



**SLOVENSKI STANDARD**  
**oSIST prEN 14163:2021**  
**01-september-2021**

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**Industrija za predelavo nafte in zemeljskega plina - Transportni cevovodni sistemi  
- Varjenje cevovodov (ISO 13847:2013, spremenjen)**

Petroleum and natural gas industries - Pipeline transportation systems - Welding of pipelines (ISO 13847:2013, modified)

Erdöl- und Erdgasindustrie - Pipeline-Transportsysteme - Schweißen von Pipelines (ISO 13847:2013, modifiziert)

Industries du pétrole et du gaz naturel - Systèmes de transport par conduites - Soudage des conduites (ISO 13847:2013 modifiée)

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**Ta slovenski standard je istoveten z: prEN 14163**

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**ICS:**

25.160.10	Varilni postopki in varjenje	Welding processes
75.200	Oprema za skladiščenje nafte, naftnih proizvodov in zemeljskega plina	Petroleum products and natural gas handling equipment

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EUROPEAN STANDARD  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**prEN 14163**

July 2021

ICS 25.160.10; 75.200

Will supersede EN 14163:2001

English Version

**Petroleum and natural gas industries - Pipeline  
transportation systems - Welding of pipelines (ISO  
13847:2013, modified)**

Industries du pétrole et du gaz naturel - Systèmes de  
transport par conduites - Soudage des conduites (ISO  
13847:2013 modifiée)

Erdöl- und Erdgasindustrie - Pipeline-  
Transportsysteme - Schweißen von Pipelines (ISO  
13847:2013, modifiziert)

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 12.

If this draft becomes a European Standard, 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.

This draft European Standard was established by CEN 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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

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## European foreword

This document (prEN 14163:2021) has been prepared by Technical Committee CEN/TC 12 “Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries”, the secretariat of which is held by NEN and CYS.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 14163:2001.

The text of ISO 13847:2013 has been adopted by CEN/TC 12 with some modifications to exclude the aspects that are covered by CEN/TC 234 “Gas infrastructure”. These modifications are indicated by a vertical line in the left margin of the text [*note: currently indicated with ‘track changes’*].

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## Introduction

Users of this document are advised that further or differing requirements might be needed for individual applications, using alternative engineering solutions, particularly where there is innovative or developing technology. Where an alternative is offered, it is advisable that the manufacturer identifies any variations from this document and provides details.

This second edition cancels and replaces the first edition (ISO 13847:2000), which has been technically revised. The following annexes have been added compared with the first edition:

- branch and fillet welding on in-service pipelines (Annex D);
- welding of European onshore natural gas transmission pipelines (Annex E);
- welding of gas distribution systems in Europe (Annex F);
- automatic ultrasonic testing of girth welds (Annex G);
- time of flight diffraction techniques (Annex I).

ISO 13847:2013, developed within ISO/TC 67/SC 2, has been adopted as EN 14163:202X (ISO 13847:2013, modified).

The scope of ISO/TC 67/SC 2 is pipeline transportation systems for the petroleum and natural gas industries without exclusions. However, in CEN the scopes of CEN/TC 12 and CEN/TC 234 overlapped until 1995. This scope overlap caused problems for the parallel procedure for the above-mentioned item. The conflict in scope was resolved when both the CEN Technical Committees concerns and the CEN Technical Board decided to amend the scope of CEN/TC 12 by explicitly excluding “*on-land supply systems used by the gas supply industry excluding gas infrastructure from the input of gas into the on-shore transmission network up to the inlet connection of gas appliances*”.

## 1 Scope

This document specifies requirements for the petroleum, petrochemical and natural gas industries, for producing and inspecting girth, branch and fillet welds in the pipeline part of pipeline transportation systems which meet the requirements of ISO 13623:2017 or equivalent.

NOTE 1 ISO 13847:2013 refers to the requirements of ISO 13623:2009 or equivalent. At the time of publication of this document, ISO 13623:2009 is superseded by ISO 13623:2017 and reference is made to this edition of ISO 13623 throughout this document. ISO 13623 is modified adopted as EN 14161 to exclude on-land supply systems used by the European gas supply industry from the input of gas into the on-land transmission network up to the inlet connection of gas appliances.

This document is applicable to the requirements for welding of carbon and low-alloy steel pipes, and includes guidance for the welding of corrosion-resistant alloy (CRA) and CRA-clad pipelines in Annex A. Application is restricted to pipes with a diameter of 20 mm or more and a wall thickness of 3 mm or more, a specified minimum yield strength of 555 MPa or less, and which are designed not to exceed permissible equivalent stresses as defined in ISO 13623:2017 or equivalent. It is also applicable to welding into pipelines of items such as spools, risers, launchers/receivers, fittings, flanges and pup pieces to pipeline valves. On-land supply systems used by the European gas supply industry from the input of gas into the on-land transmission network up to the inlet connection of gas appliances are excluded from the scope of this document.

Guidance for special welding applications is provided in:

- Annex B for hyperbaric welding;
- Annex C for brazing and aluminothermic welding of anode leads;
- Annex D for branch and fillet welding on in-service pipelines.

The welding processes covered are shielded metal arc welding (SMAW), gas tungsten arc welding (GTAW), gas metal arc welding (GMAW), gas-shielded flux-cored arc welding (GSFCAW), self-shielded flux-cored arc welding (SSFCAW) and submerged arc welding (SAW).

This document is not applicable to flash girth welding, resistance welding, solid-phase welding or other one-shot welding processes, nor to longitudinal welds in pipe or fittings or to the welding of process piping outside the scope of ISO 13623:2017.

NOTE 2 Additional requirements might be necessary for the welding of pipeline for particular pipeline operating conditions, for pipelines with a specified yield strength exceeding 555 MPa and for pipelines designed to permissible strain criteria. These can include limitations on maximum hardness or strength, minimum impact toughness values, crack tip-opening displacement, all weld metal tensile testing or bend testing, thermal stress relief, or others. Where appropriate, it is advisable that these additional requirements be added to the requirements of this document in a project-specific supplement.

NOTE 3 Annex E specifies additional requirements for the welding of onshore gas supply systems applicable only when located in European member states. Annex F specifies additional requirements for the welding of gas distribution systems applicable only when located in European member states. It is the responsibility of the company to specify the normative applicability of these annexes.

**prEN 14163:2021 (E)****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.

ISO 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*

ISO 857-1, *Welding and allied processes — Vocabulary — Part 1: Metal welding processes*

ISO 3183, *Petroleum and natural gas industries — Steel pipe for pipeline transportation systems*

ISO 3834 (all parts), *Quality requirements for fusion welding of metallic materials*

ISO 4136, *Destructive tests on welds in metallic materials — Transverse tensile test*

ISO 5173, *Destructive tests on welds in metallic materials — Bend tests*

ISO 5178, *Destructive tests on welds in metallic materials — Longitudinal tensile test on weld metal in fusion welded joints*

ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method*

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

ISO 6947, *Welding and allied processes — Welding positions*

ISO 9015-1, *Destructive tests on welds in metallic materials — Hardness testing — Part 1: Hardness test on arc welded joints*

ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

ISO 10474, *Steel and steel products — Inspection documents*

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

ISO 13588, *Non-destructive testing of welds — Ultrasonic testing — Use of automated phased array technology*

ISO 13623:2017, *Petroleum and natural gas industries — Pipeline transportation systems*

ISO 13916, *Welding — Guidance on the measurement of preheating temperature, interpass temperature and preheat maintenance temperature*

ISO 14175, *Welding consumables — Gases and gas mixtures for fusion welding and allied processes*

ISO 14732, *Welding personnel — Qualification testing of welding operators and weld setters for mechanized and automatic welding of metallic materials*

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

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

EN 1321, *Destructive tests on welds in metallic materials — Macroscopic and microscopic examination of welds*

ASME, Boiler and Pressure Vessel Code Section V, Non-destructive examination

ASTM E1961-16, *Standard Practice for Mechanized Ultrasonic Testing of Girth Welds Using Zonal Discrimination with Focused Search Units*

AWS A5.01, *Filler metal procurement guidelines*

AWS C5.3, *Recommended practices for air carbon arc gouging and cutting*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 857-1, ISO 6520-1 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at <https://www.electropedia.org/>

— ISO Online browsing platform: available at <https://www.iso.org/obp>

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**3.1 approved welder** <https://standards.iteh.ai/catalog/standards/sist/96b33681-8a16-49cd-a539-7c2cc9393cb9/osist-pren-14163-2021>

welder who has fulfilled the requirements of this document

#### 3.2

##### **approved welding operator**

welding operator who has fulfilled the requirements of this document

#### 3.3

##### **approved WPS**

welding procedure specification which has fulfilled the requirements of this document

#### 3.4

##### **arc energy**

product of welding voltage and current divided by travel speed of welding

Note 1 to entry: The often-used term “heat input” corresponds more precisely to the arc energy modified by an arc efficiency factor.

#### 3.5

##### **automatic welding**

welding where the welding parameters and torch guidance are fully controlled mechanically or electronically

**prEN 14163:2021 (E)****3.6****by agreement**

agreed between the company and the contractor

**3.7****company**

owner company, operator or the engineering agency in charge of construction

Note 1 to entry: The company can act through an inspector or other authorized representative. The company can also be the contractor in some instances.

**3.8****contractor**

entity that performs the work covered by this document

**3.9****defect**

imperfection or discontinuity exceeding the specified acceptance criteria

**3.10****girth weld**

circumferential butt weld in pipe

**3.11****imperfection****discontinuity**

relevant indication related to welding quality

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**3.12****internal repair**

repair of the root pass from inside the pipe

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**3.13****manual welding**

welding where the welding parameters and torch guidance are controlled by the welder

**3.14****mechanized welding**

welding where the welding parameters and torch guidance are controlled mechanically or electronically, but where minor adjustments can be manually varied during welding to maintain the required welding conditions

**3.15****one-shot welding process**

process characterized by fusion or metallic bonding being induced around the entire circumference of the pipe simultaneously

EXAMPLES Flash welding, friction welding or pressure welding.

**3.16****relevant indication**

indication from welding anomalies and related to weld quality

**3.17****semi-automatic welding**

welding where the welding parameters and torch guidance are controlled by the welder, but where the equipment incorporate wire feeding

**3.18****penumbra**

shadow produced on a radiographic image when the incident radiation is partially, but not wholly, cut off by an intervening body

Note 1 to entry: The penumbra is the region of geometric unsharpness around the image of an indication.

**3.19****roll welding**

welding process in which two pipes are abutted in a horizontal position and rotated while one or more welding passes are deposited between previously prepared bevels on the abutting ends

**3.20****test piece**

welded assembly prepared for the purpose of approving a welding procedure specification, welder or welding operator

**3.21****welder**

person who holds and manipulates the electrode holder, welding torch or blowpipe by hand

[SOURCE: ISO 9606 1:2012, 3.1]

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[osIST prEN 14163:2021](https://standards.iteh.ai/catalog/standards/sist/96b33681-8a16-49cd-a539-7c2cc9393cb9/osist-pren-14163-2021)

**3.22****weld repair**

process of correcting a defect that is discovered after the weld has been completed and submitted for inspection

<https://standards.iteh.ai/catalog/standards/sist/96b33681-8a16-49cd-a539-7c2cc9393cb9/osist-pren-14163-2021>

Note 1 to entry: The repair can involve complete removal of a cylinder of pipe, or removal of a localized area by grinding or other means, followed by additional welding.

**3.23****welding operator**

person who performs mechanized and/or automatic welding

[SOURCE: ISO 14732:1998, 3.10, modified]

**3.24****welding procedure**

specific course of action to be followed in making a weld, including reference to materials, preparation, preheating (if necessary), method and control of welding and post-weld heat treatment (if necessary) and equipment to be used

**3.25****welding procedure specification****WPS**

document providing the required variables for a specific welding procedure