



SLOVENSKI STANDARD
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Ventilatorski gorilniki za tekoča goriva

Forced draught burners for liquid fuels

Gebläsebrenner für flüssige Brennstoffe

Brûleurs à air soufflé pour combustibles liquides

Ta slovenski standard je istoveten z: prEN 267 rev

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Forced draught burners for liquid fuels

Brûleurs à air soufflé pour combustibles liquides

Gebläsebrenner für flüssige Brennstoffe

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 47.

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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Foreword

This document (prEN 267:2012) has been prepared by Technical Committee CEN/TC 47 “Atomizing oil burners and their components - Function - Safety - Testing”, the secretariat of which is held by DIN.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 267:2009+A1:2009.

This document 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 and ZB, which is an integral part of this document.

According to EN 267:2009 and its amendment A1 the following fundamental changes are given:

Based on ISO 22968 where different to EN 267 such as

Flow rate from 100 kg /h to 30 kg/h

Update of definitions

Electrical interfaces for burners

Modification

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Test and working diagram NO_x emission calculation

Substitution of EN 50156-1 by EN 60204-1 to include international available requirements for the electrical safety of machines

Annex J is adapted to the new ISO EN 12100 which is substituting EN 1050 which is currently referenced to in table J.1

New functions / requirements

remote reset

environmental aspects (environmental checklist)

increase of burner efficiency

Terminology for burner load control

Introduction

This European Standard is primarily intended for automatic forced draught oil burners having a combustion air fan, operated with liquid fuels, and intended to be marketed as a complete assembly.

Forced draught oil burners according to this European Standard are often used in industrial applications. The safety principles are the same as for forced draught oil burners used for household/commercial applications. Industrial forced draught oil burners however need to operate safely in their industrial environment and the risks involved can differ from those for household applications. These industrial forced draught oil burners can be characterised by the ability to withstand industrial environmental influences, like moisture, high temperature, electrical and magnetic phenomena, vibrations, etc.

Special requirements for forced draught burners for industrial premises will be given as a note with the addition "Industrial application".

Further information and application limitations for forced draught burners, which are used for industrial application, are given in informative Annex H.

Principal requirements for installation of oil burners for industrial thermal processing are covered by EN 746-1 to -8.

This document is a type C standard as stated in EN ISO 12100.

The machinery concerned and the extent to which hazards, hazardous situations and hazardous events are covered are indicated in the scope of this document.

When provisions of this type C standard are different from those which are stated in type A or B standards, the provisions of this type C standard take precedence over the provisions of the other standard, for machines that have been designed and built according to the provisions of this type C standard.

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1 Scope

This European Standard specifies the terminology, the general requirements for the construction and operation of forced draught oil burners and also the provision of control and safety devices, and the test procedure for these burners.

This European Standard applies to automatic forced draught oil burners supplied with:

- a fuel having a viscosity at the burner inlet of 1,6 mm²/s (cSt) up to 6 mm²/s (cSt) at 20 °C; and
- higher boiling petroleum based first raffinates (viscosity greater than 6 mm²/s), that require preheating for proper atomisation.

This European Standard is applicable to:

- single burners fitted to a single combustion chamber;
- single burners fitted to an appliance with additional requirements, then the relevant standard of this appliance shall be taken into account;
- single-fuel and dual-fuel burners when operating on oil only;
- the oil function of dual-fuel burners designed to operate simultaneously on gaseous and liquid fuels, in which case the requirements of EN 676 will also apply in respect of the gaseous fuel function.

This European Standard deals with all significant machine hazards, hazardous situations and events relevant to burners, when they are used as intended and under conditions of misuse which are reasonably foreseeable by the manufacturer, see Annex J.

This European Standard also deals with the additional requirements for the burners in the scope with pressurised parts and/or firing pressurised bodies, see Annex K.

This European Standard specifies the requirements to be met by the manufacturer to ensure the safety during commissioning, start-up, operation, shut-down and maintenance.

This European Standard does not deal with hazards due to specific applications.

This European Standard is not applicable to automatic forced draught oil burners which are manufactured before the date of its publication as European Standard.

This European Standard deals also with forced draught burners intended to be used with biogenous fuels, mixtures.

This European Standard deals also with burners equipped to increase the total appliance efficiency; see Annex M.

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 230, *Automatic burner control systems for oil burners*

EN 287-1, *Qualification test of welders — Fusion welding — Part 1: Steels*

EN 676:2003+A2:2008, *Automatic forced draught burners for gaseous fuels*

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EN 953, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards*

EN 1044, *Brazing — Filler metals*

EN 1057, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*

EN 1088:1995+A2:2008, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection*

EN 1092-1, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges*

EN 1092-2, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 2: Cast iron flanges*

EN 1092-3, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories PN designated — Part 3: Copper alloy flanges*

EN 1254-1, *Copper and copper alloys — Plumbing fittings — Part 1: Fittings with ends for capillary soldering or capillary brazing to copper tubes*

EN 1254-4, *Copper and copper alloys — Plumbing fittings — Part 4: Fittings combining other end connections with capillary or compression ends*

EN 1854, *Pressure sensing devices for gas burners and gas burning appliances*

EN 10204, *Metallic products — Types of inspection documents*

EN 10220, *Seamless and welded steel tubes — Dimensions and masses per unit length*

EN 10305-1, *Steel tubes for precision applications — Technical delivery conditions — Part 1: Seamless cold drawn tubes*

EN 10305-2, *Steel tubes for precision applications — Technical delivery conditions — Part 2: Welded cold drawn tubes*

EN 10305-3, *Steel tubes for precision applications — Technical delivery conditions — Part 3: Welded cold sized tubes*

EN 10305-4, *Steel tubes for precision applications — Technical delivery conditions — Part 4: Seamless cold drawn tubes for hydraulic and pneumatic power systems*

EN 10305-5, *Steel tubes for precision applications — Technical delivery conditions — Part 5: Welded and cold sized square and rectangular tubes*

EN 10305-6, *Steel tubes for precision applications — Technical delivery conditions — Part 6: Welded cold drawn tubes for hydraulic and pneumatic power systems*

EN 13611:2007, *Safety and control devices for gas burners and gas burning appliances — General requirements*

EN 15035, *Heating boilers — Special requirements for oil fired room sealed units up to 70 kW*

EN 15036-1:2006, *Heating boilers — Test regulations for airborne noise emissions from heat generators — Part 1: Airborne noise emissions from heat generators*

EN 50156-1:2004, *Electrical equipment for furnaces and ancillary equipment — Part 1: Requirements for application design and installation*

EN 60204-1: 2009 Safety of machinery - Electrical equipment of machines - Part 1: General requirements (IEC 60204-1:2005, A1:2008, modified)

EN 60335-2-102:2005, *Household and similar electrical appliances — Safety — Part 2-102: Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections (IEC 60335-2-102:2004, modified)*

EN 60529, *Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)*

EN 60730-1, *Automatic electrical controls for household and similar use — Part 1: General requirements (IEC 60730-1:1999, modified)*

EN 61310-1, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, auditory and tactile signals (IEC 61310-1:2007)*

EN 62061 Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems (IEC 62061:2005)

EN 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)*

EN ISO 1127, *Stainless steel tubes — Dimensions, tolerances and conventional masses per unit length (ISO 1127:1992)*

EN ISO 4871, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 6806, *Plastics hoses and hose assemblies for suction and low-pressure discharge of petroleum liquids — Specification (ISO 6806:1992)*

EN ISO 9606-2, *Qualification test of welders — Fusion welding — Part 2: Aluminium and aluminium alloys (ISO 9606-2:2004)*

EN ISO 9606-3, *Approval testing of welders — Fusion welding — Part 3: Copper and copper alloys (ISO 9606-3:1999)*

EN ISO 9606-4, *Approval testing of welders — Fusion welding — Part 4: Nickel and nickel alloys (ISO 9606-4:1999)*

EN ISO 9606-5, *Approval testing of welders — Fusion welding — Part 5: Titanium and titanium alloys, zirconium and zirconium alloys (ISO 9606-5:2000)*

EN ISO 11688-1:1998, *Acoustics — Recommended practice for the design of low-noise machinery and equipment — Part 1: Planning (ISO/TR 11688-1:1995)*

EN ISO 12100:2010, Safety of machinery - General principles for design - Risk assessment and risk reduction (ISO 12100:2010)

EN ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 13857, *Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

EN ISO 15609-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding (ISO 15609-1:2004)*

EN ISO 15609-2, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 2: Gas welding (ISO 15609-2:2001)*

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EN ISO 15609-3, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 3: Electron beam welding (ISO 15609-3:2004)*

EN ISO 15609-4, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 4: Laser beam welding (ISO 15609-4:2009)*

EN ISO 15609-5, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 5: Resistance welding (ISO 15609-5:2004)*

EN ISO 15612, *Specification and qualification of welding procedures for metallic materials — Qualification by adoption of a standard welding procedure (ISO 15612:2004)*

EN ISO 15614-7, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 7: Overlay welding (ISO 15614-7:2007)*

EN ISO 15614-11, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 11: Electron and laser beam welding (ISO 15614-11:2002)*

EN ISO 23553-1, *Safety and control devices for oil burners and oil-burning appliances — Particular requirements — Part 1: Shut-off devices for oil burners (ISO 23553-1:2007, including Cor 1:2009)*

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

ISO 1129, *Steel tubes for boilers, super heaters and heat exchangers — Dimensions, tolerances and conventional masses per unit length*

ISO 3183, *Petroleum and natural gas industries — Steel pipe for pipeline transportation systems*

ISO 8217, *Petroleum products — Fuels (class F) — Specifications of marine fuels*

ISO 9329-1, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 1: Unalloyed steels with specified room temperature properties*

ISO 9330-1, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 1: Unalloyed steel tubes with specified room temperature properties*

ISO 9330-2, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 2: Electric resistance and induction welded unalloyed and alloyed steel tubes with specified elevated temperature properties*

ISO 9330-3, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 3: Electric resistance and induction welded unalloyed and alloyed steel tubes with specified low temperature properties*

ISO 9330-4, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 4: Submerged arc-welded unalloyed and alloyed steel tubes with specified elevated temperature properties*

ISO 9330-5, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 5: Submerged arc-welded unalloyed and alloyed steel tubes with specified low temperature properties*

ISO 9330-6, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 6: Longitudinally welded austenitic stainless steel tubes*

ISO 23552-1, *Safety and control devices for gas and/or oil burners and gas and/or oil appliances — Particular requirements — Part 1: Fuel/air ratio controls, electronic type*

3 Terms and definitions

For the purposes of this document the terms and definitions of EN ISO 12100:2010 and the following apply.

3.1 General definitions

3.1.1

forced draught burner

burner in which the total air for combustion is supplied by means of a fan

3.1.2

automatic forced draught burner

burner that is fitted with an automatic ignition, flame monitoring and burner control devices where the ignition, flame monitoring and the on/off switching of the burner occurs automatically

NOTE The heat input of the burner can be adjusted during operation either automatically or manually.

3.1.3

semi-automatic oil burner

burner that differs from the fully automatic burner only in that start-up of the burner is initiated manually by the operating personnel and there is no automatic recycling after switching off the burner

3.1.4

dual-fuel burner

burner in which both gaseous and liquid fuels can be burnt either simultaneously or in succession

3.1.5

industrial application

forced draught burner utilization and operation in industrial environment

EXAMPLE

- industrial application in:
- the extraction,
 - growth,
 - refining,
 - processing,
 - production,
 - manufacture or
 - preparation of materials, plants, livestock, animal products, food or artefacts.

3.2 Fuel mass flow rate and performance

3.2.1

mass flow rate

constant mass of fuel consumed during a period of time

NOTE Mass flow rate is expressed in kilograms per hour (kg/h).

3.2.1.1

maximum mass flow rate

mass of fuel consumed during a period of time at the highest mass flow rate stated by the manufacturer

NOTE Maximum mass flow rate is expressed in kilograms per hour (kg/h).

prEN 267:2012 (E)**3.2.1.2****minimum mass flow rate**

mass of fuel consumed during a period of time at the lowest mass flow rate indicated by the manufacturer

NOTE Minimum mass flow rate is expressed in kilograms per hour (kg/h).

3.2.2**heat input**

Q_F
quantity of energy used in unit time corresponding to the volume or mass flow rates, the calorific value used being either the net or gross calorific value

NOTE 1 Burners with fixed heat input or single stage burners have a single heat input.

NOTE 2 Range-rated burners have a maximum heat input and a minimum heat input declared by the manufacturer.

NOTE 3 Heat input is expressed in kilowatts (kW) or in kilograms/hour (kg/h) multiplied with the net calorific value (e.g. 11,86 kW h/kg).

3.2.2.1**maximum heat input**

Q_{Fmax}
highest value of the heat input declared by the manufacturer

NOTE Maximum heat input is expressed in kilowatts (kW).

3.2.2.2**minimum heat input**

Q_{Fmin}
lowest value of the heat input declared by the manufacturer

NOTE Minimum heat input is expressed in kilowatts (kW).
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3.2.2.3**start heat input**

Q_s
input of the burner during start-up position as a function of the maximum heat input

NOTE Start heat input is expressed in percent (%).

3.2.2.4**nominal heat input**

Q_{FN}
value of the heat input declared by the manufacturer

NOTE 1 Fixed heat input burners have a single nominal heat input.

NOTE 2 Range-rated burners can be adjusted between the maximum nominal heat input and the minimum nominal heat input stated by the manufacturer.

NOTE 3 Nominal heat input is expressed in kilowatts (kW).

3.3 Combustion chamber, burner head and test rig**3.3.1****combustion chamber**

part of the appliance in which the combustion takes place

3.3.2**pressure in the combustion chamber** p_F

pressure or depression, relative to atmospheric pressure, prevailing in the combustion chamber

NOTE Pressure in the combustion chamber is expressed in kilopascals (kPa).

3.3.3**length of the combustion chamber** l_1

distance between the face of the nozzle or the fuel outlet and the rear wall of the test flame tube or combustion chamber

NOTE Length of the combustion chamber is expressed in metres (m).

3.3.4**diameter of the combustion chamber** d_1

inner diameter of the combustion chamber around the flame tube of the burner

NOTE The diameter of the combustion chamber is measured in metres (m).

3.3.5**burner head**

mixing device consisting of an atomizing system and other components for the mixing of air and fuel

EXAMPLE Stabilizing disc, blast tube.

3.3.6**test rig**

combustion chamber defined by the manufacturer

NOTE In the case where the manufacturer has not defined a combustion chamber, the test is carried out on test rigs with the test flame tubes according to 5.3.

3.3.7**burner flame tube**

device which hosts the mixing device and the root of the flame

3.3.8**test flame tube**

cylindrical part of the test rig where the combustion takes place

3.4 Composition of the gaseous combustion products**3.4.1****content of carbon dioxide (CO₂)**

ratio of the volume of carbon dioxide to the total volume of dry gaseous products in which it is present

NOTE The carbon dioxide content is expressed as a percentage volume fraction.

3.4.2**content of oxygen (O₂)**

ratio of the volume of oxygen to the total volume of dry gaseous products in which it is present

NOTE The oxygen content is expressed as a percentage volume fraction.

3.4.3**content of carbon monoxide (CO)**

ratio of the volume of carbon monoxide to the total volume of dry gaseous products in which it is present