

Association of Home Appliance Manufacturers
Method for Measuring Performance of
Portable Household Electric Cord-Connected
Room Air Cleaners

ANSI/AHAM AC-1-2002



PREFACE

The Association of Home Appliance Manufacturers (AHAM) develops standards in accordance with AHAM's "Policy and Procedures Governing Technical Standards" which states:

"AHAM Standards shall be in the best interest, mutually, of consumers who use appliances, the industries which provide and service appliances, and other interested parties. They shall relate to actual use conditions, be technically and scientifically sound."

Use or observance of AHAM standards is voluntary.

AHAM standards are presented to the American National Standards Institute (ANSI) for recognition as American National Standards. This standard was so recognized on April 9, 2002 and bears the American National Standard designation ANSI/AHAM AC-1-2002.

This standard contains test procedures which may be applied to any brand or model of portable household electric cord-connected room air cleaners within the stated confines of the standard's limits of measurability for measuring performance. Results of tests in accordance with this standard may be publicly stated.

With regard to safety, AHAM recommends that all appliance products - both major and portable - manufactured or marketed in the United States be submitted to an appropriate independent laboratory for inspection and listing in conformance with the safety standards and procedures followed by such laboratories. The relevant standards for portable household electric cord connected room air cleaners are UL 867, "Standard for Electrostatic Air Cleaners" and UL 507, "Standard for Fans."

The appendices to this standard are generally for informational purposes except where referenced in the body of the standard.

AHAM welcomes comments and suggestions regarding this standard. Any standard may be reviewed and improved as needed. All standards must be updated or reconfirmed at least every five years. Any interested party, at any time, may request a change in an AHAM standard. Such request should be addressed to AHAM's President, and should be accompanied by a statement of reason for the request and a suggested alternate proposal.

This standard may involve hazardous materials, operations, and equipment. This standard does not purport to address all of the safety problems associated with its use. It is the responsibility of whomever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of any regulatory limitations prior to use

Copyright © 2002 by the Association of Home Appliance Manufacturers (AHAM)
All rights reserved.

The hard copy print version of this document shall be for individual use only.

The electronic file version of this document shall be for storage on one computer for purposes of viewing and/or printing one copy for individual use only.

This document shall not be reproduced in whole or in part by any means, and shall not be transmitted electronically or otherwise to a third person without the prior written permission of AHAM.

TABLE OF CONTENTS

1.	PURPOSE.....	1
2.	SCOPE.....	1
3.	DEFINITIONS.....	1
3.1	Portable Household Electric Cord-Connected Room Air Cleaner.....	1
3.2	Types of Portable Household Electric Cord-Connected Room Air Cleaners.....	2
3.3	Test Particulate Matter.....	2
3.4	Test Chamber.....	2
3.5	Air Circulating Equipment.....	2
3.6	Particulate Matter Removal.....	3
3.7	High Efficiency Particulate Air (HEPA) Filter.....	3
3.8	Aerosol Generator.....	3
3.9	Aerodynamic Particle Size.....	3
3.10	Terminal Velocity.....	3
3.11	Particle Number Concentration.....	3
3.12	Aerosol Spectrometer.....	3
3.13	Cigarette Smoke Diluter.....	3
3.14	Natural Decay.....	4
3.15	Clean Air Delivery Rate (CADR).....	4
4.	GENERAL CONDITIONS FOR MEASUREMENT.....	4
4.1	Electrical Supply.....	4
4.2	Test Chamber Ambient Temperature.....	4
4.3	Chamber Air Exchange Rate.....	4
4.4	Chamber Particulate or Ion Concentrations.....	4
4.5	Chamber Equipment.....	5
4.6	Test Equipment Preparation.....	5
5.	TEST PROCEDURE FOR DETERMINING PERFORMANCE ON CIGARETTE SMOKE.....	5
5.1	Natural Decay Measurement.....	6
5.2	Particulate Matter Removal Measurement.....	7
6.	TEST PROCEDURE FOR DETERMINING PERFORMANCE ON TEST DUST.....	8
6.1	Natural Decay Measurement.....	9
6.2	Particulate Matter Removal Measurement.....	10
7.	TEST PROCEDURE FOR DETERMINING PERFORMANCE ON PAPER MULBERRY POLLEN.....	12
7.1	Natural Decay Measurement.....	12
7.2	Particulate Matter Removal Measurement.....	13

8.	CALCULATION PROCEDURES.....	14
8.1	Criteria for Elimination of Data Points from an AC-1 Run.....	14
8.2	Calculating the Decay Constant.....	15
8.3	Computation of the Standard Deviation Estimate for the Slope of One Regression Line.....	16
8.4	Performance Calculation.....	17
8.5	Calculation of the Standard Deviation Estimate of the CADR for a Single Test.....	17
9.	SAFETY.....	17
	APPENDIX A.....	19
	APPENDIX B.....	24
	APPENDIX C.....	25
	APPENDIX D.....	29

1. PURPOSE

This standard method establishes uniform, repeatable procedures and standard methods for measuring specified product characteristics of portable household electric cord-connected room air cleaners.

The standard methods provide a means to compare and evaluate different brands of portable household electric cord connected room air cleaners regarding characteristics significant to product use.

The standard methods of measurement are not intended to inhibit improvement and innovation in product testing, design or performance.

2. SCOPE

This standard method applies to portable household electric cord-connected room air cleaners as defined in Section 3.

This standard method includes definitions and safety characteristics of portable household electric cord-connected room air cleaners of the types indicated.

This standard method measures the relative reduction by the air cleaner of particulate matter suspended in the air in a specified test chamber.

This standard method has defined limits of measurability. The statistical validity of test results outside of the stated practical limits is questionable and unevaluated. The practical limits of measurability are:

Dust	10 to 400 CADR
Tobacco smoke	10 to 400 CADR
Pollen	25 to 450 CADR

The precision of the Standard as based on a 0 CADR air cleaner expressed as 2 standard deviation limits (95%) are:

Dust	± 10 CADR
Tobacco smoke	± 10 CADR
Pollen	± 25 CADR

3. DEFINITIONS

3.1 Portable Household Electric Cord-Connected Room Air Cleaner

An electric cord-connected appliance with the function of removing particulate matter from the air and which can be moved from room to room.