

Shell boilers —

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

The European Standard EN 12953-5:2002 has the status of a
British Standard

ICS 27.060.30; 27.100

National foreword

This British Standard is the official English language version of EN 12953-5:2002. It partially supersedes BS 2790:1992 which will be withdrawn on publication of BS EN 12953 Parts 1, 2, 3, 4, 5, 6, 8 and 9.

When the reference to this European Standard has been published in the Official Journal of the European Communities (OJ), compliance with it will confer a presumption of conformity with the essential requirements covered by the standard in respect of the Pressure Equipment Directive.

The UK participation in its preparation was entrusted to Technical Committee PVE/16, Shell boilers, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this committee can be obtained on request to its secretary.

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

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Chaudières à tubes de fumée - Partie 5: Contrôles en cours
de construction, documentation et marquage des parties
sous pression des chaudières

Großwasserraumkessel - Teil 5: Prüfung während der
Herstellung, Dokumentation und Kennzeichnung für
drucktragende Kesselteile

This European Standard was approved by CEN on 15 May 2002.

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 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This document (EN 12953-5:2002) 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 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(s), see informative Annex ZA, which is an integral part of this standard.

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 November 2002, and conflicting national standards shall be withdrawn at the latest by November 2002.

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.*
- *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 firing systems for solid fuels for the boiler.*
- *Part 13: Operational instructions.*

CR 12953-14: *Guidelines 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 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.

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, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This Part of the European Standard specifies requirements for the inspection during construction, documentation and marking of shell boilers as defined in EN 12953-1.

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 288-3:1992, *Specification and approval of welding procedures for metallic materials — Part 3: Welding procedure tests for the arc welding of steels*.

EN 473, *Non destructive testing — Qualification and certification of NDT personnel — General principles*.

EN 571-1, *Non-destructive testing — Penetrate testing — Part 1: General principles*.

EN 764, *Pressure equipment — Terminology and symbols — Pressure, temperature, volume*.

EN 875, *Destructive tests on welds in metallic materials — Impact tests — Test specimen location, notch orientation and examination*.

EN 876, *Destructive tests on welds in metallic materials — Longitudinal tensile test on weld metal in fusion welded joints*.

EN 895, *Destructive tests on welds in metallic materials — Transverse tensile test*.

EN 910, *Destructive tests on welds in metallic materials — Bend tests*.

EN 970, *Non-destructive examination of fusion welds — Visual examination*.

EN 1290, *Non-destructive examination of welds — Magnetic particle examination of welds*.

EN 1321, *Destructive tests on welds in metallic materials — Macroscopic and microscopic examination of welds*.

EN 1435, *Non-destructive examination of welds — Radiographic examination of welded joints*.

EN 1712, *Non-destructive examination of welds — Ultrasonic examination of welded joints — Acceptance levels*.

EN 1713, *Non-destructive examination of welds — Ultrasonic examination — Characterization of indications in welds*.

EN 1714, *Non-destructive examination of welds — Ultrasonic examination of welded joints*.

EN 12953-1:2002, *Shell boilers — Part 1: General*. EN 12953-3:2002, *Shell boilers — Part 3: Design and calculation for pressure parts*.

EN 12953-4:2002, *Shell boilers — Part 4: Workmanship under construction of pressure parts of the boiler*.

EN 25817, *Arc-welded joints in steel — Guidance on quality levels for imperfections (ISO 5817:1992)*.

EN ISO 6520-1, *Welding and allied processes - Classification of geometric imperfections in metallic materials - Part 1: Fusion welding (ISO 6520-1:1998)*.

3 Terms and definitions

For the purposes of this Part of this European Standard, the terms and definitions given in EN 12953-1 and EN 764 apply.

4 Symbols

For the purposes of this Part of this European Standard, the symbols given in EN 12953-1:2002, Table 4-1 shall apply.

5 Inspection and testing

5.1 General

The manufacturer shall be responsible for ensuring the boiler conforms to the requirements of this European Standard. Conformity shall be confirmed by the completion of a series of inspection activities as given in Table 5.4-1.

Depending upon the conformity assessment module chosen by the manufacturer for the design and manufacture of each boiler (see EN 12953-1:2002, Annex B), the inspection activities shall involve, to a greater or lesser extent, organisations which are independent of the manufacturer.

NOTE For the guidance of the manufacturer, the specific involvement of such organisations, known as responsible authorities (RA), is described in CR 12953-14.

The manufacturer shall provide all the necessary access to enable the responsible authority to carry out the activities in which it is required to be involved.

5.2 Approval of personnel

5.2.1 Check of welder and welding operator approval

The manufacturer shall certify that the welding of the boiler has been done by welders and welding operators who have been approved under the requirements of EN 12953-4:2002, 5.15.3.2 and the appropriate certification shall be made available on request.

5.2.2 Approval of non-destructive examination personnel

For the purposes of this standard the term non-destructive examination (NDE) covers the conventional techniques of visual, radiographic, ultrasonic, magnetic particle examination and/or penetrant testing as specified in 5.5.2 to 5.5.4.

Personnel responsible for non-destructive examination, including interpretation, evaluation and reporting shall be certified in accordance with EN 473.

An exception to this requirement shall be made for visual examination of welds and final inspection of boilers, for which EN 473 is not applicable. Visual examination shall be in accordance with EN 970.

Visual examination shall be carried out by experienced personnel having sufficient knowledge in welding techniques, and a full comprehension of this European Standard, to identify and interpret imperfections that might occur at the surface of the weld and the heat affected zone.

Radiographs shall be viewed by personnel qualified to level 2 of EN 473 as a minimum.

Magnetic particle inspection, penetrant inspection and ultrasonic examination shall be performed under the direct supervision of personnel qualified to level 2 of EN 473 as a minimum.

5.3 Calibration of equipment

The manufacturer shall establish procedures to ensure that tools, gauges, instruments and other measuring and testing devices used in the manufacture and inspection activities affecting boiler quality, are properly controlled, calibrated and adjusted at specific intervals, to maintain accuracy within defined limits.

5.4 Inspection activities

The manufacturer shall confirm that the boiler components, as a minimum, conform to the requirements of this European Standard by performing and authenticating the inspection activities listed in Table 5.4-1.

Table 5.4-1 — List of inspection activities to be undertaken by the manufacturer

Reference no.	Area of activity	Inspection operation
1	Design and general documentation	
1.1	Design data/calculations	Ensure that the design data/calculations conform to: — technical specifications, if applicable — the requirements of this European Standard
1.2	Manufacturing drawings	Ensure that drawing information conforms to: — design data and calculations — technical specifications, if applicable — the requirements of this European Standard
1.3	Purchase specifications	Ensure that material and component specifications conform to: — technical specifications, if applicable — manufacturing drawings — the requirements of this European Standard
1.4	Specifications for sub-contracted parts	Ensure that the specification for sub-contracted parts conform to: — technical specifications, if applicable — manufacturing drawings — the requirements of this European Standard
2	Material	
2.1	Material certificates	Verify that certificate information and results conform to the design specification
2.2	Welding consumables	Verify that the consumables to be used are in accordance with the design specification
2.3	Material identification	Identify the material with the material certificates and check the markings
2.4	Transfer of identification marks	Ensure that the transfer of identification marks is in accordance with the approved procedure
2.5	Acceptance of sub-contracted parts	Verify that sub-contracted parts conform to the manufacturer's specification
3	Fabrication and welding	
3.1	Welding procedure specifications	Verify that appropriate welding specifications are available and that their contents are compatible with the welding procedure approvals
3.2	Welding procedure approvals	Verify that the welding procedures are appropriate for the materials and the field of welding application, and that they have been approved by a responsible authority
3.3	Welder approval	Verify that the welder approvals have been approved by a responsible authority and that they are available and valid