



# PE Rural Pressure Pipe

## Handling, Storage & Installation

### PPI Rural Green Pipe

PPI Rural Green is a quality polyethylene pipe manufactured to the well established imperial sizes common in all rural applications. It is tough and strong and has high impact strength to withstand the rigours of rural pipe laying.

Quality is assured by the use of virgin medium density polyethylene (MDPE) materials with strict process control.

Rural Green pipe is supplied in sizes from 3/4" - 2" inside diameter and is rated at 630 kPa at 20°C for a design life of 20 years. Of course, Rural Green is covered by PPI's full warranty replacement policy and technical backup.

### AS4130 Metric Pipe

PPI's Metric Pipe is manufactured to the latest Australian Standard which takes into account the developments in the strengths of polyethylene. It is supplied in five different pressure ratings expressed with the term "PN".

PN6.3	630 kPa	91 psi
PN8	800 kPa	116 psi
PN10	1000 kPa	145 psi
PN12.5	1250 kPa	181 psi
PN16	1600 kPa	232 psi

AS4130 Metric Pipe is suitable for systems where the water temperature is well above ambient. In fact, PPI has pioneered the successful use of PE pipe in the rehabilitation of bores on the great artesian basin.

A design life of 50 years is possible at 40°C. Use the handy Metric Pipe Re-rating chart (available separately) to calculate the maximum working pressure of the pipe for the temperature of the water.

AS4130 Metric Pipe is available in sizes from 16mm - 160mm outside diameter. This pipe is used in major rural and urban water supply systems where various pressures and flow rates are required.

### Handling and Storage

Polyethylene pipe is tough, relatively flexible and in general resistant to impact damage. It should not however be dropped, dragged or subjected to rough treatment, particularly during loading and unloading.

Polyethylene pipe is susceptible to scoring from sharp edges so the coils should not be dragged across bitumen or concrete.

Where wire ropes or chains are employed to secure the load in a truck the coils should be suitably protected against scoring.

The coils can distort under load particularly at elevated temperatures. Coils should be laid flat on a continuous surface and should only be stacked to a height where the bottom coils do not become distorted.

Black polyethylene pipe is not significantly affected by exposure to direct sunlight and may generally be stored in the open.

Protection from elevated temperatures and direct sunlight should be undertaken when the pipe is to be stored in hot, dry, high UV areas if the storage period is expected to exceed 6 months.

### Installation

Polyethylene pipe is simple to install. The long coil lengths and easy to use PPI +GF+ fittings ensure trouble free installation.

The installation guide which follows is satisfactory for the majority of rural applications, but it does not adhere to the strict requirements of the National Plumbing and Drainage Code.

If the polyethylene pipe is to be used in an area under the jurisdiction of a water authority, then reference must be made to AS3500 "National Plumbing and Drainage Code" and AS2033 "Installation of Polyethylene Pipe Systems".



### Below Ground Installation

Below ground installation provides protection to the pipe from incidental damage that may occur from traffic, bush fires or cattle.

The insulation provided by the soil will also help maintain a constant pipe temperature which will prolong the system's life.

A guide to the depth which will provide the best protection is listed in Table 1.

Load Type	Depth
Not subjected to vehicular loads	300mm
Subjected to vehicular loads	
.not in a roadway (infrequent use)	450mm
.under a sealed roadway	600mm
.under an unsealed roadway	750mm

Table 1 - Minimum Depth of Pipe

For road crossings it is sometimes easier to lay the polyethylene pipe through a concrete pipe or culvert.

Installations below ground can be performed in two ways - Trenching or "Ploughing-in".

## Trenching

The following points should be considered when laying polyethylene pipes in trenches.

- The trench width should be at least 200mm (8") wider than the outside diameter of the pipe.
- The coils may be joined at ground level and lowered into the trench provided care is taken to ensure that the pipe or joints are not excessively strained.
- For summer time installations, the final connections and trench filling should be made in the coolness of early morning. This will ensure that the pipe and ground temperature are close and that only minimal pipe contraction will occur. An allowance for contraction can be made by "snaking" the pipe from side to side in the trench.
- Curves in the trench or pipe should be restricted to 25 times the outside diameter of the pipe. Elbow fittings are available for 90° bends.
- For small bore pipe up to 2" or 63mm the trench underlay, side support, overlay and backfill may be the excavated material providing it is a smooth, free flowing soil free of any rocks or other sharp objects. A detailed guide to trench preparation is given in AS2033 section 4.2.
- The fittings should remain uncovered for inspection when the system is first pressurised.



## Ploughing-In

Polyethylene pipe can be ploughed directly into the ground using one of PPI's "Poly Pipe Ploughs". These are available from selected outlets all across Australia and are suitable for pipe sizes up to 2" or 50 mm.

The following points should be considered when laying polyethylene pipes with a "Poly Pipe Plough".

- Soils with either sharp or large stones are considered unsuitable for "ploughing-in" pipe laying.
- Grade thick grass or stubble off the route first. Rubbish build up under the ripper beam restricts the effective depth to which the pipe can be installed.
- Pre-rip the pipe route in the same direction as the laying. It is preferable to do it three times with the tine 200mm (8") apart each time.
- The pipe must be stationary in relation to the surrounding soil and special care should be taken that the pipe is not subjected to excessive tension during or after pipe laying.

- Continually check the pipe coming out of the plough to ensure that it is not being scored.
- If the pipe has been rolled out and joined along the route before laying, then some twisting will occur as it feeds through the plough. This tends to unscrew one side of the fitting and the plough will need to be stopped and the fitting checked prior to each fitting being buried.
- Mark the location of each fitting with a suitable peg or marker. These will be the first places to inspect if a leak is suspected.
- For summer-time installations, the pipe should be laid in the coolness of the morning. This will ensure that the pipe and ground temperature are close and that only minimal pipe contraction will occur.

## Above Ground Installations

Black polyethylene pipe may be used in above ground or on ground applications as it is stabilised against UV light degradation.

When the ambient temperature is significantly above 20°C, then below ground installation should be considered.

The relatively high linear thermal expansion of polyethylene means that an allowance must be made for the expansion that will occur with temperature change. The coefficient of expansion is  $1.9 \times 10^{-4}/^{\circ}\text{C}$ .

This results in an approximate expansion of 2mm per metre for a temperature change of 10°C. If the polyethylene pipe is not continually supported (e.g. laid on to the ground) then supports or saddle clamps should be used at the spacings listed in Table 2.

Table 2  
Maximum spacing for supports  
when conveying water

Nominal Pipe Size	Maximum Support Spacing (m)			
	Metric (mm)	Imperial (inch)	Horizontal (m)	Vertical (m)
16			0.25	0.50
20			0.30	0.60
25		¾	0.35	0.70
32		1	0.38	0.75
40		1¼	0.43	0.85
50		1½	0.45	0.90
63		2	0.50	1.05
75			0.60	1.20
90			0.67	1.35
110			0.71	1.40
125			0.75	1.50
140			0.85	1.70
160			1.00	2.00