

Rainbow Purifiers LLC.

TEST REPORT

SCOPE OF WORKS

AHAM AC-1 2020 CADR Dust Testing on Air Cleaner Model Luggable 16x25 5 Arctic P12 Fan Configuration

REPORT NUMBER

105443787CRT-001

ISSUE DATE

24-May-2023

REVISE DATE

TESTING LOCATION: Intertek Cortland, 3933 US Route 11, Cortland New York, 13045

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RAINBOW PURIFIERS LLC.

Report No.: 105443787CRT-001

Date: May 24, 2023

OBJECTIVE

To provide clean air delivery rate (CADR) result from testing accordance with ANSI/AHAM AC-1-2020 entitled, "Association of Home Appliance Manufacturers Method for Measuring Performance of Portable Household Electric Room Air Cleaners".

HYPOTHESIS

The CADR value is expected to be greater than the natural decay by more than two-times the measurements of uncertainty. This report is for internal use only. No conclusion will be determined by the data contain in this report.

For differentiating results, it is recommended a minimum of three representative samples are to be tested and results are to be a minimum of two times the measurement uncertainty.

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SECTION 2

OBJECTIVE

To provide clean air delivery rate (CADR) results from testing conducted according to the ANSI/AHAM AC-1 2020 test procedure at one operation mode for the pollutants: Dust.

ANSI/AHAM AC-1 2020 Limits of Measurability:

Dust CADR 10 - 600 cfm

Accuracy:

Dust 5.4 %

Measurement Uncertainty:

Dust CADR 5.4%

To determine repeatability of results, multiple samples (as many as needed) should be tested.

SECTION 3

PARAMETERS

The following parameters are controlled

| VALUE | DESCRIPTION | UNITS | METHOD | Measurement Uncertainty |
|-----------|--------------------------|----------------|---------------|-----------------------------|
| Voltage | Line Voltage | Volts ac | Power Supply | 0.064 V (Approx. 95 %, K=2) |
| Frequency | Line Frequency | Hz | Power Supply | 0.5Hz (Approx.95 %, k=2) |
| Dust | Dust Particulate Conc. | Particles / CC | Dust Solenoid | 0.2 (Approx. 95 %, k=2) |
| Time | Dust Injection over Time | Seconds (s) | Chamber | 0.45 s (Approx. 95 %, K=2) |

The following parameters are monitored

| VALUE | DESCRIPTION | UNITS | METHOD | MU |
|-------------|---------------------------------------|----------------|--|-----------------------------|
| Temperature | Air Temperature | °F | DAQ, Vaisala Temperature Humidity Sensor | 0.55 °F (Approx. 95 %, k=2) |
| Humidity | Relative Humidity | % | DAQ, Vaisala Temperature Humidity Sensor | 2.1% (Approx. 95 %, K=2) |
| Wattage | Energy Consumption | Watts | DAQ, Yokogawa WT210 Power Analyzer | 0.041 W (Approx. 95 %, K=2) |
| Dust | Dust Injection .5µm– 3 µm total decay | Particles / CC | Chamber | 0.2 (Approx. 95 %, k=2) |

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SECTION 4**SAMPLE ACQUISITION**

Samples Provided by Client.

| SAMPLE # | DESCRIPTION | SERIAL # | PURCHASE LOCATION | DATE | CONDITION |
|---------------------------------|-------------|-------------------|-------------------|--------------|-----------------------------|
| Luggable 16x25 5 Arctic P12 Fan | Air Cleaner | CRT2305100927-002 | Sent in by Client | May 10, 2023 | Sample Received from Client |

SECTION 5**TECHNICAL STAFF**

| # | Staff Name | Area of Expertise |
|---|---------------|--|
| 1 | Mike Podoliak | Proficient in Air Cleaner testing according to ANSI/AHAM AC-1 2020 |
| 2 | Cory Keeney | Proficient in Air Cleaner testing according to ANSI/AHAM AC-1 2020 |
| 3 | Nirali Patel | Qualified to review Air Cleaner testing according to ANSI/AHAM AC-1 2020 |

SECTION 6**EQUIPMENT LIST**

| # | EQUIPMENT DESCRIPTION | MANUFACTURER'S NAME / MODEL # / SERIAL # | INTERTEK ASSET # | CALIBRATION DATE | CALIBRATION DUE |
|---|-----------------------------|--|------------------|------------------|-----------------|
| 1 | Aerodynamic Particle Sizer | TSI Inc. 3321 | A261 | 6/3/2022 | 6/3/2023 |
| 2 | Laser Aerosol Spectrometer | TSI 3340A | D708 | 11/28/2022 | 11/28/2023 |
| 3 | Humidity/Temperature Sensor | Vaisala Inc. HMW31YB | T680 | 9/15/2022 | 9/15/2023 |
| 4 | Power Analyzer | Yokogawa WT210 | G065 | 9/15/2022 | 9/15/2023 |
| 5 | Stopwatch | Control Company S/N:170715011 | D715 | 12/1/2022 | 12/1/2023 |

Note: The equipment measurement uncertainty is stated in the Test Procedure.

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SECTION 7
TEST DATA

16 x 25 Arctic P12 5 Fan Configuration DATA

| Model/Configuration | Test Particulate | Natural Decay Rate (-) | CADR (FT ³ /Min) | CADR STDEV (FT ³ /Min) | Power (Watts) |
|---|------------------|------------------------|-----------------------------|-----------------------------------|---------------|
| Luggable 16x25 5 Arctic P12 Fans – Continuous Speed CRT2305100927-002 Tested on Floor | Dust | 0.00647 | 189.1 | 1.1 | 8.1 |

| Model/Configuration | Test Particulate | Test Voltage V | Test Frequency Hz | Ambient Test Temperature °F | Ambient Humidity %RH |
|---|------------------|----------------|-------------------|-----------------------------|----------------------|
| Luggable 16x25 5 Arctic P12 Fans – Continuous Speed CRT2305100927-002 Tested on Floor | Dust | 120 | 60 | 71 | 40 |

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SECTION 8

PHOTO



Unit in Test – Arctic P12 Fans – 5 Fan Configuration

SECTION 9

CONCLUSION

The CADR value is greater than natural decay by more than two times the measurements uncertainty for Dust. This report is for internal use only. No conclusion will be determined by the data contained in this report.

For differentiating results, results a minimum of two times the measurement uncertainty is needed. It is recommended a minimum of three representative samples are to be tested.

Tested by
Cory Keeney

Reviewer
Nirali Patel

Date: May 24, 2023

SECTION 10

REVISION

| Date/ Proj # Site ID | Project Handler/ Reviewer | Page No | Description of Change |
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