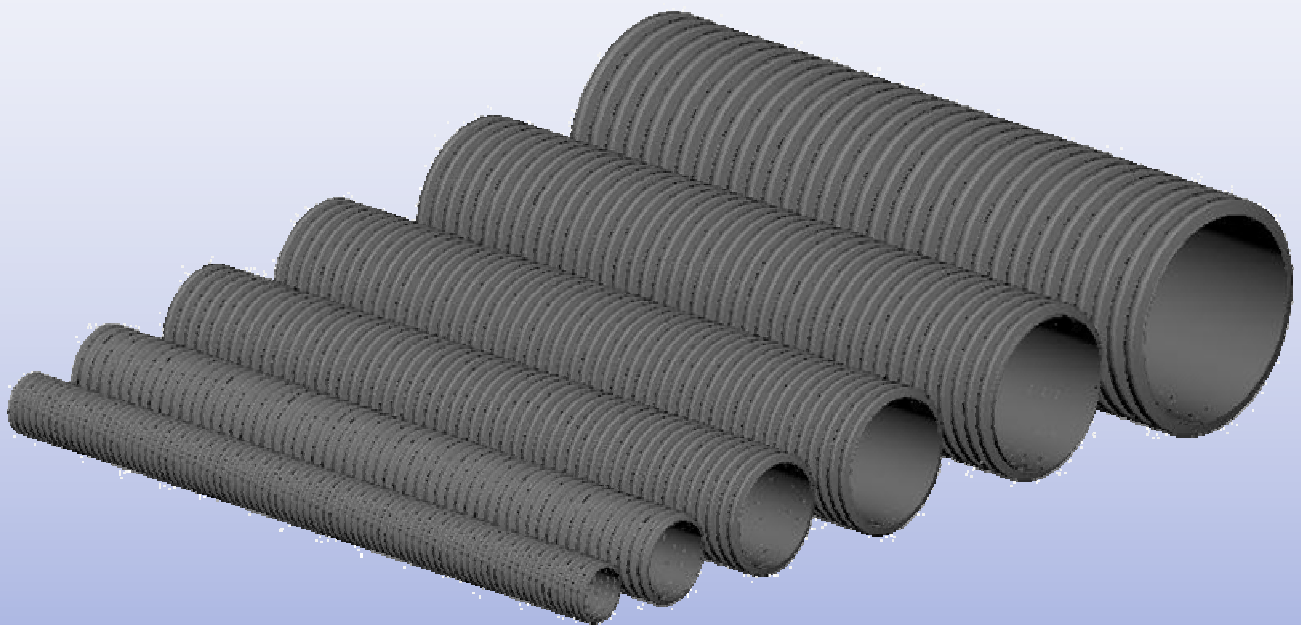




CorriPipe™

Technical Specification



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CorriPipe™ Technical Specification

1. Introduction

CorriPipe™ is a twin wall high density polyethylene pipe manufactured from a blended black polyethylene by a twin extrusion process.

Two high density polyethylene walls are extruded simultaneously, one inside the other, and heat-welded together in one continuous process. The outer wall is corrugated and the inner wall is smooth finished.

It is a combination of the corrugations, and the heat-welding of the two walls, that give CorriPipe™ its excellent structural strength while its smooth inner wall ensures increased flow capacity.

Its applications include surface and storm water drainage in civil engineering, construction, sports amenity, agricultural and other sub-soil applications.

CorriPipe™ is fully BBA (British Board of Agrément) approved and HAPAS (Highways Agency Product Approval Scheme) certified.



Figure 1. – CorriPipe™

2. Dimensions

CorriPipe™ comes in a complete range between 100mm and 600mm and is available in either carrier or filter pipe. CorriPipe™ also has a complete range of fittings and junctions as detailed below.

Nominal Size (mm)	Inside Diameter (mm)	Outside Diameter (mm)	Pipe Length (m)
100	94	110	6
150	149	176	6
225	221	265	6
300	295	354	6
375	370	426	6
450	445	512	6
600	590	680	6

Table 1. – CorriPipe™ Dimensions

Nominal Size (mm)	No. of slots per alternate dwell	Nom. Slot Width (mm)	Perforated Area (mm ² /m)
100	4	1	6350
150	4	2	6120
225	4	2	4680
300	4	2	5120
375	3	3	4263
450	3	3	4024
600	3	3	4942

Table 2. – Perforated Pipe Detail

Note: CorriPipe also available in various perforation specification. e.g. half perforated, double perforated

Nominal Size (mm)	Code	Fitting Type
150	150TB30	30° Bend
150	150TB45	45° Bend
150	150TB90	90° Bend
150	150TT90	Equal Tee
150	150TY45	Equal Wye
150	150SWSTT90	Single Wall Tee
225	225TB30	30° Bend
225	225TB45	45° Bend
225	225TB90	90° Bend
225	225TT90	Equal Tee
225	225TY45	Equal Wye
225	225/150TT90	Unequal Tee 150
225	225/150TY45	Unequal Wye 150
225	225SWSTT90	Single Wall Tee
300	300TB30	30° Bend
300	300TB45	45° Bend
300	300TB90	90° Bend
300	300TT90	Equal Tee
300	300TY45	Equal Wye
300	300/150TT90	Unequal Tee 150
300	300/150TY45	Unequal Wye 150
300	300/225TT90	Unequal Tee 225
300	300/225TY45	Unequal Wye 225
300	300SWSTT90	Single Wall Tee

Table 3. – CorriPipe™ Fittings

Note: Larger fitting sizes fabricated on request

3. Hydraulic Capacity

There are two main formulas used in hydraulic calculations of gravity flow pipelines – Manning’s and Colebrook-White:

Manning’s

Manning’s is the most popular equation for stormwater design because it is simple to apply and it generally provides an acceptable level of accuracy.

$$Q = \frac{1}{n} AR^{\frac{2}{3}} S^{\frac{1}{2}}$$

Q = Water Discharge [m³/s]

n = Manning’s roughness factor [s/m^{1/3}]

A = Cross-sectional area [m²]

R = Hydraulic radius [m]

S = Surface Water Slope [m/m]

Colebrook-White

A more accurate method for calculations involving FRC™ pipes is to utilize the Colebrook-White formula. The Colebrook-White design chart for FRC™ should allow quick and easy estimates without involved calculations.

$$V = -2\sqrt{2gDS} \log\left(\frac{k}{3.7D} + \frac{2.51\nu}{d\sqrt{2gDS}}\right)$$

V = Velocity (m/s)

S = Hydraulic gradient (m/m)

k = Hydraulic roughness (m)

R = Hydraulic radius = D/4 (m)

D = Pipe internal diameter (m)

g = Gravitational acceleration (m/s²)

ν = Kinematic viscosity of water (m²/s)

4. Cover Depths

Minimum Cover Depths

JFC Manufacturing Limited recommends the following minimum cover depths.

- 0.6m for non trafficked green areas
- 0.9m to finished surface for trafficked areas not subject to Highways Agency or National Roads Authority requirements
- 1.2m to finished surface for trafficked areas subject to Highways Agency or National Roads Authority requirements.

In certain circumstances lower minimum cover levels may be allowed. e.g. installation with rigid pavement, concrete surround etc. Please contact JFC for more information.

Maximum Cover Depths

The maximum cover depth for CorriPipe™ is normally between 6-10 meters when installed in accordance with series 500 of the MCDHW Volume 1 as detailed in the CorriPipe™ BBA certificate.

The actual maximum allowable cover level is dependent on the following installation parameters and is often well in excess of 6-10 meters:

- The native soil stiffness
- The pipe bed and surround stiffness
- The size of the trench
- The density of the overburden
- Hydrostatic loading
- Factor of Safety
- Maximum allowable deflection limit

For specific site conditions JFC can calculate the maximum pipe deflection based on the above parameters. Contact JFC for more details.

4. Installation

JFC CorriPipe is to be installed in accordance with the following national guidelines. In countries outside that specified contact JFC for more details.

Ireland

The Manual of Contract Documents for Road Works, Volume 1 series 500, clauses 503 and 505 as published by the NRA.

United Kingdom

The Manual of Contract Documents for Highway Works, Volume 1 series 500, clauses 503, 505, 518.7 and 518.8 as published by the Highways Agency

Trench Preparation

The trench width is generally between OD+300mm and OD+600mm but larger trenches are permissible. The trench should provide for a minimum of 150mm pipe bed and local soft spots must be removed and replaced with hardcore. The pipe must sit evenly on the bed and must be free of voids under the pipe. The trench should not be excavated too far in advance of pipe installation. All trenches are to be excavated in accordance with national health and safety regulations and local building regulations.

Sidefill

CorriPipe™ is to be backfilled as described in the MCDHW, Volume 1, Series 500. Sidefill material is dependent on specification but is normally a well graded granular material or small single size aggregate. The pipe surround material must fully support the pipe. Compaction may be required depending on ground conditions and sidefill material used. If compaction is required the compaction equipment must not come in contact with the pipe. The sidefill material should extend to 100mm over the crown of the pipe.

Backfill

Backfill is to continue to a minimum of 300mm above the crown of the pipe with suitable material as per specification. The material should be free of any stone particles greater than 50mm. Compaction should not be carried out until a minimum cover of 300mm is achieved. Compaction equipment should be sized so as not to exert any undue stress in the pipe. Further backfill to the required level should be carried out in layer no greater than 300mm.

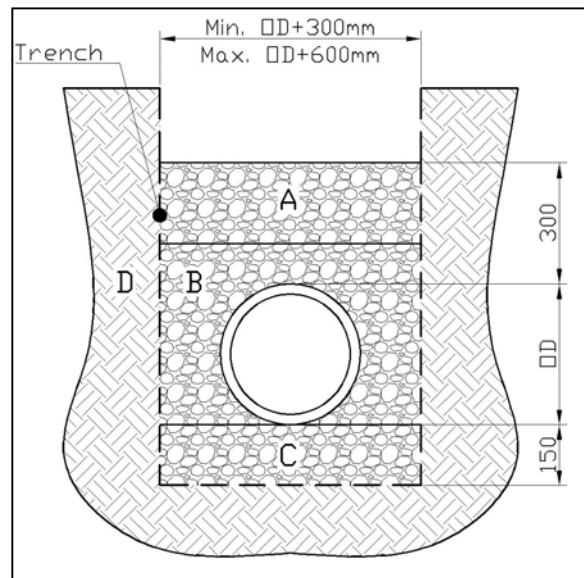


Figure 2. – Typical Installation Details

- A = Backfill
- B = Sidefill
- C = Bed
- D = Earth
- OD = Outside Diameter of Pipe

5. Jointing

CorriPipe™ is manufactured in 6 meter lengths and is joined with straight couplers or suitable fittings (e.g. tees, wyes, bends etc.)

CorriPipe™ provides a fully watertight seal when installed in accordance with JFC recommendations.

Leak tightness is in accordance with BS EN 1277:1997. The maximum permitted angular deflection is 2°.

Rubber seals used in watertight applications are in accordance with BS EN 681-1:1996

JFC recommends the following procedure for joining CorriPipe™ and associated fittings / couplers.

- Cut the pipe to the require length with a conventional handsaw.
- Clean the end of the pipe and accompanying coupler / fitting.
- Install a ring seal in the first dwell of the pipe for watertight joints.
- Ring seals are bi directional
- Lubricate the ring seal and accompanying coupler / fitting.
- Offer the fitting / coupler up to the pipe
- Lever the fitting / coupler onto the pipe with a piece of timber ensuring not to damage the pipe. Larger pipes may require mechanical assistance.
- Ensure the fitting / coupler is butted fully against the pipe.
- For joining pipes to the opposite side of the fitting / coupler follow the same steps as outlined above.

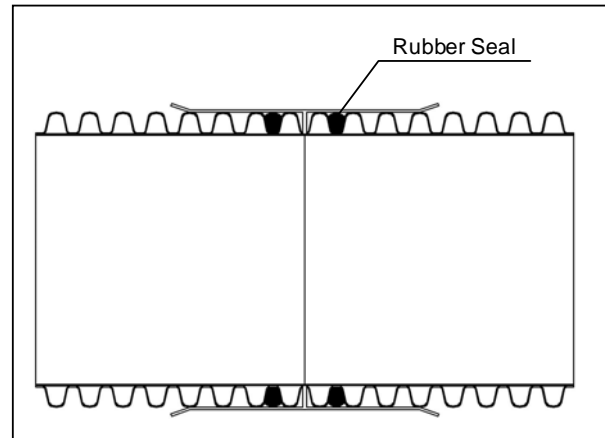


Figure 3. – Typical Joint Details

6. Pressure Testing

There are two methods of pressure testing, the air test method and the water test method. The most common method is the air test method and the test procedure is outlined below.

- Block the ends of the pipe / fitting with a suitable expanding stopper, ensuring both plug and pipe are cleaned prior to fitting.
- Fill a U-Tube manometer with water to the correct level, ensuring there are no trapped air bubbles in the water.
- Connect the u-tube to the fitting on the expandable stopper.
- Increase the pressure in the pipe until a head of water of 100mm is reached.
- Allow the pressure to stabilise for a number of minutes, increasing the pressure if it drops.
- Record the pressure drop over a five minute period.
- To pass the test the pressure should not drop below a 75mm head of water.

Note: Temperature has a critical effect on the test, a 1°C change in air temperature inside the pipe is sufficient for the test to fail.

6. Transportation, Handling and Storage

General

Handling should be done carefully and in accordance with national health and safety guidelines. Dragging of pipes and fittings must be avoided. HDPE pipes and fittings become slippery in wet or in cold weather and extra precautions may be necessary.

Pipes up to 450mm in size are palletised with wooden frames and steel straps. 600mm pipes are generally steel banded in two's but can also be supplied loose.

Nominal Size (mm)	Number of Pipes per Pallet
100	81
150	33
225	14
300	8
375	5
450	4
600	2 / steel banded

Table 4. – CorriPipe™ Pallet Quantities

Storage

All materials should be carefully inspected at the time of delivery and any defects should be notified and reported immediately. All pipe stacks should be made on firm, flat ground to support the weight of the pipes and lifting equipment. For safety and Pipes and fittings should be transported and stored in their packaging.

Delivery vehicles should be provided with a clean, flat bed, free from sharp objects. Care must be taken to prevent slippage or excessive bowing of the pipes. Tie the load well to prevent rubbing. Use nylon straps, not chains or ropes.

The stacking height for pipes should be limited to not more than 3 meters. Pipes should be not be stored in open areas subject to high winds.

It is recommended that CorriPipe™ is not stored in direct sunlight for more than 3 months.