Note—ANSI/AARST MAMF and MALB consolidated into a single publication

ANSI/AARST MA-MFLB 2023



An American National Standard

Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily, School, Commercial and Mixed-Use Buildings

AARST CONSORTIUM ON NATIONAL STANDARDS
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MA-MAMF 2023

Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily, School, Commercial and Multi-Use Buildings

Scope Summary and Introduction

MA-MFLB consolidates ANSI/AARST MAMF (rev. 1/21) and ANSI/AARST MALB (rev. 1/21) into a single publication. This standard of practice specifies procedures and minimum requirements when measuring radon concentrations in shared structures, or portions of shared structures, used for residential, non-residential or mixed-use purposes[1] to determine if radon mitigation is necessary to protect current and future occupants. These protocols address low-rise and high-rise structures and procedures for testing whole buildings but also for testing only one or several individual rooms or dwellings within a shared building.

Updates for 2023

Updates for 2023 include revised latitude in Section 6.2 (Quality Control for Number of Valid Tests). While recommended for immediate use, the effective date for compliance with this standard is **December 1st, 2023**.

Purpose

Radon is the leading cause of lung cancer among nonsmokers and the second leading cause of lung cancer in the general population.[2] Radon in U.S. homes causes approximately 21,000 lung cancer deaths each year.[3] This risk is largely preventable. Most people receive their greatest exposure to radon in their home dwellings. Radon concentrations in ground-contact apartments have been found to be similar to those in low-rise residential buildings located in the same area.[4] 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.

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 for mine workers. This discovery resulted in the Indoor Radon Abatement Act (1988) that authorized U.S. state and federal activities to reduce citizen risk of lung cancer caused by indoor radon concentrations. Since 1988, the United States Environmental Protection Agency (USEPA) and the U.S. Surgeon General have recommended that all homes be tested for radon. Since the early 1990s, the U.S. Environmental Protection Agency (EPA) has advised all U.S. schools to test for radon and to reduce levels to below 4 pCi/L.

In 1999, with publication of the BEIR VI[3] study, the National Academy of Science confirmed that any 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 concentrations found in residential buildings.[2]

Normative References

ANSI/AARST MS-QA	(Radon Measurement Systems Quality Assurance)
ANSI/AARST MAH	(Protocol for Conducting Measurements of Radon and Radon Decay Products in Homes) *in regards to conducting radon decay product (RDP) measurements*.
ANSI/AARST MS-PC	(Performance Specifications for Instrumentation Systems Designed to Measure Radon Gas in Air)
ANSI/AARST MW-RN	(Protocol for the Collection, Transfer and Measurement of Radon in Water)

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[1] As point of reference, see the International Building Code (IBC) as published by the International Code Council.

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

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

[4] 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

Other ANSI/AARST standards developed to respond to the threat of cancer caused by radon:

ANSI/AARST SGM-SF	(Soil Gas Mitigation in Existing Homes)
ANSI/AARST SGM-MFLB	(Soil Gas Mitigation in Existing Multifamily, School, Commercial and Mixed-Use Buildings) *Note—Previously published as ANSI/AARST RMS-MF and RMS-LB and now harmonized and consolidated into a single standard.*
ANSI/AARST CCAH	(Reducing Radon in New Construction of One & Two Family Dwellings and Townhouses)
ANSI/AARST CC-1000	(Soil Gas Control Systems in New Construction of Multifamily, School, Commercial and Mixed-Use Buildings)
ANSI/AARST RRNC	(Rough-in of Radon Control Components in New Construction of 1 & 2 Family Dwellings and Townhouses)

Designation of the standard: MA-MFLB

For catalogue identification, "MA-MFLB" stands for Measurement of Air in Multifamily and Large Buildings.

The Consensus Process

The consensus process developed for the AARST Consortium on National 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

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Protocol for Conducting Measurements of Radon and Radon Decay Products in Multifamily, School, Commercial and Mixed-Use Buildings

1.0 SCOPE

1.1 Scope and Purpose

This standard of practice specifies procedures and minimum requirements when measuring radon concentrations in shared structures, or portions of shared structures, used for residential, non-residential or mixed-use purposes to determine if radon mitigation is necessary to protect current and future occupants. These protocols address low-rise and high-rise structures and procedures for testing whole buildings but also for testing only one or several individual rooms or dwellings within a shared building.

1.1.1 *Multifamily and other residential occupancies*

The protocols in this standard of practice address residential occupancies that include:

a) Buildings having more than one attached dwelling or other occupied unit under the same ownership or designated maintenance or management authority;

b) Buildings or structures, or a portion thereof that are used, for example, as apartment houses, dormitories, military congregate residences, fraternities and sororities, non-transient boarding houses, hotels, convents, monasteries, motels, and live/work units; and

c) Multifamily structures that can include those with shared ownership or maintenance such as co-op units, townhouses, condominiums or vacation timeshare properties.

1.1.2 *Schools, commercial buildings and other non-residential occupancies* [5]

The protocols in this standard of practice also address non-residential occupancies that include:

a) Educational occupancies including for religious and educational purposes through the 12th grade and day care facilities (Group E);

b) Business occupancies including for offices, training and educational facilities to include universities, professional services or service-type transactions (Group B);

c) Assembly occupancies including for civic, social or religious functions (Group A);

d) Factory occupancies including for fabrication or manufacturing, repair or processing (Group F);

e) High-hazard occupancies (Group H);

f) Institutional occupancies including those where people are cared for or live in a supervised environment such as under restraint or security, detained in a penal institution, or for medical, surgical, psychiatric, nursing and custodial care or for childcare facility purposes (Group I); and

g) Mercantile occupancies including for the display and sale of merchandise, goods, wares or merchandise incidental to such purposes and accessible to the public (Group M).

1.2 Applicability

The terms "shall" and "required" indicate provisions herein that are mandatory for compliance with this standard. The terms "note", "informative", "should" and "recommended" indicate provisions that are considered to be helpful or good practice but that do not contain a mandatory requirement.

[5] As point of reference, see the International Building Code (IBC) as published by the International Code Council.