

Gaasi infrastruktuur. Üle 0,5 bar töö rõhuga tööstuslike gaasipaigaldiste torustikud ning tööstuslike ja mittetööstuslike üle 5 bar töö rõhuga paigaldiste torustikud. Osa 1: Üksikasjalikud talitluslikud nõuded projekteerimisele, materjalidele, ehitamisele, ülevaatusele ja katsetamisele

Gas Infrastructure - Gas installation pipework with an operating pressure greater than 0,5 bar for industrial installations and greater than 5 bar for industrial and non-industrial installations - Part 1: Detailed functional requirements for design, materials, construction, inspection and testing

EESTI STANDARDI EESSÕNA**NATIONAL FOREWORD**

<p>Käesolev Eesti standard EVS-EN 15001-1:2009 sisaldab Euroopa standardi EN 15001-1:2009 ingliskeelset teksti.</p>	<p>This Estonian standard EVS-EN 15001-1:2009 consists of the English text of the European standard EN 15001-1:2009.</p>
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English Version

Gas Infrastructure - Gas installation pipework with an operating pressure greater than 0,5 bar for industrial installations and greater than 5 bar for industrial and non-industrial installations - Part 1: Detailed functional requirements for design, materials, construction, inspection and testing

Infrastructures gazières - Canalisations d'installations de gaz avec une pression de service supérieure à 0,5 bar pour les installations industrielles et supérieures à 5 bar pour les installations industrielles et non industrielles (domestiques et commerciales) - Partie 1: Exigences fonctionnelles détaillées relative à la conception, aux matériaux, à la construction, à l'inspection et aux essais

Gasinfrastruktur - Gas-Leitungsanlagen mit einem Betriebsdruck größer 0,5 bar für industrielle Installationen und größer 5 bar für industrielle und nicht-industrielle Installationen - Teil 1: Detaillierte funktionale Anforderungen an Planung, Material, Bau, Inspektion und Prüfung

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Foreword

This document (EN 15001-1:2009) 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of an identical text or by endorsement, at the latest by January 2010, and conflicting national standards shall be withdrawn at the latest by January 2010.

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.

Annexes A to D are informative.

The normative Annex E of this document lists some suitable materials for pipework, in addition to the materials listed in Clause 5.

This standard includes requirements concerning current design practice and reflects the state of the art at the time of publication. It provides clear solutions for users of the standard. Other design solutions and construction materials, as well as new developments, may be used if equal or greater safety than that required by this EN can be demonstrated or established.

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 input of gas to the transmission system up to the inlet connection of the gas appliances, whether for residential, 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 recognised standards of gas engineering and the specific requirements imposed by the legal structures of the member countries.

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, 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 the United Kingdom.

1 Scope

This European Standard specifies detailed functional requirements for the design, selection of materials, construction, inspection and testing of

- industrial gas installation pipework and assemblies with an operating pressure greater than 0,5 bar, and
- non-industrial gas installation pipework (residential and commercial) with an operating pressure greater than 5 bar in buildings,

starting from the outlet of the network operator's point of delivery up to the inlet connection to the gas appliance; normally the inlet isolation valve. This standard also covers the inlet connection to the gas appliance comprising of the pipework that does not fall within the scope of the appliance standard.

NOTE The use of the term installation and pipework is interchangeable.

This standard applies to gas installations operating at ambient temperatures between - 20 °C and 40 °C and operating pressures up to and including 60 bar. For operating conditions outside these limitations, reference should additionally be made to EN 13480 for metallic pipework.

For industrial gas installations up to and including 0,5 bar and for non-industrial (residential and commercial) gas installations up to and including 5 bar in buildings, EN 1775 applies.

For gas installations that do not fall within the scope of EN 1775 or other European Standards, this standard applies.

In this standard, the term "gas" refers to combustible gases, which are gaseous at 15 °C and 1 013 mbar absolute atmospheric pressure (normal conditions). These gases are commonly referred to as manufactured gas, natural gas or Liquefied Petroleum Gas (LPG). They are also referred to as first, second or third family gases (see Table 1 of EN 437:2003). The given values are considered as normal conditions for all volumes given in this standard.

LPG storage vessels (including all ancillaries fitted directly to storage vessels) are excluded. Also excluded are LPG installations and sections of LPG installations operating at vapour pressure in the liquid state (e.g. between the storage vessel and any pressure regulator).

In this standard, all pressures are gauge pressures unless otherwise stated.

This standard has been harmonised to address the essential safety requirements of the Pressure Equipment Directive (PED, 97/23/EC) relevant for the joining of gas installation pipework (assemblies) falling within the scope of the PED. These are listed in Annex ZA. However, "this Directive does not cover the assembly of pressure equipment on the site and under the responsibility of the user, as in the case of industrial installations" (PED, Preamble, 5th recital, last paragraph).

Although in this respect, the standard takes into account the essential safety requirements of the PED, no inference can be drawn from this as to whether or not the installation or parts of the installation falls within the scope of the PED. Reference should be made to the PED and national legislation.

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 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 standard, the national legislation/regulation shall take precedence as illustrated in CR 13737.

This provision does not apply to requirements that are harmonised to directive 97/23/EC (see Annex ZA).

This CR 13737 gives:

- clarification of all legislations/regulations applicable in a country;
- if appropriate, more restrictive national requirements thereof;
- a national contact point for the latest information.

Functional requirements for commissioning, operation and maintenance of industrial gas installations and assemblies with an operating pressure greater than 0,5 bar and of gas installations greater than 5 bar in buildings and areas intended for non-industrial installations greater than 5 bar are described in EN 15001-2.

Generally, additional safety precautions may be necessary where non-odorized gas is used. For non industrial purposes, the gas should be odorized.

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 287-1, *Qualification test of welders — Fusion welding — Part 1: Steels*

EN 331:1998, *Manually operated ball valves and closed bottom taper plug valves for gas installations for buildings*

EN 334:2005, *Gas pressure regulators for inlet pressures up to 100 bar*

EN 571-1, *Non destructive testing — Penetrant testing — Part 1: General principles*

EN 583-1:1998, *Non-destructive testing — Ultrasonic examination — Part 1: General principles*

EN 751-1:1996, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 1: Anaerobic jointing compounds*

EN 751-2:1996, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 2: Non-hardening jointing compounds*

EN 751-3:1996, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 3: Unsintered PTFE tapes*

EN 764-5:2002, *Pressure equipment — Part 5: Compliance and Inspection Documentation of Materials*

EN 970:1997, *Non-destructive examination of fusion welds — Visual examination*

EN 1044:1999, *Brazing — Filler metals*

EN 1057:2006, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*

EN 1092-1:2007, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges*

EN 1092-3:2003, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 3: Copper alloy flanges*

EN 1254-1:1998, *Copper and copper alloys — Plumbing fittings — Part 1: Fittings with ends for capillary soldering or capillary brazing to copper tubes*

EN 1254-2:1998, *Copper and copper alloys — Plumbing fittings — Part 2: Fittings with compression ends for use with copper tubes*

EN 1254-5:1998, *Copper and copper alloys — Plumbing fittings — Part 5: Fittings with short ends for capillary brazing to copper tubes*

EN 1290, *Non-destructive examination of welds — Magnetic particle examination of welds*

EN 1435:1997, *Non-destructive examination of welds — Radiographic examination of welded joints*

EN 1514-1:1997, *Flanges and their joints — Dimensions of gaskets for PN-designated flanges — Part 1: Non-metallic flat gaskets with or without inserts*

- EN 1514-2:2005, *Flanges and their joints — Gaskets for PN-designated flanges — Part 2: Spiral wound gaskets for use with steel flanges*
- EN 1515-1:1999, *Flanges and their joints — Bolting — Part 1: Selection of bolting*
- EN 1515-2:2001, *Flanges and their joints — Bolting — Part 2: Classification of bolt materials for steel flanges, PN designated*
- EN 1555-1:2002, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 1: General*
- EN 1555-2:2002, *Plastics piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 2: Pipes*
- EN 1555-3:2002, *Plastic piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 3: Fittings*
- EN 1555-4:2002, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) — Part 4: Valves*
- EN 1555-5:2002, *Plastic piping systems for the supply of gaseous fuels — Polyethylene (PE) — Part 5: Fitness for purpose of the system*
- EN 1563:1997, *Founding — Spheroidal graphite cast irons*
- EN 1594:2009, *Gas supply systems — Pipelines for maximum operating pressure over 16 bar — Functional requirements*
- EN 1714:1997, *Non-destructive examination of welds — Ultrasonic examination of welded joints*
- EN 1759-1:2004, *Flanges and their joint — Circular flanges for pipes, valves, fittings and accessories, Class designated - Part 1: Steel flanges, NPS 1/2 to 24*
- EN 1775:2007, *Gas supply- Gas pipework for buildings — Maximum operating pressure less than or equal to 5 bar — Functional recommendations*
- EN 10002-1, *Metallic materials — Tensile testing — Part 1: Method of test at ambient temperature*
- EN 10045-1:1990, *Metallic materials — Charpy impact test — Part 1: Test method*
- EN 10087:1998, *Free-cutting steels — Technical delivery conditions for semi-finished products, hot-rolled bars and rods*
- EN 10088-1:2005, *Stainless steels — Part 1: List of stainless steels*
- EN 10088-3:2005, *Stainless steels — Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes*
- EN 10204:2004, *Metallic products — Types of inspection documents*
- EN 10208-1:2009, *Steel pipes for pipelines for combustible fluids — Technical delivery conditions — Part 1: Pipes of requirement class A*
- EN 10208-2, *Steel pipes for pipe lines for combustible fluids — Technical delivery conditions — Part 2: Pipes of requirement class B*
- EN 10216-1:2002, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 1: Non-alloy steel tubes with specified room temperature properties*

- EN 10216-5:2004, *Seamless steel tubes for pressure purpose — Technical delivery conditions — Part 5: Stainless steel tubes*
- EN 10217-1:2002, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 1: Non-alloy steel tubes with specified room temperature properties*
- EN 10217-7:2005, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 7: Stainless steel tubes*
- EN 10220:2002, *Seamless and welded steel tubes — Dimensions and masses per unit length*
- EN 10226-1:2004, *Pipe threads where pressure tight joints are made on the threads — Part 1: Taper external threads and parallel internal threads — Dimensions, tolerances and designation*
- EN 10240:1997, *Internal and/or external protective coatings for steel tubes — Specification for hot dip galvanized coatings applied in automatic plants*
- EN 10253-2:2007, *Butt-welding pipe fittings — Part 2: Non alloy and ferritic alloy steels with specific inspection requirements*
- EN 10255:2004, *Non-alloy steel tubes suitable for welding and threading — Technical delivery conditions*
- EN 10289:2002, *Steel tubes and fittings for onshore and offshore pipelines — External liquid applied epoxy and epoxy-modified coatings*
- EN 10290:2002, *Steel tubes and fittings for onshore and offshore pipelines — External liquid applied polyurethane and polyurethane-modified coatings*
- EN 12007-2:2000, *Gas supply systems — Gas 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 12007-3:2000, *Gas supply systems — Pipelines for maximum operating pressure up to and including 16 bar — Part 3: Specific functional recommendations for steel*
- EN 12068:1998, *Cathodic protection — External organic coatings for the corrosion protection of buried or immersed steel pipelines used in conjunction with cathodic protection — Tapes and shrinkable materials*
- EN 12186:2000, *Gas supply systems — Gas pressure regulating stations for transmission and distribution — Functional requirements*
- EN 12266-1:2003, *Industrial valves — Testing of valves — Part 1: Pressure tests, test procedures and acceptance criteria - Mandatory requirements*
- EN 12279:2000, *Gas supply systems — Gas pressure regulating installations on service lines — Functional requirements*
- EN 12327:2000, *Gas supply systems — Pressure testing, commissioning and decommissioning procedures — Functional requirements*
- EN 12560-1:2001, *Flanges and their joints — Gaskets for Class-designated flanges — Part 1: Non-metallic flat gaskets with or without inserts*
- EN 12560-2:2001, *Flanges and their joints — Gaskets for Class-designated flanges — Part 2: Spiral wound gaskets for use with steel flanges*
- EN 12732:2000, *Gas supply systems — Welding steel pipework — Functional requirements*
- EN 12799:2000, *Brazing — Non-destructive examination of brazed joints*

- EN 12954:2001, *Cathodic protection of buried or immersed metallic structures — General principles and application for pipelines*
- EN 13100-1:1999, *Non destructive testing of welded joints of thermoplastics semi-finished products — Part 1: Visual examination*
- EN 13134:2000, *Brazing — Procedure approval*
- EN 13445-6, *Unfired pressure vessels — Part 6: Requirements for the design and fabrication of pressure vessels and pressure parts constructed from spheroidal graphite cast iron*
- EN 13480-2:2002, *Metallic industrial piping — Part 2: Materials*
- EN 13480-3:2002, *Metallic industrial piping — Part 3: Design and calculation*
- EN 13480-5:2002, *Metallic industrial piping — Part 5: Inspection and testing*
- EN 13480-6:2004, *Metallic industrial piping — Part 6: Additional requirements for buried piping*
- EN 13774:2003, *Valves for gas distribution systems with maximum operating pressure less than or equal to 16 bar — Performance requirements*
- EN 13785:2005, *Regulators with a capacity of up to and including 100 kg/h, having a maximum nominal outlet pressure of up to and including 4 bar, other than those covered by EN 12864 and their associated safety devices for butane, propane or their mixtures*
- EN 13786:2004, *Automatic change-over valves having a maximum outlet pressure of up to and including 4 bar with a capacity of up to and including 100 kg/h, and their associated safety devices for butane, propane or their mixtures*
- EN 14141:2003, *Valves for natural gas transportation in pipelines — Performance requirements and tests*
- EN 14291:2004, *Foam producing solutions for leak detection on gas installations*
- EN 14382:2005, *Safety devices for gas pressure regulating stations and installations — Gas safety shut-off devices for inlet pressures up to 100 bar*
- EN 20898-2:1993, *Mechanical properties of fasteners — Part 2: Nuts with specified proof load values — Coarse thread (ISO 898-2:1992)*
- EN 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*
- EN 60079-10:2003, *Electrical apparatus for explosive gas atmospheres — Part 10: Classification of hazardous areas (IEC 60079-10:2002)*
- EN 60079-14, *Explosive atmospheres — Part 14: Electrical installations design, selection and erection (IEC 60079-14:2007)*
- EN ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*
- EN ISO 898-1:2009, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread (ISO 898-1:2009)*
- EN ISO 3506-1:1997, *Mechanical properties of corrosion-resistant stainless-steel fasteners — Part 1: Bolts, screws and studs (ISO 3506-1:1997)*

EN ISO 3506-2:1997, *Mechanical properties of corrosion-resistant stainless-steel fasteners — Part 2: Nuts* (ISO 3506-2:1997)

EN ISO 5817, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections* (ISO 5817:2003, corrected version:2005, including Technical Corrigendum 1:2006)

EN ISO 10380:2003, *Pipework — Corrugated metal hoses and hose assemblies* (ISO 10380:2003)

EN ISO 10806:2003, *Pipework — Fittings for corrugated metal hoses* (ISO 10806:2003)

EN ISO 12944-1:1998, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 1: General introduction* (ISO 12944-1:1998)

EN ISO 15607:2003, *Specification and qualification of welding procedures for metallic materials — General rules* (ISO 15607:2003)

EN ISO 15609-1:2004, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding* (ISO 15609-1:2004)

EN ISO 15610:2003, *Specification and qualification of welding procedures for metallic materials — Qualification based on tested welding consumables* (ISO 15610:2003)

EN ISO 15612:2004, *Specification and qualification of welding procedures for metallic materials — Qualification by adoption for a standard welding procedure* (ISO 15612:2004)

EN ISO 15614-1:2004, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys* (ISO 15614-1:2004)

ISO 9329-2, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 2: Unalloyed and alloyed steels with specified elevated temperature properties*

ISO 15348, *Pipework — Metal bellows expansion joints — General*