PE100RC pipe tests

In close collaboration with LATEP, CEIS provides the markets with a global solution that will undoubtedly contribute to proving compliance with the very highest standards of quality by water and gas distribution systems through PE100RC pipes.

The new revisions of the UNE-EN 1555 standard series *"Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) and UNE-EN 12201 "Plastics piping systems for water supply, and for drainage and sewerage under pressure. Polyethylene (PE)"* as the main new feature include a new material, i.e. PE100RC, ultra-resistant to the main enemy of plastic pipes: slow crack growth.

CEIS recently reached an agreement with the Polymer Technology Laboratory (LATEP) at King Juan Carlos University (URCJ) to provide the market with testing to assess PE100RC materials. CEIS will therefore provide market players in the value chain, including manufacturers and certification bodies, the complete test package required for conformity assessment of water and gaseous fuel supply systems that are made with this new material.

New tests

The **Strain Hardening Test (SHT)** described in ISO 18488:2015, consists of a strain test carried out at 80°C to determine the gradient of the strain graph compared to the time at the final stage of hardening before the sample breaks. In this case, the minimum Gp modulus requirement value is 53 MPa.

The **'Crack Round Bar Test' (CRBT)** described in ISO 18489:2015 is a cyclic strength test under a constant load conducted on a cylindrical sample (∅=14mm) notched in the middle to start quick fracture, and in which the sample must withstand a minimum number of cycles (1.5 x 106) before breaking.

Other tests

In addition to these two tests, another two which were already included in the previous revision, have been significantly modified to adapt them to the high performance of PE100RC.

The **'Accelerated Full Notch Creep Test' (AFNCT)** based on ISO 16770:2019 in which a square sample (10 x 10 mm) is notched in the middle plane for accelerated creep of the crack, is subject to a tensile test under a constant load while submerged in an aqueous tensoactive medium at high temperature (90°C). In the original test an ethoxylated detergent (Nonylphenol) was used, which in this case a highly effective tensoactive agent is used (Lauramine Oxide). The sample must withstand a minimum number of hours (300h at σ=5 MPa or 550h at σ=4MPa) before breaking.

The **'Accelerated Notch Pipe Test' (ANPT)** based on ISO/DIS 13479:2020 is the traditional internal high pressure test (80°C) conducted on pipes with notches on the outer surface, but adding a tensoactive agent (Nonylphenol Ethoxylate) to the medium (water) to accelerate the growth of the fracture. In this case, the sample must also be able to withstand a minimum number of hours (300 h) before breaking.

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