Australian Standard®

Fire detection and alarm systems

Part 8: Carbon monoxide fire detectors using an electro-chemical cell in combination with a heat sensor

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- Australasian Fire Authorities Council
- Australian Building Codes Board
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- Australian Electrical and Electronic Manufacturers Association
- Australian Government Analytical Laboratories, Scientific Services Laboratory
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- Fire Protection Association Australia
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- National Electrical and Communications Association
- National Fire Industry Association
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PREFACE

This Standard was prepared by the Standards Australia Committee FP-002, Fire Detection, Warning, Control and Intercom Systems. This Standard is identical with, and has been reproduced from, 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*.

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

(a) Its number does not appear on each page of text and its identity is shown only on the cover and title page.

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References to International Standards should be replaced by references to equivalent Australian or Australian/New Zealand Standards, as follows:

References to International Standard or other Publication		*Australian/New Zealand 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
IEC		AS	
60068	Environmental testing	60068	Environmental testing
60068-1	General and guidance	60068.1	General and guidance
60068-2-1	Tests—Test A: Cold	60068.2.1	Tests—Test A: Cold
60068-2-2	Tests—Test B: Dry heat	60068.2.2	Tests—Test B: Dry heat
60068-2-6	Tests—Test Fc: Vibration (sinusoidal)	60068.2.6	Tests—Test Fc: Vibration (sinusoidal)
60068-2-27	Tests—Test Ea and guidance: Shock	60068.2.27	Tests—Test Ea and guidance: Shock
60068-2-30	Tests—Test Db and guidance: Damp heat, cyclic (12 h + 12 h cycle)	60068.2.30	Tests—Test Db and guidance: Damp heat, cyclic (12 hour + 12 hour cycle)
60068-2-42	Tests—Test Kc: Sulphur dioxide test for contacts and connections	60068.2.42	Tests—Test Kc: Sulphur dioxide test for contacts and connections
60068-2-78	Tests—Test Cab: Damp heat steady state	60068.2.78	Tests—Test Cab: Damp heat steady state

The terms 'normative' and 'informative' are used to define the application of the annex 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

This part of ISO 7240 has been prepared by the Subcommittee ISO/TC 21/SC 3 and is based on both ISO 7240-5 for heat detectors and ISO 7240-6 for carbon monoxide fire detectors.

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

Carbon monoxide (CO) fire detectors can react promptly to slow, smouldering fires involving carbonaceous materials. Although in the majority of fires the products of combustion are transported by convection, the gaseous nature of CO means that it also diffuses and, particularly in low energy fires, it can move ahead of the smoke plume and thus provide earlier detection.

CO fire detectors alone might not react quickly to flaming fires and the addition of a heat sensor as described in this part of ISO 7240 provides better detection to a broader spectrum of fires.

CO fire detectors based on electrochemical cells might be better suited to applications where smoke detectors can produce unwanted alarms due to the presence of dust, steam or cooking vapours, etc.

Whilst CO gas has greater mobility than smoke, it can be diluted by ventilation systems and be affected by convection currents. Hence, the same considerations as for point smoke detectors should be taken into account. Re-circulating systems confined to a single room have little effect on dilution, as this is similar to the natural diffusion of the CO gas.

It is important that the location of CO fire detectors take into account areas where false operation or non-operation is likely. Some typical locations where it is important to carefully evaluate the use of CO fire detectors are

a) areas where CO gas can be present from exhausts and normal manufacturing processes;

EXAMPLES Car parks, car-park return air plenums, loading docks.

b) confined areas where cigarette smoking is likely.

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1 Scope

This part of ISO 7240 specifies requirements, test methods and performance criteria for point multi-sensor fire detectors that incorporate an electrochemical cell for sensing carbon monoxide (CO) in combination with 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 CO multi-sensor fire detectors, or CO and heat multi-sensor fire detectors working on different principles, this part of ISO 7240 can be used for guidance. CO and heat multi-sensor fire detectors with special characteristics and 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*

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

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

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

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

IEC 60068-2-27, *Environmental testing — Part 2: Tests. Test Ea and guidance: Shock*

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

IEC 60068-2-42, *Environmental testing — Part 2-42: Tests — Test Kc: Sulphur dioxide test for contacts and connections*

IEC 60068-2-78, *Environmental testing — Part 2-78: Tests — Test Cab: Damp heat, steady state*

EN 50130-4, *Alarm Systems — Part 4: Electromagnetic compatibility — Product family standard: Immunity requirements for components of fire, intruder and social alarm systems*