

DIN EN 1366-10:2025-01 (E)

Fire resistance tests for service installations - Part 10: Smoke control dampers (includes Amendment A1:2024)

Contents		Page
European foreword		6
Introduction		8
1 Scope.....		9
2 Normative references.....		9
3 Terms and definitions.....		9
4 Test equipment.....		12
4.1 General.....		12
4.2 Test duct for surface mounted SCDs		12
4.3 Connecting duct for compartment boundary mounted SCDs		13
4.3.1 Compartmentation test.....		13
4.3.2 Maintenance of opening test.....		13
4.4 Cycling equipment.....		13
4.5 Condensing unit.....		13
4.6 Gas temperature measuring devices		13
4.7 Exhaust fan system.....		13
4.8 Perforated plate		14
4.9 Volume and flow measurement for duct mounted SCDs		14
4.10 Volume flow measurement for compartment boundary mounted SCDs.....		14
4.10.1 Compartmentation test.....		14
4.10.2 Maintenance of opening test.....		14
4.11 Ambient leakage measurement equipment.....		15
4.12 Pressure sensors for differential pressure control		15
4.12.1 Duct mounted smoke control dampers		15
4.12.2 Compartment boundary mounted smoke control dampers		15
4.13 Welded connecting tube		15
4.14 Extract fan connecting duct.....		15
4.15 Extraction fan		15
4.16 Thermocouples.....		15
4.17 Oxygen measuring equipment.....		15
4.18 Observation windows.....		16
5 Test specimens		16
5.1 Cross-section		16
5.2 Design.....		16
5.2.1 General.....		16
5.2.2 Supporting constructions		16
5.2.3 Inclusion of grilles		17
6 Test methods		17
6.1 General.....		17
6.2 Test sequence.....		17
6.3 Ambient leakage.....		19
6.3.1 Units of the largest size.....		19
6.3.2 Units of smallest size		19
6.4 Cycling requirements.....		19
6.4.1 General.....		19

6.4.2	Smoke control damper to be used in dedicated smoke control systems, operated only in the case of emergency	19
6.4.3	Smoke control damper to be used as part of a general HVAC system as well as a smoke control system, or as part of a smoke control systems that is cycled every day to check operation	19
6.4.4	Smoke control damper to be used as part of a general HVAC system as well as a smoke control system, that uses a modulating actuator	20
6.5	Selection of elevated temperature and fire resistance tests	20
6.6	Fire resistance tests and elevated temperature tests	21
6.6.1	Duct mounted smoke control dampers	21
6.6.2	Compartment boundary mounted smoke control dampers	22
6.6.3	Additional test information	25
6.7	Initiation regime	26
6.7.1	Smoke control dampers for systems with automatic activation (AA).....	26
6.7.2	Smoke control damper for systems with manual activation (MA)	27
6.8	HOT400/30 extension test.....	29
6.9	Special constructions	29
7	Test procedure	29
7.1	Fire resistance or elevated temperature and maintenance of opening test for duct mounted smoke control dampers	29
7.1.1	General	29
7.1.2	Pre-test calibration	29
7.1.3	Ignition of furnace	31
7.1.4	Operate the damper.....	31
7.1.5	Furnace conditions.....	31
7.1.6	Thermocouples for insulation (I)	31
7.1.7	Oxygen measurements	32
7.1.8	General observations	32
7.1.9	Reduction of cross-section/maintenance of opening.....	32
7.1.10	Leakage calculations	32
7.1.11	Termination of test	32
7.2	Fire resistance tests for smoke control dampers mounted in a compartment boundary	33
7.2.1	General	33
7.2.2	Pre-test calibration	33
7.2.3	Ignition of furnace	33
7.2.4	Operate the damper.....	33
7.2.5	Furnace conditions.....	33
7.2.6	Thermocouples for insulation (I)	33
7.2.7	General observations	34
7.2.8	Leakage calculations	34
7.2.9	Termination of test	34
7.3	Maintenance of opening test for compartment boundary mounted smoke control dampers	34
7.3.1	General	34
7.3.2	Pre-test calibration	34
7.3.3	Ignition of furnace	35
7.3.4	Operate a damper	35
7.3.5	Furnace conditions.....	35
7.3.6	Thermocouples for insulation (I)	36
7.3.7	General observations	36
7.3.8	Reduction of cross-section/maintenance of opening.....	36
7.3.9	Termination of test	36

8	Performance criteria	37
8.1	Integrity	37
8.1.1	General.....	37
8.1.2	Integrity at perimeter	37
8.2	Insulation.....	40
8.2.1	General.....	40
8.2.2	Thermocouples at the compartment boundary outside of the furnace	40
8.3	Reduced leakage	40
8.4	Times and observations	41
8.5	Other.....	41
9	Test report.....	41
9.1	General.....	41
9.2	Duct mounted single and multi-compartment tests	42
9.3	Compartment boundary compartmentation test.....	43
9.4	Compartment boundary maintenance of opening test	43
10	Direct field of application of test results (DIAP)	44
10.1	Compartment boundary mounted smoke control dampers	44
10.2	Smoke control damper sizes.....	44
10.3	Duct mounted smoke control damper mounting positions	44
10.4	Distance between mounting positions in compartment boundary applications	44
10.5	Blade pivot axis.....	44
10.6	Pressure difference.....	45
10.7	Elevated temperatures	45
10.8	Cycling tests	45
10.8.1	Smoke control dampers meeting the cycling requirements for modulating applications.....	45
10.8.2	Smoke control dampers meeting the cycling requirements for use with combined smoke control and general HVAC applications and for smoke control systems that are cycle checked every day	45
10.8.3	Smoke control dampers meeting the cycling requirements for smoke control dampers that are operated only in the case of emergency.....	45
10.8.4	Load application.....	45
10.9	Initiation method.....	45
10.10	Duct mounted smoke control dampers - application to ducts other than that tested	46
10.10.1	Single compartment smoke control dampers.....	46
10.10.2	Multi compartment smoke control dampers	46
10.11	Compartment mounted smoke control dampers - application to A1 constructions other than that tested	47
10.11.1	Single compartment smoke control dampers.....	47
10.11.2	Multi compartment smoke control dampers	47
10.12	Standard damper open or closed position.....	47
Annex A (normative)	Cycling test.....	73
A.1	General.....	73
A.2	Purpose of the test.....	73
A.3	Method of Application for loading	73
A.4	Background for the torque value (informative).....	79
Annex B (informative)	Leakage calculation from oxygen measurement	81
B.1	General.....	81

B.2	Supporting information on leakage flowrate calculations.....	82
Annex C (normative)	Maintenance of opening calculation.....	87
C.1	Calculation of the theoretical total mass M_{\max} of hot gases during the fire test.....	87
C.2	Calculation of the actual total mass M_{actual} of hot gases during the fire test.....	89
Annex D (normative)	Optional High Operating Test HOT 400/30 classification	93
D.1	General	93
D.2	Tests	93
Annex E (informative)	Leakage and pressure classification clarification	98
Bibliography	99