



Canopy Hero Pro: Performance testing results

Summary

Full reports on subsequent pages

| Test Type | Protocol | Lab | Requirement | Canopy result | Pass / fail |
|--|---------------------------|-------------------------------|--|---|-------------|
| Filtration Efficiency | NIOSH TEB-APR-STP-0059 | NIOSH (Pittsburgh) | 95.00% minimum efficiency | 98.06% | Pass |
| Inhalation Resistance | NIOSH TEB-APR-STP-0007 | NIOSH (Pittsburgh) | Maximum Resistance 35mm of H ₂ O | 7.5 mm H ₂ O | Pass |
| Exhalation Resistance | NIOSH TEB-APR-STP-0003 | NIOSH (Pittsburgh) | Maximum Resistance 25mm of H ₂ O | 7.3mm H ₂ O | Pass |
| Respirator Fit Capability | ASTM F3407-20 | ICS Labs (Ohio) | Minimum fit factor of 100 | 125.2 | Pass |
| Residual CO ₂ concentration | NIOSH RCT-APR-STP-0064 | ICS Labs (Ohio) | Maximum: 2.0% CO ₂ | Max: 0.5% CO ₂ | Pass |
| Microbial Growth | DIN EN ISO 846:2019 | Mann + Hummel (Germany) | N/A | Growth Intensity 0 / No Growth The material contains no nutrients for the growth of fungi or bacteria | Pass |

National Institute for Occupational Safety and Health
Evaluation and Testing Branch
Test Data Sheet

Note: Passing test results do not indicate approval



Task Number: TN-25631

Reference No.: CFR 84.174

Test: Sodium Chloride (NaCl) - N95

STP No.: 59

Manufacturer: Grove Biomedical LLC DBA Canopy

Item Tested: C10-FC-N95/C10-TF-FF

| Filter | Flow Rate lpm | Initial Filter Resistance mm water gauge | Maximum Allowable Percent Leakage | Initial Percent Leakage | Maximum Percent Leakage | Result |
|--------|------------------|--|---|-------------------------------|-------------------------------|--------|
| 1 | 85 | 10.3 | 5.00 | 2.539 | 2.539 | PASS |
| 2 | 85 | 11.6 | 5.00 | 1.446 | 1.551 | PASS |
| 3 | 85 | 10.6 | 5.00 | 1.720 | 2.137 | PASS |
| 4 | 85 | 9.3 | 5.00 | 2.172 | 2.172 | PASS |
| 5 | 85 | 9.0 | 5.00 | 1.473 | 1.473 | PASS |
| 6 | 85 | 8.4 | 5.00 | 2.451 | 2.451 | PASS |
| 7 | 85 | 9.3 | 5.00 | 2.656 | 2.656 | PASS |
| 8 | 85 | 8.7 | 5.00 | 2.148 | 2.148 | PASS |
| 9 | 85 | 9.1 | 5.00 | 2.005 | 2.005 | PASS |
| 10 | 85 | 8.8 | 5.00 | 2.011 | 2.011 | PASS |
| 11 | 85 | 9.3 | 5.00 | 1.682 | 1.682 | PASS |
| 12 | 85 | 10.2 | 5.00 | 1.562 | 1.562 | PASS |
| 13 | 85 | 10.0 | 5.00 | 2.524 | 2.524 | PASS |
| 14 | 85 | 9.6 | 5.00 | 2.505 | 2.505 | PASS |
| 15 | 85 | 9.4 | 5.00 | 1.901 | 2.920 | PASS |
| 16 | 85 | 8.3 | 5.00 | 1.168 | 1.188 | PASS |
| 17 | 85 | 7.8 | 5.00 | 2.698 | 2.698 | PASS |
| 18 | 85 | 9.3 | 5.00 | 1.585 | 2.038 | PASS |
| 19 | 85 | 8.8 | 5.00 | 1.450 | 1.988 | PASS |
| 20 | 85 | 8.2 | 5.00 | 1.246 | 1.246 | PASS |

Overall Result: PASS

Signature:

Date: 5/5/2022

Engineering Technician

Form revision: 1.1 2 October 2019

**National Institute for Occupational Safety and Health
Respirator Branch
Test Data Sheet**

Note: Passing test
results do not
indicate approval



Task Number: TN-25631

Reference No.: CFR 84.172

Test: Inhalation Resistance Test

STP No.: 7

Manufacturer: Grove Biomedical LLC DBA Canopy

Item Tested: C10-M-CLS/C10-FC-N95/C10-FS-S/C10-STC

Filter Type: Filter Only

| Sample | Maximum Allowable Resistance (MM of H2O) | Actual Resistance (MM of H2O) | Result |
|--------|---|----------------------------------|--------|
| | Inhalation | Inhalation | |
| 1 | 35 | 7.9 | PASS |
| 2 | 35 | 7.4 | PASS |
| 3 | 35 | 7.4 | PASS |

Overall Result: PASS

Signature:

Date: 4/27/2022

Engineering Technician

**National Institute for Occupational Safety and Health
Respirator Branch
Test Data Sheet**

Note: Passing test results do not indicate approval



Task Number: TN-25631

Reference No.: CFR 84.172

Test: Exhalation Resistance Test

STP No.: 3

Manufacturer: Grove Biomedical LLC DBA Canopy

Filter Type: Filter Only

Item Tested: C10-M-CLS/C10-FC-N95/C10-FS-S/C10-STC

| Sample | Maximum Allowable Resistance (MM of H2O) | Actual Resistance (MM of H2O) | Result |
|--------|---|----------------------------------|--------|
| | Exhalation | Exhalation | |
| 1 | 25 | 7.6 | PASS |
| 2 | 25 | 7.4 | PASS |
| 3 | 25 | 7.1 | PASS |

Overall Result: PASS

Comments:

Was all equipment verified to be in calibration throughout all testing? Yes No

Signature:

Date: 4/27/2022

Engineering Technician



Test Report No. T15808-01-1 Issue 1
Abbreviated testing to:
*ASTM F3407-20 Respirator Fit Capacity for Negative-Pressure
Half-Facepiece Particulate Respirators*
Grove Biomedical dba Canopy
Canopy Hero Pro
02 April 2021

Reviewed by:

A handwritten signature in black ink that reads 'Paul Shiller'.

Paul Shiller, PhD
Senior Analytical Chemist
Respiratory and Chemical Protective Equipment

Performed by:

A handwritten signature in black ink that reads 'Tyler Jenkins'.

Tyler Jenkins
Technical Manager
Respiratory and Chemical Protective Equipment

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Issued to: Grove Biomedical dba Canopy
1153 9th Street
Golden, CO 80401
USA

Date: 02 April 2021
Report: T15808-01-1
Issue: 1
Page: 1 of 3

Summary:

10 Canopy Hero Pro elastomeric respirators underwent abbreviated testing in general accordance with ASTM F3407-20, the Standard Test Method for Respirator Fit Capability for Negative-Pressure Half-Facepiece Particulate Respirators. The abbreviated testing utilized 10 individuals and did not directly adhere to the required panel outlined in the standard. The samples were submitted by Grove Biomedical dba Canopy. The samples produced an overall RFC (respirator fit capability) > 100 on all 10 of the test subjects.

Objectives:

Abbreviated testing to: ASTM F3407-20, “Standard Test Method for Respirator Fit Capability for Negative-Pressure Half-Facepiece Particulate Respirators” Edition approved: 01 October, 2020 [**10 subject**]

Materials:

| <i>Model Number</i> | <i>Description</i> | <i>Qty</i> |
|---------------------|---|------------|
| Canopy Hero Pro | Respirator with two optional facepieces (sizes S and L), straps, and filter cartridge | 12 |

Date provided by the Client: 25 February 2021
Date Testing Authorized: 24 February 2021
Dates of tests: 24 – 30 March 2021
Manufacturer/Supplier: 25 February 2021

Equipment:

PortaCount Model 5308, TSI (EQ0320-02)

Procedure:

All tests were conducted in a standard laboratory atmosphere unless otherwise specified. The equipment and instrument calibrations were verified current and within specification prior to use. The materials for assessment were inventoried, numbered, and logged upon receipt.

A TSI PortaCount Model 5308 was used to perform the evaluation in accordance with the OSHA 29 CFR 1910.134 protocol. The system was validated and underwent daily checks per the manufacturer’s recommended procedure. The system was operated in N95 companion mode – an operational mode intended to be used with devices which provide submicron filtration at < 99 % efficiency.

10 subjects were selected to perform the abbreviated fit capability testing. All subjects selected underwent facial width and length measurements to classify them within the NIOSH bivariate panel, available in the standard. Each subject donned a ported respirator. The system monitored ambient particulates both inside and outside of the mask, calculating an RFC for each exercise, as well as an overall RFC for each subject. Each subject performed the following exercises, each for one minute: Normal breathing, deep breathing, turning head side-to-side, moving head up-and-down, speaking aloud, bending forward at the waist, and normal breathing.



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 Golden, CO 80401
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Results:

The results of the abbreviated fit capability testing is outlined below in Table I.

Table I
 Fit Capability Test Results – Canopy Hero Pro Respirator

| Subject ID | Bivariate Panel Cell | Individual Exercise RFC | | | | | | | Overall RFC | Result |
|-------------------------------|----------------------|-------------------------|----------------|-------------------|------------------|----------------|------------------|------------------|-------------|--------|
| | | Normal Breathing | Deep Breathing | Head Side-to-Side | Head Up-and-Down | Speaking Aloud | Bending at Waist | Normal Breathing | | |
| TJ | 6 | 200 + | 45 | 200 + | 71 | 92 | 200 + | 193 | 104 | Pass |
| JL | 6 | 200 + | 174 | 200 + | 200 + | 87 | 96 | 200 + | 147 | Pass |
| KA | 4 | 197 | 126 | 135 | 191 | 45 | 143 | 108 | 109 | Pass |
| JE | 1 | 200 + | 144 | 129 | 143 | 71 | 135 | 200 + | 132 | Pass |
| KW | 8 | 200 + | 74 | 200 + | 200 + | 86 | 164 | 135 | 130 | Pass |
| JM | 5 | 147 | 156 | 200 + | 200 + | 57 | 100 | 196 | 126 | Pass |
| PS | 3 | 200 + | 177 | 200 + | 200 + | 50 | 200 + | 200 + | 138 | Pass |
| SH | 3 | 200 + | 200 + | 200 + | 200 + | 58 | 200 + | 200 + | 148 | Pass |
| PT | 7 | 129 | 72 | 200 + | 200 + | 54 | 163 | 151 | 111 | Pass |
| VP | 3 | 200 + | 153 | 200 + | 139 | 41 | 101 | 132 | 107 | Pass |
| Individual Requirement | | | | | | | | | ≥ 100 | |

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Photographs:



Figure 1: Canopy Hero Pro respirator

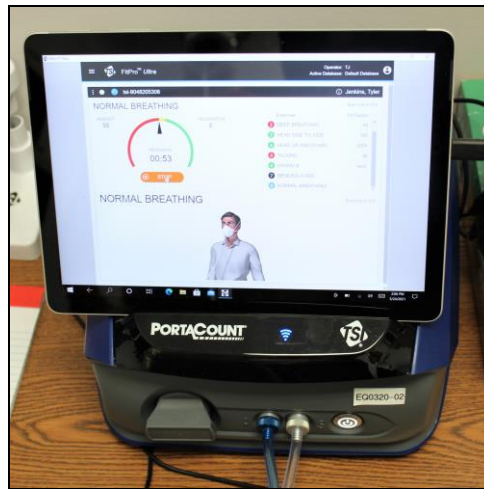


Figure 2: Exemplar test in progress,
TSI PortaCount 5308



Figure 2: Subject performing normal breathing



Figure 3: Subject bending at the waist

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9. Client is responsible for procuring, at its cost, insurance protecting the value of its property, extending to provided samples.
10. For the safety of our personnel, Client must advise if samples are known or suspected to contain hazardous substances. Safety Data Sheets must be provided upon request.
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13. Certain work may be subcontracted to ICS-approved laboratories as required or applicable. Client will be notified of this in advance.
14. Client agrees to pay any and all additional costs associated with unexpected or above-standard communications and/or consultations with Client or third parties as designated by Client.
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16. Client understands and agrees that ICS, in entering into this Contract and by performing services hereunder, does not assume, abridge, abrogate or undertake to discharge any duty or responsibility of Client to any other party or parties. No one other than Client shall have any right to rely on any Report or other representation or conduct of ICS and ICS disclaims any obligations of any nature whatsoever with respect to such third parties.
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18. Client agrees, in consideration of ICS undertaking to perform the test(s) hereunder, to protect, defend and indemnify ICS from any and all claims, damages, expenses either direct or consequential for injuries to persons or property arising out of or in consequence of the performance of the testing, inspection and reporting hereunder and/or the performance of the products tested or inspected hereunder, unless caused by the negligence of ICS.
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