DIN EN 1366-8:2025-04 (E)

Fire resistance tests for service installations - Part 8: Smoke extraction ducts

Contents

Page

European foreword 5

Introduction 7

1 Scope 8

2 Normative references 8

3 Terms and definitions 9

4 Test equipment 10
4.1 General 10
4.2 Furnace 10
4.3 Perforated plate 10
4.4 Air velocity measuring station 11
4.5 Ambient temperature leakage measuring device 11
4.6 Pressure sensors for differential pressure control 11
4.7 Welded connecting duct 12
4.8 Extraction fan 12
4.9 Thermocouples 12
4.10 Surface thermocouples 12
4.11 Oxygen measuring equipment 12
4.12 Oxygen measurement probes 12
4.13 Restraining equipment 12
4.14 Deflection measurements 13

5 Test conditions 13

6 Test specimen 13
6.1 Size 13
6.1.1 General 13
6.1.2 Length 13
6.1.3 Cross-section 13
6.2 Number 13
6.3 Design 14
6.3.1 General 14
6.3.2 Openings in duct 14
6.3.3 Joints in horizontal ducts 14
6.3.4 Joints in vertical ducts 14
6.3.5 Support for vertical ducts 14
6.3.6 Compensators 15
6.3.7 Access panels 15

7 Installation of test specimen 15
7.1 General 15
7.2 Standard supporting construction 15
7.3 Restraint of ducts 15
7.3.1 Inside the furnace 15
7.3.2 Outside the furnace 16

8 Conditioning 16
8.1 General 16

8.2 Water-based sealing materials ... 16

9 Application of instrumentation ... 16
9.1 Thermocouples ... 16
9.1.1 Furnace thermocouples (plate thermometers) ... 16
9.1.2 Unexposed surface thermocouples ... 16
9.1.3 Measurement of gas temperature adjacent to nozzles ... 16
9.2 Pressure ... 16
9.2.1 Furnace pressure ... 16
9.2.2 Under-pressure in duct ... 17
9.3 Oxygen measurements ... 17
9.4 Deflection measurement for determination of reduction in internal cross-sectional area ... 17

10 Test procedure ... 18
10.1 General ... 18
10.2 Pre-test adjustment of the perforated plate ... 19
10.3 Test at ambient temperature ... 19
10.4 Pre-fire test procedures ... 19
10.5 Fire test ... 20

11 Performance criteria ... 21
11.1 General requirements ... 21
11.2 Criteria at ambient temperature ... 22
11.2.1 Ambient leakage ... 22
11.2.2 Reduction in internal cross-sectional area under ambient conditions outside the furnace 22
11.3 Criteria under fire conditions ... 22
11.3.1 General ... 22
11.3.2 Integrity ... 23
11.3.3 Insulation ... 23
11.3.4 Smoke-Leakage ... 23

12 Test report ... 23

13 Field of direct application of test results ... 24
13.1 General ... 24
13.2 Vertical and horizontal ducts ... 24
13.3 Sizes of ducts ... 24
13.4 Supporting construction ... 25
13.5 Steel ducts ... 25

Annex A (normative) Measurement of volume/mass flow ... 42

A.1 Hints on measuring volume flow or mass flow with differential pressure devices ... 42
A.2 Density ... 42
A.3 Absolute pressure (barometric pressure) ... 43
A.4 Viscosity ... 43
A.5 Characteristic data of the inlet nozzles according to Figure 7 of this standard ... 44

Annex B (informative) Measurement of oxygen concentration Details on measuring oxygen concentration with paramagnetic cell analysers ... 47

B.1 General ... 47
B.2 Choice of O2 measuring devices ... 47
B.3 Effect of O2 measuring device errors ... 48
B.4 Zero and end point drift ... 48

Annex C (informative) The usage of correction factors for the consideration of different parameters ... 51

C.1 Details for the development of the correction factors and their error limits ... 51
C.2 The complete formula for the leakage mass flow and the parameters ... 51

C.3 Application of correction factors in the simple mass flow formulae and achievable accuracy 54

Annex D (normative) Method for testing air leakage post fire test when the oxygen measuring system indicates a failure (after corrections) 56

D.1 General purpose of Annex D 56
D.2 Presumptions for conducting post fire leakage test 56
D.3 Undertaking the air leakage test 57

Bibliography 58