ANSI/AARST

RMS-MF 2018 *with 12/20 revisions*

An American National Standard

Radon Mitigation Standards for Multifamily Buildings

AARST CONSORTIUM ON NATIONAL RADON STANDARDS
www.standards.aarst.org

RMS-MF 2018 *with 12/20 revisions*

Radon Mitigation Standards for Multifamily Buildings

Scope Summary and Introduction

This standard specifies practices, minimum requirements and general guidance for mitigation of radon in existing multifamily buildings, including both low-rise and high-rise multifamily buildings. The techniques addressed in this standard provide whole-building consideration yet also apply when implemented to portions of a building or individual occupied spaces.

12/20 Revisions for 2021

This publication is the first in a series of mitigation standards updates that seek to harmonize and improve as many provisions as possible across ANSI/AARST SGM-SF, RMS-MF and RMS-LB. While recommended for immediate use, the effective date of this revised standard for compliance purposes is Sept. 1st, 2021.

Substantive changes: Continuous maintenance efforts have resulted in harmonized updates for most provisions in Sections 6, 7 and 8 for *active soil depressurization (ASD)* to read the same in RMS-LB (schools and large buildings), RMS-MF (multifamily buildings) and SGM-SF (existing homes).

Editorial changes: Reconciliation for harmonized order of content, informational renderings and page layout.

Significance of Purpose

Radon is the leading cause of lung cancer among nonsmokers and the second leading cause of lung cancer in the general population. Most people receive their greatest exposure to radon in their home or dwelling. Radon concentrations in ground-contact apartments have been found to be similar to those in low-rise residential buildings located in the same area.[1]

Radon in U.S. homes causes approximately 21,000 U.S. lung cancer deaths each year.[2] Be it at home, work or school, an individual's exposure to radon gas combines over time to increase the risk of preventable lung cancer. This document contains minimum requirements and guidance designed to respond to the health threat in multifamily buildings.

Historical Perspective

In the 1950s, studies confirmed increased incidence of radon-induced lung cancer for workers in underground mines.

In the 1980s, studies found that exposure to radon in homes can exceed exposures found in studies of mine workers.

Since 1988, the Indoor Radon Abatement Act has authorized U.S. state and federal activities to reduce citizen risk of lung cancer caused by indoor radon concentrations.

Since the early 1990s, USEPA has advised all U.S. schools to test for radon and to reduce levels to below 4 pCi/L[3].

In 1999, with the publication of BEIR VI [3], the National Academy of Sciences confirmed that any exposure to radon holds a degree of risk. In addition, the Academy's BEIR VII committee stated that exposure to radiation, including any concentration of radon, carries risk.

In 2009, the World Health Organization's WHO Handbook on Indoor Radon confirmed the association between indoor radon exposure and lung cancer, even at the relatively low radon levels found in residential buildings. [3]

Initiated in 2010, the U.S. Federal Radon Action Plan (FRAP), followed by the National Radon Action Plan (NRAP), has highlighted an ultimate public health goal of eliminating preventable radon-induced cancer.

Designation: RMS-MF

As used for catalogue identification, "RMS-MF" stands for Radon Mitigation in Multifamily Buildings.

Normative References

Referenced publications, including those delineated as normative, are found in Appendix A.

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[1] Swedish Radiation Protection Authority, "Radon in Estonia Dwellings, Stockholm" 2003; and Valmari, T, Arvela, T and Reisbacka, "Radon in Finnish Apartment Buildings, Radiation Protection Dosimetry" 2012

[2] National Academy of Sciences, "Biological Effects of Ionizing Radiation" (BEIR VI Report) 1999

[3] World Health Organization, "WHO Handbook on Indoor Radon: A Public Health Persspective" 2009

Adoption

These standards of practice can be adopted as requirements for contractual relationships or adopted as recommendations or requirements of an authority or jurisdiction such as for private proficiency programs, a state radon program or other governmental body. AARST recommends that any authority or jurisdiction considering substantial modifications of this document as a condition of its use seek consensus within the consortium process at AARST Consortium on National Radon Standards prior to adopting a modified version. This provides the jurisdiction with a higher degree of expertise across diverse stakeholders and offers the Consortium on National Radon Standards an opportunity to update this document as appropriate.

AARST Consortium on National Radon Standards

Website: www.standards.aarst.org Email: standards@aarst.org

527 N Justice Street, Hendersonville, NC 28739-4217

The Consortium Consensus Process

The consensus process developed for the AARST Consortium on National Radon Standards and as accredited to meet essential requirements for American National Standards by the American National Standards Institute (ANSI) has been applied throughout the process of approving this document.

Continuous Maintenance

This standard is under continuous maintenance by the AARST Consortium on National Radon Standards for which the Executive Stakeholder Committee has established a documented program for regular publication of revisions, including procedures for timely consensus action on requests for change to any part of the standard. User tools are also posted online as they become available (such as templates for field notices, inspection forms).
For access to details: (www.standards.aarst.org/public-review)

Notices

Notice of right to appeal: Bylaws for the AARST Consortium on National Radon Standards are available at www.standards.aarst.org/public-review. Section 2.1 of Operating Procedures for Appeals (Appendix B) states, "Persons or representatives who have materially affected interests and who have been or will be adversely affected by any substantive or procedural action or inaction by AARST Consortium on National Radon Standards committee(s), committee participant(s), or AARST have the right to appeal; (3.1) Appeals shall first be directed to the committee responsible for the action or inaction."

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Table of Contents

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Radon Mitigation Standards for Multifamily Buildings

Note—12/20 revisions (Sections 1 -5 do NOT contain changed requirements)

1.0 SCOPE

1.1 This standard specifies practices, minimum requirements and general guidance for *mitigation* of *radon* in existing multifamily buildings including both low-rise and *high-rise* multifamily buildings.

This standard addresses a wide range of multifamily buildings including, among others, the use of a building or structure, or a portion thereof used as *townhouses*, apartment houses, convents, dormitories, military congregate residences, fraternities and sororities, and nontransient boarding houses, hotels, live/work *units*, monasteries, motels and vacation timeshare properties. [4]

1.1.1 The techniques addressed in this standard provide whole building consideration yet also apply when implemented to portions of a multifamily building or individual *dwelling*.

1.1.2 This standard pf practice addresses a wide range of *mitigation* methods and is applicable to structures be they rented or owned including condominiums, co-op owned buildings and timeshare properties.

1.2 Limitations

1.2.1 *Water and building materials*
This standard doe~~s~~ not address all *mitigation* techniques such as may be needed for airborne *radon* that results from *radon* in water, building materials or other less common sources of *radon* gas.

1.2.2 Mitigation *of other soil gasses (e.g., chemical vapors)*
When applying *radon mitigation* techniques herein for other hazardous soil gasses such as for chemical vapor intrusion into buildings. Applicable requirements are found in ANSI/AARST SGM-SF *"Soil Gas Mitigation for Existing Homes"* to include Section 11 (Health and Safety) and Section 13 (Additional Requirements).

1.2.3 *Mixed-use buildings or complicated ventilation*
When portions of building are used for non-residential purposes and/or contain ventilation systems more elaborate than basic heating and cooling, see ANSI/AARST RMS-LB "*Radon Mitigation Standards for Schools and Large Buildings*" for appropriate additional practices.

1.2.4 *Jurisdictional compliance*
This standard does not contain all code or other requirements of the jurisdictions where the *radon mitigation* system is being installed. Although the provisions in this standard have been reviewed for potential conflicts with other regulatory requirements, adherence to this standard does not guarantee or supersede compliance with the applicable codes or regulations of any federal, state or local agency with jurisdiction.

1.2.5 *Safety*
This standard is not intended to address all of the safety concerns associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices. It is the responsibility of the user of this standard to determine the applicability of regulatory limitations prior to use.

1.2.6 *Design and warranties*
This standard is not intended to be used as a design manual, and compliance with its provisions will not guarantee reduction of indoor *radon* to any specific concentration.

[4] As point of reference, see the International Building Code (IBC) Section 310 for Residential Group R2 (as published by the International Code Council).