

PUHURPÕLETID VEDELKÜTUSTELE

Forced draught burners for liquid fuels

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 267:2020 sisaldab Euroopa standardi EN 267:2020 ingliskeelset teksti.	This Estonian standard EVS-EN 267:2020 consists of the English text of the European standard EN 267:2020.
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English Version

Forced draught burners for liquid fuels

Brûleurs à air soufflé pour combustibles liquides

Gebläsebrenner für flüssige Brennstoffe

This European Standard was approved by CEN on 8 October 2019.

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European foreword

This document (EN 267:2020) 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 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of an identical text or by endorsement, at the latest by July 2020, and conflicting national standards shall be withdrawn at the latest by January 2023.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 267:2009+A1:2011.

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 Directives.

For relationship with EU Directives, see informative Annex ZA, which are integral parts of this document.

Compared to EN 267:2009+A1:2011 the following fundamental changes have been made:

- based on ISO 22968 where different to EN 267:2009+A1:2011 such as:
 - flow rate from 100 kg/h to 30 kg/h requires a second valve, where the 30 kg/h are replaced by 400 kW;
 - update of definitions;
 - electrical interfaces for burners;
- modification:
 - test and working diagram NO_x emission calculation;
 - replacement of EN 50156-1:2004 by EN 60204-1 to include international available requirements for the electrical safety of machines; see Annex L with editorial allocation in Annex K;
 - Annex J is adapted to the new ISO EN 12100 which is substituting EN 1050 which is currently referenced to in Table J.1;
 - mass flow rate is changed into heat input;
- new functions / requirements:
 - remote reset;
 - environmental aspects (environmental check list);
 - increase of burner efficiency;
 - terminology for burner load control;
 - NO_x mean value for evaluating the NO_x classes;
 - implementing new requirements to comply with the 2013/813 (ErP);

- requiring of a risk assessment as required by EU directive 2014/35/EU for LVD and EU Directive 2014/30/EU for EMC.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

This document is primarily intended for 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 document are also 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 characterized 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 are given in the form of notes and identified by "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 746-2.

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.

1 Scope

This document 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 document applies to forced draught oil burners supplied with:

- fuel based on first raffinates and their mixtures with biogenous liquid fuels 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 atomization.

This document is applicable to:

- single burners fitted to a single combustion chamber;
- single burners fitted to an appliance with additional requirements;

NOTE When additional requirements which are not identified or specified in this standard apply, the specification of the required safety measures and/or protective devices and compliance with them is outside the scope of this standard.

- single-fuel and dual-fuel burners when operating on oil only;
- the oil function of dual-fuel burners designed to operate simultaneously on liquid and gaseous fuels, which, for the latter, the requirements of EN 676 also apply.

This document 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, see Annex J.

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

This document specifies the requirements to ensure the safety during commissioning, start-up, operation, shut-down and maintenance.

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

This document deals also with burners and their equipment to increase the total appliance efficiency, see Annex M.

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.

EN 298:2012, *Automatic burner control systems for burners and appliances burning gaseous or liquid fuels*

EN 676:2017, *Forced draught burners for gaseous fuels*

EN 1057:2006+A1:2010, *Copper and copper alloys — Seamless, round copper tubes for water and gas in sanitary and heating applications*

EN 1092-1:2007+A1:2013, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges*

EN 1092-2:1997, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 2: Cast iron flanges*

EN 1092-3:2003, *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 1254-4:1998, *Copper and copper alloys — Plumbing fittings — Part 4: Fittings combining other end connections with capillary or compression ends*

EN 1854:2010, *Pressure sensing devices for gas burners and gas burning appliances*

EN 10204:2004, *Metallic products — Types of inspection documents*

EN 10220:2002, *Seamless and welded steel tubes — Dimensions and masses per unit length*

EN 10305-1:2016, *Steel tubes for precision applications — Technical delivery conditions — Part 1: Seamless cold drawn tubes*

EN 10305-2:2016, *Steel tubes for precision applications — Technical delivery conditions — Part 2: Welded cold drawn tubes*

EN 10305-3:2016, *Steel tubes for precision applications — Technical delivery conditions — Part 3: Welded cold sized tubes*

EN 10305-4:2016, *Steel tubes for precision applications — Technical delivery conditions — Part 4: Seamless cold drawn tubes for hydraulic and pneumatic power systems*

EN 10305-5:2016, *Steel tubes for precision applications — Technical delivery conditions — Part 5: Welded cold sized square and rectangular tubes*

EN 10305-6:2016, *Steel tubes for precision applications — Technical delivery conditions — Part 6: Welded cold drawn tubes for hydraulic and pneumatic power systems*

EN 13611:2015, *Safety and control devices for burners and appliances burning gaseous and/or liquid fuels — General requirements*

EN 15035:2006, *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 15456:2008, *Heating boilers — Electrical power consumption for heat generators — System boundaries - Measurements*

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

EN 50205:2002, *Relays with forcibly guided (mechanically linked) contacts*

EN 60204-1:2006, *Safety of machinery — Electrical equipment of machines — Part 1: General requirements (IEC 60204-1:2005)*

EN 60335-2-102:2016, *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)*

HD 60364-4-41:2007, *Low-voltage electrical installations — Part 4-41: Protection for safety — Protection against electric shock (IEC 60364-4-41:2005)*

EN 60529:1991, *Degrees of protection provided by enclosures (IP Code) (IEC 60529:1989)*

EN 60664-1:2007, *Insulation coordination for equipment within low-voltage systems — Part 1: Principles, requirements and tests (IEC 60664-1:2007)*

EN 60721-3-1:1997, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 1: Storage (IEC 60721-3-1:1997)*

EN 60721-3-2:1997, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 2: Transportation (IEC 60721-3-2:1997)*

EN 60721-3-3:1995, *Classification of environmental conditions — Part 3: Classification of groups of environmental parameters and their severities — Section 3: Stationary use at weatherprotected locations (IEC 60721-3-3:1994)*

EN 60730-1:2011, *Automatic electrical controls for household and similar use — Part 1: General requirements (IEC 60730-1:2010, modified)*

EN 60730-2-5:2015, *Automatic electrical controls — Part 2-5: Particular requirements for automatic electrical burner control systems (IEC 60730-2-5:2013)*

EN 60947-4-1:2010, *Low-voltage switchgear and controlgear — Part 4-1: Contactors and motor-starters — Electromechanical contactors and motor-starters (IEC 60947-4-1:2009)*

EN 60947-2:2016, *Low-voltage switchgear and controlgear — Part 2: Circuit-breakers (IEC 60947-2:2016)*

EN 61000-4, *Electromagnetic compatibility (EMC) — Testing and measurement techniques*

EN 61000-4-13:2002, *Electromagnetic compatibility (EMC) — Part 4-13: Testing and measurement techniques — Harmonics and interharmonics including mains signalling at a.c. power port, low frequency immunity tests (IEC 61000-4-13:2002)*

EN 61310-1:2008, *Safety of machinery — Indication, marking and actuation — Part 1: Requirements for visual, acoustic and tactile signals (IEC 61310-1:2007)*

EN 61558-2-3:2010, *Safety of transformers, reactors, power supply units and combinations thereof — Part 2-3: Particular requirements and tests for ignition transformers for gas and oil burners (IEC 61558-2-3:2010)*

EN 61558-2-6:2009, *Safety of transformers, reactors, power supply units and similar products for supply voltages up to 1 100 V — Part 2-6: Particular requirements and tests for safety isolating transformers and power supply units incorporating safety isolating transformers (IEC 61558-2-6:2009)*

EN 61810-1:2015, *Electromechanical elementary relays — Part 1: General and safety requirements (IEC 61810-1:2015)*

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

EN ISO 228-1:2003, *Pipe threads where pressure-tight joints are not made on the threads — Part 1: Dimensions, tolerances and designation (ISO 228-1:2000)*

EN ISO 1127:1996, *Stainless steel tubes — Dimensions, tolerances and conventional masses per unit length (ISO 1127:1992)*

EN ISO 3183:2012, *Petroleum and natural gas industries — Steel pipe for pipeline transportation systems (ISO 3183:2012)*

EN ISO 4871:2009, *Acoustics — Declaration and verification of noise emission values of machinery and equipment (ISO 4871:1996)*

EN ISO 6806:2014, *Rubber hoses and hose assemblies for use in oil burners — Specification (ISO 6806:2014)*

EN ISO 9606-1:2013, *Qualification testing of welders — Fusion welding — Part 1: Steels (ISO 9606-1:2012 including Cor 1:2012)*

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

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

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

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

EN ISO 11688-1:2009, *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 13849-1:2015, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2015)*

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

EN ISO 14119:2013, *Safety of machinery — Interlocking devices associated with guards — Principles for design and selection (ISO 14119:2013)*

EN ISO 14120:2015, *Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards (ISO 14120:2015)*

- EN ISO 15609-1:2004, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 1: Arc welding (ISO 15609-1:2004)*
- EN ISO 15609-2:2001, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 2: Gas welding (ISO 15609-2:2001)*
- EN ISO 15609-3:2004, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 3: Electron beam welding (ISO 15609-3:2004)*
- EN ISO 15609-4:2009, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 4: Laser beam welding (ISO 15609-4:2009)*
- EN ISO 15609-5:2011, *Specification and qualification of welding procedures for metallic materials — Welding procedure specification — Part 5: Resistance welding (ISO 15609-5:2011, Corrected version 2011-12-01)*
- EN ISO 15612:2004, *Specification and qualification of welding procedures for metallic materials — Qualification by adoption of a standard welding procedure (ISO 15612:2004)*
- EN ISO 15614-7:2016, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 7: Overlay welding (ISO 15614-7:2016)*
- EN ISO 15614-11:2002, *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 17672:2016, *Brazing — Filler metals (ISO 17672:2016)*
- EN ISO 23553-1:2014, *Safety and control devices for oil burners and oil-burning appliances — Particular requirements — Part 1: Automatic and semi-automatic valves (ISO 23553-1:2014)*
- ISO 7-1:1994, *Pipe threads where pressure-tight joints are made on the threads — Part 1: Dimensions, tolerances and designation*
- ISO 1129:1980, *Steel tubes for boilers, superheaters and heat exchangers — Dimensions, tolerances and conventional masses per unit length*
- ISO 8217:2017, *Petroleum products — Fuels (class F) — Specifications of marine fuels*
- ISO 9329-1:1989, *Seamless steel tubes for pressure purposes — Technical delivery conditions — Part 1: Unalloyed steels with specified room temperature properties*
- ISO 9330-1:1990, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 1: Unalloyed steel tubes with specified room temperature properties*
- ISO 9330-2:1997, *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 9330-3:1997, *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 9330-4:2000, *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 9330-5:2000, *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 9330-6:1997, *Welded steel tubes for pressure purposes — Technical delivery conditions — Part 6: Longitudinally welded austenitic stainless steel tubes*

ISO 23552-1:2007, *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 given in EN ISO 12100:2010 and the following 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 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

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

Note 1 to entry: 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,