SLOVENSKI STANDARD
oSIST prEN 12327:2011

01-februar-2011

Infrastruktura za plin - Tlačni preskus, postopki za začetek in prenehanje obratovanja - Funkcionalne zahteve

Gas infrastructure - Pressure testing, commissioning and decommissioning procedures - Functional requirements

Gasinfrastruktur - Druckprüfung, In- und Außerbetriebnahme - Funktionale Anforderungen

Infrastructures gazières - Essaies de pression, modes opératoires de mise en service et de mise hors service des réseaux - Prescriptions fonctionnelles

Ta slovenski standard je istoveten z: **prEN 12327**

ICS:

91.140.40	Sistemi za oskrbo s plinom	Gas supply systems

oSIST prEN 12327:2011 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 12327

November 2010

ICS 91.140.40

Will supersede EN 12327:2000

English Version

Gas infrastructure - Pressure testing, commissioning and decommissioning procedures - Functional requirements

Infrastructures gazières - Essaies de pression, modes opératoires de mise en service et de mise hors service des réseaux - Prescriptions fonctionnelles

Gasinfrastruktur - Druckprüfung, In- und Außerbetriebnahme - Funktionale Anforderungen

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 234.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CEN in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. prEN 12327:2010: E

Contents

Page

Foreword

This document (prEN 12327:2010) has been prepared by Technical Committee CEN/TC 234 “Gas infrastructure”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12327:2000.

There is a complete suite of functional standards prepared by CEN/TC 234, "Gas infrastructure"‘ to cover all parts of the gas supply system from the point of input of gas to the transmission system up to the inlet connection of the gas appliances, whether for domestic, commercial or industrial purposes. In addition, a new EN Work Item is being prepared by CEN/TC 234/WG 10, "Gas Service Lines".

In preparing this standard a basic understanding of gas supply by the user has been assumed.

Gas supply systems are complex and the importance on safety of their construction and use has led to the development of very detailed codes of practice and operating manuals in the member countries. These detailed statements embrace recognized standards of gas engineering and the specific requirements imposed by the legal structures of the member countries.

1 Scope

This European Standard describes common principles for pressure testing, commissioning and decommissioning of gas supply systems as covered by the European functional standards of the Technical Committee CEN/TC 234 (see Annex B) except for pipework for buildings according to EN 1775. They have been extracted from the detailed codes of practice and operating manuals in the member countries.

The specified procedures are applicable to strength testing, tightness testing and combined testing. Test pressure levels, test periods and acceptance criteria are not covered by this standard.

Additional measures or different methods of testing, commissioning or decommissioning can be required by legislation of the individual member countries or at the discretion of the pipeline operator.

This European Standard specifies common basic principles for gas supply systems. Users of this European Standard should be aware that more detailed national standards and/or codes of practice can exist in the CEN member countries.

This European Standard is intended to be applied in association with these national standards and/or codes of practice setting out the above mentioned principles

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 837-1, *Pressure gauges — Part 1: Bourdon tube pressure gauges — Dimensions, metrology, requirements and testing*

EN 837-2, *Pressure gauges — Part 2: Selection and installation recommendations for pressure gauges*

EN 837-3, *Pressure gauges — Part 3: Diaphragm and capsule pressure gauges — Dimensions, metrology, requirements and testing*

EN 1775, *Gas supply — Gas pipework for buildings — Maximum operating pressure less than or equal to 5 bar — Functional recommendations*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
authorized person
competent person who is appointed to fulfil a given task on gas supply systems

3.2
competent person
person who is trained, experienced and approved to perform activities relating to gas supply systems

NOTE Means of approval, if any, will be determined within each member country.

3.3
competent authority
body authorized by the member country to ensure that the pipeline operator fulfils the requirements of this and other relevant standards

3.4
pipeline operator
private or public organization authorized to design, construct and/or operate and maintain the gas supply system

3.5
gas supply system
pipeline systems including pipework and their associated stations or plants for the transmission and distribution of gas

3.6
pipeline
system of pipework with all associated equipment and stations up to the point of delivery

NOTE This pipework is mainly below ground but includes also aboveground parts.

3.7
pipework
assembly of pipes and fittings

3.8
design pressure
DP
pressure on which design calculations are based

3.9
operating pressure
OP
pressure which occurs within a system under normal operating conditions

3.10
maximum operating pressure
MOP
maximum pressure at which a system can be operated continuously under normal operating conditions

NOTE Normal operating conditions are: no fault in any device or stream.

3.11
maximum incidental pressure
MIP
maximum pressure which a system can experience during a short time, limited by the safety devices

3.12
lower explosive limit
LEL
concentration of flammable gas or vapour in air, below which the gas atmosphere is not explosive

3.13
strength test
specific procedure to verify that the pipework and/or station meets the requirements for mechanical strength

3.14
tightness test
specific procedure to verify that the pipework and/or station meets the requirements for tightness

3.15
combined test
specific procedure to verify that the pipework and/or station meets the requirements for mechanical strength and tightness

3.16
commissioning
activities required to pressurise pipework, stations, equipment and assemblies with gas and to put them into operation

3.17
decommissioning
activities required to take out of service any pipework, station, equipment or assemblies filled with gas and to disconnect them from the system

3.18
purging
process for safely removing air or inert gas from pipework and/or pipeline components and replacing it with gas, or the reverse process

NOTE 1 A distinction is made between the following methods:

— direct purging: the displacement of air by gas or vice versa;

— indirect purging: the displacement of air by inert gas followed by the displacement by gas or vice versa.

NOTE 2 Alternatively by means of a barrier (a slug of inert gas or a pig) between the air and the gas or vice versa.

4 Pressure testing

4.1 General

The implementation of the requirements for pressure testing shall be performed by an authorized person.

The pressure of a strength test or combined test shall be higher than the maximum incidental pressure (MIP) of the system. The pressure of the tightness test, which will normally follow a strength test, may be below the MIP of the system. Where no previous strength test has been carried out, as in the case of

— short extensions of existing pipework; and

— connections between new and existing systems, where joints are exposed for testing, the tightness test pressure shall be at least the operating pressure of the system.

All pressure levels are gauge pressures (relative pressures) measured at the prevailing atmospheric pressure.

A written procedure shall be prepared by the pipeline operator or competent authority, taking into account local conditions, national legislation, standards and/or codes of practice, and shall specify the following:

— test method;

— test pressure;

— test period;

— test medium;

— acceptance criteria;

— allowable pressure/volume variation;

— minimum pressure in the existing gas supply system;

— leak detection methods;

— release of test medium;

— disposal of water.

The test method and pressure level to be applied in each case depends on the materials used, the type of joints, the intended application and the provisions of the relevant functional standards for gas supply systems (see Annex B).

The maximum allowable pressure/volume variation depends on the material, pressure level, diameter and the location of the test section.

The effects of atmospheric pressure variations and/or temperature variations, particularly where a part of the test section is not completely buried, will need to be taken into account.

When plastic material is being tested, consideration should be given to creep effects during pressurization and testing.

EXAMPLE Polyethylene.

The pressure level shall be verified using pressure measurement equipment of minimum class 0,6 with a maximum measurement range between 1.1 to 1,5 times the test pressure." A recording device of class 1 may be used, if appropriate. A check shall be made to verify that the complete test section is pressurized. To take into account temperature changes affecting the test pressure, the temperature can be measured with an instrument having a minimum scale reading of 1 K.

Measuring instruments shall comply with appropriate standards or specifications and shall have valid certificates of calibration. Pressure gauges shall comply with EN 837-1, EN 837-2 and EN 837-3, where applicable.

The test equipment shall be capable of withstanding the specified test pressure.

Care shall be taken not to over-pressurize the test section beyond the specified test pressure level.

Suitable precautions shall be taken in order to avoid potential hazards to persons and to the environment.

As far as possible pipework should be buried, however, if pipework is exposed, it shall be adequately secured.

While the pressure is being raised no unauthorized person shall enter the test area of any exposed part of the test section or interfere with it. Warning notices shall be displayed, if necessary.

Only work related to the pressure test shall be carried out on the test section. Pressure testing shall not be carried out against closed valves.

All pipework that does not have end load resistance shall be restrained against movement during the test by design or external means.

Upon satisfactory completion of the pressure test, the pipeline section should be commissioned as soon as possible. If there is a time lag between testing and commissioning, the pipeline section should be kept under pressure. Before commissioning, the pressure shall be checked to make sure that the pipeline section has not been damaged.

4.2 Classification of test methods

Table 1 gives the relationship between test methods, test media and the relevant subclauses within this standard.

Table 1 — Test medium/ Test method relationship

	Water	Air or inert gas	Gas at operating pressure
Volume measuring method	4.3.2.1		
Pressure recording method	4.3.2.2	4.4.2.1	
Visual inspection method	4.3.2.3	4.4.2.2	4.4.2.2
Differential pressure measuring method		4.4.2.3	

4.3 Hydrostatic testing

4.3.1 General

Hydrostatic testing should be carried out with water. The water used for testing shall not have an aggressive effect on the pipeline components. The test section and the water shall be free of contamination, as this can impair testing and the subsequent operation of the test section. Provisions shall be made for the suitable disposal of water after testing.

A preliminary test with air or inert gas at low pressure (max. 0,5 bar) may be performed before hydrostatic testing. This preliminary test shall not replace the tightness test.

The length of the test section will be governed by ground contours and the need to avoid excessive pressures at low points due to hydrostatic head, taking into account the materials used for the construction of the test section.

The test pressure shall be maintained at the highest point of the test section and, if necessary, be checked by using a suitable pressure gauge.

While pressurizing, the pressure shall be monitored to ensure that critical stress limits of the materials are not exceeded.

EXAMPLE Specified minimum yield strength for steel or rapid crack propagation for polyethylene. If necessary, precautions against freezing of the water shall be taken.

When filling the test section with water, no air should remain at high points.

The system used for filling the test section should have sufficient water capacity available to maintain a continuous and even flow to ensure that firstly the entrained air is reduced to a minimum and secondly that it is capable of overcoming any hydraulic peak due to geographic contours.

Where practical, water should be introduced into the test section at the lowest point.

Where difficulties exist in the introduction and eventual removal of water from pipework, suitable pig dispatching and receiving stations should be fitted at the ends of the pipework

Where the volume of ‘make up‘ water or the pressure loss is unacceptable, a check should be made of the pressure testing equipment and for any indication of leakage.

Where inspection does not reveal the source of leakage, a method mentioned in 4.5 shall be used.