Vinidex
Systems & Solutions

PE Pressure Pipe



POLYETHYLENE TO 1000MM DIAMETER

Product Catalogue

High Impact Strength
Abrasion Resistance
Chemical Resistance
Flexible
Tough
Versatile
Weather Resistance
Corrosion Resistance

Quality System
Quality Endorsed Company
ISO 9002 Lic 570
Standards Australia

PE Pressure Pipe

POLYETHYLENE TO 1000MM DIAMETER

product manual

Contents

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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.

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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).

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Table 2. PE Pipe Dimensions AS/NZS 4130:2003 (Polyethylene pipes for pressure applications)

NOM. Size DN	SDR 41		SDR 33		SDR 26		SDR 21		SDR 17		SDR 13.6		SDR 11		SDR 9		SDR 7.4	
	Min. Wall Thickness	Mean I.D.	Min. Wall Thickness	Mean I.D.	Min. Wall Thickness	Mean I.D.	Min. Wall Thickness	Mean I.D.	Min. Wall Thickness	Mean I.D.	Min. Wall Thickness	Mean I.D.	Min. Wall Thickness	Mean I.D.	Min. Wall Thickness	Mean I.D.	Min. Wall Thickness	Mean I.D.
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)
16	1.6	13	1.6	13	1.6	13	1.6	13	1.6	13	1.6	13	1.6	13	1.8	12	2.2	11
20	1.6	17	1.6	17	1.6	17	1.6	17	1.6	17	1.6	17	1.9	16	2.3	15	2.8	14
25	1.6	22	1.6	22	1.6	22	1.6	22	1.6	22	1.9	21	2.3	20	2.8	19	3.5	18
32	1.6	29	1.6	29	1.6	29	1.6	29	1.9	28	2.4	27	2.9	26	3.6	24	4.4	23
40	1.6	37	1.6	37	1.6	37	1.9	36	2.4	35	3.0	34	3.7	32	4.5	31	5.5	28
50	1.6	47	1.6	47	2.0	46	2.4	45	3	44	3.7	42	4.6	40	5.6	38	6.9	35
63	1.6	60	2.0	59	2.4	58	3.0	57	3.8	55	4.7	53	5.8	51	7.1	48	8.6	45
75	1.9	71	2.3	70	2.9	69	3.6	67	4.5	66	5.5	63	6.8	61	8.4	58	10.3	53
90	2.2	86	2.8	84	3.5	83	4.3	81	5.4	78	6.6	76	8.2	73	10.1	69	12.3	65
110	2.7	105	3.4	103	4.3	101	5.3	99	6.6	96	8.1	93	10.0	89	12.3	84	15.1	78
125	3.1	119	3.9	117	4.8	115	6.0	113	7.4	110	9.2	106	11.4	101	14.0	96	17.1	89
140	3.5	133	4.3	131	5.4	129	6.7	126	8.3	123	10.3	118	12.7	114	15.7	108	19.2	99
160	4.0	152	4.9	150	6.2	148	7.7	144	9.5	140	11.8	136	14.6	130	17.9	123	21.9	114
180	4.4	171	5.5	169	6.9	166	8.6	163	10.7	158	13.3	153	16.4	145	20.1	138	24.6	128
200	4.9	190	6.2	188	7.7	184	9.6	180	11.9	175	14.7	170	18.2	162	22.4	154	27.3	143
225	5.5	215	6.9	211	8.6	207	10.8	203	13.4	198	16.6	191	20.5	183	25.1	173	30.8	161
250	6.2	238	7.7	235	9.6	230	11.9	225	14.8	219	18.4	212	22.7	203	27.9	192	34.2	179
280	6.9	267	8.6	263	10.7	258	13.4	253	16.4	246	20.6	238	25.4	228	31.3	215	38.3	200
315	7.7	300	9.7	296	12.1	290	15.0	285	18.7	278	23.2	268	28.6	256	35.2	242	43.0	226
355	8.7	338	10.9	333	13.6	328	16.9	320	21.1	311	26.1	301	32.2	289	39.6	273	48.5	225
400	9.8	380	12.3	376	15.3	370	19.1	362	23.7	351	29.4	340	36.3	326	44.7	307	54.6	287
450	11.0	429	13.8	422	17.2	415	21.5	406	26.7	395	33.1	382	40.9	366	50.2	347	61.5	322
500	12.3	476	15.3	470	19.1	462	23.9	452	29.6	440	36.8	424	45.4	407	55.8	348	-	-
560	13.7	534	17.2	526	21.4	518	26.7	506	33.2	494	41.2	475	50.8	455	-	-	-	-
630	15.4	600	19.3	592	24.1	582	30.0	570	37.3	554	46.3	535	57.2	512	-	-	-	-
710	17.4	676	21.8	667	27.2	656	33.9	641	42.1	624	52.2	603	-	-	-	-	-	-
800	19.6	762	24.5	752	30.6	739	38.1	723	47.4	704	58.8	679	-	-	-	-	-	-
900	22.0	858	27.6	846	34.4	831	42.9	814	53.5	791	-	-	-	-	-	-	-	-
1000	24.5	953	30.6	940	38.2	924	47.7	904	59.3	880	-	-	-	-	-	-	-	-

Note : 1. Additional sizes and classes may be manufactured. Product availability varies from state to state, please check product availability with your nearest Vinidex office.
2. Coiled pipes in sizes 16mm to 110mm inclusive are also available.
3. PE pipes for 'Fit For Purpose' and special applications are also available and are manufactured to order (conditions apply).
4. Pipe dimensions highlighted are not included in AS/NZS 4130:2003.

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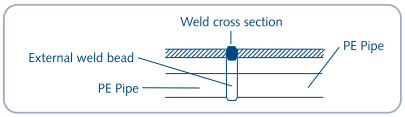
Jointing

There are several jointing 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.

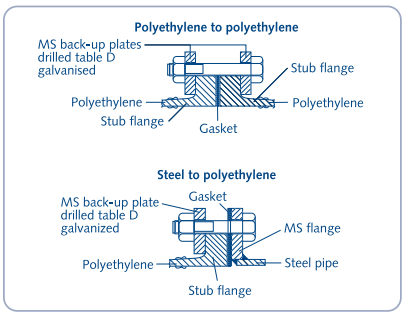
- **Butt Welding**

  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**

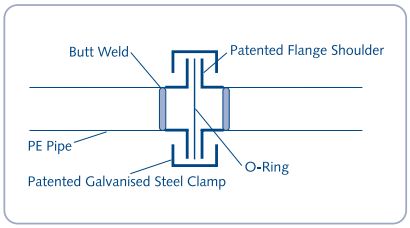
  PE pipes can be flange-jointed by using PE stub flange ends in conjunction with metal backing plates and rubber sealing gasket to provide a demountable joint or to match up with pumps, valves etc.



- **Poly Clamp**

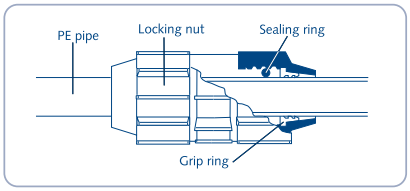
  This is an easy demountable joint system using a patented two bolt galvanised steel with integral O ring, on patented flanged shoulders, which are welded on to the ends of the PE pipe.

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



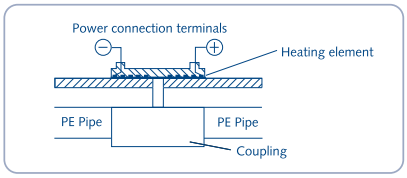
- **Mechanical Compression Joints**

  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).

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