Shaping Tomorrow's Global Built Environment Today

ASHRAE Position Document on

Human Health and Wellness in the Built Environment

Approved by the ASHRAE Board of Directors June 25, 2025

Expires June 25, 2028

ASHRAE is a global professional society of over 55,000 members, committed to serving 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.

Human Health and Well-Being in the Built Environment is a Public Interest Issue

Indoor environmental quality encompasses all aspects of the built environment and its impacts on occupants, addressing, at a minimum, the thermal, acoustic, visual, and indoor air quality parameters of the built environment as well as the occupants themselves. No aspects of indoor environmental quality, including their interactions, should be compromised or ignored in the context of their impact on human health and well-being.

Indoor environmental quality should foster quality of life, health, physical and mental activity, climate resilience, and sleep quality. *Health* has been defined by multiple organizations and groups, often differently, inconsistently, and non-operationally. The definition most often referred to is by the World Health Organization (WHO) and is stated as the "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (WHO 2020, p. 1). Health and well-being exist on a continuum from illness to optimal well-being. Health also exists on a spectrum, which may be defined differently if the application is from a physician, a psychologist, an engineer, or an individual. There currently is no engineering-focused operational definition of health within the built environment.

Any metrics or definitions of health and well-being must be addressed within this continuum and limit adverse environmental exposures. ASHRAE's influence on the built indoor environment supports these various definitions of health through its standards, guidelines, research, education, and community involvement.

Indoor environmental quality encompasses the full range of well-being of the building occupants. *Well-being* is a holistic state of being comfortable, healthy, and happy. It is broad and multidimensional and includes physical, mental, emotional, social, and spiritual aspects, thus

focusing on the overall state of being of the occupants. *Wellness* is an active process referring to lifestyle behaviors such as exercise and sleep. Wellness is one component of well-being. Throughout this document, *well-being* is used instead of *wellness* to indicate that ASHRAE stresses the importance of the holistic state of being and not only wellness.

Poor indoor environmental quality in buildings can result in a multitude of chronic and acute adverse health outcomes, ranging from life threatening (for example, heart disease and cancer) to annoying (such as sinus issues). Neurological and psychological outcomes also have been attributed to adverse indoor environments; these include depression, reduced work performance and productivity, and impaired learning. These outcomes may result from building-related exposures such as uncomfortable temperature or humidity levels, increased contaminant inhalation, excessive noise, and poor lighting. Requirements of maintaining the built environment to achieve optimal indoor environmental quality are situational and populational, for example, varying between occupants, occupant type (e.g., age, activities, health status), building type, and climate. In addition, requirements for maintaining optimal indoor environmental quality during episodic events, such as forest fires or infectious disease outbreaks, should be considered.

The determination of indoor environmental quality metrics to define the degree to which a building's indoor environment may impact occupant health and well-being is necessary for the development of standards and guidelines as well as for developing solutions and ensuring proper operation, sustainability, and maintenance of the building. Constructive focus on human health and well-being in the built environment depends on standards, guidelines, the collaboration among ASHRAE committees, and member attitudes. This effort also requires collaboration with other professional societies, public and private institutions, and disciplines.

Why ASHRAE Takes Positions on Human Health and Well-Being in the Built Environment

The ASHRAE vision is "a healthy and sustainable built environment for all."[1] Consequently, ASHRAE is committed to the promotion and support of health and well-being in the built environment through its mission "to serve humanity by advancing the arts and sciences of heating, ventilation, air conditioning, refrigeration, and their allied fields." ASHRAE standards and design guides provide the technical foundation for numerous international building practices, energy codes, and regulations and should balance energy efficiency and decarbonization with the need for a healthy and comfortable indoor environment for occupants. The thoughtful design, construction, and operation of a building can improve the ability to support human health and well-being in the indoor environment. Methods of providing a health-based approach to building design, construction, and operation include, among others, selecting low-emission building materials, designing HVAC systems to provide sufficient dilution and/or removal of airborne contaminants prior to occupant exposure, controlling unwanted noise and vibration, and using appropriate lighting quality. ASHRAE is uniquely positioned to provide guidance and standardization on effective measures in building design, construction, and operation for optimizing occupant and environmental health and well-being in the built environment. ASHRAE's international community and research programs can

[1] https://www.ashrae.org/about/mission-and-vision

develop and communicate the knowledge necessary to advance built environments that support health and well-being.

Indoor environmental quality metrics and definitions must be addressed within the health and well-being continuum. There is ongoing research into potential metrics, from engineering, societal, and healthcare professionals' viewpoints, that will provide the necessary parameters to understand a building's impact on human health and well-being. ASHRAE research can build on these metrics and their ability to accomplish health and well-being in the built environment.

Positions and Recommendations

ASHRAE Takes the Positions that:

- The physical, mental, and social health and well-being of occupants is impacted by the built environment.
- Sustainability within the built environment must include a focus on occupant health and well-being.
- Addressing the health and well-being of building occupants is essential at every stage throughout a project, from cradle to grave.
- Ensuring that health and well-being of building occupants and occupant-focused innovations are achieved through interdisciplinary collaboration amongst all professionals and policymakers involved in the built environment is paramount.
- It is important that building design, construction, and operation address occupants' diverse needs, preferences, and characteristics.

ASHRAE Recommends that:

- Research, policy/regulation development, and education be conducted on the following topics:
  - Indoor environmental quality objective metrics to assess the impacts of various aspects of the indoor environment on the health and well-being of occupants.
  - Development of indoor air quality metrics covering a wide range of indoor contaminants and environmental conditions and impacting building occupant health and well-being.
  - Assessment of situational and population-related requirements for optimal indoor environmental quality.
  - Technology for the assessment of the effect of a building's indoor environmental quality on occupant health and well-being.
  - Development of operation and maintenance procedures and policies to promote and support health and well-being in the indoor environment.
  - Financial benefits of the implementation of optimizing health and well-being in the built environment.

ASHRAE Commits to:

- Developing a health and well-being framework that will lead to an indoor environmental quality standard focusing on health and well-being in the built environment.
- Continuing to support and promote the attainment of health and well-being priorities within

the engineering community through its standards, guidelines, research, education, certifications, and community outreach.

- Designing a framework for incorporating health and well-being in its standards, guidelines, research, education, and community outreach.
- Developing an award or awards given to ASHRAE members who demonstrate an understanding of the application of evidence-based processes for the design, construction, operation, and maintenance of buildings for the health and well-being of building occupants.
- Partnering and developing MOUs to jointly advance built environmental health and well-being with professional medical and public health advocacy organizations such as American Medical Association; American Thoracic Association; American College of Allergy, Asthma, and Immunology; American Association of Public Health Physicians; American Lung Association; and American Public Health Association, and partnering with and leading relevant stakeholders such as industry groups, certification agencies, public health groups, researchers, government agencies, and relevant programs and consortia to actively promote indoor environmental quality and health and well-being.
- Driving innovation in technology which improves indoor environmental quality, with a strong focus on integrating emerging knowledge and trends in health and well-being into building systems and engineering practice.
- Advocating for the inclusion of indoor environmental quality, health and well-being engineering practices, and research into mechanical engineering degree programs, in collaboration with organizations such as American Society for Engineering Education and Technology and Engineering Education Collegiate Association.
- Promoting research and educational programs on the impact and importance of the indoor environment on all aspects of health and well-being, including social and mental health.
- Developing a comprehensive indoor environmental quality consensus standard including as a minimum a roadmap towards the best indoor environmental quality built environment.

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ASHRAE Resources

ANSI/ASHRAE/ASHE Standard 170-2021, *Ventilation of Health Care Facilities*

ANSI/ASHRAE/ASHE Standard 189.3-2025, *Design, Construction, and Operation of Sustainable High-Performance Health Care Facilities*

ANSI/ASHRAE/ICC/USGBC/IES Standard 189.1-2023, *Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings*

ANSI/ASHRAE Standard 52.2-2025, *Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size*
ANSI/ASHRAE Standard 55-2023, *Thermal Environmental Conditions for Human Occupancy*
ANSI/ASHRAE Standard 62.1-2022, *Ventilation and Acceptable Indoor Air Quality*
ANSI/ASHRAE Standard 62.2-2022, *Ventilation and Acceptable Indoor Air Quality in Residential Buildings*
ASHRAE and CIBSE Position Document on Resiliency in the Built Environment
ASHRAE Guideline 10-2023, *Interactions Affecting the Achievement of Acceptable Indoor Environments*
ASHRAE Guideline 27-2019, *Measurement Procedures for Gaseous Contaminants in Commercial Buildings*
ASHRAE Guideline 29-2009, *Guideline for the Risk Management of Public Health and Safety in Buildings*
ASHRAE Guideline 42-2023, *Enhanced Indoor Air Quality in Commercial and Institutional Buildings*
ASHRAE Guideline 44-2024, *Protecting Building Occupants from Smoke During Wildfire and Prescribed Burn Events*
ASHRAE Position Document on Building Decarbonization
ASHRAE Position Document on Combustion of Solid Fuels and Indoor Air Quality in Primarily Developing Countries
ASHRAE Position Document on Environmental Tobacco Smoke
ASHRAE Position Document on Filtration and Air Cleaning
ASHRAE Position Document on Indoor Air Quality
ASHRAE Position Document on Indoor Carbon Dioxide
ASHRAE Position Document on Infectious Aerosols
ASHRAE Position Document on Limiting Indoor Mold and Dampness in Buildings
ASHRAE Position Document on Unvented Combustion Devices and Indoor Air Quality
ASHRAE Standard 241-2023, *Control of Infectious Aerosols*
Damp Buildings, Human Health, and HVAC Design
Design Guidance for Education Facilities: Prioritization for Advanced Indoor Air Quality, Version 2.0
Healthier Homes During Epidemics
Indoor Air Quality Guide: Best Practices for Design, Construction, and Commissioning
Report of Multidisciplinary Task Group (MTG) Health and Wellness of the Built Environment (HWBE)
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DOCUMENT COMMITTEE ROSTER

The ASHRAE Position Document on Human Health and Wellness in the Built Environment was developed by the Society's Human Health and Wellness in the Built Environment Position Document Committee, formed on April 13, 2023, with Charlene Bayer as its chair.

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DOCUMENT HISTORY

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:

***6/25/2025**—BOD approves Position Document titled ASHRAE Human Health and Wellness in the Built Environment*