ICS 23.040.01 SLOVENSKÁ TECHNICKÁ NORMA Január 2024

STN	**Plynárenská infraštruktúra Plynovody s prevádzkovým tlakom väčším ako 0,5 bar pre priemyselné rozvody plynu a väčším ako 5 bar pre priemyselné a nepriemyselné rozvody plynu Časť 1: Podrobné funkčné požiadavky na navrhovanie, materiály, výstavbu, kontrolu a skúšanie**	**STN EN 15001-1** 38 6429

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

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 12/23

Obsahuje: EN 15001-1:2023

Oznámením tejto normy sa ruší
STN EN 15001-1 (38 6429) z januára 2010

137908

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 15001-1

February 2023

ICS 23.040.01 Supersedes EN 15001-1:2009

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 supérieure à 5 bar pour les installations industrielles et non industrielles (domestiques et commerciales) - Partie 1 : Exigences fonctionnelles détaillées relatives à la conception, aux matériaux, à la construction, à l'inspection et aux essais

Gasinfrastruktur - Gasleitungsanlagen 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

This European Standard was approved by CEN on 9 October 2022.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Ref. No. EN 15001-1:2023 E

Contents

European foreword

This document (EN 15001-1:2023) 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 August 2023, and conflicting national standards shall be withdrawn at the latest by August 2023.

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

This document supersedes EN 15001-1:2009.

A list of the significant changes compared to EN 15001-1:2009 can be found in informative Annex E, Table E.1.

This document 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 document. Other design solutions and construction materials, as well as new developments, may be used if equal or greater safety than that required by this document can be demonstrated or established.

The scope of this revised document is extended with biomethane and vaporized LNG gases. This document is not designed for various mixtures of natural gas and hydrogen which may be allowed in the different member states.

With respect to hydrogen there are proposals to inject hydrogen (H2) from renewable sources into the natural gas network. Investigations have been conducted to evaluate the impact. According to EN 16726:2015+A1:2018 at present it is not possible to specify a limiting hydrogen value which would generally be valid for all parts of the European gas infrastructure.

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 document, 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.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of this document.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

1 Scope

This document 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 document also covers the pipework to the inlet connection of a gas appliance that is not included within the scope of the appliance standard.

Apart from the exceptions stated below, this document applies to gas installation pipework 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 is additionally made to EN 13480 (all parts) for metallic pipework.

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

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

In this document, 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 as classified in EN 437:2021, Table 1. The given values are considered as normal conditions for all volumes given in this document.

This document is applicable to gas installation pipework for the carriage of:

— processed, non-toxic and non-corrosive natural gas according to EN 437:2021 and EN 16726:2015+A1:2018 "Gas infrastructure — Quality of gas — Group H";

— biomethane, complying with EN 16723-1:2016;

— vaporized LNG.

NOTE The specification of vaporized LNG is equal to that of natural gas as classified in EN 437:2021.

This document does not cover pipework for hydrogen rich gases that fall outside the definitions within EN 437:2021.

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 or in the liquid state.

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

This document has been harmonized to address the essential safety requirements of the Pressure Equipment Directive (PED, 2014/68/EU [formerly 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 should not apply to the assembly of pressure equipment on the site and under the responsibility of a user who is not the manufacturer, as in the case of industrial installations." (PED, Preamble, 7th recital, last paragraph).

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

This document specifies common basic principles for gas supply systems. Users of this document are expected to be aware that more detailed national standards and/or code of practice may exist in the CEN member countries.

This document 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 document, the national legislation/regulation takes precedence as illustrated in CEN/TR 13737-1 and CEN/TR 13737-2.

This provision does not apply to requirements that are harmonized to directive 2014/68/EU (see Annex ZA).

CEN/TR 13737-1 and CEN/TR 13737-2 give:

— 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 installation pipework with an operating pressure greater than 0,5 bar and of gas installation pipework greater than 5 bar in buildings and areas intended for non-industrial installation pipework are described in EN 15001-2:2023.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 331:2015, *Manually operated ball valves and closed bottom taper plug valves for gas installations for buildings*

EN 334:2005+A1:2009, *Gas pressure regulators for inlet pressure up to 10 MPa (100 bar)*

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

EN 764-5:2014, *Pressure equipment - Part 5: Inspection documentation of metallic materials and compliance with the material specification*

[1] As impacted by EN 751-3:1996/AC:1997.

EN 1057:2006+A1:2010, *Copper and copper alloys - Seamless, round copper tubes for water and gas in sanitary and heating applications*

EN 1092-1:2018, *Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 1: Steel flanges*

EN 1092-2:1997, *Flanges and their joints - Circular flanges for pipes, valves, fittings and accessories, PN designated - Part 2: Cast iron flanges*

EN 1092-3:2003,[2] *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 3: Copper alloy flanges*

EN 1254-1:2021, *Copper and copper alloys - Plumbing fittings - Part 1: Capillary fittings for soldering or brazing to copper tubes*

EN 1254-2:2021, *Copper and copper alloys - Plumbing fittings - Part 2: Compression fittings for use with copper tubes*

EN 1254-3:2021, *Copper and copper alloys - Plumbing fittings - Part 3: Compression fittings for use with plastics and multilayer pipes*

EN 1254-4:2021, *Copper and copper alloys - Plumbing fittings - Part 4: Threaded fittings*

EN 1254-5:2021, *Copper and copper alloys - Plumbing fittings - Part 5: Capillary fittings with short ends for brazing to copper tubes*

EN 1254-6:2021, *Copper and copper alloys - Plumbing fittings - Part 6: Push-fit fittings for use with metallic tubes, plastics and multilayer pipes*

EN 1254-7:2021, *Copper and copper alloys - Plumbing fittings - Part 7: Press fittings for use with metallic tubes*

EN 1254-8:2021, *Copper and copper alloys - Plumbing fittings - Part 8: Press fittings for use with plastics and multilayer pipes*

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 1514-2:2014+A1:2021, *Flanges and their joints - Gaskets for PN-designated flanges - Part 2: Spiral wound gaskets for use with steel flanges*

EN 1515-4:2021, *Flanges and their joints - Bolting - Part 4: Selection of bolting for equipment subject to the Pressure Equipment Directive 2014/68/EU*

EN 1555-2:2021, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 2: Pipes*

EN 1555-3:2021, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 3: Fittings*

EN 1555-4:2021, *Plastics piping systems for the supply of gaseous fuels - Polyethylene (PE) - Part 4: Valves*

[2] As impacted by EN 1092-3:2003/AC:2007.

EN 1594:2013, *Gas infrastructure - Pipelines for maximum operating pressure over 16 bar - Functional requirements*

EN 1775:2007, *Gas supply - Gas pipework for buildings - Maximum operating pressure less than or equal to 5 bar - Functional recommendations*

EN ISO 683-4:2018, *Heat-treatable steels, alloy steels and free-cutting steels - Part 4: Free-cutting steels (ISO 683-4:2016)*

EN 10088-1:2014, *Stainless steels - Part 1: List of stainless steels*

EN 10088-3:2014, *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 10216-1:2013, *Seamless steel tubes for pressure purposes - Technical delivery conditions - Part 1: Non-alloy steel tubes with specified room temperature properties*

EN 10216-2:2013, *Seamless steel tubes for pressure purposes - Technical delivery conditions - Part 2: Non-alloy and alloy steel tubes with specified elevated temperature properties*

EN 10216-3:2013, *Seamless steel tubes for pressure purposes - Technical delivery conditions - Part 3: Alloy fine grain steel tubes*

EN 10216-5:2021, *Seamless steel tubes for pressure purposes - Technical delivery conditions - Part 5: Stainless steel tubes*

EN 10217-1:2019, *Welded steel tubes for pressure purposes - Technical delivery conditions - Part 1: Electric welded and submerged arc welded non-alloy steel tubes with specified room temperature properties*

EN 10217-2:2019, *Welded steel tubes for pressure purposes - Technical delivery conditions - Part 2: Electric welded non-alloy and alloy steel tubes with specified elevated temperature properties*

EN 10217-3:2019, *Welded steel tubes for pressure purposes - Technical delivery conditions - Part 3: Electric welded and submerged arc welded alloy fine grain steel tubes with specified room, elevated and low temperature properties*

EN 10217-5:2019, *Welded steel tubes for pressure purposes - Technical delivery conditions - Part 5: Submerged arc welded non-alloy and alloy steel tubes with specified elevated temperature properties*

EN 10217-7:2021, *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 10222-5:2017, *Steel forgings for pressure purposes - Part 5: Martensitic, austenitic and austenitic-ferritic stainless steels*

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 10226-2:2005, *Pipe threads where pressure tight joints are made on the threads - Part 2: Taper external threads and taper internal threads - Dimensions, tolerances and designation*

EN 10241:2000, *Steel threaded pipe fittings*

EN 10242:1994, *Threaded pipe fitting in malleable cast iron*

EN 10253-2:2007, *Butt-welding pipe fittings — Part 2: Non alloy and ferritic alloy steels with specific inspection requirements*

EN 10253-4:2008,[3] *Butt-welding pipe fittings — Part 4: Wrought austenitic and austenitic-ferritic (duplex) stainless steels with specific inspection requirements*

EN 10255:2004+A1:2007, *Non-Alloy steel tubes suitable for welding and threading - Technical delivery conditions*

EN 10269:2013, *Steels and nickel alloys for fasteners with specified elevated and/or low temperature properties*

prEN 10344:2006,[4] *Malleable cast iron fittings with compression ends for steel pipes*

EN 12007-2:2012, *Gas infrastructure - Pipelines for maximum operating pressure up to and including 16 bar - Part 2: Specific functional requirements for polyethylene (MOP up to and including 10 bar)*

EN 12007-3:2015, *Gas infrastructure - Pipelines for maximum operating pressure up to and including 16 bar - Part 3: Specific functional requirements for steel*

EN 12068:1998, *Cathodic protection - External organic coatings for the corrosion protection of burried or immersed steel pipelines used in conjunction with cathodic protection - Tapes and shrinkable materials*

EN 12186:2014, *Gas infrastructure - Gas pressure regulating stations for transmission and distribution - Functional requirements*

EN 12266-1:2012, *Industrial valves - Testing of metallic valves - Part 1: Pressure tests, test procedures and acceptance criteria - Mandatory requirements*

EN 12266-2:2012, *Industrial valves - Testing of metallic valves - Part 2: Tests, test procedures and acceptance criteria - Supplementary requirements*

EN 12279:2000,[5] *Gas supply systems — Gas pressure regulating installations on service lines — 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 12560-2:2013, *Flanges and their joints - Dimensions of gaskets for Class-designated flanges - Part 2: Spiral wound gaskets for use with steel flanges*

EN 12732:2021, *Gas infrastructure - Welding steel pipework - Functional requirements*

EN 12799:2000,[6] *Brazing — Non-destructive examination of brazed joints*

---

3 As impacted by EN 10253-4:2008/AC:2009.
4 At draft stage.
5 As impacted by EN 12279:2000/A1:2005.
6 As impacted by EN 12799:2000/A1:2003.

EN 12954:2019, *General principles of cathodic protection of buried or immersed onshore metallic structures*

EN 13100-1:2017, *Non destructive testing of welded joints of thermoplastics semi-finished products - Part 1: Visual examination*

EN 13134:2000, *Brazing - Procedure approval*

EN 13480-2:2017,[7] *Metallic industrial piping - Part 2: Materials*

EN 13480-3:2017,[8] *Metallic industrial piping — Part 3: Design and calculation*

EN 13480-4:2012,[9] *Metallic industrial piping - Part 4: Fabrication and installation*

EN 13480-6:2017, *Metallic industrial piping - Part 6: Additional requirements for buried piping*

EN 13774:2013, *Valves for gas distribution systems with maximum operating pressure less than or equal to 16 bar - Performance requirements*

EN 14141:2013, *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,[10] *Gas safety shut-off devices for inlet pressure up to 10 MPa (100 bar)*

EN 15001-2:2023, *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 2: Detailed functional requirements for commissioning, operation and maintenance*

EN 16129:2013, *Pressure regulators, automatic change-over devices, having a maximum regulated pressure of 4 bar, with a maximum capacity of 150 kg/h, associated safety devices and adaptors for butane, propane, and their mixtures*

EN 60079-14:2014,[11] *Explosive atmospheres — Part 14: Electrical installations design, selection and erection (IEC 60079-14:2013)*

EN 60529:1991,[12] *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN ISO 148-1:2016, *Metallic materials - Charpy pendulum impact test - Part 1: Test method (ISO 148-1:2016)*

EN ISO 228-1:2003, *Pipe threads where pressure-tight joints are not made on the threads - Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

---

7 As impacted by EN 13480-2:2017/A7:2020

8 As impacted by EN 13480-3:2017/A1:2020, EN 13480-3:2017/A2:2020 and EN 13480-3:2017/A3:2021.

9 As impacted by EN 13480-4:2012/A1:2013 and EN 13480-4:2012/A2:2015

10 As impacted by EN 14382:2005+A1:2009 and EN 14382:2005+A1:2009/AC:2009.

11 As impacted by EN 60079-14:2014/AC:2016.

12 As impacted by EN 60529:1991/A1:2000, EN 60529:1991/A2:2013, EN 60529:1991/corrigendum May 1993 and EN 60529:1991/AC:2016-12.

EN ISO 898-1:2013,[13] *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 — Technical Corrigendum 1 (ISO 898-1:2013)*

EN ISO 898-2:2012, *Mechanical properties of fasteners made of carbon steel and alloy steel - Part 2: Nuts with specified property classes - Coarse thread and fine pitch thread (ISO 898-2:2012)*

EN ISO 3183:2019, *Petroleum and natural gas industries - Steel pipe for pipeline transportation systems (ISO 3183:2019)*

EN ISO 3452-1:2021, *Non-destructive testing - Penetrant testing - Part 1: General principles (ISO 3452-1:2021)*

EN ISO 3506-1:2020, *Fasteners - Mechanical properties of corrosion-resistant stainless steel fasteners - Part 1: Bolts, screws and studs with specified grades and property classes (ISO 3506-1:2020)*

EN ISO 3506-2:2020, *Fasteners - Mechanical properties of corrosion-resistant stainless steel fasteners - Part 2: Nuts with specified grades and property classes (ISO 3506-2:2020)*

EN ISO 4014:2011, *Hexagon head bolts - Product grades A and B (ISO 4014:2011)*

EN ISO 4017:2014, *Fasteners - Hexagon head screws - Product grades A and B (ISO 4017:2014)*

EN ISO 4032:2012, *Hexagon regular nuts (style 1) - Product grades A and B (ISO 4032:2012)*

EN ISO 4033:2012, *Hexagon high nuts (style 2) - Product grades A and B (ISO 4033:2012)*

EN ISO 5817:2014, *Welding - Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) - Quality levels for imperfections (ISO 5817:2014)*

EN ISO 6520-1:2007, *Welding and allied processes - Classification of geometric imperfections in metallic materials - Part 1: Fusion welding (ISO 6520-1:2007)*

EN ISO 6892-1:2019, *Metallic materials - Tensile testing - Part 1: Method of test at room temperature (ISO 6892-1:2019)*

EN ISO 9606-1:2017, *Qualification testing of welders - Fusion welding - Part 1: Steels (ISO 9606-1:2012 including Cor 1:2012 and Cor 2:2013)*

EN ISO 9712:2012, *Non-destructive testing - Qualification and certification of NDT personnel (ISO 9712:2012)*

EN ISO 10380:2012, *Pipework - Corrugated metal hoses and hose assemblies (ISO 10380:2012)*

EN ISO 10675-1:2021, *Non-destructive testing of welds - Acceptance levels for radiographic testing - Part 1: Steel, nickel, titanium and their alloys (ISO 10675-1:2021)*

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

EN ISO 10863:2020, *Non-destructive testing of welds - Ultrasonic testing - Use of time-of-flight diffraction technique (TOFD) (ISO 10863:2020)*

[13] As impacted by EN ISO 898-1:2013/AC:2013.

EN ISO 10893-8:2011, *Non-destructive testing of steel tubes - Part 8: Automated ultrasonic testing of seamless and welded steel tubes for the detection of laminar imperfections (ISO 10893-8:2011)*

EN ISO 11666:2018, *Non-destructive testing of welds - Ultrasonic testing - Acceptance levels (ISO 11666:2018)*

EN ISO 12944-1:2017, *Paints and varnishes - Corrosion protection of steel structures by protective paint systems - Part 1: General introduction (ISO 12944-1:2017)*

EN ISO 13585:2012, *Brazing - Qualification test of brazers and brazing operators (ISO 13585:2012)*

EN ISO 13588:2019, *Non-destructive testing of welds - Ultrasonic testing - Use of automated phased array technology (ISO 13588:2019)*

EN ISO 14732:2013, *Welding personnel - Qualification testing of welding operators and weld setters for mechanized and automatic welding of metallic materials (ISO 14732:2013)*

EN ISO 15607:2019, *Specification and qualification of welding procedures for metallic materials - General rules (ISO 15607:2019)*

EN ISO 15609-1:2019, *Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 1: Arc welding (ISO 15609-1:2019)*

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

EN ISO 15612:2018, *Specification and qualification of welding procedures for metallic materials - Qualification by adoption of a standard welding procedure specification (ISO 15612:2018)*

EN ISO 15614-1:2017, *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 15614-1:2017, Corrected version 2017-10-01)*

EN ISO 15626:2018, *Non-destructive testing of welds - Time-of-flight diffraction technique (TOFD) - Acceptance levels (ISO 15626:2018)*

EN ISO 17636-1:2013, *Non-destructive testing of welds - Radiographic testing - Part 1: X- and gamma-ray techniques with film (ISO 17636-1:2013)*

EN ISO 17636-2:2013, *Non-destructive testing of welds - Radiographic testing - Part 2: X- and gamma-ray techniques with digital detectors (ISO 17636-2:2013)*

EN ISO 17637:2016, *Non-destructive testing of welds - Visual testing of fusion-welded joints (ISO 17637:2016)*

EN ISO 17638:2016, *Non-destructive testing of welds - Magnetic particle testing (ISO 17638:2016)*

EN ISO 17640:2018, *Non-destructive testing of welds - Ultrasonic testing - Techniques, testing levels, and assessment (ISO 17640:2018)*

EN ISO 17672:2016, *Brazing - Filler metals (ISO 17672:2016)*

EN ISO 19285:2017, *Non-destructive testing of welds - Phased array ultrasonic testing (PAUT) - Acceptance levels (ISO 19285:2017)*

EN ISO 23277:2015, *Non-destructive testing of welds - Penetrant testing - Acceptance levels (ISO 23277:2015)*

EN ISO 23278:2015, *Non-destructive testing of welds - Magnetic particle testing - Acceptance levels (ISO 23278:2015)*

EN ISO 23279:2017, *Non-destructive testing of welds - Ultrasonic testing - Characterization of discontinuities in welds (ISO 23279:2017)*

HD 60364-1:2008, *Low-voltage electrical installations - Part 1: Fundamental principles, assessment of general characteristics, definitions*