# Analytical and Environmental Services Laboratory

Test Report for Respirators

Company: Ronco Disposable Products Inc.
ATTN: Dariush Firouzi
Address: 70 Planchet Road
Concord, ON
L4K 2C7
PO: Wire
Samples Received: 23
Sample Description: White Respirator
Test: Sodium Chloride (NaCl) Aerosol Particulate Filtration Efficiency
Method: TWI_N95PFE
Reference No: 42 CFR 84 Subpart K § 84.181
Flow Rate: 85 LPM

Report Number: 21-PPE-00282-1
Version: 1
Report Date: 26-Mar-2021
Authorized By:

Date: 2021.03.26 13:38:49 -04'00'

Michael McDonald
Scientist - Kinectrics
michael.mcdonald@kinectrics.com

| Filter ID | Test | Date Tested | Initial Filter Resistance (mmH2O) | Initial Percent Penetration | Maximum Percent Penetration | Filtration Efficiency % | Result |
|---|---|---|---|---|---|---|---|
| 1 | Load Test - 200 mg | 24-Mar-21 | 7.8 | 0.41 | 0.43 | 99.57 | PASS |
| 2 | Load Test - 200 mg | 24-Mar-21 | 8.4 | 0.38 | 0.40 | 99.60 | PASS |
| 3 | Load Test - 200 mg | 24-Mar-21 | 7.5 | 0.43 | 0.47 | 99.53 | PASS |
| 4 | Load Test - max pen. | 25-Mar-21 | 7.8 | 0.45 | 0.48 | 99.52 | PASS |
| 5 | Load Test - max pen. | 25-Mar-21 | 8.0 | 0.34 | 0.37 | 99.63 | PASS |
| 6 | Load Test - max pen. | 25-Mar-21 | 8.0 | 0.26 | 0.30 | 99.70 | PASS |
| 7 | Load Test - max pen. | 25-Mar-21 | 8.1 | 0.25 | 0.29 | 99.71 | PASS |
| 8 | Load Test - max pen. | 25-Mar-21 | 7.6 | 0.49 | 0.58 | 99.42 | PASS |
| 9 | Load Test - max pen. | 25-Mar-21 | 7.5 | 0.48 | 0.53 | 99.47 | PASS |
| 10 | Load Test - max pen. | 25-Mar-21 | 7.7 | 1.44 | 1.52 | 98.48 | PASS |
| 11 | Load Test - max pen. | 25-Mar-21 | 7.7 | 0.72 | 0.78 | 99.22 | PASS |
| 12 | Load Test - max pen. | 25-Mar-21 | 7.8 | 0.41 | 0.46 | 99.54 | PASS |
| 13 | Load Test - max pen. | 26-Mar-21 | 8.0 | 0.59 | 0.62 | 99.38 | PASS |
| 14 | Load Test - max pen. | 26-Mar-21 | 8.1 | 0.34 | 0.37 | 99.63 | PASS |
| 15 | Load Test - max pen. | 26-Mar-21 | 7.6 | 0.41 | 0.45 | 99.55 | PASS |
| 16 | Load Test - max pen. | 26-Mar-21 | 7.6 | 0.57 | 0.62 | 99.38 | PASS |
| 17 | Load Test - max pen. | 26-Mar-21 | 7.6 | 0.71 | 0.78 | 99.22 | PASS |
| 18 | Load Test - max pen. | 26-Mar-21 | 7.9 | 0.33 | 0.35 | 99.65 | PASS |
| 19 | Load Test - max pen. | 26-Mar-21 | 7.8 | 0.43 | 0.47 | 99.53 | PASS |
| 20 | Load Test - max pen. | 26-Mar-21 | 7.8 | 0.38 | 0.42 | 99.58 | PASS |

Overall Result: Pass

Comments: First three respirators tested to 200 mg NaCl loading. Remaining 17 respirators were tested to maximum penetration.

Kinectrics is accredited to ISO 17025:2017 by the Standards Council of Canada for the tests in this report. Test results only apply to the samples submitted for analysis. Samples are randomly selected for each test from the submitted batch. It is the responsibility of the client to ensure the tested batch is representative of the entire lot of respirators. Additional test information is available upon request.

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Company: Ronco Disposable Products Inc.

ATTN: Dariush Firouzi
Address: 70 Planchet Road
Concord, ON
L4K 2C7

PO: Wire
Samples Received: 23
Sample Description: White Respirator
Test: Inhalation/Exhalation Resistance

Report Number: 21-PPE-00282-1
Version: 1
Report Date: 26-Mar-2021

Method: TWI_N95DIFFPRES
Reference No: 42 CFR 84 Subpart K § 84.180
Flow Rate: 85 LPM

| Filter ID | Test | Date Tested | Inhalation Resistance (mmH2O) | Inhalation Result | Exhalation Resistance (mmH2O) | Exhalation Result |
|---|---|---|---|---|---|---|
| 1 | Inhalation/Exhalation | 26-Mar-21 | 9.4 | PASS | 8.8 | PASS |
| 2 | Inhalation/Exhalation | 26-Mar-21 | 10.4 | PASS | 9.0 | PASS |
| 3 | Inhalation/Exhalation | 26-Mar-21 | 9.1 | PASS | 8.9 | PASS |

Overall Result: Pass

Comments: Maximum allowable resistances: 25 mmH2O - exhalation; 35 mmH2O - inhalation.

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## Test Descriptions

**Particulate Filtration Efficiency Testing:**
Prior to testing, respirators were removed from packaging and conditioned at temperature of 38 ± 2.5 °C and relative humidity of 85 ± 5% for 25 ± 1 hours.

The test equipment used in this evaluation is an ATI 100X capable of performing efficiency measurement per 42 CFR 84 Subpart K § 84.181.

A solution of sodium chloride (NaCl) is aerosolized and passed through a sample filter at prescribed flow rate. The testing specification requires an NaCl aerosol with a count median diameter (CMD) of 0.075 ± 0.020 µm with a particle distribution having a standard geometric deviation of less than 1.86. The aerosol concentration is determined on the test day by a gravimetric method. The aerosol produced is also subjected to an ionized air stream, to shift the electrically-charged generated aerosol to a neutral state (Boltzmann equilibrium), characteristic of naturally occurring aerosols. A forward light scattering photometer is used to determine aerosol concentrations upstream and downstream of the test specimen.

**Load Test**: For a load test, a conditioned respirator is mounted to a test fixture and subjected to an aerosol challenge at constant flow rate until either the respirator has been exposed to a specified mass of NaCl, or for a predetermined test duration. The maximum penetration observed during the load test is used to determine the reported filtration efficiency.

**Inhalation/Exhalation Testing:** The test equipment used in this evaluation is capable of performing airflow resistance measurement per 42 CFR 84 Subpart K § 84.180. Tests were conducted according to NIOSH TEB-APR-STP-0003 (exhalation) and TEB-APR-STP-0007 (inhalation).

A fully-formed respirator is mounted and sealed to an anthropometric headform. Inhalation airflow is set to 85 ± 1.4 LPM through the respirator and differential pressure across the respirator is recorded. Flow is then reversed to simulate exhalation at 85 ± 1.4 LPM, and differential pressure across the respirator is again recorded.