

PE100 Pipe – The precursor to PE4710 Pipe

The following is a comparison between PE4710 and PE100 materials for pressure piping applications.

Overview

PE100 materials have been used successfully in Europe for pressure pipe applications for 22 years¹. The physical properties of PE100 and PE4710 materials are extremely similar. PE4710 uses a more stringent Design Factor and has higher performance requirements. Therefore, the performance of PE4710 materials can generally be considered to be similar, if not better, to that of PE100 materials.

The successful history of PE100 is, thus, extremely pertinent to that of PE4710 materials.

Data

Table 1, below, provides a comparison between PE4710 and PE100 material data; note that

- PE100 materials have similar or lower physical property requirements than PE4710 materials.
- The Design Factor of PE4710 is more conservative than for PE100 (0.63 versus 0.8).

PE4710 materials also have additional high performance requirements to qualify as a PE4710 material that are not required for PE100 materials. Therefore, not all PE100 materials will qualify as a PE4710 material.

Table 1: Summary of Physical Properties

ASTM D3350 Cell Class	PE4710	PE100*
Density (g/cm ³)	0.947 – 0.955	0.940 – 0.955
Slow Crack Growth Resistance (PENT, hours)	500	10 or 500
Hydrostatic Strength Classification	1600 psi HDB at 23°C	1450 psi (10MPa) MRS at 20°C
Design Factor / HDS	0.63 / 1000 psi	0.8 / 1160psi

* When evaluated under the North American system, a PE100 material will have a similar or lower classification compared to a PE4710 material.

Performance History

For 22 years, PE100 pipe has had a very successful history in Europe which shows that, even with a Design Factor as high as 0.8 (as is used in Europe), PE materials can perform well in water distribution piping applications. PE100 pipe is also used widely in gas distribution applications in Europe and the United States.

Conclusion

As there are higher requirements for PE4710 materials (lower Design Factor and additional performance requirements), the performance of PE4710 materials can be expected to be similar, if not greater, to that of PE100 materials.

¹ Borouge. *PE100 compounds – essential for durable gas and water pipes.*