ASHRAE 52.2 Update

What is ASHRAE 52.2 up to? Will ISO 16890 change 52.2? Does 52.2 need PM efficiencies?

Kathleen Owen, ASHRAE Fellow, ASHRAE 52.2 chair

ASHRAE 52.2 is always a busy committee dealing with items with potentially high impact to the filtration world and those with much lower influence.

A small item from this spring is that the Public Review of our Addendum a received no comments. Thus, within a few weeks, the psychrometric chart in ASHRAE 52.2 will be replaced with equations to be used to determine the air density from the temperature and humidity. This will provide better guidance for the use of spreadsheets to do this important calculation.

ASHRAE 52.2 vs. ISO 16890

The biggest issue that 52.2 has under consideration now is a request from ASHRAE to consider whether we, the ASHRAE 52.2 committee, want ASHRAE to adopt the ISO 16890 standard as the ASHRAE particle filtration test standard. If a vote is eventually called, we have the options to keep ASHRAE 52.2 as is, switch to ISO 16890 as written, or adopt ISO 16890 with minor changes. To prepare for this possible vote, the committee has had many lively discussions on the merits of ISO 16890, comparisons of the two methods, the flaws in both, and even the economics of changing to one method vs. keeping both. For the summer ASHRAE meeting this year, I called for input and presentations on the topic from all members and interested parties. Although we have members who are both for and against switching, all offered presentations were either simply informative or against the change.

A round robin of ISO 16890 was conducted this spring by Christine Sun of Filtration Technologies International. The presentation to 52.2 in Chicago in January showed a significant amount of scatter in the efficiency data both before and after IPA conditioning. In June, I showed a breakout of efficiency data by particle counter type and discussed that neither the counter nor any other yet identified variable accounted for the difference. The data set shown in Houston included graphs of the efficiency changes in the filters tested due to the IPA conditioning step. For example, for the electret filter, the efficiency drop varied from ~8 to 42 percentage points. For the mechanical filters, the drop varied from ~12 to 34 percentage points (note that no drop-off was expected for these filters).

Not presented at the committee meeting but brought to my attention later is a round robin run by Eurovent that showed good correlation across the test labs. Neither data set is publicly available, but discussions are underway to allow us to share the data. We expect that these results will help us determine if we feel comfortable accepting ISO 16890 as a repeatable test method.

Other issues in the ISO 16890 discussion at the Houston meeting of 52.2 were:

- variations in particle size distributions (urban vs rural, changes over time, indoor vs. outdoor, and more) in the air to be filtered and what distributions should be used to calculate efficiencies to approximate PM (particulate matter) removal.
- applicability of the IPA (isopropyl alcohol) vapor conditioning step - specifically does using this step do a good job of estimating actual use performance?
- degradation of filter fibers due to IPA exposure – does the IPA cause changes that lead to misrepresenting the efficiency changes especially in mechanical filters? Data on this will be presented at the next meeting.
- differences in gradations shown by methods – where 52.2 has 16 MERV levels, ISO has dozens of possibilities. One interesting comparison was noted: filters in the MERV ~6-9 range would all be ISO Coarse filters and their efficiencies would only be reported based on their arrestance values. Since the US uses many filters in this range, this could be a concern.

- the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) position against switching to ISO 16890. In a letter to me, as chair, AHRI presented their position including their main reasons for opposing the switch: the IPA conditioning step, the need for the US to have a standard influenced by the US and applicable to our market, and that, while knowing PM removal efficiency is useful, there is no accepted standard way to measure this value at this time. This letter is included in the 52.2 minutes and will be available on the 52.2 website through ashrae.org shortly.

ASHRAE 52.2 Round Robin

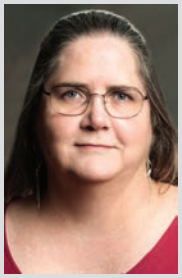
A planned ASHRAE-sponsored round robin on 52.2 will look at the improvements in repeatability and reproducibility due to the most recent changes to 52.2. Since ISO 16890 incorporated these same requirements, this work will shed light on how well both tests work. The project should go out for bid in the fall.

PM (particulate matter) Removal Efficiency

ASHRAE 62.1 and 62.2 currently specify allowed filters using minimum MERV levels. Both committees have recently put forth addendum to add ePM ratings based on ISO 16890 testing as alternatives. ASHRAE 52.2 members have responded with various objections. While allowing ISO 16890 as an option in these methods is likely to go forward, 52.2 is working with these committees to try to address their needs. Several 52.2 members attended the 62.1 meeting in Houston to meet their request for an in-person discussion. What we learned was that 62.1 strongly wants to be able to meet the current trend in air quality discussions to use PM as a measure of contamination and in the naming of contaminant removal effectiveness. Specifically, they plan to use an efficiency rating or value with the letters PM in it whether it comes from ISO, ASHRAE or some other recognized test. They recognize our expertise in the filter testing area, but they must have an ePM (ISO 16890's rating) or similar rating with PM in the name to use for specifications to meet the needs of their communities. 52.2 has formed a committee to discuss this issue and work on a solution so that 52.2 can meet this need and stay a cited test standard in the 62.1 standard. This group hopes to have their suggestions ready to unveil before the January 2109 meeting.

For More Information

For any readers who would like to participate in the ISO vs 52.2 discussion or any other topic on the 52.2 table, please feel free to attend our meetings. If you want to present something, let me know ahead. I'd like to have input from as many interested people as possible; plus, I can give you input as to whether we have already discussed your topic or answered your questions. ▪



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She was involved in the development of ASHRAE 52.2, 145.1& .2 (for gas-phase air cleaners), and 185.1 & .2 (UV/bioaerosol). She was the PI for ASHRAE 1360-RP, a study on dust collected by HVAC filters and the influence on filter performance and will be the PI on ASHRAE 1720 which will start in September.