INTERNATIONAL STANDARD

ISO 7240-24

First edition
2010-03-01

Fire detection and fire alarm systems —

Part 24: Sound-system loudspeakers

Systèmes de détection d'incendie et d'alarme —

Partie 24: Haut-parleurs pour systèmes d'alarme vocale

Reference number
ISO 7240-24:2010(E)

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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

ISO 7240-24 was prepared by Technical Committee ISO/TC 21, *Equipment for fire protection and fire fighting*, Subcommittee SC 3, *Fire detection and alarm systems*.

ISO 7240 consists of the following parts, under the general title *Fire detection and fire alarm systems*:

— *Part 1: General and definitions*

— *Part 2: Control and indicating equipment*

— *Part 3: Audible alarm indicators*

— *Part 4: Power supply equipment*

— *Part 5: Point-type heat detectors*

— *Part 6: Carbon monoxide fire detectors using electro-chemical cells*

— *Part 7: Point-type smoke detectors using scattered light, transmitted light or ionization*

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

— *Part 9: Test fires for fire detectors* [Technical Specification]

— *Part 10: Point-type flame detectors*

— *Part 11: Manual call points*

— *Part 12: Line type smoke detectors using a transmitted optical beam*

— *Part 13: Compatibility assessment of system components*

— *Part 14: Guidelines for drafting codes of practice for design, installation and use of fire detection and fire alarm systems in and around buildings* [Technical report]

— *Part 15: Point type fire detectors using scattered light, transmitted light or ionization sensors in combination with a heat sensor*

— *Part 16: Sound system control and indicating equipment*

— *Part 17: Short-circuit isolators*

— *Part 18: Input/output devices*

— *Part 19: Design, installation, commissioning and service of sound systems for emergency purposes*

— *Part 20: Aspirating smoke detectors*

— *Part 21: Routing equipment*

— *Part 22: Smoke-detection equipment for ducts*

— *Part 24: Sound-system loudspeakers*

— *Part 25: Components using radio transmission paths*

— *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*

— *Part 28: Fire protection control equipment*

A Part 23, dealing with visual alarm indicators, is under development.

Introduction

This part of ISO 7240 is based on European standard EN 54-24, prepared by the European Committee for Standardization's Technical Committee CEN/TC 72, *Fire detection and fire alarm systems*.

The purpose of a sound-system loudspeaker as a component of a sound system for emergency purposes (see ISO 7240-19) is to provide intelligible warning to people in or within the vicinity of a building in which a fire emergency has occurred and to enable such person(s) to take appropriate measures in accordance with a predetermined evacuation plan.

The primary reason for using a sound system for emergency purposes, instead of coded warnings given by aural alarm indicators (see the future ISO 7240-3) is to reduce the time taken for those at risk to recognize that an emergency exists, and to give clear instructions on what to do next. This means that sound-system loudspeakers are required to achieve a minimum acoustical performance, as well as constructional and environmental requirements, to be suitable for use in a sound system for emergency purposes.

This part of ISO 7240 recognizes that the exact nature of the acoustical requirements for sound-system loudspeakers varies according to the nature of the space into which they are installed. It therefore specifies the minimum requirements that apply to sound-system loudspeakers and a common method for testing their operational performance against parameters specified by the manufacturers.

This part of ISO 7240 gives common requirements for the construction and robustness of sound-system loudspeakers as well as their performance under climatic and mechanical conditions that are likely to occur in the service environment. As the types of loudspeaker considered in this part of ISO 7240 are passive electromechanical devices not involving sensitive electronic circuits, electromagnetic compatibility (EMC) tests have not been included. The loudspeakers have been classified for either an indoor or an outdoor application environment category.

This part of ISO 7240 requires that manufacturers specify certain characteristics in a consistent manner so that designers can make objective decisions about which loudspeaker to use in specific applications.

Fire detection and fire alarm systems —

Part 24: Sound-system loudspeakers

1 Scope

This part of ISO 7240 specifies requirements, test methods and performance criteria for loudspeakers intended to broadcast a warning of fire between a fire detection and alarm system and the occupants of a building (see item C_4 of ISO 7240-1:2005).

This part of ISO 7240 specifies loudspeakers for two types of application environment: type A, generally for indoor use, and type B, generally for outdoor use.

This part of ISO 7240 does not cover loudspeakers for special applications, for example loudspeakers for use in hazardous applications, if such applications require additional or other requirements or tests other than those given in this part of ISO 7240.

This part of ISO 7240 is not intended to cover addressable loudspeakers or loudspeakers with active components.

Audible alarm indicators are covered in the future ISO 7240-3.

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

ISO 9001:2008, *Quality management systems — Requirements*

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*

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

IEC 60068-2-27, *Environmental testing — Part 2-27: 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 60068-2-75:1997, *Environmental testing — Part 2-75: Tests — Test Eh: Hammer tests*

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

IEC 60268-1:1985, *Sound system equipment — Part 1: General*

IEC 60529, *Degrees of protection provided by enclosures (IP code)*

IEC 60695-11-10, *Fire hazard testing — Part 11-10: Test flames — 50 W horizontal and vertical flame test methods*

IEC 60695-11-20, *Fire hazard testing — Part 11-20: Test flames — 500 W flame test methods*

IEC 61260, *Electroacoustics — Octave-band and fractional-octave-band filters*

IEC 61672-1, *Electroacoustics — Sound level meters — Part 1: Specifications*

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

3 Terms, abbreviated terms and definitions

For the purposes of this document, the terms, definitions and symbols given in ISO 7240-1 and the following apply.

3.1 Terms and definitions

3.1.1
1/3 octave
frequency band as defined in IEC 61260

3.1.2
coverage angle
smallest angle between two directions on either side of the reference axis at which the sound pressure level is 6 dB less than the sound pressure level on the reference axis

NOTE This angle is measured in the vertical and horizontal planes.

3.1.3
free-field condition
acoustical environment in which the sound pressure decreases with the distance, r, from a point source according to a $1/r$ law, with an accuracy of ± 10 %, in the region that is occupied by the sound field between the loudspeaker system and the microphone during the measurements

EXAMPLE An anechoic room, a quiet outdoor space.

3.1.4
frequency response
sound pressure level at a distance of 4 m from the reference point on the reference axis, produced at 1/3 octave frequency bands, from 100 Hz to 10 kHz (centre frequencies)

NOTE This is also referred to as magnitude or amplitude response.

