SLOVENSKI STANDARD
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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

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91.140.40	Sistemi za oskrbo s plinom	Gas supply systems

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

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

Gasinfrastruktur - Druckprüfung, In- und Außerbetriebnahme - Funktionale Anforderungen

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Contents

Page

Foreword

This document (EN 12327:2012) has been prepared by Technical Committee CEN/TC 234 “Gas infrastructure”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2013, and conflicting national standards shall be withdrawn at the latest by February 2013.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12327:2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

There is a complete suite of functional standards prepared by CEN/TC 234, "Gas infrastructure"‘ to cover all parts of the gas infrastructure 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 European Standard a basic understanding of gas supply by the user has been assumed.

Gas infrastructures 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 infrastructures as covered by the functional European Standards of the Technical Committee CEN/TC 234, see Annex B. They have been extracted from the detailed codes of practice and operating manuals in the member countries.

This European Standard does not cover installation pipework which is covered by EN 1775.

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 European 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 infrastructure. Users of this European Standard should be aware that more detailed national standards and/or code of practice may 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 basic principles.

In the event of conflicts in terms of more restrictive requirements in national legislation/regulation with the requirements of this European Standard, the national legislation/regulation should take precedence as illustrated in CEN/TR 13737 (all parts).

CEN/TR 13737 (all parts) give:

— clarification of all legislations/regulations applicable in a member state;

— if appropriate, more restrictive national requirements;

— a national contact point for the latest information.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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*

3 Terms and definitions

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

3.1 General terminology

3.1.1
gas infrastructure
pipeline systems including pipework and their associated stations or plants for the transmission and distribution of gas

3.1.2
authorized person
competent person who is appointed to fulfil a given task on gas infrastructure

3.1.3
competent person
person who is trained, experienced and approved to perform activities relating to gas infrastructures

Note 1 to entry: Means of approval, if any, will be determined within each member country.

3.1.4
competent authority
body authorized by the member country to ensure that the pipeline operator fulfils the requirements of this and other relevant standards

3.1.5
pipeline operator
private or public organization authorized to design, construct and/or operate and maintain the gas infrastructure

3.1.6
pipework
assembly of pipes and fittings

3.1.7
pipeline
system of pipework with all associated equipment and stations up to the point of delivery

Note 1 to entry: This pipework is mainly below ground but includes also aboveground parts.

3.1.8
point of delivery
point of a gas network where the gas is transferred to the user

Note 1 to entry: This can be at a means of isolation (e.g. at the outlet of a LPG storage vessel) or at a meter connection.

Note 2 to entry: For this European Standard, the point of delivery is typically nominated by the distribution system operator and may be defined in National Regulations or Codes of Practice.

3.1.9
strength test
specific procedure to verify that the pipework and/or station meets the requirements for mechanical strength

3.1.10
tightness test
specific procedure to verify that the pipework and/or station meets the requirements for tightness

3.1.11
combined test
specific procedure to verify that the pipework and/or station meets the requirements for mechanical strength and tightness

3.1.12
lower explosive limit
LEL
concentration of flammable gas or vapour in air, below which the gas atmosphere is not explosive

3.1.13
commissioning
activities required to pressurise pipework, stations, equipment and assemblies with gas and to put them into operation

3.1.14
decommissioning
activities required to take out of service any pipework, station, equipment or assemblies filled with gas and to disconnect them from the system

3.1.15
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 to entry: A distinction is made between the following methods:

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

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

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

3.2 Pressure related terminology

3.2.1
design pressure
DP
pressure on which design calculations are based

3.2.2
operating pressure
OP
pressure which occurs within a system under normal operating conditions

3.2.3
maximum operating pressure
MOP
maximum pressure at which a system can be operated continuously under normal operating conditions

Note 1 to entry: Normal operating conditions are: no fault in any device or stream.

3.2.4
maximum incidental pressure
MIP
maximum pressure which a system can experience during a short time, limited by the safety devices

4 Pressure testing

4.1 General

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

4.1.2 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 be carried out after the strength test, can be below the MIP of the system. The tightness test pressure shall be at least the operating pressure 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.

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

4.1.3 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 infrastructure;

— leak detection methods;

— release of test medium;

— disposal of water.

4.1.4 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 infrastructures (see Annex B).

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

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

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

EXAMPLE Polyethylene.

4.1.8 The pressure level shall be verified using pressure measurement equipment of minimum accuracy class 0,6 with a maximum measurement range between 1,1 to 1,5 times the test pressure. A recording device of accuracy 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 °C.

4.1.9 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.

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

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

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

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

4.1.14 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, where deemed necessary.

4.1.15 Only work related to the pressure test shall be carried out on the test section.

4.1.16 Pressure testing should not be carried out against closed valves.

NOTE Valves in the closed position should not be assumed to be leak tight.

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

4.1.18 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 European 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	