

Pipemakers Australia Pty Ltd

PRODUCT APPRAISAL REPORT PA 1521 Issue 2

Polyethylene (PE) Pipe

AS/NZS 4130:2018 Polyethylene (PE) pipes for pressure applications

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Overview of WSAA

The Water Services Association of Australia (WSAA) is the peak industry body representing the urban water industry. Our members provide water and sewerage services to over 20 million customers in Australia and New Zealand and many of Australia's largest industrial and commercial enterprises.

Based around our vision of 'customer driven, enriching life', WSAA facilitates collaboration, knowledge sharing, networking and cooperation within the urban water industry. We are proud of the collegiate attitude of our members which has led to industry-wide approaches to national water issues.

WSAA can demonstrate success in the standardisation of industry performance monitoring and benchmarking, as well as many research outcomes of national significance. The WSAA Executive retains strong links with policy makers and legislative bodies and their influencers, to monitor emerging issues of importance to the urban water industry.

WSAA was formed in 1995 as a non-profit organisation to foster the exchange of information between industry, government and the community, and to promote sustainable water resource management.

The urban water industry is committed to anchoring its services to customers' values, and to enrich communities where water services have broad economic, environmental and social values. In line with this our main activities focus on four areas:

- 1. influencing national and state policies on the provision of urban water services and sustainable water resource management
- 2. promoting debate on environmentally sustainable development and management of water resources and the community health requirements of public water supplies
- 3. improving industry performance and establishing benchmarks and industry leading practices for water service processes; and
- 4. fostering the exchange of information on education, training, research, water and wastewater management and treatment and other matters of common interest.

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1 EXECUTIVE SUMMARY

Pipemakers Australia Pty Ltd is an Australian company established in Queensland in 1990 to manufacture PVC piping. The company now maintains PE manufacturing facilities in, Deer Park in Victoria and Mackay in Queensland. Pipemakers operates a national distribution network within Australia.

This Appraisal is for a range of Series 1 PE100 polyethylene pressure pipes manufactured in compliance with AS/NZS 4130:2018 – *Polyethylene (PE) pipes for pressure applications*.

This Issue 2 is to include details relating to the Pipemakers Mackay manufacturing facility and to address an outstanding future work requirement to provide details of marking. Quality certificates have also been updated.

Pipemakers PE100 PE pipe is available in sizes from DN 16 to DN 800 with pressure classifications PN4, PN6.3, PN8, PN10, PN12.5, PN16, PN20 and PN25. The pipes are available in straight lengths of 6 or 12 metres or in coil lengths of 50 to 200 metres for sizes DN 16 to DN 125.

PE100 PE pipe is available in solid black, or black with relevant coloured stripes or jackets for drinking and non-drinking water supply and sewerage systems.

Pipemakers has confirmed that their procedures incorporate the recent additional requirements included in the relevant WSAA Specifications regarding the use of recyclates and the frequency of thermal stability testing for batch release tests. See Section 6.2.3.

Pipemakers Australia Pty Ltd has a Quality Management certification to ISO 9001:2015 incorporating both manufacturing sites.

The products have ISO Type 5 ApprovalMark Product Certification for its range of PE100 polyethylene pipes to AS/NZS 4130:2018 for Deer Park and Mackay.

Pipemakers' Series 1 PE100 polyethylene pipes included in this appraisal meet the requirements of WSA PS-207 – *Polyethylene (PE) Pipes for Pressure Applications* – *Water Supply and Sewerage* and WSA PS-215 – *Polyethylene (PE) Property Service Pipes for Pressure Applications* – *Water Supply* and are therefore considered as 'fit for purpose'.

1.2 Report Recommendation

It is recommended that WSAA members subject to any specific requirements of the member, accept or authorise Pipemakers PE100 polyethylene pipes as detailed in this report for use in water supply and sewerage networks, provided they are installed and tested in accordance with WSAA Codes and the manufacturer's requirements, where specified.

2 THE APPLICANT

The Applicant is Pipemakers Australia Pty Ltd.

2.1 The Supplier / Manufacturer

Pipemakers Australia Pty Ltd is an Australian company established in Queensland in 1990 to manufacture PVC piping. PE pipes are manufactured Deer Park in Victoria and Mackay in Queensland. Pipemakers operates a national distribution network within Australia.

Pipemakers Australia became a Pty Ltd company in January 2008 but is still managed by the Kanji group, which has extensive operations across many industries throughout Australia and Asia.

Pipemakers Australia Pty Ltd manufactures its range of thermoplastic pipes using the latest European PVC pipe manufacturing technology and equipment and has further capacity to grow and expand its product range.

3 THE PRODUCT

This product appraisal applies to Pipemakers Australia Pty Ltd PE100 pressure pipe manufactured to AS/NZS 4130:2015 *Polyethylene (PE) pipes for pressure applications* for use in drinking and non-drinking water supply and sewerage systems, incorporating the following attributes:

- a) Series 1.
- b) Material Classification: PE100.
- c) Pressure Class: PN 4, PN 6.3, PN 8, PN 10, PN 12.5, PN 16, PN 20 and PN25.
- d) Sizes: DN 16 to DN 800.
- e) Pipe Lengths: 6 m and 12 m
- f) Coil Lengths: DN 20 to DN 40 50, 100, 150 or 200m

DN 50 to DN 63 - 100, 150 or 200m

DN 75 to DN 125 - 50 or 100m.

g) Colour: Solid black or black with blue, purple or cream stripes or jacket

TABLE 1: PIPEMAKERS S1 PE100 PIPE RANGE

DN	PN	COLOUR
16	16, 20	Solid black or black with
20	12.5, 16, 20	blue, purple, or cream stripes or jackets. Other
25, 32	10, 12.5, 16, 20	colours are available on request
40, 50	8, 10, 12.5, 16, 20	1044000
63, 75, 90	6.3, 8, 10, 12.5, 16, 20	
110, 125, 140, 160, 180, 200, 225, 250, 280, 315, 355, 400, 450, 500, 560, 630,710, 800	4, 6.3, 8, 10, 12.5, 16, 20, 25	

Pipes from DN 16 to DN 800 pipes are manufactured at the Deer Park manufacturing facility and sizes from DN 110 to DN 800 are manufactured at the Mackay manufacturing facility.

4 SCOPE OF THE APPRAISAL

The Scope of this appraisal is described in Section 3 and included in the ApprovalMark Product Certification Product Schedules attached in Appendix A.

5 APPRAISAL CRITERIA

5.1 Quality Assurance Requirements

The WSAA Product Appraisal Technical Advisory Group accepts polyethylene pipe manufactured in compliance with AS/NZS 4130 and duly certified by means of an ISO Type 5 product certification scheme undertaken by a JAS-ANZ accredited Conformity Assessment Body (CAB) or by an equivalent international accreditation system recognised by JAS-ANZ.

The manufacturer is generally expected to have a production management and control system that has been duly accredited in accordance with AS/NZS ISO 9001 as a prerequisite to undergoing a product certification audit.

The ISO Type 5 Product Certification Scheme shall meet the criteria described in WSA TN-08.

5.2 Performance Requirements

Pipemakers PE100 pressure pipe has been appraised for compliance with the requirements of AS/NZS 4130:2018 *Polyethylene (PE) pipes for pressure applications.*

Appraisal criteria are also determined by the WSAA Product Appraisal Technical Advisory Group and regularly reviewed to ensure that the criteria reflect the requirements of WSAA members.

The following Product Specifications are relevant to this application:

- (a) WSA PS-207 Polyethylene (PE) Pipes for Pressure Applications Water Supply and Sewerage
- (b) WSA PS-215 Polyethylene (PE) Property Service Pipes for Pressure Applications Water Supply.

Copies of the Product Specifications are available at the following link: https://www.wsaa.asn.au/shop/product/35716

6 COMPLIANCE WITH APPRAISAL CRITERIA

6.1 Compliance with Quality Assurance Requirements

Pipemakers has submitted the following quality certificates:

- ISO 9001:2015 Certificate of Registration No. QEC22888 issued to Pipemakers Australia Pty Ltd by SAI Global.
- AS/NZS 4130:2018 ApprovalMark ISO Type 5 product certification licence No. AMI 74646 issued to Pipemakers Australia Pty Ltd – Deer Park by ApprovalMark International.
- AS/NZS 4130:2018 ApprovalMark ISO Type 5 product certification licence No. AMI 74570 issued to Pipemakers Australia Pty Ltd Mackay by ApprovalMark International.

Copies of the Quality Assurance and Product Certification licences have been included in Appendix A and are also available for downloading from the WSAA Members Website.

6.2 Compliance with Performance Requirements

6.2.1 Polyethylene (PE) compounds

Pipemakers currently use QENOS PE100 PE compound HDF 193B for the manufacture of their PE100 pipes. This compound is included in POP004 and denoted as compliant with AS/NZS 4131 and AS/NZS 4020.

Pipemakers has indicated the following PE100 PE compounds may also be used in future.

- a) Qenos (Altona) HDF 193B and HDF 145B
- b) LyondellBasell (SEPC, Saudi Arabia) CRP100 Black
- c) IRPC Public Co. Ltd (Rayong, Thailand) P901BK
- d) SCG (Rayong, Thailand) EL LENE H1000PC
- e) Sabic (Kayan, Saudi Arabia) P6006AD

All of these compounds are listed in POP004 as compliant with AS/NZS 4131 and have current AS/NZS 4020:2005 certification.

Pipemakers has undertaken that where alternative PE100 compounds are used in the future, only compounds that have been included in POP004 as compliant to AS/NZS 4131 and AS/NZS 4020 will be utilised.

6.2.2 Type tests

AS/NZS 4130 specifies performance type tests as shown in Table 2.

TABLE 2: AS/NZS 4130 TYPE TEST REQUIREMENTS

Requirement	Clause	Requirement
Dimensions	9.1 – 9.4	Geometrical characteristics for length, outside and inside diameter, wall thickness, out-of-roundness
Resistance to internal pressure at 80°C	10.1	5.4 MPa applied stress at 80°C for 165 h
Resistance to internal pressure at 80°C	10.1	5.0 MPa applied stress at 80°C for 1000 h
Reversion	10.2	≤3% when tested at 110°C
Thermal stability	10.3	Oxidation induction time ≥20 min at 200°C
Slow crack growth resistance PE100 SDR11	10.4	≥500 hours when tested at 920 kPa pressure

Pipemakers has provided test results which have been conducted at Pipemakers ISO/IEC 17025 accredited laboratories in Deer Park (Accreditation No. 0313) and Acacia Ridge (Accreditation No. 0312) and also at Australian Pipes & Fittings Testing Centre in NSW (NATA Accredited laboratory No. 19957 to demonstrate compliance to AS/NZS 4130.

6.2.3 Batch release testing

WSAA PE pipe specifications includes a requirement that the Applicants quality plan shall include a requirement in their Batch Release Test procedure that a thermal stability test is undertaken on the first pipe manufactured in a batch of a particular DN and PN and at ongoing frequencies not exceeding 24 hours of production for that batch. The quality plan is also required to include a requirement that use of recyclate in manufactured pipe other than from the manufacturer's own clean in-house production is prohibited.

Pipemakers has provided a copy of their procedures to verify compliance to the thermal stability test requirements and to confirm that only clean in house traceable recyclate is used in the production of AS/NZS 4130 pipe production.

6.2.4 Suitability for contact with drinking water

The PE100 PE pipe compounds used to produce Pipemakers PE pipes are included in PIPA POP004 as having current AS/NZS 4020:2005 test reports at the time of publication of this report.

It is the responsibility of the pipe manufacturer to ensure current certification for the PE compounds are maintained.

6.2.5 Colour coding

Pipemakers PE100 PE pipe complies with the colour coding requirements of AS/NZS 4130 and WSAA specifications as detailed in Table 3 below.

TABLE 3: COLOUR OF PIPEMAKERS PE100 PE PIPE

Application	Network Element	Colour	WSA Product Specification
Drinking Water	Pressure Main	Solid blue or co-extruded blue jacket or black with blue stripes.	Complies with WSA PS-207
Dilliking water	Property Service Pipes	Black with blue stripes.	Complies with WSA PS-215
Non-drinking	Pressure Main	Solid purple or co-extruded purple jacket or black with purple stripes.	Complies with WSA PS-215
Water	Property Service Pipes	Solid purple or co-extruded purple jacket	Complies with WSA PS-207
Sewerage	Pressure/Vacuum Main	Solid cream or co-extruded cream jacket or black with cream stripes	Complies with WSA PS-207

7 FITTING INSTRUCTIONS, TRAINING, STORAGE AND INSTALLATION

Polyethylene pipe systems have been commonly used in the urban water industry for many years. Pipemakers PE100 pipes are compatible with fittings manufactured in accordance with AS/NZS 4129:2009 *Fittings for Polyethylene Pipes for Pressure Applications*. It is recommended to refer to the manufacturers of the electrofusion fittings for the installation instructions as the method may be specific to the fitting geometry.

Electrofusion welding and butt fusion processes may be used for joining pipe-to-pipe or fitting-to-pipe. All welding shall be performed by welders who have successfully completed training by a Registered Training Organisation, endorsed by the Plastics Industry Pipe Association for the relevant welding method(s).

The Plastics Industry Pipe Association provides technical guidelines for electrofusion welding in the following documents.

- a) POP001 Electrofusion Jointing of Pipe and fittings for Pressure Applications
- b) POP003 Butt Fusion Jointing of PE Pipes and Fittings Recommended Parameters.

POP001 contains recommendations for equipment required, for jointing, maintenance, servicing and calibration procedures, records to be kept and the training program to be respected to produce good fusion joints in polyethylene pipes.

POP003 is a guide to the butt fusion of polyethylene pipe using AS/NZS 4130 material as a basis, recommending the butt fusion procedures and parameters as specified in ISO 21307.

Copies of these documents can be downloaded from the PIPA website www.pipa.com.au.

Polyethylene pipe systems should be installed in accordance with AS/NZS 2033:2008 *Installation of polyethylene pipe systems.*

PE pipe shall be stored in accordance with the storage requirements of POP005 *Packaging, handling and storage of polyethylene pipe and fittings.*

8 PRODUCT MARKING

Pipemakers PE100 pipes are marked in accordance with AS/NZS 4130 as follows:

Manufacturer's name: Pipemakers

Pipe Series: S1

Dimensions:

e.g. DN560

Pressure rating:
e.g. PN20

SDR:
e.g. SDR9

Material: PE100

Date of manufacture: yy.mm.dd hh:mm

Place of manufacture: M for Mackay, D for Deer Park

Standard: AS/NZS4130 Certification No.: LIC No. 74570

For recycled water applications: RECYCLED WATER-DO NOT DRINK

For pressure sewer applications: SEWAGE

See Figure 1 for an example of marking.



FIGURE 1 EXAMPLE OF PIPE MARKING

9 PACKAGING AND TRANSPORTATION

Pipemakers PE pipe is available in 6 or 12 metre lengths or coils.

The method of packaging and transport of PE pipes is dependent on the size of the pipe or coil. Smaller sizes of straight pipes are bound in packs (and in some cases coils) while larger sizes of straight lengths use bearers, which are held in place with side supports and metal straps. When quantities less than a full pack are required, pipes are strapped in bundles to minimise damage. See Figure 2.

The Plastics Industry Pipe Association also provides technical guidelines for Packaging, Handling and storage of Polyethylene pipe and fittings in POP005 *Packaging, Handling, and Storage of Polyethylene Pipes and Fittings*.

Copies of these documents can be downloaded from the PIPA website www.pipa.com.au.



FIGURE 2: PIPEMAKERS PE100 PE PIPE, STRAIGHT LENGTHS

10 PRODUCT WARRANTY

The products are covered by the normal commercial and legal requirements of the Competition and Consumer Act 2010, which covers manufacture to the relevant Standard. and details of Pipemakers Pty Ltd's warranty is included in their terms and conditions of sale.

11 WATER AGENCY EXPERIENCE WITH THE PRODUCT OR FIELD-TESTING REPORT

Polyethylene pipe has been in used by the Australian water industry for many years and is regarded as a mature product. When installed in accordance with the manufacturer's instructions and operated within its stated performance capacity, PE pipe has proved to be a low maintenance product over a long service life. Inadequate PE pipeline performance has often been associated with the quality of pipeline joint working and attached appurtenances.

PE pipelines jointed by means of butt and electrofusion welding processes are known to deliver an acceptable pipeline life expectancy when designed by competent experienced designers and installed by qualified experienced welders.

For information on quality installation processes refer to the following WSAA National Codes list.

- a) WSA 01 Polyethylene Pipeline Code of Australia
- b) WSA 02 Sewerage Code of Australia
- c) WSA 03 Water Supply Code of Australia
- d) WSA 04 Sewage Pumping Station Code of Australia
- e) WSA 06 Vacuum Sewerage Code of Australia
- f) WSA 07 Pressure Sewerage Code of Australia

12 OUTCOMES OF EXPERT PANEL PRODUCT REVIEW

There are no outstanding queries.

13 FUTURE WORKS

No future works have been identified.

14 DISCLAIMERS

This Product Appraisal Report (Report) is issued by the Water Services Association of Australia Limited on the understanding that:

This Report applies to the product(s) as submitted. Any changes to the product(s) either minor or major shall void this Report.

To maintain the recommendations of this Report any such changes shall be detailed and notified to the Product Appraisal Manager for consideration and review of the Report and appropriate action. Appraisals and their recommendations will be the subject of continuous review dependent upon the satisfactory performance of products.

WSAA reserves the right to undertake random audits of product manufacture and installation. Where products fail to maintain appraised performance requirements the appraisal and its recommendations may be modified and reissued. Appraisal reports will be reviewed and reissued at regular intervals not exceeding five (5) years.

The following information explains a number of very important limits on your ability to rely on the information in this Report. Please read it carefully and take it into account when considering the contents of this Report.

Any enquiries regarding this report should be directed to the Program Manager, Carl Radford, Phone: 03 8605 7601 email carl.radford@wsaa.asn.au.

14.1 Issue of Report

This Report has been published and/or prepared by the Water Services Association of Australia Limited and nominated Project Manager and peer group of technical specialists (the Publishers).

The Report has been prepared for use within Australia only by technical specialists that have expertise in the function of products such as those appraised in the Report (the Recipients).

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APPENDIX A - PRODUCT LITERATURE



Water & Civil Systems



Metric Standard Dimensions to AS/NZ 4130:2018

Nom Size	PN Rating	SDR Rating	OD Min (mm)	OD Max (mm)	Ovality	Min Wall (mm)	Max Wall (mm)	Kgs / m	STD Lengt (m)
32mm PN6.3	6.3	26	32.00	32.30	0.60	1.60	1.90	0.16	200,00
40mm PN6.3	6.3	26	40.00	40.40	0.80	1.60	1.90	0.20	150.00
50mm PN6.3	6.3	26	50,00	50.50	1,00	2.00	2.30	0.31	150.00
63mm PN6.3	6.3	26	63.00	63.60	1.20	2.40	2.80	0.46	100:00
75mm PN6.3	6.3	26	75.00	75,70	1.50	2.90	3.30	0.67	12,00
90mm PN6.3	6.3	26	90.00	90.90	1,80	3.50	4.00	0.98	12.00
110mm PN6.3	6.3	26	110,00	111,00	2.20	4.30	4.90	1.47	12.00
125mm PN6.3	6.3	26	125,00	126.20	2.50	4.80	5,40	1.85	12.00
140mm PN6.3	6.3	26	140.00	141.30	2.80	5.40	6.10	2,34	12.00
160mm PN6.3	6.3	26	160,00	161.50	3.20	6.20	7.00	3.06	12,00
180mm PN6.3	6.3	26	180.00	181.70	3.60	6.90	7.70	3.81	12.00
32mm Pn8	8	21	32.00	32.30	0.60	1.60	1.90	0.16	200.00
40mm Pn8	8	21	40.00	40.40	0.80	1.90	2.20	0.24	150.00
50mm Pn8	8	21	50:00	50.50	1,00	2.40	2.80	0.37	150.00
63mm Pn8	8	21	63.00	63.60	1,20	3.00	3.40	0.58	100.00
75mm Pn8	8	21	75.00	75,70	1.50	3.60	4.10	0.83	100.00
90mm Pn8	8	21	90.00	90.90	1.80	4.30	4.90	1,19	100.00
110mm Pn8	8	21	110.00	111.00	2.20	5.30	6.00	1.78	12.00
125mm Pn8	8	21	125.00	126.20	2.50	6.00	6.70	2.28	12.00
140mm Pn8	8	21	140.00	141.30	2.80	6.70	7.50	2.86	12.00
160mm Pn8	8	21	160.00	161.50	3.20	7,70	8.60	3.74	12.00
180mm Prill	8	21	180.00	181.70	3.60	8.60	9.60	4.71	12.00
		17		1000000		10000			Name and Address of
32mm Pn10	10		32,00	32.30	0.60	1,90	2.20	0,19	200.00
40mm Pn10	10	17	40.00	40.40	0.60	2.40	2.80	0.29	150.00
50mm Pn10	10	17	50.00	.50.50	1.00	3.00	3.40	0.45	150.00
63mm Ph10	10	17	63.00	63.60	1.20	3.80	4.30	0.72	100.00
75mm Pn10	10	17	75.00	75.70	1,50	4.50	5.10	1.02	100.00
90mm Pn10	10	17	90.00	90.90	1.80	5.40	6.10	1.47	100.00
110mm Pn10	10	17	110,00	111.00	2.20	6.60	7.40	2.18	12.00
125mm Pn10	10	17	125.00	126.20	2.50	7,40	8.30	2.76	12.00
140mm Pn10	-10	17	140.00	141.33	2.80	8.30	9.30	3.49	12.00
160mm Pn10	10	17	160.00	161.50	3.20	9.50	10.60	4.56	12.00
180mm Pn10	10	17	180.00	181.70	3.60	10.70	11.90	5.77	12.00
32mm Pn12.5	12.5	13.6	32,00	32.30	0,60	2.40	2.80	0.23	200.00
40mm Pn 12.5	12.5	13.6	40,00	40.40	0.80	3.00	3.40	0.36	150.00
50mm Pn12.5	12.5	13.6	50.00	50.50	1,00	3.70	4.20	0.55	150.00
63mm Pn12.5	12.5	13.6	63.00	63.60	1.20	4.70	5.30	0.88	100.00
75mm Pn12.5	12.5	13.6	75.00	75.70	1.50	5.50	6.20	1.22	100.00
POmm Pn12.5	12.5	13.6	90.00	90.90	1.80	6,60	7.40	1.76	100.00
110mm Pn12.5	12.5	13.6	110.00	111,00	2.20	8.10	9,10	2.64	100.00
125mm Pn12.5	12.5	13.6	125.00	126.20	2.50	9.20	10.30	3.40	12:00
140mm Pn12.5	12.5	13.6	140.00	141.30	2.80	10.30	11.50	3.49	12.00
160mm Pn12.5	12.5	13.6	160.00	161.50	3.20	11.80	13.10	5.56	12.00
180mm Pn12.5	12.5	13.6	180.00	181.70	3.60	13.30	14.80	7.06	12.00
32mm Pn16	16	11	32.00	32.30	0.60	2.90	3.30	0.27	200.00
	-				10000	1000	100001		-
40mm Pn16	16	11	40.00	40.40	0.80	3.70	4.20	0.43	150.00
50mm Pri16	16	11	50.00	50.50	1.00	4.60	5.20	0.67	150.00
53mm Pn16	16	- 11	63.00	63.60	1.20	5.80	6.50	1.06	100,00
75mm Pn14	16	- 11	75.00	75.70	1,50	6.80	7.60	1,45	100,00
90mm Ph16	16	- 11	90:00	90.90	1.80	8.20	9.20	2.14	100.00
110mm Pn16	16	- 11	110.00	111,00	2.20	10.00	11.10	3.18	100.00
125mm Pn16	16	11	125.00	126.20	2.50	11.40	12.70	4.12	12,00
140mm Pn16	16	- 11	140,00	141,30	2.80	12.70	14.10	5.13	12.00
160mm Pn16	16	30	160.00	161.50	3.20	14.60	16.20	6.74	12.00

Please Note: ALL dimensions and weights are approximate and are subject to change without notice.

Metric Standard Dimensions to AS/NZ 4130:2018

Nom Size	PN Rating	SDR Rating	OD Min (mm)	OD Max (mm)	Ovality	Min Wall (mm)	Max Wall (mm)	Kgs / m	STD Length (m)
32mm Pn20	20	9	32.00	32.30	0.60	3,60	4.10	0.33	200.00
40mm Pn20	20	9	40.00	40.40	0.80	4.50	5.10	0,51	150.00
50mm Pn20	20	9	50.00	50.50	1.00	5.60	6.30	0.79	150.00
63mm Pn20	20	9	63.00	63.60	1.20	7.10	8.00	1.27	100.00
75mm Pn20	20	9	75.00	75.70	1.50	8.40	9.40	1,78	100.00
90mm Pn20	20	9	90.00	90.90	1.80	10.10	11.30	2.57	100.00
110mm Pn20	20	9	110.00	111.00	2.20	12.30	13.70	3.82	100.00
125mm Pn20	20	9	125.00	126.20	2.50	14.00	15.50	4.92	12.00
140mm Pn20	20	9	140.00	141.30	2.80	15.70	17,40	6.19	12.00
160mm Pn20	20	9	160.00	161.50	3.20	17.90	19.80	8.06	12.00
180mm Pn20	20	9	180.00	181.70	3.60	20.10	22,30	10.19	12.00

Please Note: ALL dimensions and weights are approximate and are subject to change without notice.

Pipe Coil Lengths

Nom Size	Min Wall (mm)	Mean ID (mm)	Coil OD (mm)	Coll ID (mm)
32mm PN8	200,00	1000	300	1410
10mm PN8	150,00	1000	300	1500
50mm PN8	150,00	1300	300	1900
63mm PN8	100.00	1800	300	2300
75mm PN8	100.00	1900	330	2500
POmm PN8	100.00	2200	360	3000
32mm PN10	200.00	1000	300	1410
40mm PN10	150,00	1000	300	1500
50mm PN10	150.00	1300	300	1900
63mm PN10	100.00	1600	300	2200
75mm PN10	100.00	1900	330	2500
90mm PN10	100.00	2200	360	3000
110mm FN10	100.00	2000	450	2880
32mm PN12.5	200.00	700	300	1200
40mm PN12.5	150.00	1000	300	1500
50mm PN12.5	150.00	1050	300	1750
63mm PN12.5	100,00	1300	300	1950
75mm PN12.5	100.00	1900	330	2400
90mm PN12.5	100.00	1900	400	2650
110mm PN12.5	100.00	2000	450	2880
32mm PN16	200.00	700	300	1200
40mm PN16	150.00	1000	300	1500
50mm PN16	150.00	1050	300	1750
63mm PN16	100.00	1300	300	1950
75mm PN16	100:00	1900	330	2400
90mm PN16	100,00	1900	400	2650
110mm PN16	100,00	2000	450	2880
32mm PN20	200.00	700	300	1200
40mm PN20	150.00	1000	300	1500
SOmm PN20	150.00	1050	300	1750
63mm PN20	100.00	1300	300	1950
75mm PN20	100.00	1900	330	2400
90mm PN20	100.00	1900	400	2650

Please Note: ALL dimensions and weights are approximate and are subject to change without notice.

APPENDIX B - QUALITY ASSURANCE CERTIFICATES AND SCHEDULES

TABLE B1: PIPEMAKERS AUSTRALIA PTY LTD - MANAGEMENT SYSTEMS

501 Foley Road, Deer Park VIC; 50 Dozer Drive Paget Mackay QLD			
Quality Systems Standard	AS/NZS ISO 9001:2015		
Certification No.	QEC 22888		
Certifying agency	SAI Global		
First date of certification	27 March 2006		
Current date of certification	9 April 2019		
Expiry date of certification	26 March 2021		

TABLE B2: PIPEMAKERS AUSTRALIA PTY LTD - PRODUCT CERTIFICATION

501 Foley Road, Deer Park VIC			
Product Standard/Spec.	AS/NZS 4130:2018 – Polyethylene (PE) pipes for pressure applications		
Licence	AMI 74646		
Certifying agency	ApprovalMark International		
Originally Issued	19 October 2016		
Currently issued	21 October 2019		
Expiry date of certification	19 October 2022		

TABLE B3: PIPEMAKERS AUSTRALIA PTY LTD - PRODUCT CERTIFICATION

50 Dozer Drive Paget Mackay QLD			
Product Standard/Spec.	AS/NZS 4130:2018 – Polyethylene (PE) pipes for pressure applications		
Licence	AMI 74570		
Certifying agency	ApprovalMark International		
Originally Issued	18 August 2014		
Currently issued	11 March 2020		
Expiry date of certification	6 June 2022		



This is to certify that:

Pipemakers Australia Pty Ltd

112 Landseer Street Acacia Ridge QLD 4110 AUSTRALIA 50 Dozer Drive Paget QLD 4740 AUSTRALIA 501 Foley Road Deer Park VIC 3023 AUSTRALIA

operates a

QUALITY MANAGEMENT SYSTEM

which complies with the requirements of

ISO 9001:2015

for the following scope

The manufacture and distribution of PE, UPVC, MPVC and PVC-O pipes and the purchase and distribution of complementary PVC & PE pipe fittings.

Certificate No: QEC22888

Issued: 10 April 2019 Originally Certified: 27 March 2006 Expires: 26 March 2021 Current Certification: 9 April 2019

Kevin Goodwin General Manager Technical Services





WWW.JAS-ANZ ORG/WED/STER

intered by:

Global Certification Services Pby Ltd (ACN 108 716 868) 680 George Street Sydney NSW 2000 Australia with SAI Global Certification Services Sydney NSW 2000 Australia ("SAI Global") and subject to the SAI Global Terms and Conditionalization. While all due care and skill was exercised in carrying out this assessment, SAI Global accepts responsibility for proven negligence. This certificate remains the property of SAI Global and must be returned to SAI Global upon its measter selection of the selection





These sites are registered under certificate No: QEC22888 issued on 10 April 2019.

Pipemakers Australia Pty Ltd

SAI Site Cert no. **Certified Site Details Effective Date** C-402260 112 Landseer Street Acacia Ridge QLD 4110 9 April 2019 AUSTRALIA Site Scope: The manufacture and distribution of UPVC, MPVC and PVC-O pipes and the purchase and distribution of complementary PVC pipe fittings. C-373920 50 Dozer Drive Paget QLD 4740 AUSTRALIA 9 April 2019 Site Scope: The manufacture and distribution of PE pipes and the purchase and distribution of complementary PE pipe fittings & distribution of PVC pipes. C-141387 501 Foley Road Deer Park VIC 3023 AUSTRALIA 9 April 2019

Site Scope:

The manufacture and distribution of PE, UPVC, MPVC and PVC-O pipes and the purchase and distribution of complementary PVC & PE pipe fittings.

These registrations are dependent on Pipemakers Australia Pty Ltd maintaining their scope of registration to ISO 9001:2015.

Registered by:

SAI Global Certification Services Pty Ltd (ACN 108 716 669) 680 George Street Sydney NSW 2000 Australia with SAI Global Pty Limited 680 George Street Sydney NSW 2000 Australia with SAI Global Pty Limited 680 George Street Sydney NSW 2000 Australia ("SAI Global") and subject to the SAI Global Terms and Condition for Certification. While all due care and skill wise essectised in carrying out this assessment, SAI Global accepts responsibility only for proving in the certification registers. This certificate in current property of SAI Global and matter be returned to SAI Global upon its request. To verify that this certificate is current please refer to SAI Global Co-Line Certification register at the himsolytesial as easilystate comp.





CERTIFICATE O CONFORMITY



ApprovalMark International hereby grants:

PIPEMAKERS AUSTRALIA PTY LTD

501 Foleys Road Deer Park, 3023 **AUSTRALIA**

Evaluated to:

AS/NZS 4130:2018 - Polyethylene (PE) pipes for pressure applications

The ISO Type 5 licensee shall comply with all the terms and condition as stipulated by the governance of the operating rules of the ISO Type 5 scheme, and shall comply with the standard requirements at all times including when the standard is amended. The ISO Type 5 license only covers the product which is identified in the attached product schedule.

Certificate No. AMI 74646

Issued: 21st October 2019 Expires: 19th October 2022 Original Issue: 19th October 2016

John PRASAD





Registered by: ApprovalMark International Pty Ltd (ABN 69 143 259 974) Unit 20, 33 Holbeche Road, Arndell Park NSW 2148 Australia. The assessment was carried with appropriate skill and assessment by ApprovalMark International Pty Ltd; however it will only accept its responsibility for proven negligence. The certificate remains the property of ApprovalMark International Pty Ltd.



Product Schedule

Pipemakers Australia Pty Ltd 501 Foleys Road Deer Park 3023

Australia

ISO Type 5 Certificate of Conformity

Evaluated to:

AS/NZS 4130:2018 - Polyethylene (PE) pipes for pressure applications

Model Id	Model Name	Brand Name	Product Description	Endorsement Date
DN16	Black PE100 DN16 S1 Pipe	Pipemakers	16_PN16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21st October 2019
DN20	Black PE100 DN20 S1 Pipe	Pipemakers	20_PN12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21st October 2019
DN25	Black PE100 DN25 S1 Pipe	Pipemakers	25_PN10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21 st October 2019
DN32	Black PE100 DN32 S1 Pipe	Pipemakers	32_PN8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21st October 2019
DN40	Black PE100 DN40 S1 Pipe	Pipemakers	40_PN8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21 st October 2019
DN50	Black PE100 DN50 S1 Pipe	Pipemakers	50_PN8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21st October 2019
DN63	Black PE100 DN63 S1 Pipe	Pipemakers	63_PN6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21 st October 2019
DN75	Black PE100 DN75 S1 Pipe	Pipemakers	75_PN6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21st October 2019
DN90	Black PE100 DN90 S1 Pipe	Pipemakers	90_PN6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21st October 2019
DN110	Black PE100 DN110 S1 Pipe	Pipemakers	110_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_\$1	21st October 2019
DN125	Black PE100 DN125 S1 Pipe	Pipemakers	125_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request S1	21st October 2019
DN140	Black PE100 DN140 S1 Pipe	Pipemakers	140_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21st October 2019
DN160	Black PE100 DN160 S1 Pipe	Pipemakers	160_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21st October 2019
DN180	Black PE100 DN180 S1 Pipe	Pipemakers	180_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21st October 2019

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Product Schedule

Model Id	Model Name	Brand Name	Product Description	Endorsement Dat
DN200	Black PE100 DN200 S1 Pipe	Pipemakers	200_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_51	21st October 2019
DN225	Black PE100 DN225 S1 Pipe	Pipemakers	225_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21st October 2019
DN250	Black PE100 DN250 S1 Pipe	Pipemakers	250_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21 st October 201
DN280	Black PE100 DN280 S1 Pipe	Pipemakers	280_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21 st October 201
DN315	Black PE100 DN315 S1 Pipe	Pipemakers	315_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21 st October 201
DN355	Black PE100 DN355 S1 Pipe	Pipemakers	355_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21st October 201
DN400	Black PE100 DN400 S1 Pipe	Pipemakers	400_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21 ⁵⁸ October 201
DN450	Black PE100 DN450 S1 Pipe	Pipemakers	450_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21 st October 201
DN500	Black PE100 DN500 S1 Pipe	Pipemakers	500_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21 st October 201
DN560	Black PE100 DN560 S1 Pipe	Pipemakers	560_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21st October 201
DN630	Black PE100 DN630 S1 Pipe	Pipemakers	630_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21st October 201
DN710	Black PE100 DN710 S1 Pipe	Pipemakers	710_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21 st October 201
DN800	Black PE100 DN800 S1 Pipe	Pipemakers	800_PN4, 6.3, 8, 10, 12.5, 16, 20_black, white, blue, purple and cream, other colours at customer request_S1	21 st October 201

Certificate No: AMI 74646

The models identified above in the schedule are endorsed for ISO Type 5 application only.



CERTIFICATE OF CONFORMITY



ApprovalMark International hereby grants:

PIPEMAKERS AUSTRALIA PTY LTD

50 Dozer Drive, Paget, Mackay 4740 AUSTRALIA

Evaluated to

AS/NZS 4130:2018 – Polyethylene (PE) pipes for pressure applications

The ISO Type 5 License shall comply with all the terms and conditions
As stipulated by the governance of the operating rules of the ISO Type 5
Scheme, and shall comply with the standard requirements at all times
including when the standard is amended. The ISO Type 5 License only
covers the product which is identified in the attached product schedule.

Certificate No. AMI 74570

Issued: 11th March 2020 Expires: 6th June 2022 Original Certification: 18th August 2014

Current Certification: 11th March 2020

John PRASAD

Director





Registered by: ApprovalMark International Pty Ltd (ABN 69 143 259 974) Unit 20, 33 Holbeche Road, Arndell Park NSW 2148 Australia. The assessment was carried with appropriate skill and assessment by ApprovalMark International Pty Ltd; however it will only accept its responsibility for proven negligence. The certificate remains the property of ApprovalMark International Pty Ltd.



Product Schedule

Pipemakers Australia Pty Ltd

50 Dozer Drive, Paget, Mackay 4740 AUSTRALIA

ISO Type 5 Certificate of Conformity

Evaluated to:

AS/NZS 4130:2018 - Polyethylene (PE) pipes for pressure applications

Model Id	Model Name	Brand Name	Product Description	Endorsement Date
DN110	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, Illac, white, orange Pipe	11th March 2020
DN125	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	11 th March 2020
DN140	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, Illac, white, orange Pipe	11 th March 2020
DN160	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	11 th March 2020
DN180	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	6 th June 2019
DN200	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, grange Pipe	6 th June 2019
DN225	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	6 th June 2019
DN250	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	6 th June 2019
DN280	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	6 th June 2019
DN315	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	6 th June 2019
DN355	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	6 th June 2019
DN400	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	6 th June 2019
DN450	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	6 th June 2019
DN500	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	6 th June 2019
DN560	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	6 th June 2019
DN630	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	6 th June 2019
DN710	Pipemakers	Pipemakers	PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe	6 th June 2019

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Product Schedule

DN800 Pipemakers Pipemakers Physical PN4, 6.3, 8, 10, 12.5, 16, 25 - Black, blue, red, beige, green, yellow, lilac, white, orange Pipe 6th June 2019

End of record

Certificate No: AMI 74570

The models identified above in the schedule are endorsed for ISO Type 5 application only.

ApprovalMark

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APPENDIX C - SUPPLIER CONTACTS

Pipemakers Australia Pty Ltd

Website: www.pipemakers.com.au Email: sales@pipemakers.com.au

VIC

501 Foleys Road
Deer Park VIC 3023
Tel: 03 8361-7115

QLD

112 Landseer Street Acacia Ridge QLD 4110 Tel: 07 3344-3377

50 Dozer Drive Mackay QLD 4740

WA

17 Gauge Circuit Canningvale, WA 6155 Tel: 08 6250-3100



Melbourne Office

Level 8, Suite 8.02 401 Docklands Drive Docklands VIC 3008

Sydney Office

Level 9 420 George Street Sydney NSW 2000 GPO Box 915 Sydney NSW 2001

P +61 (0) 3 8605 7666 email: info@wsaa.asn.au

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