

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



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

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CONTENTS

SECTION

1	SCOPE AND LIMITATIONS.....	5
2	REFERENCES	5
3	TERMS AND DEFINITIONS.....	6
4	BACKGROUND AND PURPOSE.....	7
5	REQUIREMENTS	7
6	CALIBRATION OF INLET FLOW RATE.....	8
7	PARTICLE SIZE CALIBRATION.....	9
8	FALSE COUNT	11
9	COUNTING EFFICIENCY— METHOD 1	12
10	COUNTING EFFICIENCY— METHOD 2	15
11	RESPONSE RATE.....	16
12	CONCENTRATION (COINCIDENCE) LIMIT.....	17
13	RESOLUTION.....	18

FIGURE

FIGURE 1—NON-MONOTONIC REGION OF AN OPC CALIBRATION CURVE.....	9
FIGURE 2—DETERMINATION OF MEDIAN VOLTAGE USING A PHA DISTRIBUTION.....	10
FIGURE 3—CONNECTIONS FOR COUNTING EFFICIENCY DETERMINATION—METHOD 1.....	13
FIGURE 4—CONNECTIONS FOR COUNTING EFFICIENCY DETERMINATION—METHOD 2.....	16
FIGURE 5—PULSE DISTRIBUTION METHOD A.....	18
FIGURE 6—PULSE DISTRIBUTION METHOD B.....	19
FIGURE B1—STANDARD DEVIATION DIAGRAM.....	29
FIGURE B2—EFFECT OF DIFFERENTIAL NONLINEARITY.....	30
FIGURE C1—ERLENMEYER FLASK MIXING CHAMBER.....	33
FIGURE D1—OPC FLOW CALIBRATION PLOT.....	35
FIGURE D2—COINCIDENCE LOSS.....	37

TABLE

1—OBSERVED COUNT AND 95% UCL.	11
D1—CALIBRATION MEASUREMENTS.....	34
D2—PARTICLE SIZE SELECTION.	35
D3—COUNTING EFFICIENCY DETERMINATION.....	36
D4—PARTICLE SIZE SELECTION.	36
D5—COUNTING EFFICIENCY DETERMINATION.....	37
D6—DETERMINATION OF CONCENTRATION LIMIT.	37

APPENDIX

A—FORMS.....	21
B—PHILOSOPHY.....	28
C—SPECIFIC IMPLEMENTATIONS OF TEST APPARATUS.....	31
D—EXAMPLES	34
E—BIBLIOGRAPHY	38

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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-RD-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

IEST

Institute of Environmental Sciences and Technology
1827 Walden Office Square, Suite 400 |
Schaumburg, IL 60173 USA
Phone: 847-981-0100
Fax: 847-981-4130
www.iest.org

ISO

International Organization for Standardization
1, ch. de la Voie-Creuse, Case postale 56
CH-1211 Geneva 20, Switzerland
Phone: +41 22 749 01 11
Fax: +41 22 733 34 30
www.iso.ch