

# **STATUS OF THE REVISION OF ASHRAE STANDARD 62**

by

**Andrew K. Persily  
Building and Fire Research Laboratory  
National Institute of Standards and Technology  
Gaithersburg, MD 20899 USA**

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## STATUS OF THE REVISION OF ASHRAE STANDARD 62

Andrew K. Persily

National Institute of Standards and Technology, USA

### ABSTRACT

The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) is in the process of revising Standard 62, Ventilation for Acceptable Indoor Air Quality. Because Standard 62 has been designated as a *high profile standard* by ASHRAE, the revision will result in three separate documents: a code-intended standard, a users manual, and a guideline containing additional information that is not appropriate for the standard. The committee's efforts are currently focused on converting the current version of Standard 62 into a code-intended standard that will be suitable for adoption into building codes, that is, it will contain only minimum requirements intended to protect public health, safety and welfare. The revision of the standard is taking place through the continuous maintenance process, in which incremental changes or addenda to the standard are developed and approved separately. The Users Manual will be a companion document to the standard, and will include the background and rationale behind the requirements in the standard and examples of their application. The third piece of the revision effort is a guideline that will contain information on building and system design, installation, operation and maintenance relevant to ventilation and indoor air quality. This information will be in the guideline rather than the standard because it may not be at a level of practicality or cost that is suitable for all buildings, and therefore not appropriate for the minimum requirements. This paper provides a summary of the current status of the revision process.

**KEYWORDS:** guidelines, HVAC design, standards, ventilation

### INTRODUCTION

In 1973 ASHRAE approved the first version of Standard 62, which was titled *Standards for Natural and Mechanical Ventilation* [1]. As new information became available, the standard was revised in 1981 [2] and 1989 [3] with a new title, *Ventilation for Acceptable Indoor Air Quality*. A committee was formed in 1991 to revise the 1989 standard, and a draft revision was produced in 1996. Based on the level of controversy associated with that draft, it was decided in 1997 that the committee would employ the *continuous maintenance* process to revise the standard. Under continuous maintenance, changes are made in discrete, incremental steps or *addenda*, rather than under *periodic maintenance* in which the standard is revised as a whole. To date five addenda have been approved by ASHRAE, and are reflected in a new version of the standard published in 1999 [4]. A number of additional addenda are under development to convert the standard into a code language document as discussed below. The purpose of the 1989 version of the standard is "to specify minimum ventilation rates and indoor air quality that will be acceptable to human occupants and are intended to minimize the potential for adverse health effects." A key aspect of this scope is the reference to both comfort (expressed as acceptability) and health. Both comfort and health have been at the root of Standard 62 since the 1973 version, and both are included in the standard's definition of

the term *acceptable indoor air quality*. The scope of the standard notes that it “applies to all indoor or enclosed spaces that people may occupy, except where other applicable standards and requirements dictate larger amounts of ventilation than this standard. Release of moisture in residential kitchens and bathrooms, locker rooms, and swimming pools is included in the scope of this standard.” As noted below, the scope of the 1999 version of Standard 62 reflects some changes, but the title and purpose remain the same.

#### DOCUMENTS UNDER DEVELOPMENT

ASHRAE Standing Standards Project Committee (SSPC) 62.1 has been tasked with the job of revising ASHRAE Standard 62-1989 Ventilation for Acceptable Indoor Air Quality [3]. Given that Standard 62 has been designated as a “High Profile Standard,” this revision is proceeding somewhat differently from most other ASHRAE Standards. As described below, the revision will result in three separate documents: a code-intended standard, a users manual to accompany the standard, and a guideline containing additional information that is not appropriate for a minimum standard.

The committee’s efforts are focusing initially on converting the current version of Standard 62 into a code-intended standard that will be suitable for adoption into building codes, that is, it will contain only minimum requirements intended to protect public health, safety and welfare. The standard is being written primarily for building code organizations and design professionals who must comply with building code provisions, and is intended for adoption by ANSI as an American National Standard. The intended audience also includes construction managers, property managers and related building professionals. While the code-intended standard will include requirements directed towards the goal of achieving acceptable indoor air quality, the standard will explicitly state that compliance will not necessarily provide health, comfort, or occupant acceptability. The requirements of the standard will be written in mandatory, enforceable language so that the user can easily understand what must be done to comply, and the enforcing entity can determine whether compliance has been achieved. The revision of the standard is taking place through the continuous maintenance process, in which incremental changes or addenda to the standard are developed and approved separately. Four new addenda were recently approved, and the standard has just been republished as ASHRAE Standard 62-1999 [4], which is the 1989 version incorporating these four changes and one other approved in 1990. A number of additional addenda are currently in various stages of development, and their eventual adoption will result in achieving the goal of a complete code-intended standard. While addenda are typically developed within the SSPC, anyone can submit a proposed change through the process described under the Standards section of ASHRAE’s web page ([www.ashrae.org](http://www.ashrae.org)).

The Users Manual will be a companion document to the code-intended Standard, and will include the background and rationale behind the requirements of the Standard and an explanation of their application through examples. Compliance forms, where appropriate, will be included to assist in demonstrating and verifying compliance. The Manual may also include software, such as spreadsheets to aid in calculations of ventilation requirements. The Users Manual will be developed under contract to ASHRAE in accordance with procedures developed by the Standards Committee. A project monitoring committee will “manage” this contract, with the SSPC represented on this committee as required by ASHRAE procedures.

The third component of the effort is a guideline document being developed by the SSPC. The Guideline will contain information on building and system design, installation, operation and

maintenance relevant to ventilation and indoor air quality. This information may not be at a level of practicality or cost that is suitable for all buildings, and therefore not appropriate for the minimum requirements of the code-intended standard. As with all ASHRAE Guidelines, this document will be subject to public review, but the approval requirements for guidelines are less stringent than for standards and the guideline is not intended for adoption by ANSI. The guideline is being written primarily for design engineers and other IAQ specialists, as well as for designers and manufacturers of building equipment, components and materials and for facility engineers and property managers. The audience will also include some users of the code-intended standard who have an interest in or a need for additional guidance.

At the same time that SSPC 62.1 is focusing on these tasks, another ASHRAE Standards Project Committee is developing a new residential ventilation and IAQ standard designated as 62.2. When that work is complete, all references to low-rise residential occupancies will be deleted from Standard 62 and it will be renumbered as Standard 62.1.

### REASONS FOR REVISING THE STANDARD

The primary motivation for revising Standard 62 is to produce a code-intended document in mandatory and enforceable language as directed by the ASHRAE Board of Directors in 1997. The 1989 and 1999 versions of Standard 62 contain many recommendations in informative language and some requirements in mandatory language that may not be enforceable. Neither can be the basis for building codes without revisions. For example, the standard states that provision for airflow measurement *should* be provided in mechanical ventilation systems, the use of energy recovery ventilation systems *should* be considered, and that systems *should* be designed to prevent reentrainment of exhaust contaminants. Do you follow this advice or don't you? Are they required or not? Examples of requirements that are difficult to enforce include statements that systems *shall* be designed so that ventilation air is supplied throughout the occupied zone and that when supply air is reduced during occupancy provisions *shall* be made to maintain acceptable indoor air quality throughout the occupied space. How do you meet these requirements? How do you know if you've met them? How will they be enforced?

The problem with informative and unenforceable language is that achieving and judging compliance can be a subjective matter depending on the building designer, code official, building owner or whoever is doing the judging. Under these circumstances, the "playing field" may not be level. A hardworking, conscientious design professional will read these provisions and make a concerted effort to meet the intent of the standard. A less conscientious design professional might not give the provisions adequate consideration, but not actually violate the word of the standard. They will be able to charge lower fees, and the diligent designer will be penalized. A code-language standard with mandatory provisions will make it clear to everyone what they must do to comply and how compliance will be determined. Standard 62 is also being revised to update its technical content. Standard 62-1989 went out for public review in 1986. There is a great deal of new information available about ventilation and indoor air quality since 1986, and the standard needs to reflect this new information. For example, there is improved understanding of the impact of ventilation rates on sick building syndrome symptoms, more information on the indoor air quality impacts of indoor sources, and more evidence for the importance of operation and maintenance.

Another reason Standard 62 is being revised is to provide a more comprehensive treatment of ventilation and indoor air quality. Experience has shown that providing sufficient ventilation and acceptable IAQ requires many things to happen well, including design, construction,

installation, commissioning, operation and maintenance. Standard 62 is currently focused on design, and in reality many users employ only the ventilation rate table in the standard. To address the stated purpose of the standard, the standard must address all of these issues. To this end, the committee is developing new sections on Construction and System Start-up and on Operation and Maintenance.

#### STANDARD 62-1989 VERSUS 62-1999

ASHRAE Standard 62-1999 is basically the 1989 version of the standard plus the four addenda approved since the standard was converted to continuous maintenance in 1997. These addenda are designated as 62c, 62d, 62e and 62f. (Addendum 62a addresses the wording of the purpose of the standard and was approved in 1990.) Addendum 62c removed consideration of thermal comfort from the standard, since ASHRAE Standard 55 already covers this subject [5]. This addendum deleted material requiring that the temperature and humidity conditions in Standard 55 be maintained whenever a ventilation system operates. This requirement implied that heating, cooling, humidifying, and dehumidifying systems could be required in all ventilated spaces, even those ventilated by infiltration or natural ventilation, as well as unconditioned spaces such as garages. Providing thermally comfortable conditions is desirable, but is not always practical and should not be required in a code-language standard.

Addendum 62d modified the scope of the standard by stating that compliance with the standard will not necessarily result in acceptable indoor air quality. While we don't fully understand the impact of indoor environmental conditions on comfort and health, we do know that they are complex. Therefore, we are not yet able to develop a standard that can guarantee acceptable indoor air quality. The caveats noted in the revised scope include the diversity of indoor sources and contaminants, the many other factors that impact occupant perception of indoor environments (e.g. temperature, humidity and lighting) and the variations in occupant susceptibility to different contaminants.

Addendum 62e removed a statement in the table of ventilation rates that these rates accommodate "a moderate amount of smoking." This addendum is based on the purpose of the standard, which is to "...specify minimum ventilation rates and indoor air quality that will be acceptable to human occupants and are intended to minimize the potential for adverse health effects." In addition, the standard's definition of acceptable indoor air quality refers to "air in which there are no known contaminants at harmful concentrations as determined by cognizant authorities...." Since the publication of the 1989 standard, numerous cognizant health authorities have stated that environmental tobacco smoke is harmful to human health. These authorities include, among others, the American Medical Association, American Lung Association, National Academy of Sciences, National Institute of Occupational Safety and Health, Occupational Safety and Health Administration, Office of the U.S. Surgeon General, United States Environmental Protection Agency, and World Health Organization. Based on the statements of these organizations and the purpose of the standard to minimize adverse health effects, the phrase referring to a moderate amount of smoking was deleted from the table of ventilation rates.

Addendum 62f clarified material in the standard on the significance of indoor carbon dioxide (CO<sub>2</sub>) levels. Changes were made in a number of places in the standard that have contributed to several misunderstandings regarding indoor CO<sub>2</sub>. For example, some have interpreted the standard as saying that indoor CO<sub>2</sub> levels of 1800 mg/m<sup>3</sup> (1000 ppm(v)) are hazardous and

that 1800 mg/m<sup>3</sup> (1000 ppm(v)) of indoor CO<sub>2</sub> is equivalent to an outdoor air ventilation rate of 7.5 L/s per person. The changes in addendum 62f are intended to clarify that CO<sub>2</sub> itself is not a comprehensive indicator of indoor air quality, but rather a useful indicator of the concentration of human bioeffluents. Also, this addendum replaces the 1800 mg/m<sup>3</sup> (1000 ppm(v)) indoor "guideline" with a value of 1300 mg/m<sup>3</sup> (700 ppm(v)) above outdoors.

**CURRENT STATUS**

In order to achieve the goal of converting the 1999 version of the standard to a code-language document, a number of other addenda are under development by the committee. As of April 1999, the committee has recommended none of them for publication. Table 1 lists the addenda under development as of this date, but it is important to bear in mind that none are in final form, many will change significantly before publication and others could be combined or divided before approval. Also, this table is not an official document of the committee, only a summary of the situation at a given point in time. The process followed in approving an addendum begins with the committee recommending a draft addendum for public review; the actual public review requires the approval of the ASHRAE Standards Committee. During the public review, comments are submitted, which the committee must then analyze. Options for committee include making substantive changes to the addendum and recommending it for another public review or recommending it for publication with only editorial changes. Publication requires approval of several levels, including the Standards Committee and the ASHRAE Board of Directors. In this approval process, individuals who made comments during the public review have several opportunities to air their concerns before the addendum is approved for publication.

Table 1. Summary of addenda under development (all information as of April 2000)

Addenda	Description	Status
62b	Scope change on how standard covers new and existing buildings.	Two public reviews complete. Committee analyzing comments.
62g	Separation of smoking and nonsmoking spaces.	Two public reviews complete. Committee analyzing comments.
62h	When the Indoor Air Quality Procedure can and must be used.	Two public reviews complete. Committee analyzing comments.
62i	Requirements of the Indoor Air Quality Procedure.	Two public reviews complete. Committee analyzing comments.
62j	Design requirements for natural ventilation systems.	Two public reviews complete. Committee analyzing comments.
62k	Guidance on which sections of the standard should be complied with in various situations.	Two public reviews complete. Committee analyzing comments.
62l	New section on Construction and System Start-up.	One public review complete. Committee analyzing comments.
62m	New section on Operation and Maintenance.	One public review complete. Committee analyzing comments.
62n	Revision of Ventilation Rate Procedure for calculating design ventilation rates.	One public review complete. Committee analyzing comments.
62o	Design guidance on determining ventilation rates for smoking spaces.	Not yet approved for public review.
62p	Requirements for indoor combustion appliances.	Public review complete. Committee responding to comments.
62q	Revision and deletion of selected definitions.	One public review complete. Committee analyzing comments.