SLOVENSKI STANDARD
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Vodocevni kotli in pomožne napeljave - 5. del: Izdelava in izvedba tlačno obremenjenih delov kotla

Water-tube boilers and auxiliary installations - Part 5: Workmanship and construction of pressure parts of the boiler

Wasserrohrkessel und Anlagenkomponenten - Teil 5: Verarbeitung und Bauausführung für drucktragende Kesselteile

Chaudières à tubes d'eau et installations auxiliaires - Partie 5: Fabrication et construction des parties sous pression des chaudières

Ta slovenski standard je istoveten z: **prEN 12952-5**

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27.060.30	Grelniki vode in prenosniki toplote	Boilers and heat exchangers

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English Version

Water-tube boilers and auxiliary installations - Part 5: Workmanship and construction of pressure parts of the boiler

Chaudières à tubes d'eau et installations auxiliaires - Partie 5: Fabrication et construction des parties sous pression des chaudières

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 269.

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.

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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 12952-5:2020) has been prepared by Technical Committee CEN/TC 269 “Shell and water-tube boilers”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 12952-5:2011.

Annex G provides details of significant technical changes between this document and the previous edition.

EN 12952 series concerning water-tube boilers and auxiliary installations consists of the following parts:

- *Part 1: General*;
- *Part 2: Materials for pressure parts of boilers and accessories*;
- *Part 3: Design and calculation for pressure parts*;
- *Part 4: In-service boiler life expectancy calculations*;
- *Part 5: Workmanship and construction of pressure parts of the boiler*;
- *Part 6: Inspection during construction, documentation and marking of pressure parts of the boiler*;
- *Part 7: Requirements for equipment for the boiler*;
- *Part 8: Requirements for firing systems for liquid and gaseous fuels for the boiler*;
- *Part 9: Requirements for firing systems for pulverized solid fuels for the boiler*;
- *Part 10: Requirements for safeguards against excessive pressure*;
- *Part 11: Requirements for limiting devices of the boiler and accessories*;
- *Part 12: Requirements for boiler feedwater and boiler water quality*;
- *Part 13: Requirements for flue gas cleaning systems*;
- *Part 14: Requirements for flue gas DENOX systems using liquefied pressurized ammonia and ammonia water solution*;
- *Part 15: Acceptance tests*;
- *Part 16: Requirements for grate and fluidized-bed firing systems for solid fuels for the boiler*;
- *CR 12952 Part 17: Guideline for the involvement of an inspection body independent of the manufacturer.*

NOTE 1 A Part 18 on operating instructions is currently in preparation.

Although these parts may be obtained separately, it should be recognized that the parts are inter-dependent. As such, the design and manufacture of water-tube boilers requires the application of more than one part in order for the requirements of the document to be satisfactorily fulfilled.

NOTE 2 Part 4 and Part 15 are not applicable during the design, construction and installation stages.

NOTE 3 A “Boiler Helpdesk” has been established in CEN/TC 269 which may be contacted for any questions regarding the application of EN 12952 series and EN 12953 series, see the following website: http://www.boiler-helpdesk.din.de

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

For relationship with EU Directive 2014/68/EU, see informative Annex ZA, which is an integral part of this document.

1 Scope

This document specifies requirements for the workmanship and construction of water-tube boilers as defined in EN 12952-1:2015.

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

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 10025-2:2019, *Hot rolled products of structural steels - Part 2: Technical delivery conditions for non-alloy structural steels*

EN 10028-2:2017, *Flat products made of steels for pressure purposes - Part 2: Non-alloy and alloy steels with specified elevated temperature properties*

EN 10204:2004, *Metallic products - Types of inspection documents*

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

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

EN 12952-1:2015, *Water-tube boilers and auxiliary installations - Part 1: General*

prEN 12952-2:2020,[1] *Water-tube boilers and auxiliary installations — Part 2: Materials for pressure parts of boilers and accessories*

EN 12952-3:2011, *Water-tube boilers and auxiliary installations - Part 3: Design and calculation for pressure parts of the boiler*

prEN 12952-6:2020[1], *Water-tube boilers and auxiliary installations — Part 6: Inspection during construction; documentation and marking of pressure parts of the boiler*

EN 12952-7:2012, *Water-tube boilers and auxiliary installations - Part 7: Requirements for equipment for the boiler*

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

[1] Under preparation

EN ISO 3452-1:2013, *Non-destructive testing - Penetrant testing - Part 1: General principles (ISO 3452-1:2013, Corrected version 2014-05-01)*

EN ISO 4759-1:2000, *Tolerances for fasteners - Part 1: Bolts, screws, studs and nuts - Product grades A, B and C (ISO 4759-1:2000)*

EN ISO 6892-1:2016, *Metallic materials - Tensile testing - Part 1: Method of test at room temperature (ISO 6892-1:2016)*

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 14555:2017, *Welding - Arc stud welding of metallic materials (ISO 14555:2017)*

EN ISO 15609 (all parts), *Specification and qualification of welding procedures for metallic materials — Welding procedure specification*

EN ISO 15613:2004, *Specification and qualification of welding procedures for metallic materials - Qualification based on pre-production welding test (ISO 15613:2004)*

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

EN ISO 17663:2009, *Welding - Quality requirements for heat treatment in connection with welding and allied processes (ISO 17663:2009)*

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)*

CEN ISO/TR 15608:2017, *Welding — Guidelines for a metallic material grouping system (ISO/TR 15608:2017)*

3 Terms and definitions

For the purposes of this document the terms and definitions given in EN 12952-1:2015 and the following apply.

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

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
cold forming
for ferritic steels, it is forming at temperatures below the maximum permissible temperature for post-weld heat treatment and for austenitic materials it is forming at temperatures below 300 °C

Note 1 to entry: See Table 12.

3.2
hot forming
for ferritic steels, it is forming at temperatures at or above the maximum permissible temperature for post-weld heat treatment

Note 1 to entry: See Table 12.

4 Symbols and abbreviations

For the purposes of this document, the symbols given in EN 12952-1:2015 shall apply. Throughout this document, additional terminology and symbols have been included, where necessary, to meet the requirements of the specific text concerned. It should also be noted that in some clauses the same additional symbol is used in different equations to represent different terms. However, in all such cases, the special meaning of each symbol is indicated for each equation.

5 General

Water-tube boilers shall be manufactured and assembled in accordance with approved drawings, procedures and specifications and good engineering practice.

The workshops and sites associated with the construction of water-tube boilers shall be properly equipped and have suitable provisions for all the inspection and testing specified in prEN 12952-6:2020. The relevant manufacturing procedures shall be adequate and manufacturing personnel shall be competent and properly qualified for their assigned tasks. The procedures for the approval of welding and NDE personnel are given respectively in prEN 12952-6:2020, Clause 7 and 9.2.

Appropriate records of manufacturing operations shall be maintained.

6 Pressure part

6.1 Drums, headers and similar pressure parts

6.1.1 Principles for manufacturing

Drums, headers and similar pressure parts shall be constructed from tubes, forgings, plates or castings. Drums and headers shall be in a suitably clean condition, both internally and externally, to enable proper visual inspection of the surface to be carried out before drilling of holes for tube stubs, branches, etc. and before welding of any permanent connections.

6.1.2 Manufacturing process for header ends

The ends of forged or other seamless steel tube headers shall be carried out by any one of the following methods:

a) forging or spinning;

b) welding in accordance with Clause 8, see also EN 12952-3:2011, Figure 10.3-1;

c) bolted flanges in accordance with relevant European Standards e.g. EN 1092-1:2018 or EN 1759-1:2004.

Bolted flanges in accordance with c) shall not be used where the bolts would be exposed to gases of combustion.

6.1.3 Material for header ends

Header ends shall be forged or machined from steel of a grade compatible with the bodies of the headers and profiled as shown in EN 12952-3:2011, Figure 10.3-1.

6.2 Material identification

The manufacturer shall maintain a system of material identification for all pressure parts and drum lifting lugs.

The system shall be such that material used in major pressure parts (drums, tubes for header shells with $d_o > 142$ mm) can be traced back to its origin. The identification of tubes which are not used for header shells and tubes for header shells with $d_o \leq 142$ mm shall be controlled by a system which permits positive identification of cast, on receipt into the manufacturer's works and maintenance of the material type identification throughout manufacturing operations by marking.

6.3 Material marking

6.3.1 General

The marking of materials shall be maintained throughout the process of manufacture. If original markings are discarded or parts without markings could be created by dividing up parts during the course of manufacture, markings shall be transferred, normally before fabrication.

Appropriate measures shall be taken to ensure that there is no possibility of confusion in the transfer of markings.

6.3.2 Responsible personnel

Marking transfer shall be performed by the manufacturer's nominated representative(s) except for materials for which an inspection certificate (3.2) to EN 10204:2004 is required and also not for components classified as small parts.

In the case of materials for which an inspection certificate (3.2) to EN 10204:2004 is required, the markings shall be transferred in accordance with the requirements of prEN 12952-6:2020.

NOTE This does not apply to small parts which are those made from certified products, such as nipples, nozzles, flanges, compensating rings, with outside diameters equal to or less than 142 mm.