



NSAI
Standards

Irish Standard
I.S. EN 54-30:2015

Fire detection and fire alarm systems - Part 30: Multi-sensor fire detectors - Point detectors using a combination of carbon monoxide and heat sensors

I.S. EN 54-30:2015

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:

EN 54-30:2015

Published:

2015-04-08

This document was published under the authority of the NSAI and comes into effect on:

2015-04-25

ICS number:

13.220.20

NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD

EN 54-30

NORME EUROPÉENNE

EUROPÄISCHE NORM

April 2015

ICS 13.220.20

English Version

Fire detection and fire alarm systems - Part 30: Multi-sensor fire detectors - Point detectors using a combination of carbon monoxide and heat sensors

Système de détection et d'alarme incendie - Partie 30:
DéTECTEURS d'incendie multicapteur - DéTECTEURS ponctuels
utilisant une combinaison de capteurs de monoxyde de
carbone et de température

Brandmeldeanlagen - Teil 30: Mehrfachsensor-
Brandmelder - Punktförmige Melder mit kombinierten CO-
und Wärmesensoren

This European Standard was approved by CEN on 25 January 2015.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

| | |
|---|----|
| Foreword..... | 6 |
| Introduction | 8 |
| 1 Scope | 9 |
| 2 Normative references | 9 |
| 3 Terms, definitions and abbreviations | 10 |
| 3.1 Terms and definitions | 10 |
| 3.2 Abbreviations | 10 |
| 4 Requirements | 10 |
| 4.1 General..... | 10 |
| 4.2 Nominal activation conditions/sensitivity | 10 |
| 4.2.1 Individual alarm indication | 10 |
| 4.2.2 Rate sensitive CO response | 11 |
| 4.2.3 Response to slowly developing fires..... | 11 |
| 4.2.4 Repeatability of CO response..... | 11 |
| 4.2.5 Directional dependence of CO response | 11 |
| 4.2.6 Directional dependence of heat response | 11 |
| 4.2.7 Lower limit of heat response | 11 |
| 4.2.8 Reproducibility of CO response..... | 11 |
| 4.2.9 Reproducibility of heat response..... | 11 |
| 4.2.10 Air movement | 11 |
| 4.3 Operational reliability | 12 |
| 4.3.1 Connection of ancillary devices..... | 12 |
| 4.3.2 Monitoring of detachable detectors..... | 12 |
| 4.3.3 Manufacturer's adjustments | 12 |
| 4.3.4 On-site adjustment of behaviour..... | 12 |
| 4.3.5 Software-controlled detectors..... | 12 |
| 4.3.6 Long-term stability..... | 13 |
| 4.4 Tolerance to supply voltage — Variation in supply parameters..... | 14 |
| 4.5 Performance parameters under fire conditions — Fire sensitivity | 14 |
| 4.6 Durability of nominal activation/sensitivity | 14 |
| 4.6.1 Temperature resistance | 14 |
| 4.6.2 Humidity resistance..... | 14 |
| 4.6.3 Corrosion resistance — SO ₂ corrosion (endurance) | 14 |
| 4.6.4 Shock and vibration resistance..... | 15 |
| 4.6.5 Electrical stability — EMC, immunity (operational)..... | 15 |
| 4.6.6 Resistance to chemical agents | 15 |
| 5 Test and evaluation methods | 15 |
| 5.1 General..... | 15 |
| 5.1.1 Atmospheric conditions for tests | 15 |
| 5.1.2 Operating conditions for tests | 16 |
| 5.1.3 Mounting arrangements | 16 |
| 5.1.4 Tolerances | 16 |
| 5.1.5 Measurement of CO response value..... | 16 |
| 5.1.6 Measurement of heat response value | 17 |
| 5.1.7 Provision for tests | 17 |
| 5.1.8 Test schedule | 18 |
| 5.2 Nominal activation conditions/sensitivity | 19 |

| | | |
|---------|---|----|
| 5.2.1 | Individual alarm indication | 19 |
| 5.2.2 | Rate sensitive CO response | 19 |
| 5.2.3 | Response to slowly developing fire | 19 |
| 5.2.4 | Repeatability of CO response | 20 |
| 5.2.5 | Directional dependence of CO response | 20 |
| 5.2.6 | Directional dependence of heat response | 21 |
| 5.2.7 | Lower limit of heat response | 21 |
| 5.2.8 | Reproducibility of CO response | 22 |
| 5.2.9 | Reproducibility of heat response | 22 |
| 5.2.10 | Air movement..... | 23 |
| 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 | Software controlled devices..... | 23 |
| 5.3.6 | Long-term stability (operational) | 24 |
| 5.4 | Tolerance to supply voltage — Variations in supply parameters | 24 |
| 5.4.1 | Object..... | 24 |
| 5.4.2 | Test procedure..... | 24 |
| 5.4.3 | Requirements..... | 24 |
| 5.5 | Performance parameters under fire conditions — Fire sensitivity | 25 |
| 5.5.1 | Object..... | 25 |
| 5.5.2 | Principle | 25 |
| 5.5.3 | Test procedure..... | 25 |
| 5.5.4 | Requirements..... | 27 |
| 5.6 | Durability | 27 |
| 5.6.1 | Temperature resistance | 27 |
| 5.6.2 | Humidity resistance | 30 |
| 5.6.3 | Corrosion resistance — Sulphur dioxide SO ₂ corrosion (endurance)..... | 34 |
| 5.6.4 | Shock and vibration resistance | 35 |
| 5.6.5 | Electrical stability — EMC, immunity (operational) | 39 |
| 5.6.6 | Resistance to chemical agents | 41 |
| 6 | Assessment and verification of constancy of performance (AVCP) | 43 |
| 6.1 | General | 43 |
| 6.2 | Type testing | 43 |
| 6.2.1 | General | 43 |
| 6.2.2 | Test samples, testing and compliance criteria | 44 |
| 6.2.3 | Test reports | 44 |
| 6.3 | Factory production control (FPC)..... | 44 |
| 6.3.1 | General | 44 |
| 6.3.2 | Requirements..... | 45 |
| 6.3.3 | Product specific requirements..... | 47 |
| 6.3.4 | Initial inspection of factory and FPC | 48 |
| 6.3.5 | Continuous surveillance of FPC | 48 |
| 6.3.6 | Procedure for modifications | 49 |
| 6.3.7 | One-off products, pre-production products, (e.g. prototypes) and products produced in very low quantities | 49 |
| 7 | Classification | 50 |
| 8 | Marking, labelling and packaging..... | 50 |
| Annex A | (normative) Gas test chamber for CO response value and cross-sensitivity to chemical agents | 51 |
| A.1 | General | 51 |
| A.2 | Gas test chamber specification | 51 |

EN 54-30:2015 (E)

| | |
|--|-----------|
| Annex B (normative) Fire test room | 52 |
| B.1 General | 52 |
| B.2 Fire test room specification | 52 |
| Annex C (normative) Measuring instruments for smoke and CO | 55 |
| C.1 General | 55 |
| C.2 CO measuring instrument | 55 |
| C.3 Obscuration meter | 55 |
| C.4 Measuring ionization chamber (MIC) | 55 |
| Annex D (informative) Establishing exposure levels of chemical agents | 56 |
| D.1 General | 56 |
| D.2 Establishing concentration of chemical agents for test gases 1 to 9 of 5.23 | 56 |
| D.3 Verification of test chamber leakage | 56 |
| D.4 Establishing concentration of ozone | 56 |
| Annex E (normative) Heat tunnel for heat response value | 58 |
| E.1 General | 58 |
| E.2 Heat tunnel specification | 58 |
| Annex F (normative) Smouldering (pyrolysis) wood fire (TF2) | 59 |
| F.1 General | 59 |
| F.2 Fuel | 59 |
| F.3 Hotplate | 59 |
| F.4 Arrangement | 59 |
| F.5 Heating rate | 59 |
| F.6 End-of-test condition | 59 |
| F.7 Test validity criteria | 60 |
| Annex G (normative) Glowing smouldering cotton fire (TF3) | 64 |
| G.1 Introduction | 64 |
| G.2 Fuel | 64 |
| G.3 Arrangement | 64 |
| G.4 Ignition | 65 |
| G.5 End-of-test condition | 66 |
| G.6 Test validity criteria | 66 |
| Annex H (normative) Open plastics (polyurethane) fire (TF4) | 70 |
| H.1 Introduction | 70 |
| H.2 Fuel | 70 |
| H.3 Conditioning | 70 |
| H.4 Arrangement | 70 |
| H.5 Ignition | 70 |
| H.6 Method of ignition | 70 |
| H.7 End-of-test condition | 70 |
| H.8 Test validity criteria | 71 |
| Annex I (normative) Liquid (heptane) fire (TF5) | 74 |
| I.1 Introduction | 74 |
| I.2 Fuel | 74 |
| I.3 Arrangement | 74 |
| I.4 Ignition | 74 |
| I.5 End-of-test condition | 74 |
| I.6 Test validity criteria | 74 |
| Annex J (informative) Information concerning the construction of the gas test chamber | 78 |
| J.1 General | 78 |
| J.2 Construction of the gas test chamber | 78 |
| Annex K (informative) Construction of the heat tunnel | 80 |
| K.1 General | 80 |

| | | |
|---------------------|--|-----------|
| K.2 | Construction of the heat tunnel | 80 |
| Annex L | (informative) Apparatus for impact test..... | 84 |
| L.1 | General | 84 |
| L.2 | Impact apparatus construction..... | 84 |
| Annex ZA | (informative) Clauses of this European Standard addressing the provisions of the EU | |
| | Construction Products Regulation..... | 87 |
| Bibliography | | 97 |

EN 54-30:2015 (E)**Foreword**

This document (EN 54-30:2015) has been prepared by Technical Committee CEN/TC 72 "Fire detection and fire alarm systems", the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2015, and conflicting national standards shall be withdrawn at the latest by April 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of Regulation (EU) 305/2011.

For relationship with EU Regulations see informative Annex ZA, which is an integral part of this document.

EN 54, *Fire detection and fire alarm systems*, consists of the following parts:

- *Part 1: Introduction;*
- *Part 2: Control and indicating equipment;*
- *Part 3: Fire alarm devices — Sounders;*
- *Part 4: Power supply equipment;*
- *Part 5: Heat detectors — Point detectors;*
- *Part 7: Smoke detectors — Point detectors using scattered light, transmitted light or ionization;*
- *Part 10: Flame detectors — Point detectors;*
- *Part 11: Manual call points;*
- *Part 12: Smoke detectors — Line detectors using an optical light beam;*
- *Part 13: Compatibility assessment of system components;*
- *Part 14: Guidelines for planning, design, installation, commissioning, use and maintenance [CEN Technical Specification];*
- *Part 16: Voice alarm control and indicating equipment;*
- *Part 17: Short circuit isolators;*
- *Part 18: Input/output devices;*
- *Part 20: Aspirating smoke detectors;*
- *Part 21: Alarm transmission and fault warning routing equipment;*
- *Part 22: Resettable line-type heat detectors [currently at acceptance stage];*
- *Part 23: Fire alarm devices — Visual alarms devices;*

- *Part 24: Components of voice alarm systems — Loudspeakers;*
- *Part 25: Components using radio links;*
- *Part 26: Carbon monoxide detectors — Point detectors;*
- *Part 27: Duct smoke detectors;*
- *Part 28: Non-resettable line type heat detectors [currently at drafting stage];*
- *Part 29: Multi-sensor fire detectors — Point detectors using a combination of smoke and heat sensors;*
- *Part 30: Multi-sensor fire detectors — Point detectors using a combination of carbon monoxide and heat sensors [the present document];*
- *Part 31: Multi-sensor fire detectors — Point detectors using a combination of smoke, carbon monoxide and optionally heat sensors;*
- *Part 32: Planning, design, installation, commissioning, use and maintenance of voice alarm systems [currently at acceptance stage].*

NOTE This list includes standards that are in preparation and other standards may be added. For current status of published standards refer to www.cen.eu.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

EN 54-30:2015 (E)**Introduction**

Carbon monoxide (CO) is a product of the incomplete combustion of carbon-based materials. CO fire detectors can react promptly to smouldering fires involving carbonaceous materials because CO does not depend solely on convection, but also moves by diffusion. CO fire detectors might be better suited to applications where other fire detection techniques are prone to false alarms, for example due to dust, steam and cooking vapours. Detectors based on the use of CO sensors alone, are covered by EN 54-26.

Some fires may not produce a sufficient amount of CO to trigger an alarm condition from a detector conforming to EN 54-26. These are typically free-burning, open, well-ventilated fires. The inclusion of heat sensing combined with CO sensing can increase the sensitivity of such a detector to these types of fires.

A number of different methods for sensing CO are suitable. However, most sensors will also be influenced by other gases and phenomena. Tests have therefore been included in the test schedule to assess cross-sensitivity to substances normally present in the service environment that may affect the performance of the detector.

Test Fires TF2, TF3, TF4 and TF5 from EN 54-7 have been included to verify the detection performance. TF4 and TF5 specifically demonstrate the influence of the heat sensor(s). For these Test Fires, the CO level and, where applicable, the temperature is used as test validity criteria.

Detectors may have modes of operation, in which only one fire phenomenon is evaluated. This standard does not include tests for additional alarm outputs corresponding to the sensing of only one fire phenomenon. Reference should be made to other parts of EN 54, which may cover such modes of operation or outputs.

1 Scope

This European Standard specifies requirements, test methods and performance criteria for point-type multi-sensor fire detectors for use in fire detection systems installed in and around buildings (see EN 54-1:2011), incorporating in one mechanical enclosure at least one carbon monoxide sensor and at least one heat sensor and where the overall fire detection performance is determined utilizing the combination of the detected phenomena.

This European Standard provides for the assessment and verification of consistency of performance (AVCP) of multi-sensor fire detectors using a combination of carbon monoxide and heat sensors to this EN.

Multi-sensor fire detectors using carbon monoxide and heat sensors having special characteristics suitable for the detection of specific fire risks are not covered by this European Standard. The performance requirements for any additional functions are beyond the scope of this standard (e.g. additional features or enhanced functionality for which this European Standard does not define a test or assessment method).

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 54-1:2011, *Fire detection and fire alarm systems — Part 1: Introduction*

EN 54-5:2000¹⁾, *Fire detection and fire alarm systems — Part 5: Heat detectors - Point detectors*

EN 54-7:2000²⁾, *Fire detection and fire alarm systems — Part 7: Smoke detectors — Point detectors using scattered light, transmitted light or ionization*

EN 50130-4:2011, *Alarm systems — Part 4: Electromagnetic compatibility — Product family standard: Immunity requirements for components of fire, intruder, hold up, CCTV, access control and social alarm systems*

EN 60068-1:2014, *Environmental testing — Part 1: General and guidance (IEC 60068-1:2013)*

EN 60068-2-1:2007, *Environmental testing — Part 2-1: Tests — Test A: Cold (IEC 60068-2-1:2007)*

EN 60068-2-2:2007, *Environmental testing — Part 2-2: Tests — Test B: Dry heat (IEC 60068-2-2:2007)*

EN 60068-2-6:2008, *Environmental testing — Part 2-6: Tests — Test Fc: Vibration (sinusoidal) (IEC 60068-2-6:2007)*

EN 60068-2-27:2009, *Environmental testing — Part 2-27: Tests — Test Ea and guidance: Shock (IEC 60068-2-27:2008)*

EN 60068-2-30:2005, *Environmental testing — Part 2-30: Tests — Test Db: Damp heat, cyclic (12 h + 12 h cycle) (IEC 60068-2-30:2005)*

1) This document is currently impacted by the stand-alone amendment EN 54-5:2000/A1:2002.

2) This document is currently impacted by the stand-alone amendments EN 54-7:2000/A1:2002 and EN 54-7:2000/A2:2006.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
 - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-