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Guide for Proper Use of System Smoke Detectors

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Foreword

Proper Use of Smoke Detectors

Studies have shown that in the United States, the use of early warning fire and smoke detection systems has resulted in a significant reduction in overall fire deaths. The sooner a fire is detected, the better the chances are for the survival of lives in danger and for the reduction of property damage.

A potential problem with smoke detectors is unwanted (nuisance) alarms that can result in people being desensitized to the alarm system or, in severe cases, disconnecting the system. This is an industry-wide problem that in most cases is caused by improper application, installation, or maintenance of smoke detectors. It is hoped that the information in this guide will be used by those involved with the application, installation, and maintenance of automatic fire alarm systems to minimize these problems.

This *Guide for Proper Use of System Smoke Detectors* has been published by the National Electrical Manufacturers Association's Fire, Life Safety, Security and Emergency Communications Section for the automatic fire detection and alarm industry.

This edition of the manual supersedes all prior versions of *Guide for Proper Use of System Smoke Detectors*.

About the National Electrical Manufacturers Association (NEMA)

Founded in 1926 and headquartered near Washington, D.C., NEMA represents 325 member companies that manufacture products used in the generation, transmission and distribution, control, and end use of electricity. These products are used in utility, industrial, commercial, institutional, and residential applications. The association's Medical Imaging & Technology Alliance (MITA) Division represents manufacturers of cutting-edge medical diagnostic imaging equipment, including MRI, CT, x-ray, and ultrasound products. Worldwide sales of NEMA-scope products exceed \$140 billion.

About the NEMA Fire, Life Safety, Security and Emergency Communications Section

The objective of the section is to be the principal source of technical, training, and educational materials essential for the specification and manufacture of reliable life safety products, their installation, performance, inspection, and maintenance.

The section currently represents U.S., United Kingdom, and Japanese manufacturers in support of the automatic fire detection and alarm industry and the healthcare communications industry. Fire detection and alarm products include life safety/fire alarm systems and devices that provide early warning of an impending or actual fire, heat, or gaseous hazard. The products detect, notify, and initiate control functions in case of hazard to life or property.

For more information on NEMA and the Fire, Life Safety, Security and Emergency Communications Section, go to <http://www.nema.org/Products/Pages/Signaling-Protection-and-Communications.aspx> or <http://www.lifefiresafety.org>.

This technical publication was developed by the NEMA Fire, Life Safety, Security and Emergency Communications Section. At the time it was approved, the section was composed of the following members:

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This publication contains excerpted material from the 2022 edition of NFPA 72 *National Fire Alarm and Signaling Code*. Reprinted by permission of the National Fire Protection Association.

Section 1 General

1.1 Scope

This manual, developed by NEMA's Fire, Life Safety, Security and Emergency Communications Section, provides technical information on basic fire alarm systems with a focus on early warning smoke detection devices. This document covers smoke detectors connected to a control panel and listed as complying with UL 268. This manual does not cover smoke alarms listed as complying with UL 217.

1.2 Purpose

The purpose of this guide is to provide information concerning the proper application of smoke detectors used in conjunction with fire alarm systems. It outlines basic principles, which should be considered in the application of early warning fire and smoke detection devices. Operating characteristics of detectors and environmental factors, which may aid, delay, or prevent their operation, are presented.

The intent of this guide is to provide educational material for fire protection engineers, mechanical and electrical engineers, fire service personnel, fire alarm designers, and installers.

Though this information is based upon industry expertise and many years of experience, it is intended to be used only as a technical guide. The requirements of applicable codes and standards, as well as directives of the Authorities Having Jurisdiction (AHJs), should be followed. In particular, NFPA 72 for installation of detectors and for testing of systems is a key element for the effectiveness of smoke detection systems.

1.3 Standards that Apply

There are many code-writing groups that publish standards for the proper application, installation, and maintenance of automatic smoke detectors. The principal code-writing bodies and applicable standards that should be reviewed before specifying or installing automatic smoke detectors are below.

International Code Council
500 New Jersey Avenue, NW
Washington, DC 20001
www.iccsafe.org

Local and state building officials are organized into a national code organization, the International Code Council (ICC), which writes model building codes that become law when adopted by local and state governments. These codes also specify smoke detector requirements based on building and occupancy type. Most local and state governments adopt versions of the following model codes:

International Building Code (IBC)

International Fire Code (IFC)

International Residential Code (IRC)

These codes are generally used throughout the United States.