SLOVENSKI STANDARD
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Kovinski industrijski cevovodi - 5. del: Pregled in preskušanje

Metallic industrial piping - Part 5: Inspection and testing

Metallische industrielle Rohrleitungen - Teil 5: Prüfung

Tuyauteries industrielles métalliques - Partie 5: Inspection et contrôle

Ta slovenski standard je istoveten z: **EN 13480-5:2024**

ICS:

23.040.10	Železne in jeklene cevi	Iron and steel pipes
77.140.75	Jeklene cevi in cevni profili za posebne namene	Steel pipes and tubes for specific use

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EUROPEAN STANDARD

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English Version

Metallic industrial piping - Part 5: Inspection and testing

Tuyauteries industrielles métalliques - Partie 5: Inspection et contrôle

Metallische industrielle Rohrleitungen - Teil 5: Prüfung

This European Standard was approved by CEN on 9 July 2024.

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.

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

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European foreword

This document (EN 13480-5:2024) has been prepared by Technical Committee CEN/TC 267 “Industrial piping and pipelines”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by December 2024, and conflicting national standards shall be withdrawn at the latest by December 2024.

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 13480-5:2017.

This new edition incorporates the Amendments which have been approved previously by CEN members, and the corrected pages up to Issue 2 without any further technical change. Annex Y provides details of significant technical changes between this European Standard and the previous edition.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

This European Standard EN 13480 for metallic industrial piping consists of eight interdependent and not dissociable Parts which are:

— *Part 1: General;*

— *Part 2: Materials;*

— *Part 3: Design and calculation;*

— *Part 4: Fabrication and installation;*

— *Part 5: Inspection and testing;*

— *Part 6: Additional requirements for buried piping;*

— *CEN/TR 13480-7, Guidance on the use of conformity assessment procedures;*

— *Part 8: Additional requirements for aluminium and aluminium alloy piping.*

Although these Parts may be obtained separately, it should be recognized that the Parts are inter-dependant. As such the manufacture of metallic industrial piping requires the application of all the relevant Parts in order for the requirements of the Standard to be satisfactorily fulfilled.

This European Standard will be maintained by a Maintenance MHD working group whose scope of working is limited to corrections and interpretations related to EN 13480. The contact to submit queries can be found at https://unm.fr/en/maintenance-agencies/maintenance-agency-en-13480/. A form for submitting questions can be downloaded from the link to the MHD website. After subject experts have agreed an answer, the answer will be communicated to the questioner. Interpretation sheets will be posted on the website of the MHD.

Amendments to this new edition may be issued from time to time and then used immediately as alternatives to rules contained herein. These amendments will be consolidated within EN 13480:2024 in accordance with the maintenance system of EN 13480 series approved by CEN/BT Decision C172/2021.

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 organizations 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 the requirements for inspection and testing of industrial piping as specified in EN 13480-1:2024 to be performed on individual spools or piping systems, including supports, designed in accordance with EN 13480-3:2024 and EN 13480-6:2024 (if applicable), and fabricated and installed in accordance with EN 13480-4:2024.

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 13480-1:2024, *Metallic industrial piping — Part 1: General*

EN 13480-2:2024, *Metallic industrial piping — Part 2: Materials*

EN 13480-3:2024, *Metallic industrial piping — Part 3: Design and calculation*

EN 13480-4:2024, *Metallic industrial piping — Part 4: Fabrication and installation*

EN 13480-6:2024, *Metallic industrial piping — Part 6: Additional requirements for buried piping*

CEN/TR 13480-7:2017, *Metallic industrial piping — Part 7: Guidance on the use of conformity assessment procedures*

EN 14917:2021, *Metal bellows expansion joints for pressure applications*

EN ISO 5817:2023, *Welding — Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) — Quality levels for imperfections (ISO 5817:2023)*

EN ISO 9712:2022, *Non-destructive testing — Qualification and certification of NDT personnel (ISO 9712:2021)*

EN ISO 10893-5:2011,[1] *Non-destructive testing of steel tubes — Part 5: Magnetic particle inspection of seamless and welded ferromagnetic steel tubes for the detection of surface imperfections (ISO 10893-5:2011)*

EN ISO 17635:2016, *Non-destructive testing of welds — General rules for metallic materials (ISO 17635:2016)*

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

ISO 3057:1998, *Non-destructive testing — Metallographic replica techniques of surface examination*

[1] As impacted by EN ISO 10893-5:2011/A1:2020.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13480-1:2024 apply.

4 Symbols and abbreviations

For the purposes of this document, the symbols given in EN 13480-1:2024 apply together with the following abbreviations.

NDT Non-destructive testing

MT Magnetic particle testing

PT Penetrant testing

RT Radiographic testing

UT Ultrasonic testing

VT Visual testing

PWHT Post-weld heat treatment

PED Pressure Equipment Directive.

5 Determination of inspection and testing requirements

5.1 General

The manufacturer shall be responsible for the fabrication and the installation, even if this work will be sub-contracted to other fabricators and/or installers.

The fabricator and/or installer shall be responsible for carrying out the inspection and testing including subcontracted NDT (if any) specified in this European Standard, for all piping.

NOTE For guidance on the use of conformity assessment procedures see CEN/TR 13480-7:2017.

5.2 Classification of piping

Industrial piping shall be classified in accordance with EN 13480-1:2024, Table 5.1-1.

NOTE Categories I to III are identical to categories I to III of the Pressure Equipment Directive.

6 Design review

Before fabrication/installation commences, a review of the piping design and its supports shall be performed.

Where design and fabrication are carried out by separate organisations, the piping designer shall prepare a confirmation for the manufacturer that the design is in compliance with the requirements of this European Standard.

A list of the relevant drawings shall be attached to the confirmation.

Where the design of parts has already been reviewed in accordance with this European Standard, and where an appropriate confirmation is available, a further design review shall not be required.

NOTE For guidance on the use of conformity assessment procedures see CEN/TR 13480-7:2017.

7 In-process inspection and testing

7.1 General

Testing and inspection shall be carried out by personnel qualified for the method used. European Standards, specifications or written procedures (if necessary) shall be available to all testing personnel and inspectors prior to the testing/inspection.

Reports on NDT specified in 7.2.4 and Clause 8 and reports on destructive testing specified in 7.2.5 shall be prepared to demonstrate that all required testing has been carried out and that the results are acceptable.

7.2 Materials and formed pressure retaining parts

7.2.1 General

The testing and inspection specified below shall be restricted to parts formed during the fabrication process, especially induction bending. Formed bought out standardized parts and components shall not be a part of this requirement.

Formed parts shall be subject to appropriate testing in accordance with the fabricators/installers test programme.

7.2.2 Verification of material

A verification shall be performed that materials are in accordance with the specified material standard or purchase order.

7.2.3 Verification of formed pressure retaining parts

It shall be verified that all formed pressure retaining parts comply with the specified shape and dimensional requirements, and have received the specified finish or heat treatment.

7.2.4 Non-destructive testing of formed parts

7.2.4.1 General

All formed parts shall be subject to non-destructive testing. Depending on material, dimensions and type of forming process testing can include:

a) visual testing;

b) wall thickness measurements;

c) dimensional checks (ovality, angle of bend etc.) and tolerances (see EN 13480-4:2024);

d) hardness tests;

e) testing for surface imperfections (magnetic particle or penetrant testing);

on formed parts of each component or batch of identical components.

Material, heat treatment conditions, heat treatment lot, degree of deformation shall be considered in the definition of the batch.

Replicas of the surface structure in the tension zone can be required in case of lifetime monitoring for creep range application.

Ultrasonic testing can be performed if specified. Specification shall include area, extent, method and acceptance criteria.

NOTE A customary interpretation of a heat treatment lot is the entire content of a furnace of a single heat treatment.

7.2.4.2 Induction bending

Material surfaces shall be suitable for induction bending. EN ISO 10893-5:2011 specifies surface qualities and acceptance levels. The acceptance levels shall be agreed, considering material, dimensions and service (creep, fatigue).

Induction bends shall be tested according to Table 7.2.4.2-1.

Heat treatment shall be done if required by EN 13480-4:2024. Subsequent hardness testing shall be performed on the straight length and within bending zone to verify the homogeneity of annealing.

If no heat treatment is required after forming, hardness testing is required in the bending zone only if specified for service reasons.

Dimensional checks shall include ovality, angle of bend, wall thickness and tolerances (see EN 13480-4:2024).

MT/PT testing shall be performed to verify that the outside surface in the bended zone is free of cracks.

If specified for the component or by Table 7.2.4.2-1, replicas of the surface structure in the tension zone shall be taken on each component or batch of identical components. Replicas shall be made in accordance with ISO 3057:1998.

The material grade, the heat treatment conditions of the material, the heat treatment lot after bending and the forming conditions shall be considered in the definition of the batch.