Institute of Environmental Sciences and Technology

IEST-RP-CC014.2

Contamination Control Division
Recommended Practice 014.2

Calibration and Characterization of Optical Airborne Particle Counters

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1 SCOPE AND LIMITATIONS

1.1 Scope

This Recommended Practice (RP) covers procedures for calibrating and characterizing the performance of optical particle counters (OPCs) that detect and measure the size of single particles in air and other gases. These procedures are intended for use by OPC manufacturers, specialized test houses, and OPC users who maintain calibration and testing facilities to determine the sizing and counting accuracy of these instruments.

1.2 Limitations

The procedures for characterization and calibration described in this document use monodisperse particles. The response of actual contamination particles, typically with refractive indices different from the monodisperse particles used for calibration, will differ slightly from the results obtained from the procedures in this document. Also, the differences will vary for particle counters with different optical designs.

This RP does not discuss calibration of condensation nucleus counters (CNCs). The document assumes CNCs used as reference counters have 100% counting efficiency in the range of interest for OPCs.

NOTE: This RP does not purport to address all of the safety issues that may arise from its use. The user is responsible for assessing potential safety issues associated with a given method at its point of use. Before using the methods described herein, the user should consider all general laboratory safety precautions. In particular, the user should identify and implement suitable health and safety measures and comply with all applicable regulations.

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 Reference Documents

IEST-RP-CC011.2: A Glossary of Terms and Definitions Related to Contamination Control

IEST-RP-CC013: Calibration Procedures and Guidelines for Select Equipment Used in Testing Cleanrooms and Other Controlled Environments

ISO 21501-4: Determination of particle size distribution—Single particle light-interaction methods—Part 4: Light-scattering airborne particle counter for clean spaces

2.2 Sources and Addresses

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