

# Public Review Opens On Standard 62.1 Addenda

*SSPC 62.1 accomplished much at ASHRAE's 2007 Winter Meeting, approving five addenda for public review and holding an open forum to collect ideas for the future of the standard from participants. ASHRAE approved publication of the 2007 version of the standard, expected to hit the bookshelves before the 2007 ASHRAE Annual Meeting in Long Beach, Calif.*

**By Dennis A. Stanke, Member ASHRAE**

As ASHRAE's 2007 version of its IAQ standard progresses toward publishing, Standing Standards Project Committee (SSPC) 62.1 has approved several addenda for public review in our continuing effort to maintain and improve the ventilation standard. Independently, the ASHRAE Board of Directors gave its approval for all previously recommended addenda for publishing in the 2007 version of the standard, provided here in a sidebar.

Also, in an effort to solicit thoughts on how the standard may be improved, we participated in a forum that gave attendees a chance to comment on Standard 62.1.

The following are some highlights from the committee meeting and forum.

## Addenda in Public Review

At the 2007 ASHRAE Winter Meeting, the following addenda were approved for public review during Spring 2007. Any public review comments will be considered at our next meeting, June 22 in Long Beach. Note that four of these addenda (Addendum 62.1a through 62.1d) apply to the approved to the 2007 version of the standard to be published this summer. One addendum (Addendum 62.1i) was applied to the 2004 version when we began to work on it, so to avoid confusion we didn't change its number (62.1i), even though it applies to both the 2004 and 2007 versions. The affected text is identical in both versions.

**Addendum 62.1a, Section 4 and 5 Cleanup.** Addendum 62.1a "cleans up" Sections 4 and 5 in the standard (as published in the 2004 version and the 2006 supplement). Most of these changes are editorial to make the language more clear, but a few could be viewed as substantive by some.

For instance, in Section 4.3, local site survey information, which had been optional, is now mandatory. In Section 5.16, as an option, the design must now limit migration of exhaust fumes to occupied areas, relaxing the former option to minimize migration. ("Minimizing" migration could require extraordinary design measures, by some interpretations.)

**Addendum 62.1b, Appendix C, D, F Cleanup.** Addendum 62.1b clarifies some wording in informative appendices C, D and F, and improves consistency between the standard's appendices and body. For instance, the variable names used in the single-zone system air-cleaning equations in Appendix C have been changed to match the variable names in Section 6 and Appendix A.

**Addendum 62.1c, Outdoor Air Cleaning.** Addendum 62.1c adds air-cleaning requirements to Section 6. If approved without changes, systems in non-attainment areas for PM<sub>2.5</sub> would need to use MERV 11 intake air filters. This would mean more filtration in many U.S. geographical areas. Using MERV 11 filters would improve indoor air quality in these areas, but it also might increase both installation and operating costs.

Also, systems in areas designated by the U.S. Environmental Protection Agency (EPA) as "serious," "severe" or "extreme" non-attainment areas for ozone would require ozone air cleaners with a 40% efficiency. The standard has required 40%-efficient ozone air cleaning for some of these high-ozone areas since 2004, but many designers have had difficulty applying this requirement. If more designers understood which geographical areas require ozone air cleaning and used 40% ozone air cleaners in those areas, indoor IAQ would be improved for many people.

**Addendum 62.1d, New Occupancy Categories.** At least partly in response to recent Change Proposals submitted to the SSPC, Addendum 62.1d adds some oc-

cupancy categories (which had either been ignored or overlooked in the 2004 version of the standard) and associated minimum outdoor airflow requirements to Table 6-1. It adds outdoor air requirements for kitchens (which previously had only exhaust requirements), break rooms, dry storage rooms, and banks or bank lobbies. It also adds outdoor air requirements for areas with “sorting, packing, light assembly,” general manufacturing, electrical equipment rooms, and hydraulic elevator machine rooms.

**Addendum 62.1i, Outdoor Airflow for ETS Areas.** At least partly in response to an earlier change proposal, Addendum 62.1i changes minimum outdoor airflow requirements for zones with environmental tobacco smoke (ETS), as described in Section 6.2.9. This issue attracted significant interest during the first public review period and resulted in many comments.

In the first public review, the addendum would have removed all reference to outdoor airflow requirements in smoking-permitted areas. In a sense, this approach would mean that the standard does not address ventilation for smoking areas, but in another sense, it would allow ventilation systems to comply with the standard using any unspecified amount of outdoor airflow.

Responding to the public review comments, SSPC 62.1 altered the language in the original draft. In the second public review draft, the addendum would require that ETS areas be supplied with more outdoor air than areas with the same occupancy category, but without ETS (ETS-free areas). The outdoor airflow rate would be determined using “engineered methods with the approval of the authority having jurisdiction.”

Some on the committee felt that including a requirement for increased outdoor airflow would imply dilution ventilation can be used to achieve acceptable IAQ in the presence of ETS, and, as worded, it places an undue burden on local authorities. However, the majority of the committee felt that removing all reference to outdoor airflow in ETS areas would mean that any outdoor airflow rate—even a rate below that required for ETS-free areas—would comply with the standard, and that the local code authorities must always approve engineered solutions. We’ll see what the public thinks at the conclusion of the second public review period.

## The Building Codes

David Conover of the International Code Council (ICC) gave us a quick overview of the ICC code development process and the recommended disposition of a number of code change proposals of interest to the SSPC. ASHRAE’s Code Interaction Subcommittee (CIS) submitted three alternative code change proposals for Chapter 4, Ventilation, of the International Mechanical Code (IMC). One was approved at the September 2006 ICC code development hearings. It would update the minimum outdoor airflow rates and procedures in the IMC to

match those in Standard 62.1-2004, the Ventilation Rate Procedure.

The code change proposals approved at the September code development hearings were available for challenge via public comment until January 2007. Any challenges to these proposals will be considered at public hearings in May 2007, and a final vote on all code change proposals will be taken at that time. If all goes well, the minimum outdoor airflow rates in both the UMC (approved last year) and the IMC (in 2007) will be consistent with those in Standard 62.1.

## The Forum

The current published standard (Standard 62.1-2004), has generated much discussion and differing opinions. Most designers like the fact that the ventilation rates drop (compared to Standard 62-2001 and most building codes) in 70% of the occupancy categories, and many like the flexibility and completeness of the Ventilation Rate Procedure, which includes calculation details and default values for important parameters, such as zone air change effectiveness and system ventilation efficiency.

On the other hand, some designers think that separate accounting (also known as additivity) for people-related and building-related ventilation requirements—a primary reason for the flexibility mentioned previously—complicates compliance. Some also say that calculation details for multiple-zone systems adds to the complexity, even though these calculations have been required by some building codes for many years and by Standard 62 since 1989.

Based on ongoing concerns about the standard, the Standards Committee sponsored a forum at ASHRAE’s 2007 Winter Meeting to allow public comments about the content and the future of Standard 62.1. Rick Hermans, P.E., Member ASHRAE, who recently was chair of the ASHRAE Standards Committee, chaired Forum 1, “The Future of Standard 62.1?” The forum was held at least partly in response to Board of Director action items, which directed the Standards Committee to develop options for possible future changes to the standard.

After Rick explained the purpose of the forum and posed some questions to stimulate audience participation, attendees were invited to express their opinions. Many comments resulted. They fell roughly into three categories: ventilation-only vs. ventilation and IAQ, complexity, and business vs. design. Some key comments in each of these categories are paraphrased here.

## Ventilation and/or IAQ

Should the standard be concerned strictly with minimum ventilation requirements, or should it include some requirements related to reducing potential indoor and outdoor contaminant sources (that is, improving IAQ) as well? Opinions varied:

- Some attendees, seemingly in opposition to the standard, felt that compliance could be simplified by including only requirements for ventilation while excluding all other requirements related to IAQ issues or not specifically related to minimum ventilation.

- On the other hand, attendees seemingly supportive of the standard, felt that it should only address ventilation and not indoor air quality in terms of specifics about indoor contaminants, contaminant sources and source strengths, and acceptable target concentrations. It should not establish IAQ standards (in terms of contaminant levels) because insufficient data exists to do so. Widening the scope to include IAQ more completely isn't feasible. (As published, the standard neither identifies contaminants of concern nor sets contaminant standards.) Another attendee pointed out that the standard includes

requirements for minimum ventilation and other requirements aimed at reducing contaminants introduced into the space from both indoor and outdoor sources, and that these measures appropriately address IAQ issues without establishing levels. Several expressed that ventilation cannot be separated from IAQ.

### Complexity

The complexity issue has been discussed and debated at length. It usually relates to either the addition of people-related outdoor airflow to building-related outdoor airflow to find zone outdoor airflow (additivity), to the calculation of outdoor air intake flow for VAV systems, or both. Opinions about complexity were mixed:

- Some attendees, in apparent opposition to the current standard, felt that it is too complex and difficult to use,

## Approved Addenda of Standard 62.1-2007

All addenda approved since the publication of Standard 62.1-2004 will be incorporated in the 2007 edition, which is expected to be available in second quarter of 2007. This version will include the following addenda, some of which were previously published in the 2006 Supplement to the standard:

### Addendum 62.1a, Dehumidification Systems

Published in the 2006 Addenda Supplement, this addendum limits space relative humidity at a specific design condition, to reduce dampness and mold-related indoor air quality problems. It clarifies Section 5.10, requiring that each ventilation system with mechanical cooling be designed so that space relative humidity does not exceed 65% at design dew-point outdoor conditions, with space solar load reduced to zero.

### Addendum 62.1b, Table 5.2, 6-1, 6-4 Consistency

Published in the 2006 Addenda Supplement, this addendum corrects discrepancies and omissions among Tables 5-2, 6-1 and 6-4. It actually removes all occupancy categories from Table 5-2 (deleting that table) and incorporates the occupancy categories, with airflow and air class information, into Tables 6-1 and 6-4 as appropriate.

### Addendum 62.1c, Appendix B Update

Also, published in the 2006 Addenda Supplement, this addendum updates material in informative Appendix B, which contains a number of referenced air-quality guidelines and regulations issued by bodies other than ASHRAE. For many years, this appendix has been helpful to designers using the IAQ Procedure and to those using the standard in IAQ evaluations. Of course, the standard does not propose nor endorse any specific contaminant concentration standards or guideline values, but rather lists those values established by cognizant authorities.

### Addendum 62.1d, Update to Table 4-1—NAAQS

Published in the 2006 Addenda Supplement, this addendum updates Table 4-1 (which lists the National Ambient Air Quality Standards for outdoor air) to match the U.S. EPA NAAQS pollutant listing. The table now includes concentrations and exposure times for particles with diameters of 2.5 micrometers and smaller.

### Addendum 62.1e, Documentation Appendix

Approved for publication after the 2006 Addenda Supplement, this addendum adds an informative appendix to summarize the

requirements for documentation found throughout the standard. Good documentation aids communication between all parties involved with the design, installation, operation and maintenance of ventilation systems, thereby reducing communication failures the resulting potential ventilation and indoor air quality problems.

### Addendum 62.1f, Title/Purpose/Scope

Approved for publication after the 2006 Addenda Supplement, this addendum changes the purpose and scope of Standard 62.1 to be consistent with the body of the standard. The standard's purpose retains its dual goals of providing indoor air quality that will be acceptable to human occupants and that will reduce (minimize) adverse health effects. The scope no longer includes single-family houses or multifamily buildings with three or fewer stories—Standard 62.2 covers these structures. The scope also clearly states that the standard includes no specific prescribed ventilation rates for spaces that contain environmental tobacco smoke.

### Addendum 62g, ETS Separation

Published in the 2006 Addenda Supplement, this addendum applies to buildings with both smoking-permitted and no-smoking areas. It requires proper separation of areas that contain environmental tobacco smoke (ETS areas) from those that don't (ETS-free areas). Compliance with these separation requirements reduces the amount of ETS entering ETS-free areas from ETS areas. This addendum allows designers to design buildings that comply with the standard (by properly separating ETS areas from ETS-free areas), even though smoking is permitted in some areas of the building. In addition, compliance with the separation requirements provides some level of "protection" (however great or small) to building occupants who choose to limit their exposure to ETS.

### Addendum 62.1h, Residential Rates

Approved for publication after the 2006 Addenda Supplement, this addendum adds ventilation requirements for residential occupancy categories to the ventilation rate table (Table 6-1) because the standard applies to high-rise residential buildings. These ventilation rates are somewhat higher than those required for residential ventilation by Standard 62.2, since, unlike single family and low-rise multifamily residential buildings, the high-rise buildings addressed by Standard 62.1 cannot take credit for any ventilation that might be provided due to infiltration or the operation of windows.

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and that compliance is difficult to enforce. It should only include outdoor airflow requirements in terms of cfm/person (rather than both cfm/person and cfm/square-foot). The real complexity problems relate to VAV systems (since accounting for system ventilation efficiency is required), especially since proper ventilation must be achieved at all operating conditions (so it includes operational requirements as well as design requirements).

- Other attendees seemed to speak in favor of the current standard, observing that additivity doesn't significantly change things for the designer, since information about zone size and occupant density is already required for other design calculations. Designers must study the standard, but it can and should be used to help designers make system choices. It's not an easy engineering task, but nevertheless, it is a task that engineers can perform. The complexity might motivate more contractors to rely on consulting engineers for ventilation calculations, which would benefit indoor air quality. Inasmuch as the standard levels the playing field for designers (through better enforcement of codes due to prescribe procedures, presumably), it helps protect the health and safety of the public.

## *Business vs. Design*

Some of the concerns expressed seemed to be related more to business realities rather than system design. To one attendee, complexity seems to be just a matter of

whether you're willing to invest the time (money) needed to understand the requirements of the standard. Another observed that capital expenses and operating expenses come from different "pockets," so any increase in capital expenditures resulting from compliance (dedicated outdoor air units, for instance) might not be justifiable in terms of operating or productivity cost savings. And, yet another observed that even though a system might be designed to comply with the standard, it may not be operated the way it was designed. (The current standard attempts to address this potential problem with requirements found in Section 8.)

## **Summary**

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*Dennis A. Stanke is chair of Standing Standards Project Committee 62.1.* ●