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Built Environment Today

ASHRAE Positions on LIMITING INDOOR MOLD AND DAMPNESS IN BUILDINGS

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ASHRAE is a global professional society of over 55,000 members, committed to serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration and their allied fields (HVAC&R).

ASHRAE position documents are approved by the Board of Directors and express the views of the Society on specific issues. These documents provide objective, authoritative background information to persons interested in issues within ASHRAE's expertise, particularly in areas where such information will be helpful in drafting sound public policy. The documents also clarify ASHRAE's position for its members and building professionals.

Indoor Dampness is a Public Interest Issue

Persistent dampness in buildings contributes to negative health outcomes for occupants. The causes of health-relevant dampness are complex and involve decisions that often overlap responsibilities of different design professions and are affected by decisions of building contractors, owners, operators and occupants.

Why ASHRAE Takes Positions on Indoor Dampness

ASHRAE consensus standards and design guides provide the technical foundation for international building practices and energy codes that balance the need for energy efficiency with the need to keep the indoor environment healthy and comfortable for occupants. The design, construction and operation of buildings' mechanical systems can improve—or can impede—the buildings' ability to recover from normal wetting events by providing ventilation and indoor air that remains free of excessive humidity.

Consequently, ASHRAE's positions, standards and design guidance can help avoid health risks associated with building dampness by alerting and informing those who make public policy, as well as those who make design and operational decisions for buildings and their mechanical systems.

ASHRAE Takes the Positions that:

- Public health authorities have documented consistent associations between damp buildings and increased risks of adverse health effects, including exacerbation of existing asthma, new asthma, respiratory infections and allergic rhinitis (IOM 2004; WHO 2009). In addition, credible researchers have documented a causal link between damp buildings and

exacerbations in children with asthma (Kanchongkittiphon 2015).

- Health risks are increased when materials are persistently or frequently damp¹ (i.e., when indoor dampness has become typical rather than unusual). Indicators that have each been shown to be associated with health-relevant dampness include moldy/musty odors, visible mold growth, water damage, visible moisture and previous floods or leaks (WHO 2009; Mendell 2011; Kanchongkittiphon 2015).
- Persistent indoor dampness is neither normal nor desirable and can lead to health risks for occupants in the short term and ultimately to structural risks. All building professionals, building occupants, public policymakers and regulators should be aware of this fact and take actions that will help keep buildings and their systems as dry as possible, given their normal functions.

ASHRAE Recommends that:

- Policymakers, government agencies and regulators encourage adoption of ANSI/ASHRAE Standard 62.1-2022 as the minimum requirement for humidity control during both occupied and unoccupied hours to help prevent health-relevant indoor dampness in new buildings and systems.
- When planning and designing **new buildings and HVAC systems**, building owners and HVAC design professionals provide adequate budget, equipment and controls to encourage normal drying of materials by keeping humidity below a maximum dew-point temperature of 60°F (15°C) during unoccupied hours, as required by ASHRAE Standard 62.1-2022.
- In **existing buildings**, owners, occupants and building operation and maintenance professionals review the early warning signs and detailed risk reduction measures described in ASHRAE's [Damp Buildings, Human Health and HVAC Design](#) (available at no cost). Two early warning signs can be easily monitored with low-cost instruments, namely gypsum board moisture content that is consistently above 15% WME² and indoor air humidity that remains consistently above a dew-point temperature of 60°F.
- ASHRAE committees continue to update standards and guidance to remain consistent with developing knowledge about preventing persistent indoor dampness.

References

- IOM. 2004. [Damp Indoor Spaces and Health](#). Washington, DC: Institute of Medicine. National Academies Press.
- WHO. 2009. [Guidelines for Indoor Air Quality: Dampness and Mould](#). Bonn, Germany: World Health Organization.
- Kanchongkittiphon, W., M.J. Mendell, J.M. Gaffin, G. Wang, and W. Phipatanakul. 2015. Indoor environmental exposures and exacerbation of asthma: An update to the 2000 review by the Institute of Medicine. [Environmental Health Perspectives 123\(1\): 6](#).

¹ The word “persistent” describes dampness that has become typical (i.e., the dampness is occurring or reoccurring for days or weeks at a time rather than as infrequent excursions of a few hours above the early warning thresholds described by [Damp Buildings, Human Health and HVAC Design](#)).

² WME = wood moisture equivalent; readings taken in any material, using a meter calibrated for wood.

- Mendell, M.J., A.G. Mirer, K. Cheung, M. Tong, and J. Douwes. 2011. Respiratory and allergic health effects of dampness, mold, and dampness-related agents: A review of the epidemiologic evidence. [Environmental Health Perspectives 119\(6\): 748-56.](#)
- ASHRAE. 2022. [ANSI/ASHRAE Standard 62.1-2022, Ventilation for Acceptable Indoor Air Quality.](#) Peachtree Corners, GA: ASHRAE.
- ASHRAE. 2020. [Damp Buildings, Human Health and HVAC Design.](#) Peachtree Corners, GA: ASHRAE.

Additional ASHRAE Resources

- ASHRAE. 2008. Chapter 7, Mold and Mildew. In [Humidity Control Design Guide for Commercial and Institutional Buildings.](#) Peachtree Corners, GA: ASHRAE.
- ASHRAE. 2009. Chapter 5, Avoiding Bugs, Mold and Rot. In [ASHRAE Guide for Buildings in Hot & Humid Climates, 2nd ed.](#) Peachtree Corners, GA: ASHRAE.
- ASHRAE. 2009. Chapter 17, Avoiding Mold by Keeping New Construction Dry. In [ASHRAE Guide for Buildings in Hot & Humid Climates, 2nd ed.](#) Peachtree Corners, GA: ASHRAE.
- ASHRAE. 2023. [Chapter 64, Avoiding moisture and mold problems.](#) In *ASHRAE Handbook—HVAC Applications.* Peachtree Corners, GA: ASHRAE.
- ASHRAE. 2021. [Chapter 36, Moisture management in buildings.](#) In *ASHRAE Handbook—Fundamentals.* Peachtree Corners, GA: ASHRAE.

Other Resources

- ASTM. 2009. [Moisture Control in Buildings: The Key Factor in Mold Prevention, 2nd ed.](#) ASTM MNL18-2ND. H. Treschel and M. Bomberg, eds. West Conshohocken, PA: ASTM International.
- AIHA. 2020. [Recognition, Evaluation and Control of Indoor Mold, 2nd ed.](#) L.L. Hung, S.M. Caulfield, and J.D. Miller, eds. Falls Church, VA: American Industrial Hygiene Association.
- California. 2016. [Statement on building dampness, mold and health.](#) Richmond, CA: California Department of Public Health, Environmental Health Laboratory.
- EPA. 2001. [Mold remediation in schools and commercial buildings.](#) Washington, DC: U.S. Environmental Protection Agency.
- EPA. 2013. [Moisture Control Guidance for Building Design, Construction and Maintenance.](#) Washington, DC: U.S. Environmental Protection Agency.
- GSA. 2024. [P100, Facilities Standards for the Public Buildings Service](#) (pp. 186-87, Section 5.1.2, Humidity Control, of Table 5.1, Mechanical Performance Table). Washington, DC: U.S. General Services Administration.
- NIOSH. 2013. [Preventing Occupational Respiratory Diseases from Exposures Caused by Dampness in Office Buildings, Schools and Other Nonindustrial Buildings.](#) DHHS NIOSH Publication 2013-102. Atlanta: National Institute for Occupational Safety and Health.

DOCUMENT REVISION COMMITTEE ROSTER

The ASHRAE Position Document on limiting indoor mold and dampness in buildings was developed by the Society's Position Document Revision Committee, formed on November 13th, 2020, with Lew Harriman as its chair.

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DOCUMENT HISTORY

Background

Since 2001, ASHRAE technical committees have examined the common causes of persistent indoor dampness and have published books, reports, consensus standards, and design guidance to assist building professionals in reducing health risks from indoor dampness, as listed in the Additional ASHRAE Resources section of this position document.

The recommendations and requirements contained in those ASHRAE publications now form the basis of guidance published by the United States Environmental Protection Agency, the National Institute for Occupational Safety and Health, part of the Centers for Disease Control and Prevention, the U.S. General Services Administration, the California Department of Public Health, and the American Industrial Hygiene Association (AIHA).

Publication and Revision History

ASHRAE's Technology Council and the cognizant committee recommend revision, reaffirmation, or withdrawal every 30 months. The history of this position document is described below:

2/6/2005—BOD approves Position Document titled *Minimizing Indoor Mold Problems through Management of Moisture in Building Systems*

10/22/2010—BOD approves revised Position Document titled *Limiting Indoor Mold Growth and Managing Moisture in Building Systems*

6/27/2012—BOD approves revised Position Document titled *Limiting Indoor Mold and Dampness in Buildings*

1/29/2013—Technology Council approves reaffirmation (with minor editorial updates) of Position Document titled *Limiting Indoor Mold and Dampness in Buildings*.

1/27/2016—Technology Council approves reaffirmation (with no changes) of Position Document titled *Limiting Indoor Mold and Dampness in Buildings*

6/27/2018—Technology Council approves reaffirmation (with no changes) of Position Document titled *Limiting Indoor Mold and Dampness in Buildings*.

6/23/2021—Technology Council approves reaffirmation (with no changes) of Position Document titled *Limiting Indoor Mold and Dampness in Buildings*.

11/10/2021—BOD approves revised Position Document titled *Limiting Indoor Mold and Dampness in Buildings*.

10/29/2024—Technology Council approves reaffirmation of Position Document titled *Limiting Indoor Mold and Dampness in Buildings*.