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## **SHELL BOILERS - PART 11: ACCEPTANCE TESTS**

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English version

## Shell boilers - Part 11: Acceptance tests

Chaudières à tubes de fumée - Partie 11: Essais de réception

Großwasserraumkessel - Teil 11: Abnahmeversuche

This European Standard was approved by CEN on 24 July 2003.

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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 Management Centre has the same status as the official versions.

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## Foreword

This document (EN 12953-11:2003) 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of an identical text or by endorsement, at the latest by March 2004, and conflicting national standards shall be withdrawn at the latest by March 2004.

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association. This European Standard is considered as a supporting standard to other application and product standards which in themselves support an Essential Safety requirement of a New Approach Directive and will appear as a normative reference in them.

The European Standard EN 12953 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 of the boiler.*
- *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 feedwater and boiler water quality.*
- *Part 11: Acceptance tests.*
- *Part 12: Requirements for grate firing systems for solid fuels for the boiler.*
- *Part 13: Operating instructions.*

CR 12953-14: *Guideline for the involvement of an inspection body independent of the manufacturer.*

Although these Parts can be obtained separately, it should be recognized that the Parts are interdependent. As such, the design and manufacture of shell boilers requires the application of more than one Part in order for the requirements of the European Standard to be satisfactorily fulfilled.

The annex A of this European Standard is informative. The annex B of this European Standard is normative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

## 1 Scope

This Part of this European Standard specifies a concise procedure for conducting thermal performance tests, using the indirect (losses) procedure for boilers for steam or hot water. Test results are based on either the gross or net calorific value of the fuel.

This concise procedure provides a convenient means for assessing boilers which are thermodynamically simple, i.e. having a single major source of heat input and a simple circuit for water, steam or high temperature heat transfer fluid.

NOTE 1 The use of the direct method is not advocated, because the estimated measuring error is three to four times greater than with the indirect method.

NOTE 2 An acceptance test may be required:

- a) after the commissioning of new plant or after the recommissioning of modified plant in order to verify compliance with a specification or contractual obligation;
- b) whenever the user wishes to determine the current performance of the plant either on a routine basis or due to change of load or other operating conditions or when a change of fuel or a modification to the plant is being considered;
- c) whenever the user wishes to check combustion conditions.

Regular tests in accordance with this European Standard will enable boiler plant to be monitored in normal operation for optimum efficiency in the interests of fuel conservation.

This procedure does not cover condensing boilers. The application of boilers, where heat is extracted from waste gases is specified in annex B.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN ISO 5167-1, *Measurement of fluid flow by means of pressure differential devices inserted in circular cross-section conduits running full - Part 1: General principles and requirements (ISO 5167-1:2003)*.

ISO 157, *Coal — Determination of forms of sulfur*.

ISO 334, *Solid mineral fuels — Determination of total sulfur — Eschka method*.

ISO 589, *Hard coal — Determination of total moisture*.

ISO 609, *Solid mineral fuels — Determination of carbon and hydrogen — High temperature combustion method*.

ISO 625, *Solid mineral fuels — Determination of carbon and hydrogen — Liebig method*.

ISO 1928, *Solid mineral fuels — Determination of gross calorific value by the bomb calorimetric method, and calculation of net calorific value*.

ISO 1988, *Hard coal — Sampling*.

ISO 3170, *Petroleum liquids — Manual sampling*.

ISO 6976, *Natural gas — Calculation of calorific values, density, relative density and Wobbe index from composition*.



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