



**SLOVENSKI STANDARD**  
**oSIST prEN 12952-16:2020**  
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**Vodocevni kotli in pomožne napeljave - 16. del: Zahteve za kurilne sisteme na trdna goriva z zgorevalno rešetko ali z lebdečo plastjo**

Water-tube boilers and auxiliary installations - Part 16: Requirements for grate and fluidized-bed firing systems for solid fuels for the boiler

Wasserrohrkessel und Anlagenkomponenten - Teil 16: Anforderungen an Rost- und Wirbelschichtfeuerungsanlagen für feste Brennstoffe für den Kessel

Chaudières à tubes d'eau et installations auxiliaires - Partie 16: Exigences pour les équipements de chauffe à lit fluidisé pour combustibles solides

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EUROPEAN STANDARD  
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**prEN 12952-16**

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## Water-tube boilers and auxiliary installations - Part 16: Requirements for grate and fluidized-bed firing systems for solid fuels for the boiler

Chaudières à tubes d'eau et installations auxiliaires -  
Partie 16: Exigences pour les équipements de chauffe à  
lit fluidisé pour combustibles solides

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Anforderungen an Rost- und  
Wirbelschichtfeuerungsanlagen für feste Brennstoffe  
für den Kessel

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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

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**prEN 12952-16:2019 (E)****European foreword**

This document (prEN 12952-16:2020) has been prepared by Technical Committee CEN/TC 269 “Shell and water-tube boilers”, the secretariat of which is held by DIN.

This document will supersede EN 12952-16:2002.

This document is currently submitted to the CEN Enquiry.

EN 12952 series 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 liquefied 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.*

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 the document to be satisfactorily fulfilled.

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

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 EU Directive 2014/68/EU [1].

For relationship with EU Directive 2014/68/EU, see informative Annex ZA, which is an integral part of this document.

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**prEN 12952-16:2019 (E)****1 Scope****1.1 Firing systems**

This document applies to atmospheric fluidized-bed and grate firing systems of steam boilers and hot water generators. These systems commence at the fuel bunkers and end at the ash extraction plant. For combination of various firing systems, the individual requirements of each system apply, especially those included in prEN 12952-8:2020 and prEN 12952-9:2020.

If several fuels are burnt simultaneously or if a fuel quality varies considerably (e.g. moisture content), additional safety measures may be necessary, especially with respect to limitation of the fuel flow into the firing system and ensuring proper air supply to the individual fuels.

Pressurized firing systems may require enhanced safety measures, which are not given in this European Standard.

**1.2 Fuels**

This document covers the use of solid fuels. Pulverized fuel fired in an entrained air flow (burner) system is covered by prEN 12952-9:2020.

Solid fuels covered are:

- all coal qualities, e.g. lignite or brown coal, sub-bituminous or hard brown coal, bituminous coal or hard coal, pitch coal, anthracite, coke, coal culm, coal sludge;
- other fossil solid fuels (e.g. peat, oil shale);
- biomass solid fuels (e.g. wood, wood wastes [bark], pellets, energy plants [miscanthus], harvest wastes [straw] and briquettes);
- municipal waste solid fuels (e.g. garbage, sewage sludge, refuse derived fuels [RDF]);
- industrial waste solid fuels (e.g. petrol coke, soot, tyres, paper wastes, coated wood chips, spent wood, animal product wastes).

Fuel blends from two or more groups, or fuels of unconventional or unknown quality may require special safety measures which can be proved either by practical experience gained from comparable fuels, or by suitable tests, e.g. in accordance with EN 14034-2:2006+A1:2011. Such measures specified and documented by the manufacturer.

Fuels on which the design is documented in the operating instructions (see 11.2). This includes the fuel data for 100 % input of the basic fuel and the data for any supplementary fuels together with their maximum thermal input percentage.

**1.3 Operation**

The requirements for operational equipment in Clause 4, Clause 5, Clause 6, Clause 7, Clause 8, Clause 9, Clause 10 and Clause 11 apply to steam boilers and hot water generators with permanent supervision by properly trained personnel familiar with the special conditions of the firing systems and the type of fuel.



## 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.

prEN 12952-8:2020,<sup>1</sup> *Water-tube boilers and auxiliary installations — Part 8: Requirements for firing systems for liquid and gaseous fuels for the boiler*

prEN 12952-9:2020, *Water-tube boilers and auxiliary installations — Part 9: Requirements for firing systems for pulverized solid fuel for the boiler*

EN 50156-1:2015, *Electrical equipment for furnaces and ancillary equipment - Part 1: Requirements for application design and installation*

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

### 3.1

#### **annunciator**

device to sense a non-standard or abnormal condition and initiate a visual and/or audible signal

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### 3.2

#### **back-up firing system**

separate firing system to maintain safe ignition and stable combustion

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### 3.3

#### **basic fire**

in the case of grate firing systems the layer of glowing fuel, fire bed, or flame of the fed fuel

Note 1 to entry: The basic fire ensures safe ignition.

### 3.4

#### **carrier gas**

transport medium for pneumatic conveying

### 3.5

#### **combustion air**

total air supplied to the firing system for combustion

### 3.6

#### **combustion process monitoring device**

device which detects the presence of the fire, or the conditions required for a stable combustion process

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<sup>1</sup> Under preparation

**prEN 12952-16:2019 (E)****3.7****firing system heat input**

heat input into the combustion chamber

Note 1 to entry: This normally is calculated as the mass flow of the fuel multiplied by its net calorific value.

**3.8****firing systems**

the total equipment required for the combustion of fuels, including the installations for the storage in the boiler house, preparation and supply of fuels, the combustion air supply, the grate or fluidized bed, the flue gas discharge, and all related control and monitoring devices

**3.9****fluidized-bed combustion firing systems (FBC)**

fuel is burnt in its fluidized state together with an inert component

**3.10****fuel bin****silo**

dust-tight and air-tight container for storage of fuels

**3.11****fuel bunker**

container for the storage of solid fuel

**3.12****fuel feeding system**

device to transport fuel into the combustion chamber

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Note 1 to entry: This can be effected e.g. by feeders through ports in the furnace walls, by means of chutes or lances, through the bottom grate or fluidizing gas distributor, or indirectly into the ash recirculation or combustion air supply.

**3.13****fuel handling plant**

installation for conveying, mixing and distributing solid fuels to the individual fuel bunkers or fuel bins

**3.14****grate firing system**

fuel is burnt in a layer supported by a system e.g. firebars, which can have a cooling system

**3.15****indicator**

measuring instrument which indicates a variable value (e.g. pressure, temperature, flow, level)

Note 1 to entry: It can be equipped with an annunciator.

**3.16****lighting-up equipment**

facility to achieve safe ignition of the feed fuel

**3.17****limiter**

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

**3.18****lockout**

interruption of the energy supply

Note 1 to entry: Manual unlocking is required before restart.

**3.19****minimum fluidized-bed temperature**

lowest temperature of the fluidized material at which it can be safely burnt

**3.20****minimum heat input of the firing system**

minimum heat input at which the firing system can be safely operated

**3.21****monitor**

transducer which on reaching of a fixed limit value and initiates an alarm and/or a cut-out. The output signal only reverses if the causing value has changed at a defined range

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**3.22****purging of the flue gas passes (standards.iteh.ai)**

flow including air through the combustion chamber, flue gas passes, treatment systems and associated ducts which effectively removes any ~~gaseous combustibles~~

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**3.23****cold start-up condition**

plant started when the temperature of ceramic lining and bed material is at ambient value

**4 Fuel storage facilities with conveying plant****4.1 General**

**4.1.1** All facilities shall be designed so as to withstand mechanical and thermal stresses. Fuel shall not be heated to an unacceptable level. Sites where fuel may accumulate shall be avoided.

**4.1.2** Conveyance, temporary storage, and extraction of fuel shall be arranged such that blockage is avoided.

**4.1.3** Fuels liable to volatilise or pyrolysis in the absence of external heating require measures to prevent fire, explosion and injuries to personnel.

NOTE Wet sludges can have an inherent explosion risk due to the release of volatiles (e.g. methane) when stored. Dried sludges have a fire and dust explosion risk comparable to that of pulverized fuels. Sludge storage in bins is preferable to bunker storage (see 4.4.1).

**4.1.4** The storage of fuels supplied in small grain sized particles or fibres which can be stirred up and become airborne shall only be permitted in bins (silos).