



SLOVENSKI STANDARD
SIST EN 14471:2014+A1:2015
01-marec-2015

Nadomešča:
SIST EN 14471:2014

Dimniki - Sistemski dimniki s plastičnimi dimniškimi tuljavami - Zahteve in preskusne metode

Chimneys - System chimneys with plastic flue liners - Requirements and test methods

Abgasanlagen - Systemabgasanlagen mit Kunststoffinnenrohren - Anforderungen und Prüfungen

Conduits de fumée - Système de conduits de fumée avec conduits intérieurs en plastique - Prescriptions et méthodes d'essai

<https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-c8a056c7ec1f/sist-en-14471-2014a1-2015>

Ta slovenski standard je istoveten z: EN 14471:2013+A1:2015

ICS:

91.060.40 Dimniki, jaški, kanali Chimneys, shafts, ducts

SIST EN 14471:2014+A1:2015 **en,fr,de**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 14471:2014+A1:2015](https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-c8a056c7ec1f/sist-en-14471-2014a1-2015)

<https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-c8a056c7ec1f/sist-en-14471-2014a1-2015>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 14471:2013+A1

January 2015

ICS 91.060.40

Supersedes EN 14471:2013

English Version

Chimneys - System chimneys with plastic flue liners - Requirements and test methods

Conduits de fumée - Système de conduits de fumée avec
conduits intérieurs en plastique - Prescriptions et méthodes
d'essai

Abgasanlagen - Systemabgasanlagen mit
Kunststoffinnenrohren - Anforderungen und Prüfungen

This European Standard was approved by CEN on 14 September 2013 and includes Amendment 1 approved by CEN on 3 November 2014.

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

[SIST EN 14471:2014+A1:2015](https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-c8a056c7ec1f/sist-en-14471-2014a1-2015)

<https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-c8a056c7ec1f/sist-en-14471-2014a1-2015>



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

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

Contents

	Page
Foreword.....	7
Introduction	8
1 Scope	9
2 Normative references	9
3 Terms and definitions	11
4 Classification and designation.....	15
4.1 General.....	15
4.2 Temperature classes	16
4.3 Pressure classes.....	16
4.4 Sootfire resistance classes	16
4.5 Condensate resistance classes	16
4.6 Corrosion resistance classes.....	17
4.7 Thermal resistance	17
4.8 Distance to combustible material	17
4.9 Location	17
4.10 Reaction to fire.....	17
4.11 Outer wall classes	18
4.12 Designation	18
5 Dimensions and tolerances	18
6 Performance requirements	19
6.1 General.....	19
6.2 Resistance to the combination of mechanical and thermal load	19
6.2.1 General.....	19
6.2.2 Mechanical behaviour and stability	20
6.3 Components subject to wind load	21
6.4 Fire resistance.....	21
6.5 Hygiene, health and environment	21
6.5.1 Gas tightness	21
6.5.2 Recycling	21
6.6 Safety in use.....	21
6.6.1 Thermal performance	21
6.6.2 Resistance against condensate	22
6.6.3 Rainwater penetration resistance for insulated chimneys for external installation	22
6.6.4 Flow resistance	22
6.6.5 Terminals	23
6.7 Materials, durability	23
6.7.1 General.....	23
6.7.2 Characterization.....	23
6.7.3 Long-term resistance to thermal load	23
6.7.4 Long-term resistance to condensate exposure.....	24
6.7.5 Resistance to wet/dry cycling	25
6.7.6 Resistance against weathering	26
6.7.7 Geometrical stability	26
6.7.8 Reaction to fire.....	26
6.7.9 Freeze-thaw resistance	26
6.7.10 Seals and sealants.....	27
7 Test methods.....	27

7.1	General	27
7.2	Resistance to the combination of mechanical and thermal load	27
7.2.1	Test sample	27
7.2.2	Test performance	30
7.2.3	Test environment	30
7.3	Components subject to wind load	30
7.4	Fire resistance	31
7.5	Hygiene, health and environment	31
7.5.1	Gas tightness	31
7.5.2	Recycling	32
7.6	Safety in use	33
7.6.1	Thermal performance	33
7.6.2	Thermal resistance	33
7.6.3	Resistance against condensate	33
7.6.4	Rainwater penetration resistance for insulated chimneys for external installation	33
7.6.5	Flow resistance	34
7.6.6	Terminals	34
7.7	Materials	35
7.7.1	General	35
7.7.2	Characterization	35
7.7.3	Long-term resistance to thermal load	35
7.7.4	Long-term resistance to condensate exposure	36
7.7.5	Resistance to wet/dry cycling	37
7.7.6	Resistance against weathering	37
7.7.7	Geometrical stability	38
7.7.8	Reaction to fire	38
7.7.9	Freeze-thaw resistance	38
7.7.10	Seals and sealants	38
8	Dangerous substances	38
9	Product information	38
9.1	General	38
9.2	Minimum information to be included in the manufacturer's instructions	38
9.2.1	Information for the installer	38
9.2.2	Information for the user	39
9.2.3	Additional information to be included in the manufacturer's instructions:	39
10	Assessment and Verification of the Constancy of Performance (AVCP)	41
10.1	General	41
10.2	Product type determinations	41
10.3	Further type testing	41
10.4	Continuous surveillance of FPC	41
10.5	Factory production control (FPC)	42
10.5.1	General	42
10.5.2	Equipment	43
10.5.3	Raw materials and components	43
10.5.4	Product testing and evaluation	44
11	Marking and labelling	44
11.1	Marking chimney components	44
11.2	Chimney plate	45
Annex A	(normative) Test methods for characterization	46
Annex B	(informative) Examples of characterization	48
Annex C	(normative) Test methods to determine the effect to long-term thermal load, long-term condensate exposure, wet/dry cycling and resistance to UV	49
Annex D	(normative) Simplified calculation of thermal resistance for circular flues	50

EN 14471:2013+A1:2015 (E)

Annex E (informative) Method for applying an evenly distributed load (horizontal)	52
Annex F (informative) Resistance to UV	53
Annex G (normative) Terminals	54
G.1 Characteristics of a terminal	54
G.1.1 General	54
G.1.2 Types of terminals	54
G.1.2.1 Type I	54
G.1.2.1.1 General	54
G.1.2.1.2 Type Ia	54
G.1.2.1.3 Type Ib	54
G.1.2.2 Type II	54
G.1.2.3 Type III	54
G.1.3 Wind direction characteristics	54
G.2 Requirements	55
G.2.1 General	55
G.2.2 Flow resistance of terminals Type I, II and III	55
G.2.3 Aerodynamic properties of terminals Type II and III	55
G.2.3.1 Terminal Type II	55
G.2.3.2 Terminal Type III	55
G.2.4 Rain water ingress	56
G.2.5 Icing behaviour	56
G.3 Characteristics of the terminal	56
G.3.1 Flow resistance	56
G.3.1.1 Flue duct for terminals Type I, II, III	56
G.3.1.2 Air duct for terminal Type III	56
G.3.2 Aerodynamic properties	57
G.3.2.1 Wind velocity pressure of a terminal Type II – for non room-sealed and room-sealed appliances	57
G.3.2.2 Wind velocity pressure of a terminal, Type III – for balanced flue applications	58
G.3.2.3 Recirculation factor of a terminal, Type III, (for room sealed appliances)	58
G.3.3 Rainwater ingress	59
G.3.4 Icing behaviour	59
Annex H (normative) Test methods for flow resistance	60
H.1 For terminal Type I, II and III, test method for flow resistance	60
H.1.1 Test apparatus	60
H.1.2 Test sample	60
H.1.3 Measurement parameters	60
H.1.4 Test condition	61

ITEH STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 14471:2014+A1:2015](https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-c8a056c7ec1f/sist-en-14471-2014a1-2015)

<https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-c8a056c7ec1f/sist-en-14471-2014a1-2015>

H.1.5	Test procedure.....	61
H.1.6	Test result.....	61
Annex I	(normative) Test methods for wind effects on pressure	64
I.1	For terminal Type II, test method for wind velocity pressure	64
I.1.1	Test apparatus	64
I.1.2	Test sample	64
I.1.3	Measurement parameters	64
I.1.4	Test condition	65
I.1.5	Test procedure.....	65
I.1.6	Test result.....	65
I.2	For a terminal Type III, test method for wind velocity pressure	65
I.2.1	Test apparatus	65
I.2.2	Test sample	66
I.2.3	Measurement parameters	66
I.2.4	Test condition	67
I.2.5	Test procedure.....	67
I.2.6	Test result.....	67
Annex J	(normative) Test methods for wind effects on recirculation	68
J.1	For terminal Type III, test method for recirculation	68
J.1.1	Test apparatus	68
J.1.2	Test sample	68
J.1.3	Measurement parameters	68
J.1.4	Test condition	68
J.1.5	Test procedure.....	69
J.1.6	Test result.....	69
Annex K	(normative) Test method for rain water ingress	70
K.1	For terminal Type Ib, II and III, test method without wind	70
K.1.1	Test apparatus	70
K.1.2	Test sample	70
K.1.3	Measurement parameters	70
K.1.4	Test condition	70
K.1.5	Test procedure.....	71
K.1.6	Test result.....	71
K.2	For terminal Type Ib, II and III, test method with wind.....	72
K.2.1	Test apparatus	72
K.2.2	Test sample	73
K.2.3	Measurement parameters	73
K.2.4	Test condition	73

iTech STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 14471:2014+A1:2015](https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-c8a056c7ec1f/sist-en-14471-2014a1-2015)

<https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-c8a056c7ec1f/sist-en-14471-2014a1-2015>

EN 14471:2013+A1:2015 (E)

K.2.5	Test procedure	73
K.2.6	Test result	74
Annex L	(normative) Test method of icing effects	76
L.1	For terminal Type II and III, test method for icing behaviour	76
L.1.1	Test apparatus	76
L.1.2	Test sample	76
L.1.3	Measurement parameters	76
L.1.4	Test condition	77
L.1.5	Test procedure	77
L.1.6	Test result	77
Annex ZA	(informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation	79
ZA.1	Scope and relevant characteristics	79
ZA.2	Procedure for AVCP of system chimneys with plastic flue liners and terminals	81
ZA.2.1	Systems of AVCP	81
ZA.2.2	Declaration of performance (DoP)	88
ZA.2.2.1	General	88
ZA.2.2.2	Content	88
ZA.2.2.3	Example of DoP	89
ZA.3	CE marking and labelling	93
Bibliography	96

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 14471:2014+A1:2015](https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-c8a056c7ec1f/sist-en-14471-2014a1-2015)

<https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-c8a056c7ec1f/sist-en-14471-2014a1-2015>

Foreword

This document (EN 14471:2013+A1:2015) has been prepared by Technical Committee CEN/TC 166 "Chimneys", the secretariat of which is held by ASI.

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 2015, and conflicting national standards shall be withdrawn at the latest by October 2016.

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

This document includes Amendment 1 approved by CEN on 2014-11-04.

The start and finish of text introduced or altered by amendment is indicated in the text by tags \square_{A1} \square_{A1} .

This document supersedes \square_{A1} EN 14471:2013 \square_{A1} .

The main modifications compared to EN 14471:2005 are the following:

- the Normative References were updated;
- additions were made in Clause 3 (Terms and definitions);
- Clause 4 was revised;
- the requirements in Clause 5 were completely revised;
- all annexes were revised and some annexes were added.

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, which is an integral part of this document.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The objective of this European Standard is to evaluate the behaviour of system chimneys with plastic flue liners.

A system chimney with a plastic flue liner may be a single wall chimney (only the plastic flue liner) or may be a double wall chimney or a flue liner with enclosure or with outer wall. The system chimney according to this standard can consist of a plastic liner only (e.g. single wall) or a system with plastic inner liner (e.g. concentric or with outer wall). The system chimney is defined by the manufacturer, whereas the requirements for the installation are defined by the national regulations of the member states.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 14471:2014+A1:2015](https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-c8a056c7ec1f/sist-en-14471-2014a1-2015)

<https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-c8a056c7ec1f/sist-en-14471-2014a1-2015>

1 Scope

This European Standard specifies the performance requirements and test methods for system chimneys with plastic flue liners used to convey the products of combustion from appliances to the outside atmosphere under dry and wet conditions. It also specifies the requirements for marking, manufacturer's instructions and evaluation of conformity.

This European Standard describes chimney components from which system chimneys can be assembled.

This European Standard is not applicable to chimneys with sootfire resistance classification class G.

This European Standard is not applicable for chimneys with the following classification:

corrosion resistance class 2 concerning natural wood¹⁾;

corrosion resistance class 3;

pressure class N2.

This European Standard is applicable to chimneys designed so that no condensate accumulation can occur, e.g. with a minimum inclination of 3° to the horizontal.

This European Standard is not applicable

- for system chimneys with plastic coated flue liners;
- to structurally independent (free-standing or self-supporting) chimneys.

Chimneys with components which need further processing during the installation to reach the final material properties are no system chimneys and therefore also not covered by this standard.

This European Standard does not cover the requirements for horizontal terminals (as defined for C1 installation types in CEN/TR 1749) regarding aerodynamic behaviour, rainwater ingress and icing behaviour.

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 1443:2003, *Chimneys — General requirements*

EN 13216-1:2004, *Chimneys — Test methods for system chimneys — Part 1: General test methods*

EN 13384-1:2002+A2:2008, *Chimneys — Thermal and fluid dynamic calculation methods — Part 1: Chimneys serving one appliance*

EN 13501-1:2007+A1:2009, *Fire classification of construction products and building elements — Part 1: Classification using test data from reaction to fire tests*

EN 13501-2, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*

¹⁾ There is no sufficient knowledge on data for flue gas condensate from appliances fired with natural wood.

EN 14471:2013+A1:2015 (E)

EN 13823, *Reaction to fire tests for building products — Building products excluding floorings exposed to the thermal attack by a single burning item*

EN 14241-1, *Chimneys — Elastomeric seals and elastomeric sealants — Material requirements and test methods - Part 1: Seals in flue liners*

EN 14297, *Chimneys — Freeze-thaw resistance test method for chimney products*

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

EN ISO 75-1, *Plastics — Determination of temperature of deflection under load — Part 1: General test method (ISO 75-1)*

EN ISO 178, *Plastics — Determination of flexural properties (ISO 178)*

EN ISO 179-1, *Plastics — Determination of Charpy impact properties — Part 1: Non-instrumented impact test (ISO 179-1)*

EN ISO 306, *Plastics — Thermoplastic materials — Determination of Vicat softening temperature (VST) (ISO 306)*

EN ISO 527-1, *Plastics — Determination of tensile properties — Part 1: General principles (ISO 527-1)*

EN ISO 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2)*

EN ISO 1043-1, *Plastics — Symbols and abbreviated terms — Part 1: Basic polymers and their special characteristics (ISO 1043-1)*

EN ISO 1133-1, *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 1: Standard method (ISO 1133-1)*

EN ISO 1133-2, *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 2: Method for materials sensitive to time-temperature history and/or moisture (ISO 1133-2)*

EN ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1)*

EN ISO 8256, *Plastics — Determination of tensile-impact strength (ISO 8256)*

EN ISO 9969, *Thermoplastics pipes — Determination of ring stiffness (ISO 9969)*

EN ISO 11925-2, *Reaction to fire tests — Ignitability of products subjected to direct impingement of flame — Part 2: Single-flame source test (ISO 11925-2)*

EN ISO 11357-3, *Plastics — Differential scanning calorimetry (DSC) — Part 3: Determination of temperature and enthalpy of melting and crystallization (ISO 11357-3)*

EN ISO 14021, *Environmental labels and declarations — Self-declared environmental claims (Type II environmental labelling) (ISO 14021)*

ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1443:2003, EN 13216-1:2004 and the following apply.

3.1

characterization

identification (finger print) of the material by determining a combination of properties covering the thermal, mechanical and physicochemical behaviour

3.2

material

material composition of which an individual component is made, being the result of a manufacturing process in which the raw material(s) is transformed by extrusion, moulding, welding, etc. in its intended shape

3.3

material test

test in which specific properties of a material as defined in 3.2 are tested

Note 1 to entry: The material test does not include the effects of the performance of the chimney system resulting in stress etc. on the individual components.

3.4

flue

passage for conveying the products of combustion to the outside atmosphere

3.5

flue gas

gaseous portion of the products of combustion conveyed in a flue

3.6

products of combustion

products resulting from the combustion of fuel (gaseous, liquid and solid constituents)

3.7

flue liner

wall of a chimney consisting of components the surface of which is in contact with products of combustion

[SOURCE: EN 1443:2003, 3.5]

3.8

coated flue liner

flue liner where material is applied to the inner surface of the flue liner to change the surface properties

3.9

chimney

structure consisting of a wall or walls enclosing a flue or flues

3.10

chimney component

any part of a chimney

[SOURCE: EN 1443:2003, 3.7]

3.11

chimney fitting

chimney component conveying products of combustion except a chimney section

EN 14471:2013+A1:2015 (E)**3.12****chimney section**

straight chimney component conveying products of combustion

3.13**single wall chimney**

chimney where the flue liner is the chimney

3.14**multi-wall chimney**

chimney consisting of a flue liner and at least one additional wall

3.15**outer wall**

external wall of a chimney the surface of which comes in contact with ambient or external environment, or is within cladding or enclosure

3.16**cladding**

additional non-structural outer wall around a chimney for protection against heat transfer or weathering, or for decorative purposes

3.17**external installation**

part of a chimney which is located outside the building

3.18**internal installation**

part of a chimney which is located inside a building

3.19**joint**

connection between two components

3.20**support**

chimney accessory used to fix (or transfer the load of) chimney components to structural elements (building, mast, etc.)

3.21**connecting flue pipe**

component or components connecting the heating appliance outlet and the chimney

3.22**terminal**

fitting installed at the outlet of a chimney

3.23**system chimney**

chimney that is installed using a combination of compatible chimney components, obtained or specified from one manufacturing source with product responsibility for the whole chimney

3.24**enclosure**

barrier that when built around a chimney will give additional safety in case of fire and may provide additional heat transfer resistance

3.25**dry operating condition**

condition when a chimney is designed to operate normally with the temperature of the inner surface of the flue liner above the water dew point

3.26**wet operating condition**

condition when the chimney is designed to operate normally with the temperature of the inner surface of the flue liner at or below the water dew point

3.27**condensate**

liquid products formed when the flue gas is at or below the water dew point

3.28**negative pressure chimney**

chimney designed to operate with the pressure inside the flue less than the pressure outside the flue

3.29**positive pressure chimney**

chimney designed to operate with the pressure inside the flue greater than the pressure outside the flue

3.30**sootfire**

combustion of the flammable residue deposited on the flue liner

3.31**sootfire resistant chimney**

chimney that is capable of withstanding a specified thermal shock

3.32**thermal resistance of a chimney**

resistance to heat transfer through the wall or walls of the chimney

3.33**reaction to fire**

response of a product in contributing by its own decomposition to a fire to which it is exposed, under specified conditions

3.34**resistance to fire of a chimney**

ability of the chimney to prevent ignition of adjacent combustible materials and to prevent the spread of fire to adjacent areas

3.35**nominal working temperature**

average flue gas temperature obtained during the nominal output test for the maximum temperature level

symbol : T_{nom} in °C

3.36**material test temperature**

temperature the material is actually exposed to in the oven during long-term resistance to thermal load

symbol : T_{m} in °C

iteh STANDARD PREVIEW

(standards.iteh.ai)

[SIST EN 14471:2014+A1:2015](https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-8a056c7ec1f/sist-en-14471-2014a1-2015)

[https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-](https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-8a056c7ec1f/sist-en-14471-2014a1-2015)

[8a056c7ec1f/sist-en-14471-2014a1-2015](https://standards.iteh.ai/catalog/standards/sist/ad247e1b-5714-4e10-b1a3-8a056c7ec1f/sist-en-14471-2014a1-2015)