

Graphene Laboratories Inc

Test Report

SCOPE OF WORK

AHAM AC-1 2020 CADR Testing on Air Cleaner Model BP-PRO-600

REPORT NUMBER

104673277CRT-001

ISSUE DATE

June 23, 2021

[REVISED DATE]

NA

PAGES

8

Testing Conducted by



Cory Keeney
Technician II
Energy Efficiency

Reviewed by



Nirali Patel
Project Engineer
Energy Efficiency

DOCUMENT CONTROL NUMBER

GFT-OP-10i (28-Nov-2018)

© 2021 INTERTEK



Test Report

Report Number	104673277CRT-001		
Test Laboratory Name / Address	Intertek Testing Services 3933 US Route 11, Cortland, NY 13045 USA		
Applicant Name / Address	G6 Materials Corp. DBA Graphene Laboratories Inc. 760 Koehler Ave. Suite 2 Ronkonkoma, NY 11779		
Product	Air Cleaner		
Authorization	Authorized by signed Quote No. Qu-01145856-2, February 9, 2021.		
Brand Name	Breathe+ Pro		
Model Number(s)	BP-PRO-600		
Model Similarity	NA		
Rated Voltage	220 240V	Tested Voltage	120 V
Rated Frequency	50 60Hz	Tested Frequency	60 Hz
Rated Power	90W		
Control Number	CRT2106081309-001	CRT2106081309-002	CRT2106081309-003
Serial Numbers	NA	NA	NA
Connected Functionality	No		
Date of Receipt of Sample(s)	June 8, 2021		
Sample Condition	Production		
Sample Placement	Floor		
Sample Description	Turbo Speed, Ionizer On		
Date of Test	June 10 - 14, 2021		
Test Standard(s) or Criteria(s)	ANSI/AHAM AC-1-2020 - Method for Measuring Performance of Portable Household Electric Cord Connected Room Air Cleaners ENERGY STAR Program Requirements Product Specification for Room Air Cleaners Eligibility Criteria: Version 2.0		
Conclusion	The results reported are within the minimum and maximum limits of measurability of the ANSI/AHAM AC-1-2020 & BP-PRO-600 model meets the ENERGY STAR Program Requirements version 2.0		
Date of Issue	June 23, 2021		

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program. The test report only allows to be revised only within the report defined retention period unless standard or regulation was withdrawn or invalid. When determining the test result, measurement uncertainty has been considered.

Test Method:

Tests were performed in accordance with ANSI/AHAM AC-1-2020 entitled "Association of Home Appliance Manufacturers Method for Measuring Performance of Portable Household Electric Room Air Cleaners". This standard method has defined limits of measurability. The practical limits of measurability are: Dust 10 to 600 CADR, Tobacco smoke 10 to 600 CADR and Pollen 25 to 450 CADR. The statistical validity of test results outside of the stated practical limits is questionable and unevaluated. Clean Air Delivery Rates (CADR's) were determined using Tobacco Smoke, AC Fine Test Dust, and Paper Mulberry Pollen.

Additional requirements for energy taken from IEC 62301 Ed. 2 entitled, "Household Electrical Appliances – Measurement of Standby Power".

Monitored particle size ranges for the three particulates were as follows:
Smoke - 0.10-1.0 microns; Dust - 0.5-3 microns; Pollen - 5-11 microns.

PM2.5 CADR is obtained by combining the CADR of Cigarette smoke particle sizes ranging from 0.1 and 0.5 microns with the CADR of dust particles that fall in the range of 0.5 to 2.5 microns and performing a geometric average calculation.

$$PM2.5 \text{ CADR} = \sqrt[2]{Smoke \text{ CADR}(0.1 - 0.5\mu m) \times Dust \text{ CADR} (0.5 - 2.5)}$$

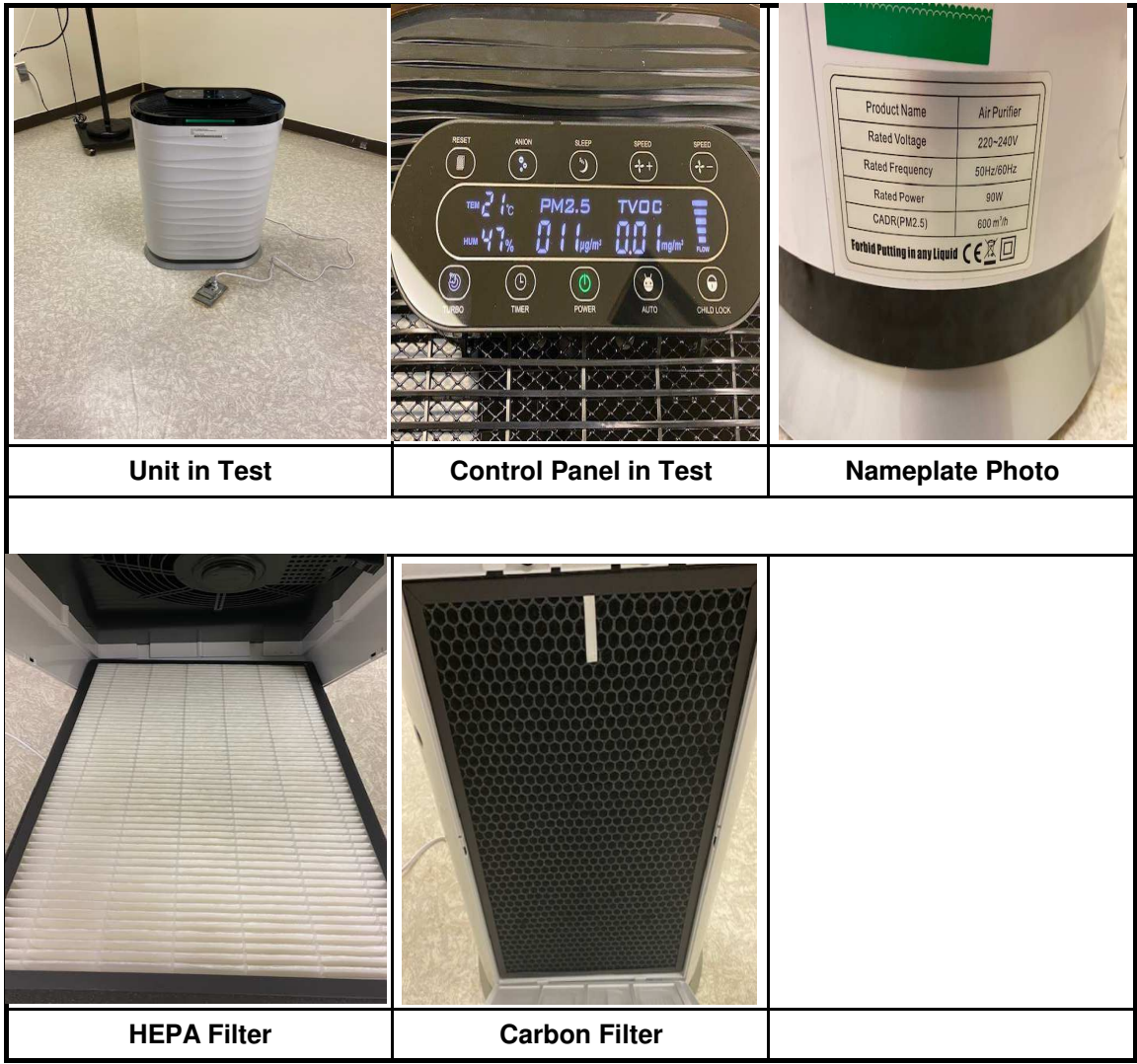
Calibrated Test Equipment List:

Equipment Name	Model No	Asset Number	Calibration Date	Due Date
Laser Aerosol Spectrometer	3340A	D708	10/23/2020	10/23/2021
Aerodynamic Particle Sizer	3321	D803	6/22/2020	6/22/2021
Fluidized Bed Aerosol Generator	3400A	--	--	--
Temperature/Humidity Sensor	HMW30YB	T680	10/2/2020	10/2/2021
Stop Watch	EX0BP	D715	12/4/2020	12/4/2021
Scale	SP202	S281	1/26/2021	1/26/2022
RPM Guage	DA Plus 115	E410	10/5/2020	10/5/2021
Flow Meter	RMA-5	D716	12/10/2020	12/10/2021
Power Supply	3001 Lx	--	--	--
Power Analyzer	WT210	G065	10/2/2020	10/1/2021

Device Under Test Description and Photos:

The device tested for this report was Model BP-PRO-600

The following device settings were used during testing: 120 V 60 Hz, Turbo Speed, Ionizer On
Connected Functionality: No



CADR Results of Performance Tests:

Model/Configuration	Test Particulate	Natural Decay Rate	CADR (FT ³ /Min)	CADR STDEV	Power (Watts)
CRT2106081309-001 Model BP-PRO-600	Smoke	0.00234	297.5	1.40	74.4
120 V 60 Hz Floor	Dust	0.00814	345.5	1.30	74.6
Turbo Speed, Ionizer On	Pollen	0.09516	424.8	42.30	74.5
	PM2.5	-	320.5	-	-
CRT2106081309-002 Model BP-PRO-600	Smoke	0.00286	288.7	1.2	72.8
120 V 60 Hz Floor	Dust	0.00897	331.8	2.2	72.8
Turbo Speed, Ionizer On	Pollen	0.10322	410.5	32.4	72.7
	PM2.5	-	309.7	-	-
CRT2106081309-003 Model BP-PRO-600	Smoke	0.00159	281.7	1.6	62.8
120 V 60 Hz Floor	Dust	0.00929	288.7	2.1	63.0
Turbo Speed, Ionizer On	Pollen	0.11124	382.3	38.0	62.7
	PM2.5	-	285.1	-	-

Dust Operating Power Test

Test Sample	Test Voltage V	Test Frequency Hz	Ambient Test Temperature °F	Ambient Humidity %RH	Dust CADR	Power Watts
CRT2106081309-001	119.9	60.0	72.0	39.0	345.5	74.6
CRT2106081309-002	119.9	60.0	73.0	37.0	331.8	72.8
CRT2106081309-003	119.9	60.0	73.0	41.0	288.7	63.0

Pollen Operating Power Test

Test Sample	Test Voltage V	Test Frequency Hz	Ambient Test Temperature °F	Ambient Humidity %RH	Pollen CADR	Power Watts
CRT2106081309-001	119.9	60.0	72.0	36.0	424.8	74.5
CRT2106081309-002	119.9	60.0	72.0	39.0	410.5	72.7
CRT2106081309-003	119.9	60.0	72.0	40.0	382.3	62.7

Conclusion:

The results reported are within the minimum and maximum limits of measurability of the ANSI/AHAM AC-1-2020 "Association of Home Appliance Manufacturers Method for Measuring Performance of Portable Household Electric Room Air Cleaners" Test Method.

Project Number:	G104673277
Report No.:	104673277CRT-001

Energy Star v2.0 Smoke CADR/Watt Requirement

Smoke CADR Bins	Minimum Smoke CADR/W
$30 \leq \text{CADR} < 100$	1.9
$100 \leq \text{CADR} < 150$	2.4
$\text{CADR} \geq 150$	2.9

Energy Star v2.0 Smoke Operating Power Test

Test Sample Information

Applicant Name	Model Number	Nameplate Voltage V	Nameplate Frequency Hz	Nameplate Watts
G6 Materials Corp. DBA Graphene Laboratories Inc.	BP-PRO-600	220 240V	50 60Hz	90W

Test Criteria

Test Voltage	Test Frequency Hz	Ambient Test Temperature °F	Ambient Humidity %RH
120 ± 1	60 ± 1	70 ± 5	40 ± 5

Test Results

Test Sample	Test Voltage V	Test Frequency Hz	Ambient Test Temperature °F	Ambient Humidity %RH	Smoke CADR	Power Watts	Smoke CADR/Watt
CRT2106081309-001	119.9	60.0	73	38	297.5	74.4	4.0
CRT2106081309-002	119.9	60.0	74	36	288.7	72.8	4.0
CRT2106081309-003	119.8	60.0	73	38	281.7	62.8	4.5

Conclusion:

These results illustrate that this sample does meet the Energy Star Program performance requirements.

Project Number:	G104673277
Report No.:	104673277CRT-001

Energy Star v2.0 Partial On Mode Power Test Requirement

Item	Partial On Mode Power Allowance (W) for models without Wi-Fi capability	Partial On Mode Power Allowance (W) for models with Wi-Fi capability
$P_{\text{Base_Allowance}}$	1.00	1.00
$P_{\text{Network_Connected}}$	0.00	1.00
$P_{\text{Maximum_Partial_On}}$	1.00	2.00

Note: $P_{\text{Maximum_Partial_On}} = P_{\text{Base_Allowance}} + P_{\text{Network_Connected}}$

Energy Star v2.0 Partial On Mode Power Test

Test Criteria - IEC 62301

Test Voltage V	Test Frequency Hz	Total Harmonic Distortion of the Electricity Supply System	Ambient Test Temperature °F
115 ± 1	60 ± 1	≤ 2%	73.4 ± 9

Test Results

Test Sample	Test Voltage (V)	Test Frequency (Hz)	THD (%)	Ambient Temp. (°F)	Measured Partial ON Mode Power	$P_{\text{Maximum_Partial_On}}$ (W)
CRT2106081309-001	115.0	60.0	0.20%	70	0.48	1.00
CRT2106081309-002	115.0	60.0	0.19%	70	0.48	1.00
CRT2106081309-003	115.1	60.0	0.20%	70	0.48	1.00

Conclusion:

The results illustrated in the Partial ON Mode Power Data shows that this unit meets the Energy Star Performance Criteria.

Revision Summary

Date/ Proj # Site ID	Project Handler/ Reviewer	Page No	Description of change
			None