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ISO 7240-27:2009

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Australian STANDARD

Fire detection and alarm systems

Part 27: Point-type fire detectors using a scattered-light, transmitted-light or ionization smoke sensor, an electrochemical-cell carbon-monoxide sensor and a heat sensor

STANDARDS Australia

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- Association of Hydraulic Services Consultants Australia
- Australasian Fire and Emergency Service Authorities Council
- Australian Chamber of Commerce and Industry
- Australian Industry Group
- Australian Institute of Building Surveyors
- CSIRO
- Deafness Forum of Australia
- Department of Human Services, Vic.
- Engineers Australia
- Fire Protection Association Australia
- National Electrical and Communications Association
- National Fire Industry Association
- Property Council of Australia
- Society of Fire Safety

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PREFACE

This Standard was prepared by Standards Australia Committee FP-002, Fire Detection, Warning, Control and Intercom Systems.

The objective of this Standard is to specify requirements, test methods and performance criteria for a point-type fire detectors using a scattered-light, transmitted-light or ionization smoke sensor, an electrochemical-cell carbon-monoxide sensor and a heat sensor, for use in fire detection and alarm systems.

This Standard is identical with, and has been reproduced from ISO 7240-27:2009, *Fire detection and alarm systems,* Part 27: *Point-type fire detectors using a scattered-light, transmitted light or ionization smoke sensor, an electrochemical-cell carbon-monoxide sensor and a heat sensor.*

As this Standard is reproduced from an International Standard, the following applies:

(a) In the source text 'this part of ISO 7240' should read 'this Australian Standard'.

(b) A full point substitutes for a comma when referring to a decimal marker.

References to International Standards should be replaced by references to Australian Standards, as follows:

Reference to International Standard		*Australian Standard*	
ISO		AS	
7240	Fire detection and alarm systems	7240	Fire detection and alarm systems
7240-1	Part 1: General and definitions	7240.1	Part 1: General and definitions
7240-5	Part 5: Point-type heat detectors	7240.5	Part 5: Point type heat detectors (ISO 7240-5:2003, MOD)
7240-6	Part 6: Carbon monoxide fire detectors using electro-chemical cells	7240.6	Part 6: Carbon monoxide fire detectors using electro-chemical cells
7240-7	Part 7: Point-type smoke detectors using scattered light, transmitted light or ionization	7240.7	Part 7: Point-type smoke detectors using scattered light, transmitted light or ionization (ISO 7240-7:2003, MOD)
IEC			
60068	Environmental testing	60068	Environmental testing
60068-1	Part 1: General and guidance	60068.1	Part 1: General and guidance
60068-2-1	Part 2-1: Tests—Test A: Cold	60068.2.1	Part 2.1: Tests—Tests A: Cold
60068-2-2	Part 2-2: Tests—Test B: Dry heat	60068.2.2	Part 2.2: Tests—Tests B: Dry heat
60068-2-6	Part 2-6: Test—Test Fc: Vibration (sinusoidal)	60068.2.6	Part 2.6: Tests—Test Fc: Vibration (sinusoidal)
60068-2-27	Part 2-27: Tests—Test Ea and guidance: Shock	60068.2.27	Part 2.27: Tests—Test Ea and guidance: Shock
60068-2-30	Part 2-30: Tests—Test Db Damp heat, cyclic (12 h + 12 h cycle)	60068.2.30	Part 2.30: Tests—Test Db Damp heat, cyclic (12 h + 12 h cycle)
60068-2-42	Part 2-42: Tests—Test Kc: Sulphur dioxide test for contacts and connections	60068.2.42	Part 2.42: Tests—Test Kc: Sulphur dioxide test for contacts and connections
60068-2-78	Part 2-78: Tests—Test Cab: Damp heat, steady state	60068.2.78	Part 2.78: Tests—Test Cab: Damp heat, steady state

Only normative references that have been adopted as Australian Standards have been listed.

The terms 'normative' and 'informative' have been used in this Standard to define the application of the annexes to which they apply. A 'normative' annex is an integral part of a Standard, whereas an 'informative' annex is only for information and guidance.

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INTRODUCTION

A fire detection and fire alarm system is required to function satisfactorily not only in the event of fire, but also during and after exposure to conditions it can likely meet in practice, such as corrosion, vibration, direct impact, indirect shock and electromagnetic interference. Some tests specified are intended to assess the performance of fire detectors under such conditions.

The performance of fire detectors is assessed from results obtained in specific tests; this part of ISO 7240 is not intended to place any other restrictions on the design and construction of such detectors.

Smoke detectors using ionization or optical sensors, and complying with ISO 7240-7, are well established for the protection of life and property. Even so, they can respond to stimuli other than smoke and in some circumstances can be prone to false alarms. False alarm rates are usually minimized by careful application, giving some limitations in use, and occasionally with a reduction in protection provided.

It is generally accepted that fire detectors using carbon monoxide (CO) sensors alone, while suitable for the detection of smouldering fires involving carbonaceous fuels, can be relatively insensitive to free-burning fires supported by a plentiful supply of oxygen. This limitation can be largely overcome by the inclusion of a heat sensor whose output is combined in some way with that of the CO sensor. Performance requirements for CO fire detectors and for CO and heat detectors can be found in ISO 7240-6 and ISO 7240-8, respectively.

Although the CO-detector — heat-detector combination is capable of responding to free-burning fires, it can still be relatively insensitive to low-temperature fires that produce large amounts of visible smoke but low concentrations of CO and little heat. This limitation prevents the CO and heat detector from being a true replacement for a smoke detector in life-safety applications.

Many false-alarm sources that affect smoke detectors do not produce CO. It is possible, therefore, that by adding a CO sensor to a smoke detector, and combining its output in some way with that of the smoke sensor, the incidence of false alarms can be reduced. This reduction can be achieved while simultaneously providing the ability to respond to a broader range of fire types than is possible with either a smoke or CO detector alone.

It can be possible to improve the performance even further by adding a heat sensor to assist in the response to clean-burning, high-energy fires. This improvement is seen as secondary to the overall performance and for this reason the heat sensor is treated as optional for compliance with this part of ISO 7240.

AUSTRALIAN STANDARD

Fire detection and alarm systems

Part 27: Point-type fire detectors using a scattered-light, transmitted-light or ionization smoke sensor, an electrochemical-cell carbon-monoxide sensor and a heat sensor

1 Scope

This part of ISO 7240 specifies requirements, test methods and performance criteria for multi-sensor point-type fire detectors that incorporate an optical or ionization smoke sensor, an electro-chemical cell for sensing carbon monoxide (CO) and, optionally, one or more heat sensors, for use in fire detection and alarm systems installed in buildings (see ISO 7240-1).

For the testing of other types of fire detectors using smoke, CO and, optionally, heat sensors working on different principles, this part of ISO 7240 can be used only for guidance. Fire detectors using smoke, CO and, optionally, heat sensors which have special characteristics and which have been developed for specific risks are not covered by this part of ISO 7240.

2 Normative references

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

ISO 209-1, *Wrought aluminium and aluminium alloys — Chemical composition and forms of products — Part 1: Chemical composition*

ISO 7240-1, *Fire detection and alarm systems — Part 1: General and definitions*

ISO 7240-5:2003, *Fire detection and alarm systems — Part 5: Point-type heat detectors*

ISO 7240-6, *Fire detection and alarm systems — Part 6: Carbon monoxide fire detectors using electro-chemical cells*

ISO 7240-7:2003, *Fire detection and alarm systems — Part 7: Point-type smoke detectors using scattered light, transmitted light or ionization*

ISO 7240-8, *Fire detection and alarm systems — Part 8: Carbon monoxide fire detectors using an electro-chemical cell in combination with a heat sensor*

IEC 60068-1, *Environmental testing — Part 1: General and guidance*

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

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

