

# DIN EN 54-29:2015-06 (E)

## Fire detection and fire alarm systems - Part 29: Multi-sensor fire detectors - Point detectors using a combination of smoke and heat sensors

---

<b>Contents</b>		<b>Page</b>
Foreword .....		6
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>10</b>
<b>4</b>	<b>Requirements .....</b>	<b>10</b>
4.1	General .....	10
4.2	Nominal activation conditions/sensitivity .....	10
4.2.1	Individual alarm indication .....	10
4.2.2	Response to slowly developing fires .....	10
4.2.3	Repeatability of smoke response .....	11
4.2.4	Directional dependence of smoke response .....	11
4.2.5	Directional dependence of heat response .....	11
4.2.6	Lower limit of heat response .....	11
4.2.7	Reproducibility of smoke response .....	11
4.2.8	Reproducibility of heat response .....	11
4.2.9	Air movement .....	11
4.2.10	Dazzling .....	11
4.3	Operational reliability .....	11
4.3.1	Connection of ancillary devices .....	11
4.3.2	Monitoring of detachable detectors .....	11
4.3.3	Manufacturer's adjustments .....	12
4.3.4	On-site adjustment of response behaviour .....	12
4.3.5	Protection against the ingress of foreign bodies .....	12
4.3.6	Software controlled detectors .....	12
4.4	Tolerance to supply parameters .....	13
4.4.1	Variation in supply parameters .....	13
4.5	Performance parameters under fire conditions .....	14
4.5.1	Fire sensitivity .....	14
4.6	Durability of nominal activation conditions/sensitivity .....	14
4.6.1	Temperature resistance .....	14
4.6.2	Humidity resistance .....	14
4.6.3	Shock and vibration resistance .....	14
4.6.4	Electrical stability .....	15
4.6.5	Resistance to chemical agents .....	15
<b>5</b>	<b>Test and assessment and sampling methods .....</b>	<b>15</b>
5.1	General .....	15
5.1.1	Atmospheric conditions for tests .....	15
5.1.2	Operating conditions for tests .....	15
5.1.3	Mounting arrangements .....	15
5.1.4	Tolerances .....	16
5.1.5	Measurement of smoke response value .....	16
5.1.6	Measurement of heat response value .....	16
5.1.7	Provision for tests .....	17
5.1.8	Test schedule .....	17

5.2	Nominal activation conditions/sensitivity .....	18
5.2.1	Individual alarm indication .....	18
5.2.2	Response to slowly developing fires .....	19
5.2.3	Repeatability of smoke response .....	19
5.2.4	Directional dependence of smoke response .....	19
5.2.5	Directional dependence of heat response .....	20
5.2.6	Lower limit of heat sensitivity .....	20
5.2.7	Reproducibility of smoke response .....	21
5.2.8	Reproducibility of heat response .....	21
5.2.9	Air movement .....	22
5.2.10	Dazzling .....	22
5.3	Operational reliability .....	23
5.3.1	Connection of ancillary devices .....	23
5.3.2	Monitoring of detachable detectors .....	23
5.3.3	Manufacturer's adjustments .....	23
5.3.4	On-site adjustment of behaviour .....	23
5.3.5	Protection against the ingress of foreign bodies .....	23
5.3.6	Software controlled devices .....	23
5.4	Tolerance to supply parameters .....	24
5.4.1	Variation in supply parameters .....	24
5.5	Performance parameters under fire conditions .....	24
5.5.1	Fire sensitivity .....	24
5.6	Durability of nominal activation conditions/sensitivity .....	26
5.6.1	Temperature resistance .....	26
5.6.2	Humidity resistance .....	28
5.6.3	Shock and vibration resistance .....	30
5.6.4	Electrical stability .....	34
5.6.5	Resistance to chemical agents .....	35
6	Assessment and verification of constancy of performance (AVCP) .....	37
6.1	General .....	37
6.2	Type testing .....	37
6.2.1	General .....	37
6.2.2	Test samples, testing and compliance criteria .....	38
6.2.3	Test reports .....	38
6.3	Factory production control (FPC) .....	38
6.3.1	General .....	38
6.3.2	Requirements .....	39
6.3.3	Product specific requirements .....	41
6.3.4	Initial inspection of factory and FPC .....	42
6.3.5	Continuous surveillance of FPC .....	42
6.3.6	Procedure for modifications .....	42
6.3.7	One-off products, pre-production products, (e.g. prototypes) and products produced in very low quantities .....	43
7	Classification and designation .....	43
8	Marking, Labelling and Packaging .....	44
	Annex A (normative) Smoke tunnel for smoke response values .....	45
	Annex B (normative) Test aerosol for smoke response value measurements .....	46
	Annex C (normative) Smoke measuring instruments .....	47
C.1	Obscuration meter .....	47
C.2	Measuring ionization chamber (MIC) .....	47
	Annex D (normative) Heat tunnel for heat response value .....	51
	Annex E (normative) Apparatus for dazzling test .....	52

<b>Annex F (informative) Apparatus for impact test .....</b>	<b>54</b>
<b>Annex G (normative) Fire test room .....</b>	<b>56</b>
<b>Annex H (normative) Open wood fire (TF1) .....</b>	<b>58</b>
H.1 Fuel .....	58
H.2 Arrangement .....	58
H.3 Method of ignition .....	58
H.4 Variables .....	58
H.5 End-of-test condition .....	58
H.6 Test validity criteria .....	59
<b>Annex I (normative) Smouldering (pyrolysis) wood fire (TF2) .....</b>	<b>61</b>
I.1 Fuel .....	61
I.2 Hotplate .....	61
I.3 Arrangement .....	61
I.4 Heating rate .....	61
I.5 End-of-test condition .....	61
I.6 Test validity criteria .....	61
<b>Annex J (normative) Glowing smouldering cotton fire (TF3) .....</b>	<b>65</b>
J.1 Fuel .....	65
J.2 Arrangement .....	65
J.3 Ignition .....	66
J.4 End-of-test condition .....	67
J.5 Test validity criteria .....	67
<b>Annex K (normative) Open plastics (polyurethane) fire (TF4) .....</b>	<b>69</b>
K.1 Fuel .....	69
K.2 Conditioning .....	69
K.3 Arrangement .....	69
K.4 Ignition .....	69
K.5 Method of ignition .....	69
K.6 End-of-test condition .....	69
K.7 Test validity criteria .....	69
<b>Annex L (normative) Liquid (heptane) fire (TF5) .....</b>	<b>71</b>
L.1 Fuel .....	71
L.2 Arrangement .....	71
L.3 Ignition .....	71
L.4 End-of-test condition .....	71
L.5 Test validity criteria .....	71
<b>Annex M (normative) Low temperature black smoke (decalene) liquid fire (TF8) .....</b>	<b>73</b>
M.1 Fuel .....	73
M.2 Arrangement .....	73
M.3 Ignition .....	73
M.4 End-of-test condition .....	73
M.5 Test validity criteria .....	73
<b>Annex N (informative) Information concerning the construction of the smoke tunnel .....</b>	<b>75</b>
<b>Annex O (informative) Construction of the heat tunnel .....</b>	<b>77</b>
<b>Annex P (informative) Information concerning test procedures and requirements for the response to slowly developing fires .....</b>	<b>80</b>

<b>Annex Q (informative) Information concerning the construction of the measuring ionization chamber .....</b>	<b>84</b>
<b>Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Regulation .....</b>	<b>86</b>
<b>ZA.1 Scope and relevant characteristics .....</b>	<b>86</b>
<b>ZA.2 Procedure for assessment and verification of constancy of performance (AVCP) of point detectors using a combination of smoke and heat sensors .....</b>	<b>88</b>
<b>ZA.3 CE marking and labelling .....</b>	<b>92</b>
<b>Bibliography .....</b>	<b>96</b>