Institute of Environmental Sciences and Technology

IEST-RP-CC007.4

Contamination Control Division

Recommended Practice 007.4

Testing HEPA and ULPA Filters

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UPDATES INCLUDED IN THIS PUBLICATION

The text on discharge methods for charged media has been revised. The discussions on charged media and aerosol for discharge have been split for clarity.

The section on efficiency from scan measurements has added clarification on the size range data required. The governing equations have been corrected and/or clarified.

The section on testing filters with media having MPPS <100nm (usually ePTFE) is revised to note that it is valid only for overall efficiency and not scanned efficiency. Explanation on the recommendation to use the alternate size to 0.1-0.2µm has been added since the efficiency in this size range is expected to be lower than the that between 0.2-0.3 µm since it is closer the MPPS of these filters.

IEST-RP-CC007.4

CONTENTS

SECTION

FIGURES

TABLES

APPENDIXES

Institute of Environmental Sciences and Technology
Contamination Control Division
Recommended Practice 007.4

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IEST-RP-CC007.4

1 SCOPE AND LIMITATIONS

1.1 Scope

This Recommended Practice (RP) describes the equipment, aerosol properties, processes, and calculations for determining the efficiency of HEPA, ULPA, and super ULPA filters in the factory, 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 0.030% to 0.00010%, between particles in the size range of 0.1 to 0.3 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.

1.3 Application of Method

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

Before testing filters, with a penetration level below 0.0005%, 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 before use of this RP.

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.

