

Polyethylene Compressed Air Pipe Guidance Note

IMPORTANT INFORMATION YOU NEED TO KNOW

This Guidance Note summarises the issues and relevant references related to the use of polyethylene (PE) pipe for compressed air applications. PE is an excellent pipe material for compressed air applications but there is some important information you need to understand before ordering or specifying your pipe.

PRESSURE DERATING

An important difference that needs to be understood relates to the relative pressure derating of pipe for compressed air applications. The reason for this derating is that compressed air is a gas that is under pressure and as such contains substantial stored energy - more so than a liquid under the same pressure. If that energy is released suddenly there is an increased risk of injury to anyone nearby. For that reason, there is a greater factor of safety applied to pipe for compressed air applications than would be applied to a pipe carrying water at the same pressure and temperature. Therefore, the allowable working pressure of a compressed air pipeline is less than the PN rating of the pipe.

HOW DO I KNOW WHAT THE ALLOWABLE PRESSURE IS?

PIPA has published a guide for PE compressed air piping called POP002, *Polyethylene (PE) pipes and fittings for compressed air*, which is available from the Technical Guidelines page. The guide has tables of allowable working pressures for given PN ratings and temperatures. For example, at 20°C a PE100 PN 10 pipe should only operate at pressures not exceeding 630kPa, similarly a PE100 PN 25 pipe should only operate at pressures not exceeding 1600kPa.

Recent changes to standards will see new markings for compressed air applications that will nominate the allowable working pressure at a given temperature. The following is what you can expect this marking to look like:

“PE100 SDR 7.4 PN 25 1600 kPa at 20°C Compressed Air”

This means that it is a PN 25 pipe made from PE 100 material, but you should *only use this pipe on a compressed air system that has an allowable working pressure that does not exceed 1600kPa at an operating temperature that does not exceed 20°C.*

It must be remembered that the allowable working pressure will reduce with increasing temperature - the tables in POP002 give you the information you need for other temperatures.

WHAT DOES UV STABILTY MEAN?

"100% UV stabilised" is a term often used in advertisements for PE pipe. This term may mislead potential purchasers into believing that the product is immune to damage by sunlight or Ultraviolet (UV) light.

Polyethylene is subject to degradation when exposed to sunlight (UV).

Polyethylene pipes manufactured to AS/NZS 4130 may be black or coloured.

The most effective additive to minimise UV degradation is carbon black, hence the predominance of black PE pipes. The addition of carbon black to the particular specification requirements of AS/NZS 4131 will enable long term use of PE when exposed to UV.

For coloured pipes and fittings, UV resistance may be optimised by the incorporation of additives, such as HALS (hindered amine light stabilisers), but resistance to UV degradation will not achieve the levels obtained with carbon black.

It may or may not be the case that 100% of the material is UV stabilised, but this does not mean 100% immunity. At best it may mean that UV stabiliser has been used throughout, thus lessening the inevitable degradation of coloured products.

Key points to remember:

- 100% UV stabilisation does not equate to immunity from UV degradation for coloured pipes.
- Correctly stabilised coloured pipes are estimated to be suitable for at least two years exposure to direct sunlight.
- Black pipes to AS/NZS 4130 are suitable for exposure periods up to 50 years.

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