

Residential Smoke Alarms: A Discussion of NFPA 72 Location Requirements

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What Is the National Fire Alarm and Signaling Code?

NFPA 72, *the National Fire Alarm and Signaling Code*, is a model standard used by electricians, architects, engineers, builders and inspectors to determine what features and equipment must be included in a fire alarm system. NFPA 72 applies to both residential and commercial buildings. Chapter 29 has specific requirements that apply to residential occupancies, including apartments, hotels and houses.

Why Is it Important?

NFPA 72 is adopted by virtually every community in the United States in one form or another through their residential, fire and building codes.

What Are the Current Location Requirements for Smoke Alarms, and How Did They Get That Way?

Prior to 1993, single station smoke alarms were required outside of sleeping rooms and on every level of a home. In 1993, the Code was updated to require smoke alarms in new construction to be provided with smoke alarms *inside every sleeping room*, in addition to the existing requirements. Because the code also required new smoke alarm installations to be interconnected, this improved the ability of residents who sleep with their doors closed to hear an alarm. At that time, existing homes were exempted from this requirement.

In the late 1980's through the 1990's, several studies were released that showed a correlation between the age of housing stock and fire death rate (see NFPA 72 Report on Proposals, 2002). In 2004, the National Institutes of Standards and Technology (NIST) released a comprehensive study on the performance of residential smoke alarms, [*Performance of Home Smoke Alarms: Analysis of the Response of Several Available Technologies in Residential Fire Settings*](#). The report has been updated several times, most recently in 2007. The NIST report showed that escape times from typical residential fires have been significantly reduced since the 1970's. In other words, fires grow faster now and people have less time to get out. The report listed higher incidence of plastic vs. cellulosic materials in modern residential furnishings as a contributing factor.

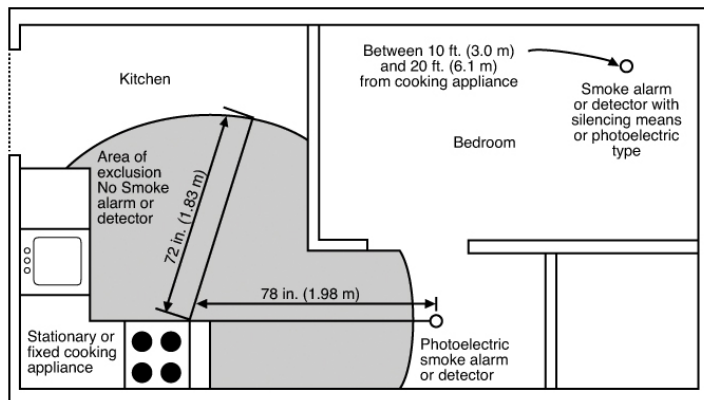
In response to these studies, the NFPA 72 household fire alarm committee re-examined the exception for existing residences that allowed them to omit smoke alarms from individual sleeping rooms. In the 2007 edition of the Code, the exception was removed. At the same time, the Code also removed the exemption for interconnection of smoke alarms. Thus, starting with the 2007 edition of NFPA 72, the *National Fire Alarm and Signaling Code* requires all homes, new and existing, to have interconnected smoke



alarms inside every sleeping room, outside all sleeping rooms, and on every level. However, most communities do not adopt NFPA 72 requirements retroactively, so these requirements are not always enforceable to existing homes.

What Does NFPA 72 Say About Nuisances?

NFPA 72 addresses nuisance alarms in several ways. First, all smoke alarms are required to be “listed” by a nationally recognized testing lab. The applicable standard for testing of smoke alarms is UL217, which has some limited requirements for resistance to nuisances. Second, NFPA 72 has requirements for technology and spacing aimed to limit nuisance alarms.



Recognizing the problem of disconnected alarms due to nuisance activations, the NFPA 72 Household committee modified spacing requirements for smoke alarms in 2010. The Code was changed (in 29.8.3.4(4)) so that alarms are not installed within 10 feet of cooking appliances. It further required that smoke alarms installed within 20 feet of a cooking appliance be either photoelectric, or include an alarm silencing means. The allowance for photoelectric detection

recognizes that ionization alarms are normally more sensitive to cooking nuisances, and so would be more likely to be disabled by the resident.

In addition, the 2013 edition of NFPA 72 required for the first time that, by 2016, smoke alarms installed within 20 feet of a cooking appliance be specifically listed for resistance to cooking nuisance sources. The National Fire Protection Research Foundation is currently studying smoke phenomena associated with cooking, with the goal to update the UL217 test standard to meet this requirement.

Is This Enough?

Standards are constantly changing to adapt to new building technologies and development patterns. It also takes time for NFPA 72 to be adopted and incorporated into local building codes. Because of the time period between when the model Code is updated and when it is adopted as law in a community, it takes years for the effects of changes to manifest. You can see this today in many homes that we would not consider “older.” For example, a home constructed in 1997 was likely to have been built under a local code that referenced pre-1993 NFPA 72 requirements.

How Can I Get Involved?

NFPA 72 is developed through an open consensus process and published by the National Fire Protection Association. Each chapter is managed by a technical committee comprised of experts representing a cross section of fire protection interests. The technical committees work to consider public input and regularly update the Code, typically every three years. The public is encouraged to provide proposed

code changes. Although work on the 2016 edition of NFPA 72 is near complete, public input will be accepted for the following edition after the 2016 is published.