

## Manufacture

A commitment to using only the highest standard of raw materials and the latest manufacturing technology has established Vinidex with a reputation as a quality supplier of Polyethylene Pipes in sizes ranging from 16mm to 1000mm in diameter.

They are manufactured and tested in accordance with AS/NZS 4130:2003 - Polyethylene (PE) pipes for pressure applications. The quality assurance schemes adopted by Vinidex have been accepted by appropriate government purchasing authorities and have led to Vinidex being regarded as a preferred supplier.

Three general types of polyethylene (PE) are used for the manufacture of Vinidex pipes. These are PE 80B, PE 80C and PE 100.

## Features

- **High Impact Strength**

The high impact strength of PE pipes compared with other materials ensures a greater resistance to the rigours of pipe laying conditions.

- **Damage Resistance**

PE has low notch sensitivity, providing a high level of resistance to the effects of external damage, especially important for pipe bursting operations and others where there is a likelihood of such damage.

- **Abrasion Resistance**

Vinidex PE pipes have excellent abrasion resistance providing long life in abrasive slurry applications. In most of these applications PE pipe outlasts other pipe materials such as mild steel and rubber lined steel.

- **Chemical Resistance**

Outstanding resistance to a wide range of chemical reagents allows the use of polyethylene systems in

applications such as: Tailings pipelines and chemical treatment applications used in mining operations.

- **Flexibility**

PE pipes are flexible and can be bent to a minimum bending radius of 30 times the pipe's outside diameter for HDPE and 20 times the pipe's outside diameter for MDPE. This flexibility is critical in applications such as submarine pipe lines, mine subsidence and earthquake prone areas. This inherent resiliency and flexibility allows the pipe to absorb surge pressures, vibration and stresses caused by soil movement.

- **Ease of Installation**

PE pipes are easy to install with their light weight and long lengths. Polyethylene coiled pipes are widely used in applications such as stock watering, irrigation systems, communication, gas and reticulated water mains due to rapid installation and the ease and less frequent jointing.

- **High Flow Capacity**

PE pipes have lower friction factors than most non-plastics materials, such as cementitious linings and fibre reinforced cement. The surface energy characteristics of PE ensure that material deposition is inhibited and the smooth bore characteristic is maintained over the working life of the pipeline.

- **Weathering Resistance**

PE pipes are stabilised against ultra violet (UV) light degradation by the inclusion of carbon black in the raw material. Black PE pipes are, therefore, suitable for installations where the pipes are exposed to direct sunlight.



Quality  
ISO 9001  
Lic 570  
SAI GLOBAL

# PE Pressure Pipe ▶

## Features (continued)

- **Co-extrusions**

PE pipe is available in a range of identification colours that may be either coextruded as stripes or "jackets" that completely surround the pipe. Such colours include yellow, blue and lilac. These pipes are coloured for identification purposes and conform with AS/NZS 4130. In addition, Vinidex produces coextruded pipes having a white jacket to minimise temperature rise when exposed to sunlight. These pipes, which are extensively used within the mining industry for example, are intended for use under exposure periods well in excess of those provided for by AS/NZS 4130.

- **Long Life**

Polyethylene pipes have a proven high reliability record across a wide range of industries and applications, now approaching a period of 50 years. PE also provides a long maintenance free lifetime with low whole life costs, compared to many other materials, as evidenced by the WSAA Polyethylene Pipeline Code, which predicts life well in excess of 100 years before major rehabilitation is required.

- **Trenchless Construction**

Polyethylene pipes offer many advantages in slip lining, pipe bursting, directional drilling and micro-tunnelling including features such as long lengths, corrosion resistance, light weight and ease of installation with minimum disruption.

## Benefits

- **cost effective system**
- **high impact strength**
- **abrasion resistance**
- **chemical resistance**
- **flexible**
- **ease of installation**
- **corrosion resistant**
- **performs at low temperatures**
- **high flow capacity**
- **weathering resistant**
- **Vinidex quality**

## Applications

The features listed in this manual enable large diameter PE pipes to be used for a diverse range of applications including:

- Mining – above and below ground installations.
- Slurry Lines – to convey suspended solid matter in quarries and mine.
- Industrial and Chemical – to transport aggressive fluids.
- Submerged Pipelines – for cable ducting, water and sewerage.
- Water Supply
- Sewage, Effluent and Waste Water.
- Gas Distribution.
- Trenchless Construction – for water supply, sewerage, conduits and gas.

## Product Data

Vinidex large diameter PE pipes range in size from 90mm to 1000mm inclusive and are predominantly available in standard 12 metre lengths. Pipe products are available in various lengths, on application. For project needs and where transport regulations permit, up to 25 metre lengths can be supplied. (Conditions apply)

Product details in the tables shown are based on PE 80 and PE100 together with the requirements of AS4130.

The relationship between the dimensions of the pipes, the PE material classification and the working pressure rating are as shown in Table 1. For simplicity, the dimensions of the pipe have been referred in terms of the Standard Dimension Ratio (SDR) where:

$$SDR = \frac{\text{Outside Diameter}}{\text{Wall Thickness}}$$

**Table 1. Comparison of SDR & Pressure Ratings (PN)**

SDR	41	33	26	21	17	13.6	11	9	7.4
PE 80	PN 3.2	PN 4	-	PN 6.3	PN 8	PN 10	PN 12.5	PN 16	PN 20
PE 100	PN 4	-	PN 6.3	PN 8	PN 10	PN 12.5	PN 16	PN 20	PN 25

Note : SDR: Nominal ratio of outside diameter to wall thickness.

PE Classification: Long term rupture stress at 20DC (Mpa multiplied by 10) to which the minimum safety factor of 1.25 is applied in order to obtain the 20DC design hoop stress.

PN: Pressure rating at 20DC (Mpa multiplied by 10).



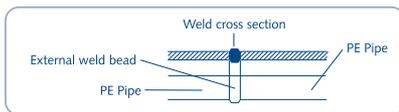
# PE Pressure Pipe

## Joining

There are several joining methods available for PE pipe systems. The extensive fittings ranges available provide design flexibility with PE pipe systems. Where possible, fittings meeting AS/NZS 4129 standard are recommended to be used.

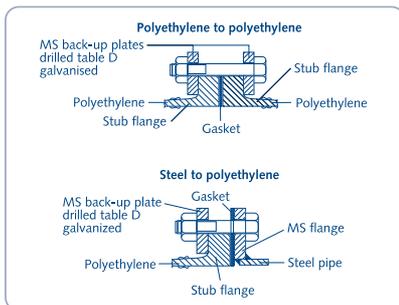
### • Butt Welding

PE pipe systems can be joined by butt welding to provide homogeneous joints. Preheated pipes and/or fittings are joined under controlled pressure and temperature conditions. A suitably skilled and/or certified operator is essential to ensure adequate weld strength development.



### • Stub Flanges and Backing Plates

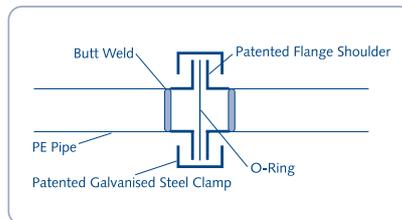
PE pipes can be flange-jointed by using PE stub flange ends in conjunction with metal backing plates and rubber sealing gasket to provide a demountable joint or to match up with pumps, valves etc.



### • Poly Clamp

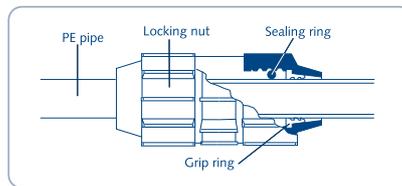
This is an easy demountable joint system using a patented two bolt galvanised steel with integral O ring, on patented flanged shoulders, which are welded on to the ends of the PE pipe.

These joints allow for fast assembly and removal or relocation of temporary pipelines in applications such as along tailings dams and dewatering applications.



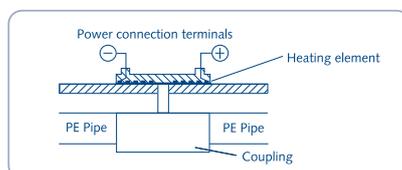
### • Mechanical Compression Joints

PE pipes 16mm to 160mm outside diameters may be joined by mechanical compression fittings. The Plasson range is recommended, and enables jointing of PE/PE or PE to other pipe materials without the need for power or special tools.



### • Electrofusion

Welding of PE pipes by electrofusion couplings provides a homogeneous joint with end load bearing capabilities and the same corrosion resistance as the parent pipe. Electrofusion joints consist of resistance wires embedded into the parent material of the coupler which, when heated by the passage of a controlled electrical current, cause the surrounding PE material to melt and form a fusion joint. Vinidex has the only fully auto recognition electrofusion system available, which is widely accepted as the bench mark for QA in PE gas pipe systems.



## Installation

PE pipes are tough, flexible, and lightweight and offer many cost saving advantages in both above ground and below ground installations.

Whilst they are robust and resistant to site damage normal care and sensible handling practices are necessary to ensure trouble free operations.

PE pipes should be handled, stored and installed in accordance with Australian Standard AS2033 – "Installation of Polyethylene Pipe Systems". Local Authority regulations and specifications should also be adhered to.

## Service

Vinidex supplies large diameter pipe systems up to and including 1000mm and the support services to assist the successful installation and operation of the system. Experienced personnel provide advisory information on such items as the range of pipes and fittings available, the technical features of the product, site and factory fusion, hiring of fusion machines and the available operators of jointing equipment.

For further information regarding the design and installation of PE, please consult the Vinidex Mining Manual 2003 Edition or the Vinidex Polyethylene Pipe Systems Technical Manual (available on CD-Rom).