



MUNICIPAL

## CIOD PVC Pressure Pipe

For usage in direct burial and  
concrete encased applications

**Westlake**  
Pipe & Fittings

# CIOD PVC Pressure Pipe

For use with CIOD PVC Pressure Fittings for pressure systems

## About CIOD Pressure Pipe

We all need clean water and Westlake Pipe & Fittings Cast Iron Outside Diameter (CIOD) PVC Pressure Pipe used in potable water systems eliminates the risk of clean water being contaminated during transmission to the end user. The benefits for using our CIOD PVC pressure pipe are numerous; it is easy to install, corrosion proof, has smooth interior walls and can withstand long-term hydrostatic pressure. These benefits reduce installation and maintenance costs and increase the service life of the system. Westlake Pipe & Fittings CIOD PVC Pressure Pipe installed today will supply clean, pure and essential water to future generations.

Westlake Pipe & Fittings CIOD PVC Pressure Pipe can service the following applications:

- Municipal watermains
- Industrial process lines
- Irrigation piping
- Sewer force mains

Westlake Pipe & Fittings CIOD PVC Pressure Pipe is manufactured with Cast Iron Outside Diameter and Rieber gaskets in the bell. Our pressure pipe is designed to withstand internal pressures typically encountered in transmission and distribution water mains. Our CIOD PVC Pressure Pipe is also available with factory-installed end caps to prevent dirt and debris from getting inside the pipe.

Our CIOD PVC Pressure Pipe is available in 100mm - 600mm (4" - 24") diameters and 6.1 metre (20') lengths. Pipe with diameters 100mm - 300mm (4" - 12") is available with Dimension Ratios (DR) of 14, 18 and 25, (Pressure Class of 305psi, 235psi and 165psi, respectively). Pipe with diameters greater than 300mm (12") is available with Dimension Ratios (DR) of 18 and 25, Pressure Rating 235psi and 165psi, respectively.





**350mm (14") and up Pipe and Fittings**

Our CIOD PVC Pressure Pipe and fabricated fittings with diameters from 350mm (14") and up shall be third party certified to CSA B137.3 (Rigid Polyvinyl Chloride (PVC) for Pressure Applications) and conform to AWWA C900 (Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14" through 48" for Water Transmission and Distribution). The pipe shall have a Dimension Ratio (DR) of 18 and 25 with Pressure Rating of 235psi and 165psi, respectively.



**Specification**

**100mm - 300mm (4" - 12") Pipe and Fittings**

Westlake Pipe & Fittings CIOD PVC Pressure Pipe and fabricated fittings with diameters from 100mm (4") to 300mm (12") shall be third party certified to CSA B137.3 (Rigid Polyvinyl Chloride (PVC) Pipe for Pressure Applications) and conform to AWWA C900 (Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4" through 12" for Water Distribution). The pipe shall have a Dimension Ratio (DR) of 14, 18 and 25 with Pressure Class of 305psi, 235psi and 165psi, respectively. Injection moulded fittings shall be certified to CSA B137.2 (PVC Injection Moulded Gasketed Fittings for Pressure Applications) and meet the AWWA C907 (Polyvinyl Chloride (PVC) Pressure Fittings for Water - 4in through 8in (100mm through 200mm).

**Certifications**

Westlake Pipe & Fittings CIOD PVC Pressure Pipe proudly meet the following standards:





Westlake Pipe & Fittings is recognized for its high quality products. Our state-of-the-art extrusion equipment and computerized material handling system ensure consistency. Our quality control testing guarantees that the pipe you install will perform in the application.

### Fittings

Westlake Pipe & Fittings carries a complete line of fabricated and injection moulded pressure fittings to complement our pipe. Our injection moulded fittings are certified to CSA B137.2 and meet AWWA C907 and our fabricated fittings are certified to CSA B137.3 and meet AWWA C900.

### Installation

Westlake Pipe & Fittings CIOD PVC Pressure Pipe is cost effective to install compared to other pipe products. Joint assembly can be handled in the trench with minimal manpower. The pipe can be easily field cut and bevelled. Our capped pipe helps prevent contamination of the inside of the pipe.

### Joining

Clean the bell and spigot of all debris. Lubricant must be applied to the spigot end and the gasket. The pipes are then placed in straight alignment and pushed to the insertion line by bar and block. Our Rieber gaskets eliminate the problems of rolling or fish mouthing. Care should be taken to avoid over insertion into the pipe bell beyond the second insertion line. (Bury one - Show one)

### Colour Coding

All Westlake Pipe & Fittings CIOD PVC Pressure Pipe and fittings are colour coded blue.

### Lubricant

Westlake Pipe & Fittings CIOD PVC Pressure Pipe must be assembled with our pipe joint lubricant non-toxic, water-soluble lubricant which is listed by the National Sanitation Foundation (NSF-61).

### Product Properties

Our pipe is corrosion resistant, durable and cost effective. It has a smooth bore and is not affected by ultra violet aging or biological attack.

### Corrosion Proof

One of the problems associated with a potable water system using some other pipe materials is corrosion. Our CIOD PVC Pressure Pipe is essentially inert and non-conductive, leaving it immune to electrolytic corrosion. Acidic and alkaline soils also have no effect on PVC pressure pipe.

### Smooth Bore

The interior wall of PVC pipe is very smooth with a Hazen-Williams C-factor of 150 for the design of PVC piping systems. This factor reduces head loss, maintains pressure and excellent water quality throughout the life of the system as compared to conventional pipe materials.

### Effects from Ultra-Violet Aging

PVC pipe was exposed to ultra-violet radiation from sunlight for two years. After two years of exposure under some of the worst conditions in North America, the tensile strength, impact strength and pipe stiffness were tested. The results showed that the effects of ultra-violet radiation on PVC pipe were considered negligible.



### Biological Attack

The performance of PVC pipe in severe environments has been studied since the 1930's. These studies have found that PVC pipe will not deteriorate or breakdown under biological attack from micro and macro-organisms. Investigations have not documented a single case in which buried PVC pipe has suffered degradation or deterioration due to biological attack.

### PVC Material

The PVC material used in the manufacture of our pipe has a hydrostatic design basis (HDB) of 4,000psi and meets the physical properties of PVC cell classification 12454 as specified in ASTM D1784.

### Quality Control and Assurance

Our pipe undergoes extensive testing and inspection in our manufacturing facilities. The following testing assures outstanding product quality.

### Extrusion Quality Test

Specimens are tested in accordance with ASTM D2152. The pipe will not flake or disintegrate after being immersed in anhydrous acetone for 20 minutes.



## Impact Resistance Test

Samples of pipe to be tested for low temperature impact resistance are conditioned at 0°C (32°F) for 16 hours. After conditioning, five samples are tested in accordance with the values shown in the table below.

There shall be no evidence of shattering, cracking or splitting when the pipe is tested in accordance with CSA B137.0 and B137.3.

Nominal Pipe Size mm (in)	Impact Force J (ft-lb)
100 (4)	135 (99.6)
150 (6)	160 (118.0)
200 (8)	175 (129.1)
250 (10)	190 (140.1)
300 (12)	205 (151.2)
350 (14)	225 (166.0)
400 (16)	240 (177.0)
450 (18)	270 (199.1)
500 (20)	300 (221.3)
600 (24)	300 (221.3)

## Hydrostatic Sustained Pressure Test

Pipe is pressure tested at two times its pressure rating for AWWA C900 pipe. The tables below show the required test pressure for all sizes:

For All Sizes		
Pressure Rating	Dimension Ratio	Hydrostatic Pressure
165	DR25	2,420 kPa (350 psi)
235	DR18	3,450 kPa (500 psi)
305	DR14	4,490 kPa (650 psi)

## Flattening Test

Three specimens of the pipe, each about 50mm (2") long are flattened between parallel plates in a suitable press until the distance between the plates is 5% of the original outside diameter of the pipe, or the walls of the pipe touch, whichever occurs first. The rate of loading shall be uniform and such that the compression is completed within 2 to 5 minutes. The specimens are examined for evidence of splitting, cracking or breaking. This test methodology is in accordance with CSA B137.3.



## Hydrostatic Proof Test

Each length of pipe is subjected to a Hydrostatic Proof Test. This test is conducted on the manufacturing line. It is a short term pressure test with a 5-second duration at the pressure listed below for all sizes:

For All Sizes		
Pressure Rating	Dimension Ratio	Hydrostatic Pressure
165	DR25	2,280 kPa (330 psi)
235	DR18	3,240 kPa (470 psi)
305	DR14	4,210 kPa (610 psi)

All Sizes - Dimensions				
Pressure Class (Dimension Ratio)	Nominal Size mm (in)	Average Inside Diameter mm (in)	Average Wall Thickness mm (in)	Average Outside Diameter mm (in)
305 (DR14)	100 (4)	103 (4.077)	9 (0.362)	122 (4.801)
	150 (6)	149 (5.855)	13 (0.522)	175 (6.899)
	200 (8)	195 (7.684)	17 (0.684)	230 (9.052)
	250 (10)	239 (9.422)	21 (0.839)	282 (11.100)
	300 (12)	284 (11.202)	25 (0.999)	335 (13.200)
235 (DR18)	100 (4)	108 (4.239)	7 (0.281)	122 (4.801)
	150 (6)	155 (6.087)	10 (0.406)	175 (6.899)
	200 (8)	203 (7.990)	13 (0.531)	230 (9.052)
	250 (10)	249 (9.794)	16 (0.531)	282 (11.100)
	300 (12)	296 (11.646)	20 (0.653)	335 (13.200)
	350 (14)	343 (13.496)	23 (0.901)	389 (15.298)
	400 (16)	390 (15.351)	26 (1.025)	442 (17.401)
	450 (18)	437 (17.206)	29 (1.147)	495 (19.500)
	500 (20)	484 (19.056)	32 (1.271)	549 (21.598)
	600 (24)	578 (22.773)	38 (1.513)	655 (25.799)
165 (DR25)	100 (4)	112 (4.395)	5 (0.203)	122 (4.801)
	150 (6)	160 (6.317)	7 (0.291)	175 (6.899)
	200 (8)	210 (8.286)	10 (0.383)	230 (9.052)
	250 (10)	258 (10.160)	12 (0.470)	282 (11.100)
	300 (12)	307 (12.082)	14 (0.559)	335 (13.200)
	350 (14)	356 (14.000)	16 (0.649)	389 (15.298)
	400 (16)	404 (15.925)	19 (0.738)	442 (17.401)
	450 (18)	453 (17.848)	21 (0.826)	495 (19.500)
	500 (20)	502 (19.764)	23 (0.917)	549 (21.598)
	600 (24)	600 (23.611)	28 (1.094)	655 (25.799)

Learn about our commitment to product innovation at [westlakepipe.com](http://westlakepipe.com).

