
Vodocevni kotli in pomožne napeljave - 8. del: Zahteve za kurilne naprave za tekoča in plinasta goriva za kotel

Water-tube boilers and auxiliary installations - Part 8: Requirements for firing systems for liquid and gaseous fuels for the boiler

Wasserrohrkessel und Anlagenkomponenten - Teil 8: Anforderungen an Feuerungsanlagen für flüssige und gasförmige für den Kessel

Chaudières a tubes d'eau et installations auxiliaires - Partie 8: Exigences pour les équipements de chauffe pour combustibles gazeux et liquides de la chaudière

[https://standards.iteh.ai/catalog/standards/sist/e7cd80dd-d37d-4c98-b8da-](https://standards.iteh.ai/catalog/standards/sist/e7cd80dd-d37d-4c98-b8da-af672c5784f2/sist-en-12952-8-2002)

[af672c5784f2/sist-en-12952-8-2002](https://standards.iteh.ai/catalog/standards/sist/e7cd80dd-d37d-4c98-b8da-af672c5784f2/sist-en-12952-8-2002)

Ta slovenski standard je istoveten z: EN 12952-8:2002

ICS:

27.060.30	Grelniki vode in prenosniki toplote	Boilers and heat exchangers
-----------	-------------------------------------	-----------------------------

SIST EN 12952-8:2002**en**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 12952-8:2002

<https://standards.iteh.ai/catalog/standards/sist/e7cd80dd-d37d-4c98-b8da-afc72c5784f2/sist-en-12952-8-2002>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 12952-8

May 2002

ICS 27.040

English version

**Water-tube boilers and auxiliary installations - Part 8:
Requirements for firing systems for liquid and gaseous fuels for
the boiler**

Chaudières à tubes d'eau et installations auxiliaires - Partie
8: Exigences pour les équipements de chauffe pour
combustibles gazeux et liquides de la chaudière

Wasserrohrkessel und Anlagenkomponenten - Teil 8:
Anforderungen an Feuerungsanlagen für flüssige und
gasförmige für den Kessel

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.

<https://standards.iteh.ai/catalog/standards/sist/e7cd80dd-d37d-4c98-b8da-af672c5784f2/sist-en-12952-8-2002>



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

	Page
Foreword	3
1 Scope	5
1.1 Firing systems	5
1.2 Fuels	5
1.3 Operation	5
2 Normative references	5
3 Terms and definitions	6
4 Fuel supply	10
4.1 General	10
4.2 Fuel transfer and preparation	10
4.3 Fuel lines	10
4.4 Safety shut-off devices (Safety trip valves)	12
5 Equipment for air supply and flue gas discharge	13
5.1 Air supply	13
5.2 Air/fuel ratio	14
5.3 Flue gas discharge	14
6 Firing system	15
6.1 Burners	15
6.2 Flue gas recirculation	15
6.3 Control and monitoring	16
6.4 Electrical equipment	17
6.5 Safety precautions	17
6.6 Common stack for several firing systems	18
7 Operating manual	18
8 Particular requirements for firing systems burning gaseous fuels with high relative density	18
8.1 Main firing systems	18
8.2 Ignition burner systems	19
Annex A (normative) Chemical recovery boiler (black liquor boiler)	20
A.1 General	20
A.2 Additional requirements for the firing system for black liquor in the chemical recovery boiler	20
A.3 Special requirements for oil- or gas firing for chemical recovery boilers	21
Annex B (informative) Operational requirements for permanent supervised firing systems for liquid and gaseous fuels	22
B.1 General	22
B.2 Operation	22
B.3 Fuel preparation	22
B.4 Safety shutoff devices	22
B.5 Air/fuel ratio	22
B.6 Modification of firing, burner or air/fuel ratio setting	22
B.7 Control and monitoring	23
B.8 Purging, start-up and shut down	23
B.9 Emergency operation	23
B.10 Operating and maintenance instructions	23
B.11 Firing systems burning gaseous fuels with high relative density	23
Annex ZA (informative) Clauses of this European Standard addressing essential safety requirements or other provisions of the Pressure Equipment Directives	25
Bibliography	26

Foreword

This document (EN 12952-8:2002) 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 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.*
- *Part 15: Acceptance tests.*
- *Part 16: Requirements for grate and fluidised 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.

Although, these Parts can be obtained separately, it should be recognized that the Parts are interdependent. 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 standard to be satisfactorily fulfilled.

EN 12952-8:2002 (E)

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

Annex A of this European Standard is normative and Annex B is informative.

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.

iTeh STANDARD PREVIEW **(standards.iteh.ai)**

SIST EN 12952-8:2002

<https://standards.iteh.ai/catalog/standards/sist/e7cd80dd-d37d-4c98-b8da-afc72c5784f2/sist-en-12952-8-2002>

1 Scope

1.1 Firing systems

This Part of this European Standard specifies requirements, for oil and gas firing systems of steam boilers and hot water generators as defined in EN 12952-1.

These requirements also apply to firing systems of chemical recovery boilers (black liquor boilers) with the additions and amendments specified in Annex A of this standard.

NOTE 1 This standard is not applicable to coil type boilers (flash boilers/small boilers) that use burners in accordance with EN 12953-7 apply for single burner installations.

1.2 NOTE 2 This standard is not applicable to the storage of liquid fuels and to transfer stations of long-distance gas pipelines. Fuels

This Part of this European Standard specifies requirements, which cover the use of liquid and gaseous fuels as defined in this standard. Fuels deviating from standardized commercially available types may require additional or alternative safety measures. For black liquor these safety measures are given in Annex A.

1.3 Operation

This Part of this European Standard specifies requirements for operational equipment in clauses 4 to 8 which apply to steam boilers and hot water generators with permanent supervision by properly trained personnel familiar with the special conditions of the firing system and the type of fuel being fired.

2 Normative references

SIST EN 12952-8:2002

<https://standards.iteh.ai/catalog/standards/sist/e7cd80dd-d37d-4c98-b8da-f62e5780204d/en-12952-8:2002>

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 161, *Automatic shut-off valves for gas burners and gas appliances.*

EN 264, *Safety shut-off devices for combustion plants using liquid fuels — Safety requirements and testing.*

EN 287-1, *Approval testing of welders — Fusion welding — Part 1: Steels.*

EN 751-1, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 1: Anaerobic jointing compounds.*

EN 751-2, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 2: Non-hardening jointing compounds.*

EN 751-3, *Sealing materials for metallic threaded joints in contact with 1st, 2nd and 3rd family gases and hot water — Part 3: Unsintered PTFE tapes.*

EN 1044, *Brazing — Filler metals.*

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

EN 12952-5:2001, *Water-tube boilers and auxiliary installations — Part 5: Workmanship and construction of pressure parts of the boiler.*

EN 13480-2, *Metallic industrial piping — Part 2: Materials.*

EN 12952-8:2002 (E)

prEN 50156-1, *Electrical equipment for furnaces and ancillary equipment — Part 1: Requirements for application design and installation.*

EN ISO 3677, *Filler metal for soft soldering, brazing and braze welding — Designation (ISO 3677:1992).*

ISO 7-1, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation. (ISO 7-1:1994)*

ISO 228-1, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000).*

3 Terms and definitions

For the purposes of this Part of this European Standard and the following terms and definitions apply.

3.1**black liquor**

spent liquor from the pulp cook

3.2**black liquor gun**

device for the introduction of the black liquor as a spray of droplets into the furnace. The black liquor gun is not a burner

3.3**high volume low concentration odorous gas**

mixtures of air and a low concentration of odorous gases collected from the pulp mill processes, where the concentration of the combustible odorous gas is always kept below the lower explosion limit

3.4**burners**

devices (including main or igniter burners) for the introduction of fuel and air into a combustion chamber at required velocities, turbulence and local fuel concentration to establish and maintain proper ignition and stable combustion of the fuel. Burners are differentiated by their mode of operation

3.4.1**automatic burners**

burners equipped with automatic ignition, flame monitoring and safety control devices that control the firing rate without the intervention by operating personnel

3.4.2**semi-automatic burners**

burners equipped with automatic ignition, flame monitoring and safety control devices which are started and stopped by the intervention of operating personnel

3.4.3**chemical recovery boiler start up burner**

oil- or gasfired burner mainly intended for the initiation of the black liquor combustion process. The chemical recovery boiler start up burners are located in and integrated with a combustion air register, like the primary or the secondary air register of the furnace. Thus they have no individual air supply and no individual combustion air control

3.4.4**multi-fuel burners**

burners in which more than one fuel is burned either simultaneously or alternately

3.4.5**pilot burner**

burner which maintains a proper permanent ignition source for one or a group of other non-monitored burners

3.5**burner group**

burners operated in unison and controlled jointly. One of the burners can be a master burner

3.6**burner management system**

system that performs a predetermined sequence of actions and always operates in conjunction with a flame monitor that reacts to signals from control and safety devices, gives control commands, controls the start-up sequence, supervises the burner operation, and manages controlled shutdown and lockout

3.7**firing system**

total equipment required for the combustion of fuels including the installations for the storage, preparation, and supply of fuels, the combustion air supply, the burner(s), the flue gas discharge, and all related control and monitoring devices. A flue gas recirculation system can be an integral part of the firing system

3.8**firing system heat input**

heat input into the combustion chamber according to the mass flow of the fuel supplied multiplied by the net calorific value

3.9**flame monitor**

device which detects the presence or absence or break-away of the flame and transmits a signal to the control device, and generally consists of a sensing device (with amplifier if necessary) and switching equipment

3.10**flue gas recirculation**

return of flue gas from downstream of the flame zone or from the flue gas exit by hydrodynamic pressure difference or a separate fan into the air register of the burner or directly into the combustion chamber

3.11**implosion**

unintentional instantaneous negative pressure build-up caused, for example, by an explosion in a confined space, by rapid closing of dampers, or by rapid reduction in temperature (flame out)

3.12**limiters**

transducer, which, on reaching a fixed value (e.g. pressure, temperature, flow, water level) is used to interrupt and lock-out the energy supply, and requires manual unlocking before restart

3.13**lock-out**

isolation of energy supply which requires a manual intervention to reinstate

3.14**master fuel trip**

device for rapid automatic shut-off of all fuel supplies to the boiler area and electrical igniters in the event of danger which may act by automatic, manual or emergency switch initiation even if a possible electrical or mechanical fault occurs

3.15**maximum heat input of the firing system**

heat input including the reserve required for load control at which the boiler can be safely operated

3.16**maximum firing rate of the burners**

firing rate at which the burner may be operated

EN 12952-8:2002 (E)

3.17**monitor**

limit transducer, which senses the reaching of a fixed limit value and initiates an alarm and/or a cut out. The output signal is only cancelled if the cause of the alarm has been removed and the value has returned to within its fixed limits

3.18**multi-fuel firing system**

firing system where, in a common combustion chamber, more than one fuel can be burnt simultaneously or alternately by separate or multi-fuel burners

3.19**purge of burner guns**

carried out after shutdown of a burner to ensure the removal of residual fuel by the introduction of steam or pressurized air into the fuel lines downstream of the shut-off devices

3.20**purging of the flue gas passes**

forced flow of air through the combustion chamber, flue gas passes, and associated ducts which effectively removes any gaseous combustibles and replace them with air

3.21**quick-acting shut-off device**

safety trip valve which closes within 1 s

3.22**relative density**

ratio of the density of the gas to the density of dry air under equal conditions of pressure and temperature

3.23**liquid fuels**

fuels include light fuel oils, and heavy fuel oils which need preheating for proper atomisation. For improvement of atomisation, emulsions of heavy fuel oil with water may be used with appropriate precautions

3.24**gaseous fuels**

standardized quality differentiated mainly by their relative density

3.24.1**light gases**

with relative density below 1,3 e.g. natural gas, coke-oven gas, blast-furnace gas

NOTE Natural gas in accordance with ISO 6976.

3.24.2**heavy gases**

with relative densities exceeding 1,3 e.g. liquefied petroleum gases, the main components of which are propane and butane

3.25**restart**

operation where fuel supply shut-off is initiated within 1 s at the latest after extinction of the flame during operation, and a directly following attempt of re-ignition is automatically made in compliance with the start-up sequence. This operation ends with the operating condition being reached or, if the flame is not ignited after expiration of the ignition safety time, with the lock-out

3.26**return-flow atomizer**

oil burners, where a portion of the quantity of oil supplied to the burner via the flow line does not flow from a burner gun vortex chamber into the combustion chamber, but flows backwards into the storage tank or to the suction side of the pump via a separate return line. Output is adjusted by a control device in the return line

3.27**safety shut-off device**

safety trip valve

valve which automatically and totally cuts off the fuel supply

3.28**safety time**

tolerance time during which the effectiveness of the safety device may be inhibited without a hazardous condition occurring

3.28.1

ignition time: When starting-up the burner, the period of time between the first fuel entering the combustion chamber and the first indication of the flame by the flame monitor

3.28.2

ignition safety time: When starting-up the burner, the period of time between the first fuel entering the combustion chamber and the de-energizing of the quick-acting shut-off device if the flame monitor does not indicate a flame

3.28.3

main burner safety time: When there is an ignition safety time applicable to an igniter burner only the period of time between the first fuel of the main burner entering the combustion chamber and the de energizing of the quick acting shut-off device of the main burner if the flame monitor does not indicate a flame

3.28.4

extinction safety time: During operation of the burner the period of time between the extinction of the flame and the de-energizing of the quick-acting shut-off device

3.29**transfer station**

one or more lines each including a pressure control valve and a quick-acting shut-off device for the protection of the downstream supply lines and the connected appliances against overpressure. The transfer station may comprise of heating and filtering equipment for the gas supply, measuring equipment for flow and calorific value and noise abatement devices