39"	2,500	8.20	1,920	6.30	2,540	8.33	1,940	6.36
		1,200	48"	2,820	9.25	1,980	6.50	2,880	9.45	2,010	6.59
		1,400	54"	3,180	10.43	2,060	6.76	3,240	10.63	2,090	6.86
		1,600	63"	3,520	11.55	2,120	6.96	3,580	11.75	2,160	7.09
		1,800	72"	3,880	12.73	2,200	7.22	3,960	12.99	2,240	7.35
2,000	78"	4,220	13.85	2,310	7.58	4,300	14.11	2,350	7.71		
2,200	84"	4,580	15.03	2,390	7.84	4,680	15.35	2,440	8.01		
2,400	96"	4,900	16.08	2,450	8.04	5,000	16.40	2,500	8.20		
2,600	102"	300	12"	1,180	3.87	1,570	5.15	1,260	4.13	1,610	5.28
		350	14"	1,240	4.07	1,640	5.38	1,340	4.40	1,690	5.54
		400	16"	1,500	4.92	1,750	5.74	1,500	4.92	1,750	5.74
		450	18"	1,580	5.18	1,760	5.77	1,600	5.25	1,760	5.77
		500	20"	1,680	5.51	1,780	5.84	1,700	5.58	1,790	5.87
		600	24"	1,840	6.04	1,840	6.04	1,860	6.10	1,850	6.07
		700	27"	2,000	6.56	1,870	6.14	2,040	6.69	1,880	6.17
		800	30"	2,160	7.09	1,900	6.23	2,200	7.22	1,910	6.27
		900	36"	2,380	7.81	1,950	6.40	2,400	7.87	1,970	6.46
		1,000	39"	2,540	8.33	2,030	6.66	2,580	8.46	2,050	6.73
		1,200	48"	2,860	9.38	2,090	6.86	2,920	9.58	2,110	6.92
		1,400	54"	3,220	10.56	2,170	7.12	3,280	10.76	2,200	7.22
		1,600	63"	3,560	11.68	2,230	7.32	3,620	11.88	2,260	7.41
		1,800	72"	3,920	12.86	2,310	7.58	4,000	13.12	2,350	7.71
2,000	78"	4,260	13.98	2,420	7.94	4,340	14.24	2,460	8.07		
2,200	84"	4,620	15.16	2,500	8.20	4,720	15.49	2,550	8.37		
2,400	96"	4,940	16.21	2,560	8.40	5,040	16.54	2,610	8.56		
2,600	102"	5,320	17.45	2,660	8.73	5,440	17.85	2,720	8.92		

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)				PN 10 bar (PN 150 psi)			
				Laying Length		Laying Length 1		Laying Length		Laying Length 1	
ND		ND1		L		L 1		L		L 1	
mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
2,800	108"	300	12"	1,180	3.87	1,670	5.48	1,260	4.13	1,710	5.61
		350	14"	1,240	4.07	1,740	5.71	1,340	4.40	1,790	5.87
		400	16"	1,500	4.92	1,850	6.07	1,500	4.92	1,850	6.07
		450	18"	1,580	5.18	1,860	6.10	1,600	5.25	1,870	6.14
		500	20"	1,680	5.51	1,890	6.20	1,700	5.58	1,890	6.20
		600	24"	1,840	6.04	1,940	6.36	1,860	6.10	1,960	6.43
		700	27"	2,000	6.56	1,970	6.46	2,040	6.69	1,990	6.53
		800	30"	2,160	7.09	2,000	6.56	2,200	7.22	2,020	6.63
		900	36"	2,380	7.81	2,060	6.76	2,400	7.87	2,070	6.79
		1,000	39"	2,540	8.33	2,130	6.99	2,580	8.46	2,150	7.05
		1,200	48"	2,860	9.38	2,190	7.19	2,920	9.58	2,220	7.28
		1,400	54"	3,220	10.56	2,270	7.45	3,280	10.76	2,300	7.55
		1,600	63"	3,560	11.68	2,330	7.64	3,620	11.88	2,370	7.78
		1,800	72"	3,920	12.86	2,410	7.91	4,000	13.12	2,450	8.04
		2,000	78"	4,260	13.98	2,520	8.27	4,340	14.24	2,560	8.40
		2,200	84"	4,620	15.16	2,600	8.53	4,720	15.49	2,650	8.69
2,400	96"	4,940	16.21	2,660	8.73	5,040	16.54	2,710	8.89		
2,600	102"	5,320	17.45	2,760	9.06	5,440	17.85	2,820	9.25		
2,800	108"	5,640	18.50	2,820	9.25	5,760	18.90	2,880	9.45		
3,000	120"	300	12"	1,180	3.87	1,770	5.81	1,260	4.13	1,810	5.94
		350	14"	1,240	4.07	1,850	6.07	1,340	4.40	1,900	6.23
		400	16"	1,500	4.92	1,960	6.43	1,500	4.92	1,960	6.43
		450	18"	1,580	5.18	1,970	6.46	1,580	5.18	1,970	6.46
		500	20"	1,680	5.51	1,990	6.53	1,680	5.51	1,990	6.53
		600	24"	1,840	6.04	2,050	6.73	1,840	6.04	2,050	6.73
		700	27"	2,000	6.56	2,080	6.82	2,000	6.56	2,080	6.82
		800	30"	2,160	7.09	2,110	6.92	2,160	7.09	2,110	6.92
		900	36"	2,380	7.81	2,160	7.09	2,380	7.81	2,160	7.09
		1,000	39"	2,540	8.33	2,240	7.35	2,540	8.33	2,240	7.35
		1,200	48"	2,860	9.38	2,300	7.55	2,860	9.38	2,300	7.55
		1,400	54"	3,220	10.56	2,380	7.81	3,220	10.56	2,380	7.81
		1,600	63"	3,560	11.68	2,440	8.01	3,560	11.68	2,440	8.01
		1,800	72"	3,920	12.86	2,520	8.27	3,920	12.86	2,520	8.27
		2,000	78"	4,260	13.98	2,630	8.63	4,260	13.98	2,630	8.63
		2,200	84"	4,620	15.16	2,710	8.89	4,620	15.16	2,710	8.89
2,400	96"	4,940	16.21	2,770	9.09	4,940	16.21	2,770	9.09		
2,600	102"	5,320	17.45	2,870	9.42	5,320	17.45	2,870	9.42		
2,800	108"	5,640	18.50	2,930	9.61	5,640	18.50	2,930	9.61		
3,000	120"	6,020	19.75	3,010	9.88	6,020	19.75	3,010	9.88		

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)				PN 10 bar (PN 150 psi)			
				Laying Length		Laying Length 1		Laying Length		Laying Length 1	
ND		ND1		L		L 1		L		L 1	
mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
3,200	126"	400	16"	1,500	4.92	2,060	6.76	1,500	4.92	2,060	6.76
		450	18"	1,580	5.18	2,070	6.79	1,580	5.18	2,070	6.79
		500	20"	1,680	5.51	2,100	6.89	1,680	5.51	2,100	6.89
		600	24"	1,840	6.04	2,150	7.05	1,840	6.04	2,150	7.05
		700	27"	2,000	6.56	2,180	7.15	2,000	6.56	2,180	7.15
		800	30"	2,160	7.09	2,210	7.25	2,160	7.09	2,210	7.25
		900	36"	2,380	7.81	2,270	7.45	2,380	7.81	2,270	7.45
		1,000	39"	2,540	8.33	2,340	7.68	2,540	8.33	2,340	7.68
		1,200	48"	2,860	9.38	2,400	7.87	2,860	9.38	2,400	7.87
		1,400	54"	3,220	10.56	2,480	8.14	3,220	10.56	2,480	8.14
		1,600	63"	3,560	11.68	2,540	8.33	3,560	11.68	2,540	8.33
		1,800	72"	3,920	12.86	2,620	8.60	3,920	12.86	2,620	8.60
		2,000	78"	4,260	13.98	2,730	8.96	4,260	13.98	2,730	8.96
		2,200	84"	4,620	15.16	2,810	9.22	4,620	15.16	2,810	9.22
		2,400	96"	4,940	16.21	2,870	9.42	4,940	16.21	2,870	9.42
		2,600	102"	5,320	17.45	2,970	9.74	5,320	17.45	2,970	9.74
2,800	108"	5,640	18.50	3,030	9.94	5,640	18.50	3,030	9.94		
3,000	120"	6,020	19.75	3,110	10.20	6,020	19.75	3,110	10.20		
3,200	126"	6,340	20.80	3,170	10.40	6,340	20.80	3,170	10.40		
3,400	132"	400	16"	1,500	4.92	2,160	7.09	1,500	4.92	2,160	7.09
		450	18"	1,580	5.18	2,170	7.12	1,580	5.18	2,170	7.12
		500	20"	1,680	5.51	2,200	7.22	1,680	5.51	2,200	7.22
		600	24"	1,840	6.04	2,250	7.38	1,840	6.04	2,250	7.38
		700	27"	2,000	6.56	2,280	7.48	2,000	6.56	2,280	7.48
		800	30"	2,160	7.09	2,310	7.58	2,160	7.09	2,310	7.58
		900	36"	2,380	7.81	2,370	7.78	2,380	7.81	2,370	7.78
		1,000	39"	2,540	8.33	2,440	8.01	2,540	8.33	2,440	8.01
		1,200	48"	2,860	9.38	2,500	8.20	2,860	9.38	2,500	8.20
		1,400	54"	3,220	10.56	2,580	8.46	3,220	10.56	2,580	8.46
		1,600	63"	3,560	11.68	2,640	8.66	3,560	11.68	2,640	8.66
		1,800	72"	3,920	12.86	2,720	8.92	3,920	12.86	2,720	8.92
		2,000	78"	4,260	13.98	2,830	9.28	4,260	13.98	2,830	9.28
		2,200	84"	4,620	15.16	2,910	9.55	4,620	15.16	2,910	9.55
		2,400	96"	4,940	16.21	2,970	9.74	4,940	16.21	2,970	9.74
		2,600	102"	5,320	17.45	3,070	10.07	5,320	17.45	3,070	10.07
2,800	108"	5,640	18.50	3,130	10.27	5,640	18.50	3,130	10.27		
3,000	120"	6,020	19.75	3,210	10.53	6,020	19.75	3,210	10.53		
3,200	126"	6,340	20.80	3,270	10.73	6,340	20.80	3,270	10.73		
3,400	132"	6,700	21.98	3,350	10.99	6,700	21.98	3,350	10.99		

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)				PN 10 bar (PN 150 psi)			
				Laying Length		Laying Length 1		Laying Length		Laying Length 1	
ND		ND1		L		L 1		L		L 1	
mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
3,600	144"	400	16"	1,500	4.92	2,270	7.45	1,500	4.92	2,270	7.45
		450	18"	1,580	5.18	2,280	7.48	1,580	5.18	2,280	7.48
		500	20"	1,680	5.51	2,300	7.55	1,680	5.51	2,300	7.55
		600	24"	1,840	6.04	2,360	7.74	1,840	6.04	2,360	7.74
		700	27"	2,000	6.56	2,390	7.84	2,000	6.56	2,390	7.84
		800	30"	2,160	7.09	2,420	7.94	2,160	7.09	2,420	7.94
		900	36"	2,380	7.81	2,470	8.10	2,380	7.81	2,470	8.10
		1,000	39"	2,540	8.33	2,550	8.37	2,540	8.33	2,550	8.37
		1,200	48"	2,860	9.38	2,610	8.56	2,860	9.38	2,610	8.56
		1,400	54"	3,220	10.56	2,690	8.83	3,220	10.56	2,690	8.83
		1,600	63"	3,560	11.68	2,750	9.02	3,560	11.68	2,750	9.02
		1,800	72"	3,920	12.86	2,830	9.28	3,920	12.86	2,830	9.28
		2,000	78"	4,260	13.98	2,940	9.65	4,260	13.98	2,940	9.65
		2,200	84"	4,620	15.16	3,020	9.91	4,620	15.16	3,020	9.91
		2,400	96"	4,940	16.21	3,080	10.10	4,940	16.21	3,080	10.10
		2,600	102"	5,320	17.45	3,180	10.43	5,320	17.45	3,180	10.43
		2,800	108"	5,640	18.50	3,240	10.63	5,640	18.50	3,240	10.63
		3,000	120"	6,020	19.75	3,320	10.89	6,020	19.75	3,320	10.89
		3,200	126"	6,340	20.80	3,380	11.09	6,340	20.80	3,380	11.09
		3,400	132"	6,700	21.98	3,460	11.35	6,700	21.98	3,460	11.35
3,600	144"	7,040	23.10	3,520	11.55	7,040	23.10	3,520	11.55		
3,800	150"	400	16"	1,500	4.92	2,370	7.78	1,500	4.92	2,370	7.78
		450	18"	1,580	5.18	2,380	7.81	1,580	5.18	2,380	7.81
		500	20"	1,680	5.51	2,410	7.91	1,680	5.51	2,410	7.91
		600	24"	1,840	6.04	2,460	8.07	1,840	6.04	2,460	8.07
		700	27"	2,000	6.56	2,490	8.17	2,000	6.56	2,490	8.17
		800	30"	2,160	7.09	2,520	8.27	2,160	7.09	2,520	8.27
		900	36"	2,380	7.81	2,580	8.46	2,380	7.81	2,580	8.46
		1,000	39"	2,540	8.33	2,650	8.69	2,540	8.33	2,650	8.69
		1,200	48"	2,860	9.38	2,710	8.89	2,860	9.38	2,710	8.89
		1,400	54"	3,220	10.56	2,790	9.15	3,220	10.56	2,790	9.15
		1,600	63"	3,560	11.68	2,850	9.35	3,560	11.68	2,850	9.35
		1,800	72"	3,920	12.86	2,930	9.61	3,920	12.86	2,930	9.61
		2,000	78"	4,260	13.98	3,040	9.97	4,260	13.98	3,040	9.97
		2,200	84"	4,620	15.16	3,120	10.24	4,620	15.16	3,120	10.24
		2,400	96"	4,940	16.21	3,180	10.43	4,940	16.21	3,180	10.43
		2,600	102"	5,320	17.45	3,280	10.76	5,320	17.45	3,280	10.76
		2,800	108"	5,640	18.50	3,340	10.96	5,640	18.50	3,340	10.96
		3,000	120"	6,020	19.75	3,420	11.22	6,020	19.75	3,420	11.22
		3,200	126"	6,340	20.80	3,480	11.42	6,340	20.80	3,480	11.42
		3,400	132"	6,700	21.98	3,560	11.68	6,700	21.98	3,560	11.68
3,600	144"	7,040	23.10	3,620	11.88	7,040	23.10	3,620	11.88		
3,800	150"	7,400	24.28	3,700	12.14	7,400	24.28	3,700	12.14		

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)				PN 10 bar (PN 150 psi)			
				Laying Length		Laying Length 1		Laying Length		Laying Length 1	
ND		ND1		L		L 1		L		L 1	
mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
4,000	156"	400	16"	1,500	4.92	2,480	8.14	1,500	4.92	2,480	8.14
		450	18"	1,580	5.18	2,490	8.17	1,580	5.18	2,490	8.17
		500	20"	1,680	5.51	2,510	8.23	1,680	5.51	2,510	8.23
		600	24"	1,840	6.04	2,570	8.43	1,840	6.04	2,570	8.43
		700	27"	2,000	6.56	2,600	8.53	2,000	6.56	2,600	8.53
		800	30"	2,160	7.09	2,630	8.63	2,160	7.09	2,630	8.63
		900	36"	2,380	7.81	2,680	8.79	2,380	7.81	2,680	8.79
		1,000	39"	2,540	8.33	2,760	9.06	2,540	8.33	2,760	9.06
		1,200	48"	2,860	9.38	2,820	9.25	2,860	9.38	2,820	9.25
		1,400	54"	3,220	10.56	2,900	9.51	3,220	10.56	2,900	9.51
		1,600	63"	3,560	11.68	2,960	9.71	3,560	11.68	2,960	9.71
		1,800	72"	3,920	12.86	3,040	9.97	3,920	12.86	3,040	9.97
		2,000	78"	4,260	13.98	3,150	10.33	4,260	13.98	3,150	10.33
		2,200	84"	4,620	15.16	3,230	10.60	4,620	15.16	3,230	10.60
		2,400	96"	4,940	16.21	3,290	10.79	4,940	16.21	3,290	10.79
		2,600	102"	5,320	17.45	3,390	11.12	5,320	17.45	3,390	11.12
		2,800	108"	5,640	18.50	3,450	11.32	5,640	18.50	3,450	11.32
		3,000	120"	6,020	19.75	3,530	11.58	6,020	19.75	3,530	11.58
		3,200	126"	6,340	20.80	3,590	11.78	6,340	20.80	3,590	11.78
		3,400	132"	6,700	21.98	3,670	12.04	6,700	21.98	3,670	12.04
3,600	144"	7,040	23.10	3,730	12.24	7,040	23.10	3,730	12.24		
3,800	150"	7,400	24.28	3,810	12.50	7,400	24.28	3,810	12.50		
4,000	156"	7,740	25.39	3,870	12.70	7,740	25.39	3,870	12.70		



**Ductile-Iron Equivalent OD series Pipe**

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)				PN 10 bar (PN 150 psi)				Nominal Spigot Outer Diameter		Nominal Spigot Outer Diameter 1	
ND		ND1		Laying Length		Laying Length 1		Laying Length		Laying Length 1		SPOD		SPOD 1	
mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
300	12"	300	12"	920	3.02	460	1.51	920	3.02	460	1.51	335.5	13.21"	335.5	13.21"
		350	14"	1,060	3.48	490	1.61	1,060	3.48	490	1.61	388.5	15.3"	388.5	15.3"
350	14"	350	14"	1,160	3.81	580	1.90	1,160	3.81	580	1.90	388.5	15.3"	388.5	15.3"
		400	16"	1,060	3.48	510	1.67	1,060	3.48	510	1.67	441.5	17.38"	335.5	13.21"
400	16"	350	14"	1,160	3.81	600	1.97	1,160	3.81	600	1.97	441.5	17.38"	388.5	15.3"
		400	16"	1,200	3.94	600	1.97	1,200	3.94	600	1.97	441.5	17.38"	441.5	17.38"
450	18"	300	12"	1,060	3.48	540	1.77	1,060	3.48	540	1.77	494.5	19.47"	335.5	13.21"
		350	14"	1,160	3.81	630	2.07	1,160	3.81	630	2.07	494.5	19.47"	388.5	15.3"
		400	16"	1,200	3.94	630	2.07	1,200	3.94	630	2.07	494.5	19.47"	441.5	17.38"
		450	18"	1,280	4.20	640	2.10	1,300	4.27	650	2.13	494.5	19.47"	494.5	19.47"
500	20"	300	12"	1,060	3.48	560	1.84	1,060	3.48	560	1.84	548.5	21.59"	335.5	13.21"
		350	14"	1,160	3.81	660	2.17	1,160	3.81	660	2.17	548.5	21.59"	388.5	15.3"
		400	16"	1,200	3.94	660	2.17	1,200	3.94	660	2.17	548.5	21.59"	441.5	17.38"
		450	18"	1,280	4.20	670	2.20	1,300	4.27	670	2.20	548.5	21.59"	494.5	19.47"
		500	20"	1,380	4.53	690	2.26	1,400	4.59	700	2.30	548.5	21.59"	548.5	21.59"
600	24"	300	12"	1,120	3.67	620	2.03	1,120	3.67	620	2.03	654.5	25.77"	335.5	13.21"
		350	14"	1,220	4.00	710	2.33	1,220	4.00	710	2.33	654.5	25.77"	388.5	15.3"
		400	16"	1,260	4.13	710	2.33	1,260	4.13	710	2.33	654.5	25.77"	441.5	17.38"
		450	18"	1,340	4.40	720	2.36	1,360	4.46	720	2.36	654.5	25.77"	494.5	19.47"
		500	20"	1,440	4.72	740	2.43	1,460	4.79	750	2.46	654.5	25.77"	548.5	21.59"
		600	24"	1,600	5.25	800	2.62	1,620	5.31	810	2.66	654.5	25.77"	654.5	25.77"
800	30"	300	12"	1,120	3.67	720	2.36	1,120	3.67	720	2.36	812.5	31.99"	335.5	13.21"
		350	14"	1,000	3.28	700	2.30	1,100	3.61	750	2.46	812.5	31.99"	388.5	15.3"
		400	16"	1,260	4.13	810	2.66	1,260	4.13	810	2.66	812.5	31.99"	441.5	17.38"
		450	18"	1,340	4.40	820	2.69	1,360	4.46	830	2.72	812.5	31.99"	494.5	19.47"
		500	20"	1,440	4.72	850	2.79	1,460	4.79	850	2.79	812.5	31.99"	548.5	21.59"
		600	24"	1,600	5.25	900	2.95	1,620	5.31	920	3.02	812.5	31.99"	654.5	25.77"
		800	30"	1,920	6.30	960	3.15	1,960	6.43	980	3.22	812.5	31.99"	812.5	31.99"

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)				PN 10 bar (PN 150 psi)				Nominal Spigot Outer Diameter		Nominal Spigot Outer Diameter 1	
ND		ND1		Laying Length		Laying Length 1		Laying Length		Laying Length 1		SPOD		SPOD 1	
mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
900	36"	300	12"	1,120	3.67	770	2.53	1,120	3.67	770	2.53	972.5	38.29"	335.5	13.21"
		350	14"	1,000	3.28	750	2.46	1,100	3.61	800	2.62	972.5	38.29"	388.5	15.3"
		400	16"	1,260	4.13	860	2.82	1,260	4.13	860	2.82	972.5	38.29"	441.5	17.38"
		450	18"	1,340	4.40	870	2.85	1,360	4.46	880	2.89	972.5	38.29"	494.5	19.47"
		500	20"	1,440	4.72	900	2.95	1,460	4.79	900	2.95	972.5	38.29"	548.5	21.59"
		600	24"	1,600	5.25	950	3.12	1,620	5.31	970	3.18	972.5	38.29"	654.5	25.77"
		800	30"	1,920	6.30	1,010	3.31	1,960	6.43	1,030	3.38	972.5	38.29"	812.5	31.99"
1,100	42"	300	12"	1,040	3.41	790	2.59	1,120	3.67	830	2.72	1129.5	44.47"	335.5	13.21"
		350	14"	1,100	3.61	860	2.82	1,200	3.94	910	2.99	1129.5	44.47"	388.5	15.3"
		400	16"	1,360	4.46	970	3.18	1,360	4.46	970	3.18	1129.5	44.47"	441.5	17.38"
		450	18"	1,440	4.72	980	3.22	1,460	4.79	980	3.22	1129.5	44.47"	494.5	19.47"
		500	20"	1,540	5.05	1,000	3.28	1,560	5.12	1,010	3.31	1129.5	44.47"	548.5	21.59"
		600	24"	1,700	5.58	1,060	3.48	1,720	5.64	1,070	3.51	1129.5	44.47"	654.5	25.77"
		800	30"	2,020	6.63	1,120	3.67	2,060	6.76	1,130	3.71	1129.5	44.47"	812.5	31.99"
1,200	48"	900	36"	2,240	7.35	1,170	3.84	2,260	7.41	1,190	3.90	1129.5	44.47"	972.5	38.29"
		1,100	42"	2,560	8.40	1,280	4.20	2,440	8.01	1,270	4.17	1129.5	44.47"	1129.5	44.47"
		300	12"	1,040	3.41	840	2.76	1,120	3.67	880	2.89	1289.5	50.77"	335.5	13.21"
		350	14"	1,100	3.61	910	2.99	1,200	3.94	960	3.15	1289.5	50.77"	388.5	15.3"
		400	16"	1,360	4.46	1,020	3.35	1,360	4.46	1,020	3.35	1289.5	50.77"	441.5	17.38"
		450	18"	1,440	4.72	1,030	3.38	1,460	4.79	1,040	3.41	1289.5	50.77"	494.5	19.47"
		500	20"	1,540	5.05	1,060	3.48	1,560	5.12	1,060	3.48	1289.5	50.77"	548.5	21.59"
1,400	54"	600	24"	1,700	5.58	1,110	3.64	1,720	5.64	1,130	3.71	1289.5	50.77"	654.5	25.77"
		800	30"	2,020	6.63	1,170	3.84	2,060	6.76	1,190	3.90	1289.5	50.77"	812.5	31.99"
		900	36"	2,240	7.35	1,230	4.04	2,260	7.41	1,240	4.07	1289.5	50.77"	972.5	38.29"
		1,100	42"	2,560	8.40	1,330	4.36	2,440	8.01	1,320	4.33	1289.5	50.77"	1129.5	44.47"
		1,200	48"	2,720	8.92	1,360	4.46	2,780	9.12	1,390	4.56	1289.5	50.77"	1289.5	50.77"
		300	12"	1,040	3.41	940	3.08	1,120	3.67	980	3.22	1461.5	57.54"	335.5	13.21"
		350	14"	1,100	3.61	1,010	3.31	1,200	3.94	1,060	3.48	1461.5	57.54"	388.5	15.3"
1,400	54"	400	16"	1,360	4.46	1,120	3.67	1,360	4.46	1,120	3.67	1461.5	57.54"	441.5	17.38"
		450	18"	1,440	4.72	1,130	3.71	1,460	4.79	1,140	3.74	1461.5	57.54"	494.5	19.47"
		500	20"	1,540	5.05	1,160	3.81	1,560	5.12	1,160	3.81	1461.5	57.54"	548.5	21.59"
		600	24"	1,700	5.58	1,210	3.97	1,720	5.64	1,230	4.04	1461.5	57.54"	654.5	25.77"
		800	30"	2,020	6.63	1,270	4.17	2,060	6.76	1,290	4.23	1461.5	57.54"	812.5	31.99"
		900	36"	2,240	7.35	1,330	4.36	2,260	7.41	1,340	4.40	1461.5	57.54"	972.5	38.29"
		1,100	42"	2,400	7.87	1,400	4.59	2,440	8.01	1,420	4.66	1461.5	57.54"	1129.5	44.47"
1,400	54"	1,200	48"	2,720	8.92	1,460	4.79	2,780	9.12	1,490	4.89	1461.5	57.54"	1289.5	50.77"
		1,400	54"	3,080	10.10	1,540	5.05	3,140	10.30	1,570	5.15	1461.5	57.54"	1461.5	57.54"

Nominal Diameter		Nominal Diameter 1		PN 1-6 bar (PN 50-100 psi)				PN 10 bar (PN 150 psi)				Nominal Spigot Outer Diameter		Nominal Spigot Outer Diameter 1	
				Laying Length		Laying Length 1		Laying Length		Laying Length 1					
ND		ND1		L		L 1		L		L 1		SPOD		SPOD 1	
mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch	mm	Inch
1,500	60"	300	12"	1,040	3.41	990	3.25	1,120	3.67	1,030	3.38	1564.5	61.59"	335.5	13.21"
		350	14"	1,100	3.61	1,070	3.51	1,200	3.94	1,120	3.67	1564.5	61.59"	388.5	15.3"
		400	16"	1,360	4.46	1,180	3.87	1,360	4.46	1,180	3.87	1564.5	61.59"	441.5	17.38"
		450	18"	1,440	4.72	1,190	3.90	1,460	4.79	1,190	3.90	1564.5	61.59"	494.5	19.47"
		500	20"	1,540	5.05	1,210	3.97	1,560	5.12	1,220	4.00	1564.5	61.59"	548.5	21.59"
		600	24"	1,700	5.58	1,270	4.17	1,720	5.64	1,280	4.20	1564.5	61.59"	654.5	25.77"
		800	30"	2,020	6.63	1,330	4.36	2,060	6.76	1,340	4.40	1564.5	61.59"	812.5	31.99"
		900	36"	2,240	7.35	1,380	4.53	2,260	7.41	1,400	4.59	1564.5	61.59"	972.5	38.29"
		1,100	42"	2,560	8.40	1,490	4.89	2,600	8.53	1,510	4.95	1564.5	61.59"	1129.5	44.47"
		1,200	48"	2,720	8.92	1,520	4.99	2,780	9.12	1,540	5.05	1564.5	61.59"	1289.5	50.77"
		1,400	54"	3,080	10.10	1,600	5.25	3,140	10.30	1,630	5.35	1564.5	61.59"	1461.5	57.54"
		1,500	60"	3,260	10.70	1,630	5.35	3,320	10.89	1,660	5.45	1564.5	61.59"	1564.5	61.59"

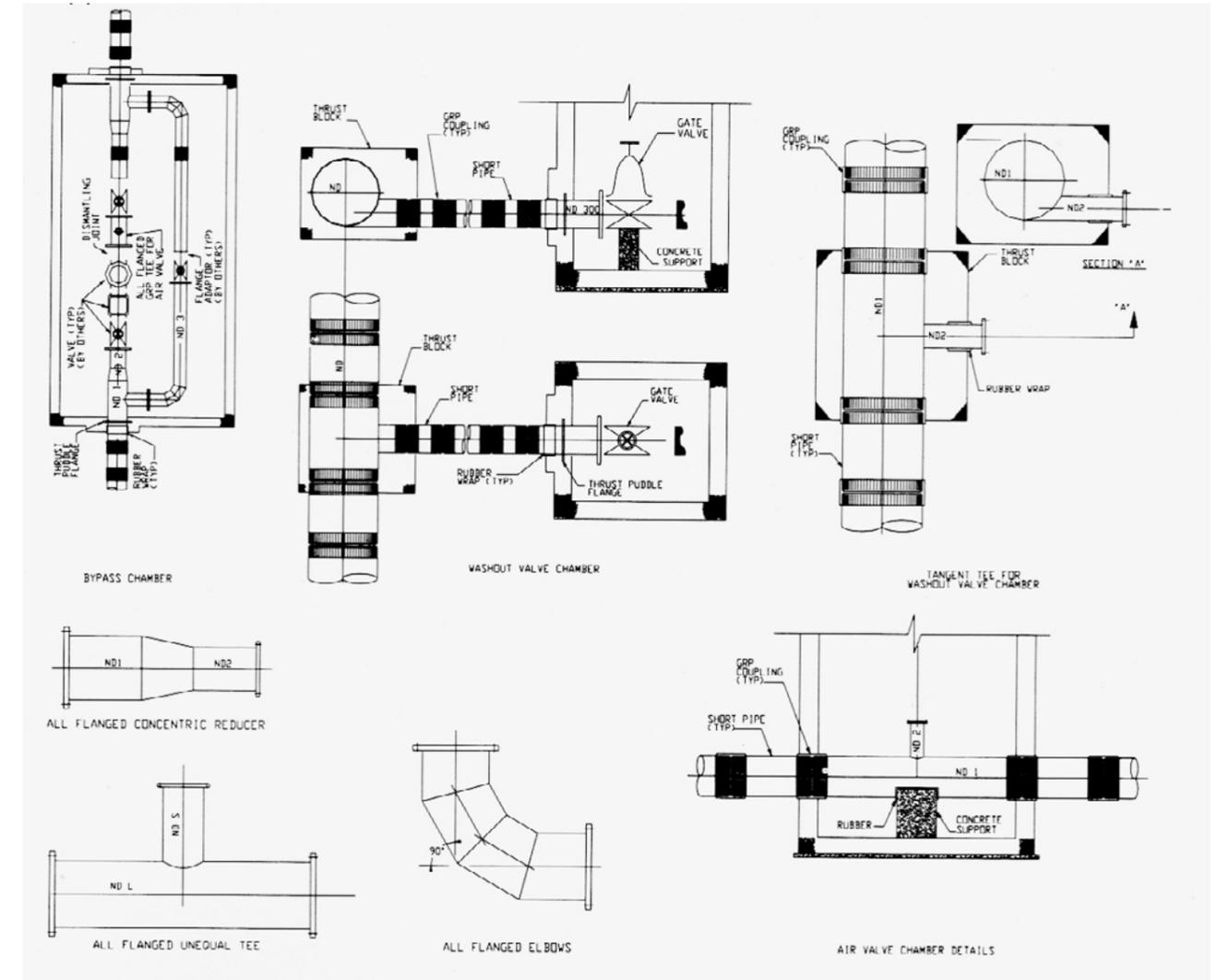
## Appendix G - Flanges

Flanges and blinds could be provided for the complete range of diameters with drilling pattern to match any international standard required such as DIN, ISO, ANSI, AWWA, JIS etc... or to client requirements.



## Appendix H - Custom Designed Fittings

Future Pipe Industries can provide custom designed fittings for Air Valve Chambers, Wash-Out Chambers, By-Pass Chambers, in addition to all flanged fittings for specific applications.



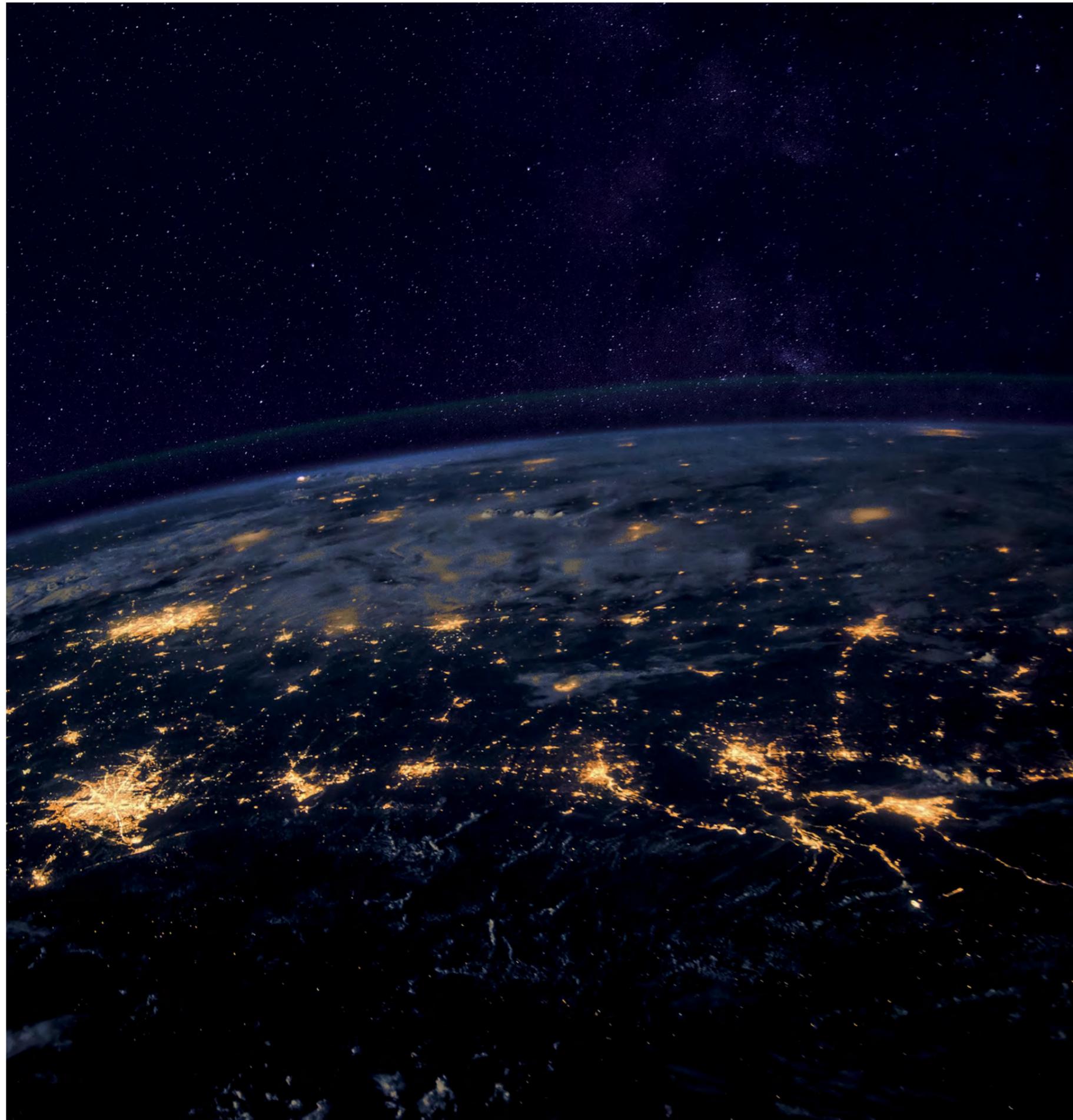
**Disclaimer:**

The product range outlined in this brochure represents our standard offering. However, we are able to evaluate and design products with higher pressures to more effectively meet client expectations.

For more information about our products and services, please scan the QR code below or visit our website to contact one of our locations.



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