INSTITUTE OF ENVIRONMENTAL SCIENCES AND TECHNOLOGY

Contamination Control Division
Recommended Practice 007.2

IEST-RP-CC007.2

Testing ULPA Filters

INSTITUTE OF ENVIRONMENTAL SCIENCES AND TECHNOLOGY
1827 Walden Office Square, Suite 400 |
Schaumburg, IL 60173 USA
Phone: (847) 981-0100 • Fax: (847) 981-4130
E-mail: iest@iest.org • Web: www.iest.org

This Recommended Practice is published by the INSTITUTE OF ENVIRONMENTAL SCIENCES AND TECHNOLOGY to advance the technical and engineering sciences. Its use is entirely voluntary, and determination of its applicability and suitability for any particular use is solely the responsibility of the user.

This Recommended Practice was prepared by and is under the jurisdiction of Working Group 007 of the IEST Contamination Control Division.

Second printing, July 2017

ISBN 978-0-9787868-4-7

PROPOSAL FOR IMPROVEMENT: The Working Groups of the INSTITUTE OF ENVIRONMENTAL SCIENCES AND TECHNOLOGY are continually working on improvements to their Recommended Practices and Reference Documents. Suggestions from those who use these documents are welcome. If you have a suggestion regarding this document, please use the online Proposal for Improvement form found on the IEST website at www.iest.org/proposal/form.html.

INSTITUTE OF ENVIRONMENTAL SCIENCES AND TECHNOLOGY
[illegible] Walden Office Square, Suite 400 | Schaumburg, IL 60173 USA
Phone: (847) 981-0100 • Fax: (847) 981-4130
E-mail: iest@iest.org • Web: www.iest.org

Testing ULPA Filters
IEST-RP-CC007.2

CONTENTS

SECTION

FIGURE

TABLE

APPENDIX

INSTITUTE OF ENVIRONMENTAL SCIENCES AND TECHNOLOGY
Contamination Control Division
Recommended Practice 007.2

Testing ULPA Filters

IEST-RP-CC007.2

1 SCOPE AND LIMITATIONS

1.1 Scope

This test procedure covers production testing of filters for particle penetration and pressure drop of ultralow-penetration air (ULPA) filters. The penetration range of the procedure is 0.001% to 0.0001%, using particle counters.

This Recommended Practice (RP) describes the equipment, aerosol properties, processes, and calculations for determining the efficiency of ULPA filters, using particle counters. The procedure may be applied to production applications. This RP provides guidelines for constructing a suitable test duct and sampling system. Also provided are test criteria for quantifying penetration in the range of 0.001% to 0.0001%, using test aerosol particles in the size range of 0.1 to 0.2 µm.

1.2 Limitations

Filters tested per IEST-RP-CC007 are typically factory-tested with uniform airflow across the filter. Ducted filters, fan filter units (FFUs), and poorly designed inlet housings for in-line filters may result in non-uniform media air velocity that can possibly reduce the in-situ filter efficiency.

Application of this RP is by mutual agreement between the customer and the supplier. To apply this RP, the agreement should also include:

a) acceptance criteria for penetration and pressure drop

b) the test aerosol

c) the test volume flow rate

Prior to testing filters according to this RP, the most penetrating particle size (MPPS) should be determined. The determination can be made for the filter medium in flat sheet form provided that the test is conducted with an aerosol as defined in section 4.2.9.

The test is performed at the same velocity as the average velocity through the medium in the assembled filter at the test volume flow rate.

CAUTION: Testing in accordance with this RP may involve hazardous materials, operations, and equipment. This RP does not purport to address 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.

1.3 Application of method

The methodology described in this RP may be applied for particle-counter testing of filters outside the efficiency and particle size range covered in the document.

2 REFERENCES

The following documents are incorporated into this RP to the extent specified herein. Users should apply the most recent editions of the references.

2.1 American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE)

ASHRAE Standard 52.2-2007: Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size