ASHRAE 52.2 MERV 16 is Not Acceptable for ASABE X613 Cabin Filtration

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To ASABE X613 Committee Members:

As a filter manufacturer that does not manufacture a MERV product, I abstained from commenting when MERV 16 was introduced to ASABE X613. As a committee member not familiar with MERV 16 and its test protocol, I relied on other members who were promoting MERV 16. During the discussion to adopt MERV 16 as the filter standard for X613-3, I received assurances from those members promoting MERV 16 that the efficiency would not go below **95% @ 0.3 µm**. **This is not true!**

NIOSH publication "Field Assessment of Enclosed Cab Filtration System Performance Using Particle Counting Measurements," page 5, states "The first MERV16-A final filter tested provided a cab protection factor of 5 as compared to 53 for the second MERV16-B final filter tested"[1]
A protection factor of 5 = 80% 53 = 98.11%

CAF tested multiple MERV 16 labeled filters. The results were efficiencies as low as **59.95% @ 0.3µm which is a Protection Factor of < 2.5.**[2]

CAF testing was performed @ 0.3µm

ASHRAE 52.2 MERV 16 testing is performed @ 0.3 – 1.0µm.

1. Averaging Efficiencies at 4 different particle sizes allows the 0.3µm efficiency to go below 90%.
2. It covers too wide of a Particulate Size Range to quantify Operator Protection Levels @ 0.3µm[1]
   99.95% = PF of 2,000 60% = PF of 2.5 This is an 800 fold difference (2.5 x 800=2,000)

When NIOSH encountered exposure levels below 98%@ 0.3µm while testing S525 cabs, they required the operator to wear a respirator[3]. In a 2005 publication, NIOSH stated, "this tractor was unacceptable and taken back to the maintenance shop…".[4]

CAF's test data proves that low end MERV 16 filters found in the marketplace fall below the minimum necessary for X613. NIOSH's test data also proves that low end MERV 16 are not acceptable,[1,5] but middle range MERV 16 filter are acceptable.[5,6,7,8] With no distinction within the MERV 16 Range, end users cannot distinguish the acceptable from the unacceptable.

We do recognize the viewpoint expressed by committee members that while the MERV 16 may not initially provide an acceptable efficiency, it will eventually dust load to an acceptable level depending on the filter/system.[5] **CAF cannot condone exposing operators to this dust-loading procedure!**

The ASHRAE 52.2 MERV 16 testing is expensive, complex, difficult to administer, destructive/non-repeatable, and produces data that is **not** intended for use as an Application Standard.[9] In fact, ASHRAE terminology in the Standard is full of disclaimers. This non-regulated consensus Standard allows filters to go below 90% @ 0.3µm.

In Conclusion
CAF recommends removing any references to MERV 16 and replacing it with 98% @ 0.3µm to put us back in alliance with NIOSH/Cal-EPA and closer to EN15695 use of Most Penetrating Particle Size.

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