SLOVENSKI STANDARD
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Mnogovodni kotli - 1. del: Splošno

Shell boilers - Part 1: General

Großwasserraumkessel - Teil 1: Allgemeines

Chaudières à tubes de fumée - Partie 1: Généralités

Ta slovenski standard je istoveten z: **prEN 12953-1**

ICS:

27.060.30	Grelniki vode in prenosniki toplote	Boilers and heat exchangers

oSIST prEN 12953-1:2024 **en,fr,de**

EUROPEAN STANDARD

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DRAFT
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April 2024

ICS 27.060.30

Will supersede EN 12953-1:2012

English Version

Shell boilers - Part 1: General

Chaudières à tubes de fumée - Partie 1: Généralités

Großwasserraumkessel - Teil 1: Allgemeines

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

Ref. No. prEN 12953-1:2024 E

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European foreword

This document (prEN 12953-1:2024) 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 12953-1:2012.

Annex E provides details of the significant technical changes between this document and EN 12953-1:2012.

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.

The series concerning shell boilers 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: Workmanship and construction of pressure parts of the boiler*

— *Part 5: Inspection during construction, documentation and marking of pressure parts of the boiler*

— *Part 6: Requirements for equipment for the boiler*

— *Part 7: Requirements for firing systems for liquid and gaseous fuels for the boiler*

— *Part 8: Requirements for safeguards against excessive pressure*

— *Part 9: Requirements for limiting devices of the boiler and accessories*

— *Part 10: Requirements for boiler feed water and boiler water quality*

— *Part 11: Acceptance tests*

— *Part 12: Requirements for firing systems for solid fuels for the boiler*

— *Part 13: Operating instructions*

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

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

1 Scope

This document applies to shell boilers with volumes in excess of 2 l for the generation of steam and/or hot water at a maximum allowable pressure greater than 0,5 bar and with a temperature in excess of 110 °C.

For the purpose of this document the following pressurized parts are included:

— the shell boiler as one entity of pressure equipment including all the pressure parts from the feedwater/hot water inlet (including the inlet valve) up to and including the steam/hot water outlet (including the outlet valve or, if there is no valve, the first circumferential weld or flange downstream of the shell boiler or if applicable the outlet header);

— all superheaters, economizers and interconnecting piping;

— additionally, the piping that is connected to the boiler involved in services such as draining, venting, desuperheating, etc., up to the first isolating valve or, if there is no valve, the first circumferential weld or flange downstream of the shell boiler or if applicable the outlet header/piping.

This document does not apply to the following types of boilers and equipments:

a) water-tube boilers;

b) non stationary boilers, e.g. locomotive boilers;

c) thermal oil boilers;

d) boilers where the main pressure housing is made of cast material;

e) pumps, gaskets, etc;

f) brickwork setting and insulation, etc.

NOTE 1 Further information on shell boilers is given in Annex A.

NOTE 2 Stainless steel boilers are covered by EN 14222:2021.

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 12953-3:2016, *Shell boilers - Part 3: Design and calculation for pressure parts*

EN 12953-4:2018, *Shell boilers - Part 4: Workmanship and construction of pressure parts of the boiler*

prEN 12953-6:2023, *Shell boilers - Part 6: Requirements for equipment for the boiler*

EN 12953-10:2003, *Shell boilers - Part 10 : Requirements for feedwater and boiler water quality*

EN 12953-13:2012, *Shell boilers - Part 13: Operating instructions*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 764-1:2015+A1:2016 and the following apply.

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

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

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

3.1
purchaser
individual or organization that buys the boiler or part thereof from the manufacturer

3.2
manufacturer
individual or organization responsible for the design, fabrication, testing, installation where relevant, and compliance with the requirements of the relevant product standard, whether executed by him or a subcontractor

[SOURCE: EN 764-1:2015+A1:2016]

Note 1 to entry: In EU member states the manufacturer is responsible for compliance with the Pressure Equipment Directive 2014/68/EU. For those manufacturers outside of the EU, their authorized representative inside the EU assumes this responsibility.

Note 2 to entry: The installer (for example reseller, end user, installation contractor, etc.) can be considered as a manufacturer, when he decided to place on the market an assembly.

3.3
material supplier
individual or organization, not being a material manufacturer, that supplies material or prefabricated parts to be used in the construction of pressure components

[SOURCE: EN 764-1:2015+A1:2016]

Note 1 to entry: A material supplier can be a stockist.

3.4
material manufacturer
individual or organization that produces material in the basic product form used in the manufacture of pressure components

[SOURCE: EN 764-1:2015+A1:2016]

3.5
installer
individual or organisation that carries out the installation of the pressure equipment at the location where it is to be put into service

Note 1 to entry: Depending on the contractual circumstances, the installer can be considered as the manufacturer of the assembly.

3.6
low pressure boiler
LPB
steam boiler with a maximum saturation temperature of 120 °C (this corresponds to a pressure of 1 bar gauge) or hot water boiler with a maximum outlet temperature of 120 °C and a maximum allowable pressure of 10 bar gauge

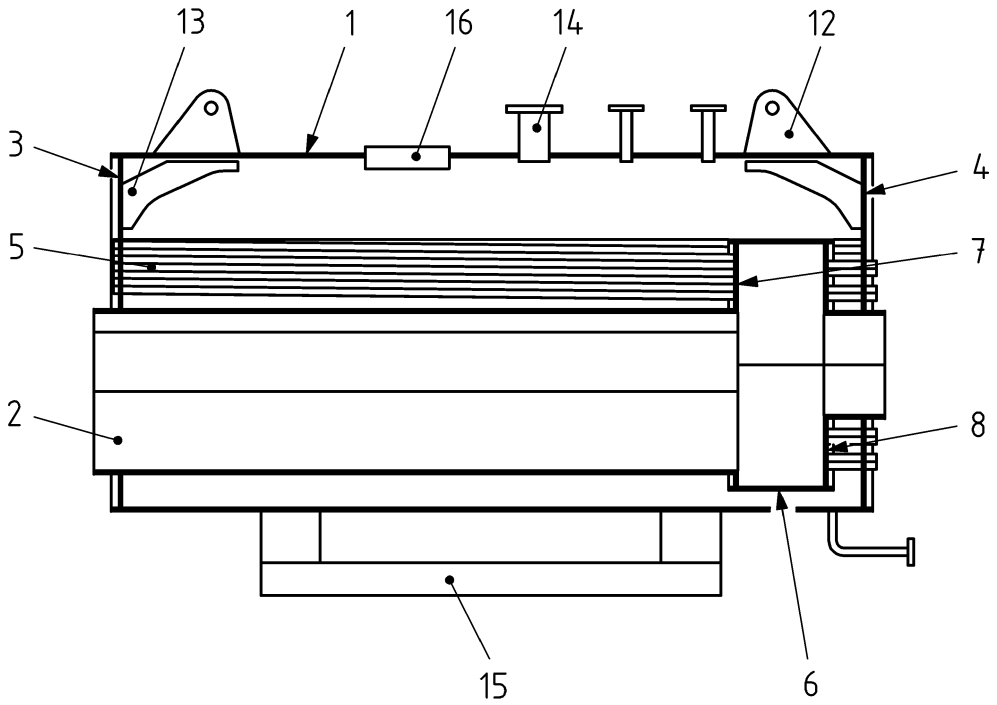
Note 1 to entry: The manufacturer can have the option of using this document or alternatively EN 14394:2005+A1:2008 for low pressure boilers which are to be used as hot water heating boilers.

3.7
shell boiler
closed vessel containing water in which flames and/or hot gases pass through the inside of tubes located within the shell

Note 1 to entry: This is opposed to water-tube boiler where the water is inside the tubes and flue gas is outside the tubes.

Note 2 to entry: Figures 1 to 6 are typical configurations and examples of shell boilers. Other configurations are also permissible (e.g. vertical shell).

Note 3 to entry: Informative Annexes C and D give translations of some typical components of a shell boiler.

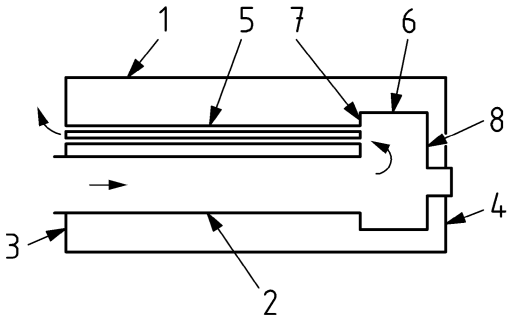


Key

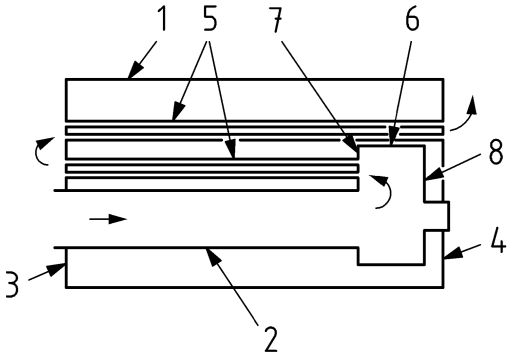
1) cylindrical shell
2) furnace tube (1st pass): for example plain or corrugated or with bowling hoops
3) front tube plate (or front plate depending on the configuration)
4) rear plate (or rear tube plate depending on the configuration)
5) smoke tube(s) (2nd pass/3rd pass) (can be with stay tubes or bar stays)
6) wrapper plate (shell of reversal chamber)
7) reversal chamber tube plate
8) wet back rear plate
12) lifting lugs
13) gusset stays
14) branches
15) supports
16) inspection opening

NOTE The main pressure-bearing parts are the parts which constitute the envelope under pressure and the parts which are essential for the integrity of the boiler.

Figure 1 — Typical components of a shell boiler



a) two pass boiler



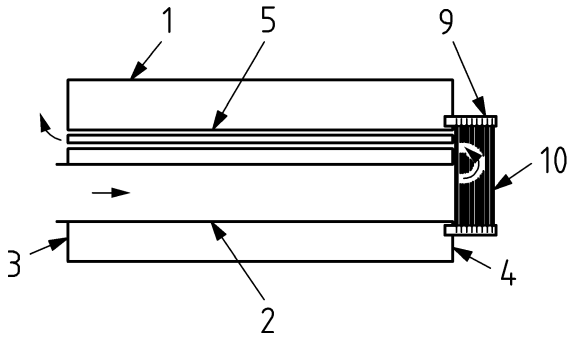
b) three pass boiler

Key

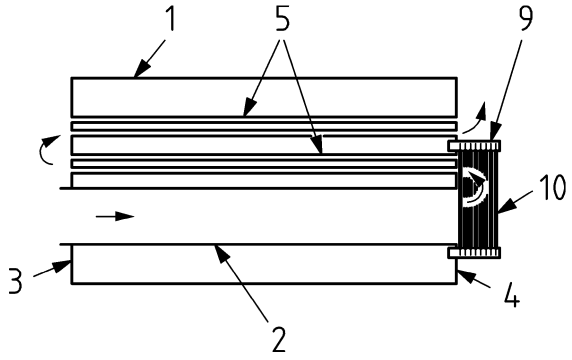
1) cylindrical shell
2) furnace tube (1st pass): for example plain or corrugated or with bowling hoops
3) front tube plate (or front plate depending on the configuration)
4) rear plate (or rear tube plate depending on the configuration)
5) smoke tube(s) (2nd pass/3rd pass) (can be with stay tubes or bar stays)
6) wrapper plate (shell of reversal chamber)
7) reversal chamber tube plate
8) wet back rear plate

NOTE The effective radiant heating surface comprises the furnace tube and the surface of the reversal chamber, where applicable.

Figure 2 — Wet back boiler with internal reversal chamber



a) two pass boiler



b) three pass boiler

Key

1) cylindrical shell
2) furnace tube (1st pass): for example plain or corrugated or with bowling hoops
3) front tube plate (or front plate depending on the configuration)
4) rear plate (or rear tube plate depending on the configuration)
5) smoke tube(s) (2nd pass/3rd pass) (can be with stay tubes or bar stays)
9) header
10) membrane wall

NOTE The effective radiant heating surface comprises the furnace tube and complete surface of the reversal chamber.

Figure 3 — Wet back boiler with external reversal chamber