STN	Vykurovacie kotly Pravidlá skúšania vykurovacích kotlov s rozprašovacími horákmi na kvapalné palivá	STN EN 304
		07 5304

Heating boilers - Test code for heating boilers for atomizing oil burners

Táto norma obsahuje anglickú verziu európskej normy. This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 04/18

Obsahuje: EN 304:2017

Oznámením tejto normy sa ruší STN EN 304 (07 5304) z októbra 1997

STN EN 15034 (07 5306) z marca 2007

#### 126577

Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2018 Slovenská technická norma a technická normalizačná informácia je chránená zákonom č. 60/2018 Z. z. o technickej normalizácii.

# EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

## EN 304

November 2017

ICS 91.140.10

Supersedes EN 15034:2006, EN 304:1992

**English Version** 

### Heating boilers - Test code for heating boilers for atomizing oil burners

Chaudières de chauffage - Règles d'essai pour les chaudières pour brûleurs à fioul à pulvérisation

Heizkessel - Prüfregeln für Heizkessel mit Ölzerstäubungsbrennern

This European Standard was approved by CEN on 2 July 2017.

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 CEN-CENELEC 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

#### Contents

Europe	ean foreword	4
1	Scope	5
2	Normative references	5
3	Terms and definitions	5
4	General conditions for testing	5
5	Measurement accuracies and uncertainties	6
6	Measurements for the heating mode	
6.1	General	
6.2	Determination of the nominal heat output	
6.3	Determination of the boiler efficiency at nominal heat output	
6.4	Performance of testing	
6.4.1	General test conditions	
6.4.2	Draught adjustment	
6.4.3	Establishment of steady-state conditions	
6.4.4	Test period	8
6.5	Calculation	8
6.5.1	General	8
6.5.2	Nominal heat output	8
6.5.3	Boiler heat input	8
6.5.4	Boiler efficiency	9
6.6	Determination of the waterside resistance	9
6.7	Determination of the standby heat loss	10
6.7.1	General	10
6.7.2	Standby heat loss method 1	11
6.7.3	Standby heat loss method 2	12
6.8	Efficiency at 30 % of the nominal heat output	14
6.8.1	General	14
6.8.2	Efficiency at 30 % - Method 1 (time dependent method)	14
6.8.3	Efficiency at 30 % - Method 2 (load dependent method)	14
6.9	Auxiliary electricity consumption	
6.10	Seasonal space heating efficiency	16
6.11	Verification of nominal condensing output	16
6.12	Formation of condensation	16
6.13	Functional test for the temperature sensing control type TR and temperature	
	sensing control type STB on the boiler	16
6.14	Surface temperature	
6.15	Floor temperatures	
6.16	Limiting temperature of the test panels	
6.17	Emission values of NO <sub>x</sub> and CO	
6.17.1	General	
6.17.2	Units	21
	Assemblies of a boiler with various burners	
7	Measurement of the sanitary water production mode	
8	Test report and other documents	
U	1 C31 1 CPUI L AIIU UUICI UULUIIICIILS	44

Annex	A (normative) Calculations for the heating mode	23
A.1	Volume measurement	23
A.2	Calculation of combustion parameters	23
A.3	Determination of air factor ( $\lambda$ ) and excess air (e)	27
A.4	Test rigs	28
A.5	Calculation of the nominal heat output $P_{\rm N}$	29
A.6	Calculation of the heat input	30
A.7	Calculation of efficiency	30
A.8	Calculation of the heat losses $q_A$ , $q_U$ , $q_S$	32
A.9	Standby heat loss (P <sub>Stby</sub> )	35
A.10	Calculation of the seasonal space heating energy efficiency	37
A.11	Fuel characteristics	38
Annex	B (informative) Applicable symbols and units	40
Annex	C (informative) Criteria for the adaptation of forced draught burners using liquid fuels to heating boilers	43
Annex	D (informative) Information for setting up and evaluation of the test rig	45
Annex	E (informative) Determination of the heat losses of the test rig	46
Annex	ZA (informative) Relationship between this European Standard and the ecodesign requirements of Commission Regulation (EU) No [813/2013] aimed to be covered	47
Annex	ZB (informative) Relationship between this European Standard and the ecodesign requirements of Commission Delegated Regulation (EU) No [811/2013] aimed to be covered	48
Bibliog	graphy	49

#### **European foreword**

This document (EN 304:2017) has been prepared by Technical Committee CEN/TC 57 "Central heating boilers", 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 May 2018, and conflicting national standards shall be withdrawn at the latest by May 2018.

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 304:1992 and EN 15034:2006.

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 Annexes ZA and ZB, which are an integral part of this document.

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

#### 1 Scope

This European Standard applies to the determination of the performances of heating boilers and combi boilers fired by liquid fuels. The requirements for the heating performances are laid down in EN 303-1:2017 and EN 303-2:2017.

This test code includes the requirements and recommendations for carrying out and evaluating the procedure for testing boilers and also the details of the technical conditions under which the tests will be carried out.

The requirements and the performance of testing for the sanitary hot water production of combi boilers are laid down in prEN 303-6.

#### 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 267:2009+A1:2011, Automatic forced draught burners for liquid fuels

EN 303-1:2017, Heating boilers - Part 1: Heating boilers with forced draught burners - Terminology, general requirements, testing and marking

EN 303-2:2017, Heating boilers - Part 2: Heating boilers with forced draught burners - Special requirements for boilers with atomizing oil burners

prEN 303-6, Heating boilers - Part 6: Heating boilers with forced draught burners - Specific requirements for the domestic hot water operation and energy performance of water heaters and combination boilers with atomizing oil burners of nominal heat input not exceeding 70 kW

EN 15456, Heating boilers - Electrical power consumption for heat generators - System boundaries - Measurements

EN ISO/IEC 17025, General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025)

koniec náhľadu – text ďalej pokračuje v platenej verzii STN