

*Institute of Environmental Sciences and Technology*

**IEST-RP-CC001.7**

Contamination Control Division  
Recommended Practice 001.7

**HEPA and ULPA Filters**



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## RP-CC001.7 WHAT IS NEW AND IMPROVED

### What is new:

- An Appendix with a draft of an alternate filter classification scheme relating classes to filter efficiency consistently instead of the nonsequential letter Types. This being a new proposed scheme, it is included in an appendix for user comments and suggestion and may be considered as a recommended filter class in a future revision.
- An Appendix providing guidelines for system qualification for testing filter sizes with high aspect ratio, i.e., narrow and long. This is based on work done at NASA to test the filters used on the International Space Station.
- Appendix describing operation and results of a low output ‘thermal’ aerosol generator for testing filters. Based on feedback from users, this may be included as a recommended generator in future revisions of the RP.

### What is improved:

- Text on the testing of filters made with ePTFE or charged media.
- Table D2 edited for improved clarity.
- Cautionary notes on the use of solid aerosol challenge and charge on it.

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# HEPA and ULPA Filters

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# HEPA and ULPA Filters

## IEST-RP-CC001.7

### 1 SCOPE AND LIMITATIONS

This Recommended Practice (RP) covers basic provisions for HEPA (high-efficiency particulate) and ULPA (ultra-low penetration air) filter units as a basis for agreement between customers and suppliers.

Filters that meet the requirements of this RP are suitable for use in clean air devices and cleanrooms that fall within the scope of ISO 14644 and for use in supply air and contaminated exhaust systems that require extremely high filter efficiency (99.97% or higher) for submicrometer ( $\mu\text{m}$ ) particles.

This RP describes 11 levels of filter performance, or types, and six grades of filter construction. For the types and grades that require scanning, these filter types generally apply to rectangular filters. Semi-circular, cylindrical, V-bank filters, and other construction configurations may not be readily scanned and thus will not meet the requirements of the filter types requiring scanning. While many of the performance measurement techniques can be adapted to other filter configurations, the filter types as described in this RP should be applied only to rectangular, flat panel filters. The customer's purchase order should specify the level of performance and grade of construction required. The customer should also specify the filter efficiency required if the efficiency level is not covered by the performance levels specified in this RP.

**NOTE:** Products and procedures discussed in this RP may involve hazardous materials, operations, and equipment. This RP does not purport to address all of the safety problems associated with its use. It is the responsibility of the user to consult and establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use of this RP.

### 2 REFERENCES

The following documents are incorporated into this RP to the extent specified herein. If no specific edition is cited, the most recent edition should be used. Where specific editions are cited, subsequent revisions of these publications do not automatically supersede the cited editions and users should investigate the applicability of revised editions.

#### 2.1 Reference Documents

ANSI A208.1: *Particleboard, Mat-Formed Wood*

ANSI A208.2: *Structural Plywood*

ASME AG-1: *Code on Nuclear Air and Gas Treatment*

ASTM A176: *Standard Specification for Stainless and Heat-Resisting Chromium Steel Plate, Sheet, and Strip*

ASTM A240: *Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications*