

# DIN EN 14471:2015-03 (E)

## Chimneys - System chimneys with plastic flue liners - Requirements and test methods (includes Amendment A1:2015)

---

<b>Contents</b>		<b>Page</b>
Foreword .....		7
Introduction .....		8
<b>1</b>	<b>Scope .....</b>	<b>9</b>
<b>2</b>	<b>Normative references .....</b>	<b>9</b>
<b>3</b>	<b>Terms and definitions .....</b>	<b>11</b>
<b>4</b>	<b>Classification and designation .....</b>	<b>15</b>
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
<b>5</b>	<b>Dimensions and tolerances .....</b>	<b>18</b>
<b>6</b>	<b>Performance requirements .....</b>	<b>19</b>
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
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
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
<b>Annex J (normative) Test methods for wind effects on recirculation .....</b>		<b>68</b>
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
<b>Annex K (normative) Test method for rain water ingress .....</b>		<b>70</b>
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
K.2.5	Test procedure .....	73
K.2.6	Test result .....	74
<b>Annex L (normative) Test method of icing effects .....</b>		<b>76</b>
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
<b>Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation .....</b>		<b>79</b>
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
<b>Bibliography .....</b>		<b>96</b>