SLOVENSKI STANDARD
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Sistemi oskrbe s plinom - Cevovodni sistemi za najvišji delovni tlak do vključno 16 bar - 4. del: Posebna funkcionalna priporočila za obnovo

Gas supply systems - Pipelines for maximum operating pressure up to and including 16 bar - Part 4: Specific functional recommendations for renovation

Gasversorgungssysteme - Rohrleitungen mit einem maximal zulässigen Betriebsdruck bis einschließlich 16 bar - Teil 4: Besondere funktionale Empfehlungen für die Sanierung

Systemes d'alimentation en gaz - Canalisations pour pression maximale de service inférieure ou égale a 16 bar - Partie 4: Recommandations fonctionnelles spécifiques pour la rénovation

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Gas supply systems — Pipelines for maximum operating pressure up to and including 16 bar — Part 4: Specific functional recommendations for renovation

Systèmes d'alimentation en gaz — Canalisations pour pression maximale de service inférieure ou égale à 16 bar — Partie 4: Recommendations fonctionnelles spécifiques pour la rénovation

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This European Standard was approved by CEN on 9 April 1999.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists 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 Central Secretariat has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Central Secretariat: rue de Stassart, 36 B-1050 Brussels

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 234 "Gas supply", 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 July 2000, and conflicting national standards shall be withdrawn at the latest by July 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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

There is a complete suite of functional standards prepared by CEN/TC 234 "Gas supply" to cover all parts of the gas supply system from the input of gas to the transmission system up to the inlet connection of the gas appliances, whether for domestic, commercial or industrial purposes.

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 high standards of gas engineering and the specific requirements imposed by the legal structures of the member countries.

For the materials used in association with this standard, reference shall be made to the standards of CEN/TC 155 "Plastics piping and ducting systems" for plastic materials and to relevant EN standards for other materials.

1 Scope

This European Standard describes specific functional recommendations for the renovation of pipeworks existing in gas supply systems and includes some requirements for materials other than plastics covered by CEN/TC 155 "Plastics piping and ducting systems". This European Standard is intended to be applied in association with EN 12007-1.

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

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 basic principles.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 12007-1	Gas supply systems - Pipelines for maximum operating pressure up to and including 16 bar - Part 1: General functional recommendations
EN 12007-2	Gas supply systems - 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 supply systems - Pressure testing, commissioning and decommissioning procedures - Functional requirements

3 Definitions

For the purposes of this standard, the following definitions apply:

3.1 gas supply system: The pipeline systems including pipework and their associated stations or plants for the transmission and distribution of gas.

3.2 pipeline operator: The private or public organization authorized to design, construct and/or operate and maintain the gas supply system.

3.3 competent person: A 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 country.

3.4 main: A pipework in a gas supply system to which service lines are connected.

3.5 pipework: An assembly of pipes and fittings.

3.6 station: A plant or facility for the operation and/or processing of gas supply systems.

3.7 service line transfer: The act of switching over the service pipe 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 supply system.

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

3.10 decommissioning: The 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: A method by which the characteristics of the gas supply system are improved by re-using the existing structure or installing a new structure in its place.

3.12 carrier pipe: An existing pipe in which a renovation system is installed.

NOTE: The carrier pipe can be either a conduit pipe or a support pipe.

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

3.14 sleeve: A length of protective pipe through which a gas pipe passes.

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

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

3.17 close fit: After reshaping and relaxation, the 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 pipeworks, 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 pipelines (PE) of gas supply systems is given in of EN 12007-2.

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

The uprating of renovated systems is the responsibility of the pipeline operator and should 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 supply system 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.

Uprating of MOP is under the responsibility of the pipeline operator and he shall ensure that all pipeline components can withstand in strength and tightness the new pressure level.

4.3 Selection of renovation technique

The following factors should 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 are a range of renovation techniques which can be used. These are described generallyin annex A. This annex 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 J.

4.4 Consultation with third parties

When planning works on gas supply systems there should be communication with the owners of other plant and street authorities near the gas supply system. 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 supply systems up to and including 16 bar is given in EN 12007-1. Specific guidance are given in EN 12007-2 for polyethylene pipelines and in EN 12007-3 for steel pipelines.

A detailed procedure of the successive steps of the works should be made. Each technique has its specific considerations which are mentionned in the annexes C to J.

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 supply systems 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 supply systems 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 detremental effect on the existing or inserted pipe.

5.2 Disconnection/Reconnection of sections of the gas supply system

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

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

For transportation, storage, handling of materials and equipment and for limiting interference from external causes, EN 12007-1 shall be considered.

5.3 Excavation/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 shall 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 shall ensure that the most appropriate information on the location of existing gas supply pipework and other utility plant are available on site. He 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 supply systems 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 or 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;

- to the presence of pyrophoric dust;

- to dispose waste material in accordance with national or local legislation.

5.4.3 Inspection of the pipework to be renovated

In case of renovation techniques which 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 can be carried out with a camera.

6 Pressure testing

Pressure testing procedures to prove the integrity of renovated 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.

EXAMPLE: Leakage survey

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 main before commissioning the service line. These tests shall be in accordance with EN 12327.

If, for technical reasons, pressure testing of the service pipework is not completed prior to connection it should 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.

9 Record system

The requirements for the establishment and maintenance of a record system for gas supply systems are given in EN 12007-1. The pipeline operator shall ensure that appropriate details of renovated pipework are included within this record system. The following data shall at least be included in the record system:

- type of pipes, diameters and lengths;
- the date of execution of the renovation;
- the technique used for the renovation;
- the presence and type of carrier pipe.

Annex A (informative)

Chart of renovation techniques