



ADDENDA

**ANSI/ASHRAE Addendum b to
ANSI/ASHRAE Standard 52.2-2017**

Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size

Approved by ASHRAE Standards Committee on June 26, 2020; by the ASHRAE Board of Directors on July 1, 2020; and by the American National Standards Institute on July 31, 2020.

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FOREWORD

Interest in specifically sized particulate matter, especially in the PM1 and PM2.5 size ranges as specified by the U.S. Environmental Protection Agency (USEPA), has grown in recent years. This led to requests for filter efficiency values based on mass collected below these particle sizes. Because of this, the committee has elected to include in each report an estimation for the removal efficiency of PM1, PM2.5, and PM10.

The calculation of removal efficiency by mass requires a choice of upstream particle size distribution (PSD). Because this distribution varies significantly both inside and outside, a wide variety of PSD were used to calculate removal efficiencies for each size range. It was determined that a simple flat distribution gives a reasonable approximation for most of the distributions. This addendum adds calculations to the test method to produce PM-based removal efficiencies to be included in the standard test reports. The test itself is unchanged. In addition, this method allows labs and companies to use existing ASHRAE/ANSI Standard 52.2-2017 data to calculate these values for already tested filters.

The goal of this addendum is to give the end user a simple method to select a filter based on an estimated percent removal efficiency for PM1, PM2.5, and PM10, depending on which they need.

Note: In this addendum, changes to the current standard are indicated in the text by underlining (for additions) and ~~strike through~~ (for deletions) unless the instructions specifically mention some other means of indicating the changes.

Addendum b to Standard 52-2017

Modify Section 3 as shown.

3. DEFINITIONS AND ACRONYMS

3.1 Definitions

particulate matter (PM): mass concentrations of particles of certain sizes in the air.

3.2 Acronyms

PM_{52.2} calculated filter efficiency for particulate matter removal, estimated

[...]

Modify Section 10 as shown.

10. DETERMINATION OF PARTICLE SIZE EFFICIENCY

[...]

10.8.4 The data points from the Section 10.8.2 composite curve in each of the three size range groups from Table 10-3 shall be averaged, and the resultant three average minimum PSEs, PM1_{52.2}, PM2.5_{52.2}, and PM10_{52.2}, shall be reported.

~~10.8.54~~

~~10.8.65~~

~~10.8.76~~

Table 10-3 Size Range Groups

Average Minimum PSE Designator	Corresponding Size Range Group, μm
PM1 _{52.2}	0.30 to 1.0
PM2.5 _{52.2}	0.30 to 3.0
PM10 _{52.2}	0.30 to 10

Modify Section 11 as shown.

11.2 The summary section of the performance report shall include the following information:

[. . .]

m. Particulate matter efficiency (PM_{52.2})

1. The average of the minimum PSE of the four size ranges from 0.30 to 1.0 µm (PM_{152.2})
2. The average of the minimum PSE of the eight size ranges from 0.30 to 3.0 µm (PM_{2.552.2})
3. The average of the minimum PSE of the twelve size ranges from 0.30 to 10.0 µm (PM_{1052.2})

~~nn.~~

~~oa.~~

~~pe.~~

Modify Informative Appendix J as shown.

**INFORMATIVE APPENDIX J
OPTIONAL METHOD OF CONDITIONING A FILTER USING
FINE KCL PARTICLES TO DEMONSTRATE EFFICIENCY LOSS THAT
MIGHT BE REALIZED IN FIELD APPLICATIONS**

[. . .]

J11.3 Particulate Matter Efficiency (PM_{52.2}) According to Appendix J

- a. The average of the minimum PSE of the four size ranges from 0.30 to 1.0 µm (PM_{152.2-A})
- b. The average of the minimum PSE of the eight size ranges from 0.30 to 3.0 µm (PM_{2.552.2-A})
- c. The average of the minimum PSE of the twelve size ranges from 0.30 to 10.0 µm (PM_{1052.2-A})

J11.34 Minimum Efficiency Reporting Value (MERV-A) According to Appendix J for Air Cleaners

J11.34.1 The minimum efficiency reporting value (MERV-A) for an air cleaner shall be based on three composite average PSE points developed from a test at a manufacturer's specified airflow rate selected in accordance with Section 8.1. Dust loading shall follow the procedure outlined in Section 10.7 except substituting Section J10 of this appendix for Section 10.7.1.2(b) of the standard. The results of the tests shall be reported in accordance with Sections 10.8.1 and 10.8.2. The four data points from the Section 10.8.2 composite curve in each of the three size range groups from Table J-1 shall be averaged, and the resultant three average minimum PSEs (E_1-A , E_2-A , and E_3-A) shall be reported. ~~Likewise, the data points from the Section 10.8.2 composite curve in each of the three size range groups from Table J-2 shall be averaged, and the resultant three average minimum PSEs PM_{152.2-A}, PM_{2.552.2-A}, and PM_{1052.2-A} shall be reported.~~

J11.34.2

J11.43.3

Table J-2 Size Range Groups

<u>Average Minimum PSE Designator</u>	<u>Corresponding Size Range Group, µm</u>
PM _{152.2-A}	0.30 to 1.0
PM _{2.552.2-A}	0.30 to 3.0
PM _{1052.2-A}	0.30 to 10

Table J-23 KCI Conditioned per Appendix J Minimum Efficiency Reporting Value (MERV-A) Parameters

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