Plastics Industry Pipe Association of Australia Limited ACN 086 511 686

Industry Guidelines

POLYETHYLENE RURAL AND FLOOD PIPE

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Pipelines Integrity For a Cleaner Environment

Disclaimer

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POLYETHYLENE RURAL AND FLOOD PIPE

This document provides guidelines for polyethylene (PE) Rural and Flood Pipes used for conveying irrigation and “domestic and stock water”. They are an alternative to PE pipes complying in full with AS/NZS 4130 “Polyethylene pipes for pressure applications” or AS2698.2 “Polyethylene rural pipe”.

NOTE: For potable water applications, polyethylene pipes complying with AS/NZS 4130 and fittings complying with AS/NZS 4129 should be used.

APPLICATION

Flood Pipes are intended for use under flow conditions where the maximum operating pressure does not exceed 250 kPa at 20°C. Flood pipes should not be used where sub atmospheric service pressures less than minus 12 kPa could occur e.g. pump suction and syphon pipelines.

Rural pipes are intended for use under conditions where the maximum operating pressure does not exceed 630 kPa at 20ºC.

When used in buried applications, the provisions of the following Standards apply apart from any variation noted in this document:

- AS/NZS 2566 “Buried flexible pipelines - Part 1, Design and Part 2, Installation”
- AS/NZS 2566.1 Supplement “Buried flexible pipelines, Part 1 Structural Design -Commentary”.
- AS 2033 Installation of polyethylene pipe systems

Where pipes are to be joined by butt fusion the provisions of:

- PIPA Guideline POP003 “Butt fusion jointing of PE pipes and fittings – recommended parameters” apply.

DIMENSIONS

Flood Pipe

Pipes should be manufactured to the dimensions and dimensional tolerances of Series 1, SDR 41 pipe complying with Table 2 of AS/NZS 4130. The methods of measurement should be to AS/NZS 1462.1. Standard pipe lengths are 12.0– 0 m and 15.0– 0m.

Rural Pipe

Pipes must be manufactured to the dimensions listed in Table 1.

TABLE 1
Dimensions of Rural Pipe

Nominal Size	Mean ID (mm)		Wall Thickness (mm)	
	Min.	Max.	Min.	Max.
19 ($^{3}/_{4}$)	18.6	19.5	1.4	1.7
25 (1)	24.9	25.8	1.5	1.8
32 ($1\,^{1}/_{4}$)	31.2	32.1	1.9	2.2
40 ($1\,^{1}/_{2}$)	37.6	38.6	2.2	2.5
50 (2)	50.2	51.5	3.0	3.4

MATERIAL REQUIREMENTS

The PE compound used for both rural pipe and flood must comply with the requirements listed in Table 2.

TABLE 2
PE Compound Material Requirements

Property	Specification
Density Test Methods: ISO 1183, ISO 1872-2 Method B	>940 kg/m^3
Environmental stress crack resistance (hours) Test method ASTM F 1473. Compression moulded plaque, 2.4 MPa, 3.5mm notch, 80°C in air.	>10
Thermal stability (min. at 200 deg. C) ISO 11357-6	>40
Melt Flow Rate 190°C, 5 kg (gm/10 min.) Test method ISO 1133	0.3 - 1.1
Carbon Black % Test Method ISO 6964	2.0 - 3.0
Dispersion (Grade) Test method AS/NZS1462.28	Arithmetic average ≤ 60 μm, corresponding to Grade 3.
Volatile content (mg/kg) ISO 4437	< 350

The carbon black used in compound to produce rural pipe and flood pipe should meet the requirements of Table 3.

TABLE 3
Carbon Black Material Requirements

Average Particle size (nm) Test method ASTM D-3849	< 40

When tested, the pipes should meet the requirements given in Table 4.

TABLE 4
Pipe performance

Resistance to internal pressure at 80°C at a hoop stress of 3.5MPa. (Applicable to Rural Pipe only) Test method AS/NZS1462.6	No rupture, leakage or weeping at <165h
Reversion AS/NZS1462.4	3% max.
Thermal stability (min. at 200 deg. C) ISO 11357-6	>20

MARKING

The minimum marking requirements for pipes complying with these guidelines include the following:

Flood Pipe

Pipes must be legibly marked with the manufacturer's registered name and/or trademark, product name, nominal diameter, standard dimension ratio, pressure rating, place and date of manufacture [YYMMDD] and the name of these guidelines at intervals not exceeding one metre.

Example: (for DN315 flood pipe manufactured on 15 June 2004):-

"**Trade name or manufacturer's name FLOOD PE DN 315 SDR 41 250kPa P2 040615 PIPA POP009**"

Rural Pipe

Pipes must be legibly marked with the manufacturer's registered name and/or trademark, product name, nominal size, dimension ratio and date of manufacture [YYMMDD] and the name of these guidelines at intervals not exceeding one metre

Example:

"**Trade name or manufacturer's name RURAL PE 25 630 kPa P1 040615 PIPA POP009**"

TEMPERATURE DERATING

For service temperatures exceeding 20°C the maximum allowable operating head for Rural Pipe should be in accordance with Table 5.

TABLE 5
Maximum Allowable Operating Head at Elevated Temperatures.

Temp °C	Allowable Head (m)
20	63
25	55
30	50
35	45
40	40
45	35