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**Petroleum- och naturgasindustrier – Rörledningssystem –
Svetsning av rörledningar (ISO 13847:2013, IDT)**

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



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Den internationella standarden ISO 13847:2013 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av ISO 13847:2013.

The International Standard ISO 13847:2013 has the status of a Swedish Standard. This document contains the official version of ISO 13847:2013.

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Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Stålrör, rördelar och rörlänsar, SIS/TK 118.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: Foreword - Supplementary information.

The committee responsible for this document is Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 2, *Pipeline transportation systems for the petroleum and natural gas industries*.

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](#)).

Introduction

Users of this International Standard 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 International Standard and provides details.

Petroleum and natural gas industries — Pipeline transportation systems — Welding of pipelines

1 Scope

This International Standard 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 13623:2009 or equivalent.

This International Standard 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 13623:2009 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.

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 International Standard 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 13623:2009.

NOTE 1 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 International Standard in a project-specific supplement.

NOTE 2 [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.

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.

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*

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- 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 10863:2011, *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 13623:2009, *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 15614-1:2004, *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 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 E1961:2011, *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.

3.1

approved welder

welder who has fulfilled the requirements of this International Standard

3.2

approved welding operator

welding operator who has fulfilled the requirements of this International Standard

3.3

approved WPS

welding procedure specification which has fulfilled the requirements of this International Standard

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

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 International Standard

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

3.12

internal repair

repair of the root pass from inside the pipe