

THE UNIQUE TESTING UNIT FOR RAPID CRACK PROPAGATION

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The development of PE pipeline construction technologies has created an interest in seeing how pipes respond to an initiated rapid crack propagation at lower temperatures. Initially, crack tests on PE pipes were optional and then were included in ISO 4437 and EN 1555-1.2 for gas pipelines.

A unique testing unit for small-scale determination of resistance to rapid crack propagation (S4) of 400 mm pipes was installed at a testing laboratory at the POLYPLASTIC Group Klimovsk Pipe Plant in 2011. Previously there were only a few testing units for 160–225 mm pipes in CIS countries. Increased use of PE pipes up to 400 mm with increased operating pressures up to 12 bar has made such tests obligatory.

The idea for the unit came from I. Gvozdev and V. Biserov. The group of designers under the management of V. Biserov completed all the necessary calculations and drafted technical specification for the stand (under V. Gotovko, leader of the group). The production of structural components, assembling and commissioning was provided by a mechanical repairs shop at KTZ (S. Ermakov, Manager). This turned out to be a difficult task. The installation, commissioning and development of reliable results has taken over one year and required an investment of over 5 million rubles.

That is how the first and only Russian unit for small-scale determination of resistance to rapid crack propagation (S4) of 400 mm pipes was created.

The unit is numbered 01 and has a technical data sheet and manual. The State Regional Centre for standardisation and metrology of the Moscow Region has issued a Certificate No. AA 7018116 that confirms that “the stand for small-scale determination of resistance to rapid crack propagation (S4) belonging to the Klimovsk Pipe Plant has been approved for use during small-scale determination of resistance to rapid crack propagation according to GOST R 50838-2009, PE pipes for gas pipelines.”

The presence of this unit has made the use of PE pipes with gas distribution pipelines of medium pressure possible, after the S4 GOST R 50838 test changed from being optional to obligatory.

Currently, the testing laboratory of Klimovsk Pipe Plant (A. Senkovskiy, Head of the Laboratory) is conducting small-scale rapid crack propagation tests using DD GOST R 50838-2009. The pipes with outer diameters of 110 mm, 160 mm, 225 mm, 315 mm and 400 mm are being tested.

This unit is used for testing products made by the POLYPLASTIC Group and other companies from CIS countries, as well as for research works that study different types of PE pipe produced by local and foreign companies. In particular, it gives reliable data on highly popular PE types with high crack resistance (PE RC). The great wall thickness of the pipes (up to 36 mm) gives a comprehensive analysis of different types of PE crack resistance properties at low temperatures. This is particularly pertinent in Russia with its lengthy gas pipelines, where construction and repairs are often done in cold weather.

These units are still rare – not all European Testing Centres have them. Klimovsk Pipe Plant is therefore prepared to conduct testing for our European partners, producers of special types of raw materials, and pipe companies.

