DIN EN 14471:2014-03 (E)

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

Contents

Page

Foreword 6

Introduction 7

1 Scope 8

2 Normative references 8

3 Terms and definitions 9

4 Classification and designation 14
4.1 General 14
4.2 Temperature classes 14
4.3 Pressure classes 15
4.4 Sootfire resistance classes 15
4.5 Condensate resistance classes 15
4.6 Corrosion resistance classes 15
4.7 Thermal resistance 16
4.8 Distance to combustible material 16
4.9 Location 16
4.10 Reaction to fire 16
4.11 Outer wall classes 17
4.12 Designation 17

5 Dimensions and tolerances 17

6 Performance requirements 18
6.1 General 18
6.2 Resistance to the combination of mechanical and thermal load 18
6.2.1 General 18
6.2.2 Mechanical behaviour and stability 18
6.3 Components subject to wind load 19
6.4 Fire resistance 20
6.5 Hygiene, health and environment 20
6.5.1 Gas tightness 20
6.5.2 Recycling 20
6.6 Safety in use 20
6.6.1 Thermal performance 20
6.6.2 Thermal resistance 21
6.6.3 Resistance against condensate 21
6.6.4 Rainwater penetration resistance for insulated chimneys for external installation 21
6.6.5 Flow resistance 21
6.6.6 Terminals 21
6.7 Materials, durability 22
6.7.1 General 22
6.7.2 Characterization 22
6.7.3 Long-term resistance to thermal load 22
6.7.4 Long-term resistance to condensate exposure 23
6.7.5 Resistance to wet/dry cycling 24
6.7.6 Resistance against weathering 25
6.7.7 Geometrical stability 25

6.7.8 Reaction to fire ... 25
6.7.9 Freeze-thaw resistance ... 26
6.7.10 Seals and sealants ... 26

7 Test methods ... 26
7.1 General ... 26
7.2 Resistance to the combination of mechanical and thermal load ... 26
7.2.1 Test sample ... 26
7.2.2 Test performance ... 27
7.2.3 Test environment ... 27
7.3 Components subject to wind load ... 28
7.4 Fire resistance ... 28
7.5 Hygiene, health and environment ... 28
7.5.1 Gas tightness ... 28
7.5.2 Recycling ... 28
7.6 Safety in use ... 28
7.6.1 Thermal performance ... 28
7.6.2 Thermal resistance ... 29
7.6.3 Resistance against condensate ... 29
7.6.4 Rainwater penetration resistance for insulated chimneys for external installation ... 29
7.6.5 Flow resistance ... 29
7.6.6 Terminals ... 30
7.7 Materials ... 30
7.7.1 General ... 30
7.7.2 Characterization ... 30
7.7.3 Long-term resistance to thermal load ... 30
7.7.4 Long-term resistance to condensate exposure ... 31
7.7.5 Resistance to wet/dry cycling ... 32
7.7.6 Resistance against weathering ... 32
7.7.7 Geometrical stability ... 33
7.7.8 Reaction to fire ... 33
7.7.9 Freeze-thaw resistance ... 33
7.7.10 Seals and sealants ... 33

8 Dangerous substances ... 33

9 Product information ... 33
9.1 General ... 33
9.2 Minimum information to be included in the manufacturer's instructions ... 33
9.2.1 Information for the installer ... 33
9.2.2 Information for the user ... 34
9.3 Additional information to be included in the manufacturer's instructions: ... 34
9.3.1 Information for the installer ... 34
9.3.2 Information for the user ... 35
9.3.3 Additional information for terminals ... 35

10 Assessment and Verification of the Constancy of Performance (AVCP) ... 36
10.1 General ... 36
10.2 Product type determinations ... 36
10.3 Further type testing ... 36
10.4 Continuous surveillance of FPC ... 36
10.5 Factory production control (FPC) ... 37
10.5.1 General ... 37
10.5.2 Equipment ... 38
10.5.3 Raw materials and components ... 38
10.5.4 Product testing and evaluation ... 39

11 Marking and labelling ... 39
11.1 Marking chimney components ... 39
11.2 Chimney plate ... 40

Annex A (normative) Test methods for characterization ... 45

Annex B (informative) Examples of characterization 47

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 48

Annex D (normative) Simplified calculation of thermal resistance for circular flues 49

Annex E (informative) Method for applying an evenly distributed load (horizontal) 51

Annex F (informative) Resistance to UV 52

Annex G (normative) Terminals 53

G.1 Characteristics of a terminal 53
G.1.1 General 53
G.1.2 Types of terminals 53
G.1.3 Wind direction characteristics 53
G.2 Requirements 54
G.2.1 General 54
G.2.2 Flow resistance of terminals Type I, II and III 54
G.2.3 Aerodynamic properties of terminals Type II and III 54
G.2.4 Rain water ingress 55
G.2.5 Icing behaviour 55
G.3 Characteristics of the terminal 55
G.3.1 Flow resistance 55
G.3.2 Aerodynamic properties 56
G.3.3 Rainwater ingress 58
G.3.4 Icing behaviour 58

Annex H (normative) Test methods for flow resistance 59

H.1 For terminal Type I, II and III, test method for flow resistance 59
H.1.1 Test apparatus 59
H.1.2 Test sample 59
H.1.3 Measurement parameters 59
H.1.4 Test condition 60
H.1.5 Test procedure 60
H.1.6 Test result 60

Annex I (normative) Test methods for wind effects on pressure 63

I.1 For terminal Type II, test method for wind velocity pressure 63
I.1.1 Test apparatus 63
I.1.2 Test sample 63
I.1.3 Measurement parameters 63
I.1.4 Test condition 64
I.1.5 Test procedure 64
I.1.6 Test result 64
I.2 For a terminal Type III, test method for wind velocity pressure 64
I.2.1 Test apparatus 64
I.2.2 Test sample 65
I.2.3 Measurement parameters 65
I.2.4 Test condition 66
I.2.5 Test procedure 66
I.2.6 Test result 66

Annex J (normative) Test methods for wind effects on recirculation 67

J.1 For terminal Type III, test method for recirculation 67
J.1.1 Test apparatus 67
J.1.2 Test sample 67

J.1.3 Measurement parameters 67
J.1.4 Test condition 68
J.1.5 Test procedure 68
J.1.6 Test result 68

Annex K (normative) Test method for rain water ingress 69

K.1 For terminal Type Ib, II and III, test method without wind 69
K.1.1 Test apparatus 69
K.1.2 Test sample 69
K.1.3 Measurement parameters 69
K.1.4 Test condition 69
K.1.5 Test procedure 70
K.1.6 Test result 70
K.2 For terminal Type Ib, II and III, test method with wind 71
K.2.1 Test apparatus 71
K.2.2 Test sample 72
K.2.3 Measurement parameters 72
K.2.4 Test condition 72
K.2.5 Test procedure 72
K.2.6 Test result 73

Annex L (normative) Test method of icing effects 75

L.1 For terminal Type II and III, test method for icing behaviour 75
L.1.1 Test apparatus 75
L.1.2 Test sample 75
L.1.3 Measurement parameters 75
L.1.4 Test condition 76
L.1.5 Test procedure 76
L.1.6 Test result 76

Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation 78

ZA.1 Scope and relevant characteristics 78

ZA.2 Procedure for AVCP of system chimneys with plastic flue liners and terminals 80

ZA.2.1 Systems of AVCP 80

ZA.2.2 Declaration of performance (DoP) 87

ZA.2.2.1 General 87

ZA.2.2.2 Content 87

ZA.2.2.3 Example of DoP 89

ZA.3 CE marking and labelling 91

Bibliography 95