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Infrastruktura za plin - Cevovodni sistemi za najvišji delovni tlak do vključno 16 bar - 4. del: Posebne funkcionalne zahteve za obnovo

Gas infrastructure - Pipelines for maximum operating pressure up to and including 16 bar - Part 4: Specific functional requirements for renovation

Gasinfrastruktur - Rohrleitungen mit einem maximal zulässigen Betriebsdruck bis einschließlich 16 bar - Teil 4: Spezifische funktionale Anforderungen für die Sanierung

Infrastructures gazières - Canalisations pour pression maximale de service inférieure ou égale à 16 bar - Partie 4: Recommandations fonctionnelles spécifiques pour la rénovation

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Gas infrastructure - Pipelines for maximum operating pressure up to and including 16 bar - Part 4: Specific functional requirements for renovation

Infrastructures gazières - Canalisations pour pression maximale de service inférieure ou égale à 16 bar - Partie 4: Prescriptions fonctionnelles spécifiques pour la rénovation

Gasinfrastruktur - Rohrleitungen mit einem maximal zulässigen Betriebsdruck bis einschließlich 16 bar - Teil 4: Spezifische funktionale Anforderungen für die Sanierung

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Foreword

This document (EN 12007-4:2012) 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of an identical text or by endorsement, at the latest by February 2013, and conflicting national standards shall be withdrawn at the latest by February 2013.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 12007-4:2000.

Annex J provides details of significant technical changes between this European Standard and the previous edition.

EN 12007 *Gas infrastructure — Pipelines for maximum operating pressure up to and including 16 bar* consists of the following parts:

Part 1: General functional requirements

Part 2: Specific functional requirements for polyethylene (MOP up to and including 10 bar)

Part 3: Specific functional requirements for steel

Part 4: Specific functional requirements for renovation

Part 5: Specific functional recommendations of new service lines[1]

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.

[1] To be published.

1 Scope

This European Standard describes specific functional requirements for the renovation of pipework in existing gas infrastructures. This European Standard is intended to be applied with the requirements of EN 12007-1.

This European Standard does not apply to pipework in above ground installations.

This European Standard covers the various renovation technologies for gas piping in the range of sizes covering gas mains and gas service lines and is intended to be applied in association with EN 12007-1. Certain pipe networks originally for other purposes can be considered for renovation technologies to make them suitable for gas infrastructure.

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 takes 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 12007-1, *Gas infrastructure — Pipelines for maximum operating pressure up to and including 16 bar — Part 1: General functional recommendations*

EN 12007-2, *Gas infrastructure — Pipelines for maximum operating pressure up to and including 16 bar — Part 2: Specific functional recommendations for polyethylene (MOP up to and including 10 bar)*

EN 12007-3, *Gas supply systems — Pipelines for maximum operating pressure up to and including 16 bar — Part 3: Specific functional recommendations for steel*

EN 12327, *Gas infrastructure — Pressure testing, commissioning and decommissioning procedures — Functional requirements*

3 Terms and definitions

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

3.1
gas infrastructure
pipeline systems including pipework and their associated stations or plants for the transmission and distribution of gas

3.2
pipeline operator
private or public organization authorized to design, construct and/or operate and maintain the gas infrastructure

3.3
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 country.

3.4
gas main
pipework in a gas infrastructure to which service lines are connected

3.5
pipework
assembly of pipes and fittings

3.6
station
plant or facility for the operation and/or processing of gas infrastructures

3.7
service line transfer
act of switching over the service line connection from the old pipe to the new one

3.8
pressure uprating
activities pertaining to the increase of the operating pressure beyond the existing maximum operating pressure level of a gas infrastructure

3.9
commissioning
activities required to pressurize pipework, stations, equipment and assemblies with the gas and to put them into operation

3.10
decommissioning
activities required to take out of service any pipework, stations, equipment and assemblies filled with gas and to disconnect them from the system

3.11
renovation
method by which the characteristics of the gas infrastructure are improved by re-using the existing structure or installing a new structure in its place

3.12
carrier pipe
existing pipework in which a renovation system is installed

Note 1 to entry: The carrier pipe can be either a conduit pipe or a support pipe.

3.13
support pipe
existing pipe which remains the gas carrying pipe and remains a structural integral part of the pressure system after lining

3.14
sleeve
purposely installed length of protective pipe through which a gas pipe passes

3.15
conduit pipe
pipe through which a gas pipe is inserted without necessarily providing support

3.16
annular space
space enclosed between the carrier pipe and the new pipe when the latter is inserted inside

3.17
close fit
after reshaping and relaxation, outer surface of the inserted pipe is in close contact with the internal surface of the old pipe

4 Design

4.1 General

Choice of renovation techniques to be used on pipework, up to and including 16 bar, shall be made by a competent person.

The selection of materials, dimensions and assembling techniques shall be the responsibility of the pipeline operator and comply with EN 12007-1.

Further guidance on the design of polyethylene (PE) pipelines of gas infrastructure is given in EN 12007-2.

Further guidance on the design of steel pipelines of gas infrastructure is given in EN 12007-3.

The uprating of renovated systems is the responsibility of the pipeline operator and shall conform to the relevant procedure. The Maximum Operating Pressure (*MOP*) of a renovated system shall be limited by the weakest point of the system.

4.2 Pressure uprating

Renovation of a gas infrastructure can be a part of a strategy plan for uprating the maximum operating pressure. Some renovation techniques lead to a reduction in diameter of the pipe, so that an increase in pressure is required to maintain the flow capacity of the system.

Up rating of *MOP* is the responsibility of the pipeline operator. The pipeline operator shall ensure that all pipeline components are capable of withstanding, in strength and tightness, the new pressure level.

4.3 Selection of renovation technique

The following factors shall be considered when selecting a renovation technique. These include but are not limited to:

— the future structure of the distribution network;

— the pressure level at which the pipework will operate after renovation;

— the required capacity of the pipework;

— the number of gas service lines connected to the section of pipework;

— the presence and number of branches, bends, valves;

— the current condition of the pipework to be renovated;

— the position of the pipework;

EXAMPLE 1 The covering depth of the pipework.

EXAMPLE 2 Disruption to traffic and pedestrians.

EXAMPLE 3 The location of adjacent plant.

EXAMPLE 4 Areas sensitive to break phenomena.

— the number, type and condition of pipe joints in the section of pipework;

— any supply obligations to consumers during and after renovation works.

NOTE 1 There is a range of renovation techniques use. These are described generally in Annex A. Annex A does not represent an exhaustive list of available techniques.

NOTE 2 The advantages and disadvantages of the techniques described in Annex A are outlined in Annex B. Further details of the different techniques are given in Annexes C to Annex I.

4.4 Consultation with third parties

When planning works on gas infrastructure, there should be communication with the owners of other plant and street authorities near the gas infrastructure. Any relevant information on the presence of any adjacent plant required to plan the intended works should be collected from these parties.

Further guidance is given in EN 12007-1.

5 Construction

5.1 General

Pipework shall only be laid or renovated by competent persons working to the specification provided by the pipeline operator and/or pipework manufacturer. General guidance on the construction of gas infrastructures up to and including 16 bar is given in EN 12007-1. Specific guidance is given in EN 12007-2 for polyethylene pipelines and in EN 12007-3 for steel pipelines.

A detailed procedure for the successive steps of the works should be made. Each technique has its specific considerations which are mentioned in the Annex C to Annex I.

Where, as a requirement of the renovation technique, it is necessary to raise the temperature of polyethylene pipe, the pipe temperature shall not exceed the maximum allowable temperature stated by the pipe manufacturer.

The safety of personnel engaged on gas supply works, and of members of the public shall be ensured during the whole period of the works. Considerations shall be given to the needs of the elderly or disabled.

Before assembly and laying parts of gas infrastructures the condition of all pipes and fittings shall be checked for conformity. Existing pipework should be checked for unwanted obstructions or blockages.

The construction of gas infrastructures should be organized so that the impact on the environment during construction is reduced to the minimum practicable level. Further guidance on environmental considerations is given in EN 12007-1.

Lubricants used to aid renovation by pipe insertion shall not have a detrimental effect on the existing or inserted pipe.

5.2 Disconnection/reconnection of sections of the gas infrastructure

Where it is necessary to disconnect a section of the gas infrastructure to undertake renovation works, care shall be taken to ensure that supplies in the other parts of the existing gas infrastructure are not adversely affected.

Care shall be taken to identify all service lines supplied from the section of gas main to be disconnected and consideration shall be given to the renovation of these service lines.

The pipes and fittings shall be correctly stored, handled and transported to ensure continued fitness for purpose as required in EN 12007-1, EN 12007-2 and EN 12007-3.

5.3 Excavation and no dig techniques

The position and size of excavations shall be determined taking into account the covering depth of the pipework to be renovated, the diameter of the new pipe and other factors which can affect the insertion process.

EXAMPLE 1 The proximity of other buried plant.

EXAMPLE 2 The length of the new section of pipe.

EXAMPLE 3 The position of service lines to be transferred.

Consultation should take place with other utilities before undertaking excavation work, so that adequate measures for the protection of other pipework, cables and underground constructions can be agreed.

The competent person on site should ensure that the most appropriate information on the location of existing gas supply pipework and other utility plant are available on site. The competent person should ensure that safe digging practices are followed at all times.

Adequate provision should be made for the effective temporary support of pipework, cables, and other apparatus during the progress of the work, and for their permanent support where the ground has been disturbed.

Further guidance on the precautions to be taken when excavating is given in EN 12007-1.

Excavations created in the process of renovating gas infrastructures shall be suitably backfilled and surface features such as roads and footways shall be reinstated according to standards agreed within the Member Countries.

5.4 Laying

5.4.1 Laying of pipework

Any new pipe installed shall be laid in accordance with the specific guidance if appropriate given in EN 12007-2 for polyethylene pipelines and in EN 12007-3 for steel pipelines. Further general guidance is given in EN 12007-1.

5.4.2 Cleaning of carrier pipe

When the carrier pipe contains quantities of dust, pitch or other contaminates which could affect the renovation process, consideration should be given to pipe cleaning. Pipe cleaning can be achieved by either mechanical, hydraulic or pneumatic means.

NOTE In certain renovation techniques the condition of the internal bore of the carrier pipe is a major factor in determining whether the technique can be successfully applied.

EXAMPLE Close-fit lining.

During any pipe cleaning care should be taken to:

- minimize any damage to the environment;
- the presence of pyrophoric dust;
- dispose waste material in accordance with national or local legislation.

5.4.3 Inspection of the pipework to be renovated

Where renovation techniques use the pipe as carrier pipe, it should be inspected internally prior to introduction of the new pipe, in order to locate possible obstructions and deficiencies which can damage or have otherwise detrimental effects on the new pipe or block the passage.

The inspection may be carried out with a camera.

6 Pressure testing

Pressure testing procedures to prove the integrity of renovated gas mains and service lines shall be selected from EN 12327.

The pressure testing shall be carried out in accordance with minimum test pressure levels given in EN 12007-1.

General guidance is given in EN 12007-1. Further guidance for polyethylene systems is given in EN 12007-2.

Where a tightness test cannot be carried out, for example joint repairs carried out under live conditions at operating pressure, the pipeline operator shall specify the test method.

7 Service line transfer

Service line transfer shall be carried out in accordance with the specifications given by the pipeline operator and the technical requirements of the renovation technique. A strength test, a tightness test or a combined test shall be carried out on the renovated service line and/or connection between service line and gas main before commissioning the service line. These tests shall be in accordance with EN 12327.

If, for technical reasons, pressure testing of the service line pipework is not completed prior to connection it shall be tested at the same time as the new section of pipeline.

8 Commissioning and decommissioning

Commissioning and decommissioning shall be carried out in accordance with EN 12327. General guidance is given in EN 12007-1.