



don't crack under pressure



The PE100+ Association

Founded on February 24, 1999, the PE100+ Association is an industry organisation of several polyethylene (PE) manufacturers whose objective is to guarantee consistent quality at the highest level in the production and use of PE100 pipe material.

By monitoring the most critical properties of enhanced requirements, we are able to issue a **"PE100+ Association Positive List of Materials"** on a regular basis. We also aim to create a marketing platform to promote the use of PE piping in general.

This is why three leading PE manufacturers - Borealis A/S, Elenac GmbH and Solvay Polyolefins Europe SA - took the initiative to launch the PE100+ Association.

The PE100+ Association's Advisory Committee

The PE100+ Association has an Advisory Committee of representatives from the gas and water industries, pipe and fitting manufacturers and contractors. Their main tasks are market guidance and feedback, but they also ensure that industry requirements are fulfilled.

The Positive List of materials

On behalf of the PE100+ Association, Gastec, an independent testing authority in the Netherlands, regularly issues a "PE100+ Association Positive List of Materials". It is also posted on www.pe100plus.net. Various independent and internationally respected laboratories repeat the tests every seven months.

Plastics and performance excellence

The plastics industry continues to innovate. Tailor-made solutions must always be a combination of functional excellence, long life and technological advancement. Plastics play an important role in the pursuit of sustainable development, a vital challenge for society at the dawn of the new millennium.

Plastics in a challenging environment

The supply of water and energy are crucial for humanity in the 21st century. Millions of people throughout the world already suffer from drinking water shortages, and the global population keeps growing. The highest quality in pressure piping material is critical for ensuring the safe transport of not only drinking water, but also natural gas and industrial fluids.

PE pipe - an excellent choice

The construction industry is increasingly turning to novel materials which are waterproof, stable, weather-resistant, light and easy to handle. Polyethylene (PE) was introduced in the late 1950s and has undergone tremendous development to reach the world-wide position it enjoys today. Compared to traditional materials, PE pipe installations are the most competitive by combining key advantages:

- **Ease of handling due to flexibility and light weight**
- **Leak-tight installation due to excellent fusion-welding possibilities**
- **Long life with low operational costs**
- **Capability for relining existing pipelines**
- **Possibility for on-site extrusion, alternative installations**
- **Chemical resistance**

The outstanding quality of PE pipe is documented by international standardisation bodies.

PE has a long, proven track record for water and gas distribution, and the introduction of PE100 material has broadened the range of pipe applications even further. PE100 pipe sets new standards in three fundamental properties:

- **Creep rupture strength**
- **Stress crack resistance**
- **Resistance to rapid crack propagation**



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Why PE100+

The PE100+ Association ensures the very highest quality of PE100 by continuously monitoring the fundamental properties listed above. Network engineers also rely on these for increasing the use of PE in gas and water distribution networks.

The PE100+ Association aims to set higher performance standards than those founded in CEN/ISO.

Durability under pressure is determined by both the creep rupture strength and stress crack resistance.

PE100 demonstrates significant improvement in the creep rupture strength, which is an important factor in ultimately determining the lifetime of a material. Stress crack resistance of PE100 is also clearly improved. This ensures a longer, safer operational life for the pipe. Notched pipe testing is an accelerated method of assessing high stress crack resistance.

As in all materials for pressure applications, including steel, engineers want to minimise the risk of rapid crack propagation. As PE100 is a highly ductile material, this risk is very low.

The internationally-standardised S4 test is used to assess the material's performance, and it shows PE100's performance well beyond its operational pressure.

By measuring all three properties on the same pipe at a higher level and on a regular basis, the pipe materials listed by the PE100+ Association deliver continuous, outstanding performance.

Requirements of the PE100+ Association

Firstly, the ready made compounds must conform to EN 1555-1 and ISO 4437, or EN 12201-1 and ISO 4427. Fully documented data sets must be provided to demonstrate long-term strength of an MRS10 material according to ISO 12162.

To ensure the highest quality, independent, internationally-respected laboratories carry out the tests described in the table below. The tests are repeated every seven months, and we publish a list of materials that meet these stringent requirements. The user can be sure of a safer, more durable pipe network by using one of the materials listed by the PE100+ Association.

PE100+ Requirements compared with European Standards

Property	Test Method	CEN/ISO Standard requirements	PE100+ Association requirements
Creep Rupture Strength	Pressure test at 20°C and 12.4 MPa	≥ 100 h	≥ 200 h
Stress Crack Resistance	Pipe notch test at 80°C and 9.2 bar	≥ 165 h	≥ 500 h
Resistance to Rapid Crack Propagation	S4 Test at 0°C	$P_c \geq \frac{MOP}{2.4} - \frac{13}{18}$	≥ 10 bar

All tests are performed on 110mm SDR 11 pipe.



Safety and quality play critical roles.

The Association is open to any manufacturer whose materials comply with our enhanced requirements, and who is able to produce consistent compound quality according to ISO 9000 standards.

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A large, stylized graphic of a tire tread pattern, consisting of several concentric, slightly overlapping circular bands, rendered in a light gray color against a white background.



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