Veetorudega katlad ja abipaigaldised. Osa 4: Kasutuses olevate katelde eeldatava kasutusaja arvutamine

Water-tube boilers and auxilary installations - Part 4: In-service boiler life expectancy calculations

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 12952-4:2011 sisaldab Euroopa standardi EN 12952-4:2011 ingliskeelset teksti.	This Estonian standard EVS-EN 12952-4:2011 consists of the English text of the European standard EN 12952-4:2011.
Standard on kinnitatud Eesti Standardikeskuse 31.08.2011 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 31.08.2011 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 27.07.2011.	Date of Availability of the European standard text 27.07.2011.
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Water-tube boilers and auxiliary installations - Part 4: In-service boiler life expectancy calculations

Chaudières à tubes d'eau et installations auxiliaires - Partie 4: Calculs de la durée de vie prévisible des chaudières en service

Wasserrohrkessel und Anlagenkomponenten - Teil 4: Betriebsbegleitende Berechnung der Lebensdauererwartung

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

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Foreword

This document (EN 12952-4:2011) has been prepared by Technical Committee CEN/TC 269 “Shell and water-tube boilers”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by January 2012, and conflicting national standards shall be withdrawn at the latest by January 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12952-4:2000.

Annex C provides details of significant technical changes between this European Standard and the previous edition.

The European Standard EN 12952, 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 liquified 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 this European Standard 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 European Standards series EN 12952 and EN 12953, see the following website: http://www.boiler-helpdesk.din.de

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard is applicable to water-tube boilers as defined in EN 12952-1:2001.

This European Standard specifies procedures for calculating the creep and/or the fatigue damage of boiler components during operation. These calculations are not required to be carried out by the manufacturer as part of his responsibilities within this European Standard.

2 Normative references

The following referenced documents are indispensable for the application 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 12952-1:2001, *Water-tube boilers and auxiliary installations — Part 1: General*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12952-1:2001 apply.

4 Symbols and abbreviations

For the purposes of this document, the symbols and abbreviations given in EN 12952-1:2001, Table 4-1 apply.

5 General

The calculations may be carried out, using transposed design equations. The measured (actual) wall thickness of the components shall be used in the calculations, i.e. taking into account any wall thickness reduction that may have occurred due to corrosion or erosion during the service life up to the time of the analysis, see EN 12952-3:2011, 5.7.

Operating temperature, pressure and especially the magnitude of load changes often differ from the estimations used for the design. Thus, these calculations may help to prevent unexpected early failure of components. The results may be used as a guideline for the decision to inspect a component for fatigue cracks or to inspect for creep pores by the replica method or any other suitable method.

NOTE In some cases, the influence of both creep and fatigue damage will be significant. It is normally conservative to combine the creep and fatigue damage mechanisms by adding the calculated usage factors. If necessary, more detailed methods of assessment may be used (see [1] PD 7910 Published by British Standardization Institute, London, UK). Thus, the components are not necessarily to be replaced, if the calculated usage factor exceeds the value of 1.

The highest loaded components shall be chosen for monitoring purposes.

6 Calculations

Annex A describes the creep damage calculation. Annex B describes the fatigue damage calculation.