

AIR QUALITY TEST REPORT AND COMPARISON **(STERILYFT vs STANDARD PASSENGER ELEVATOR FAN)**

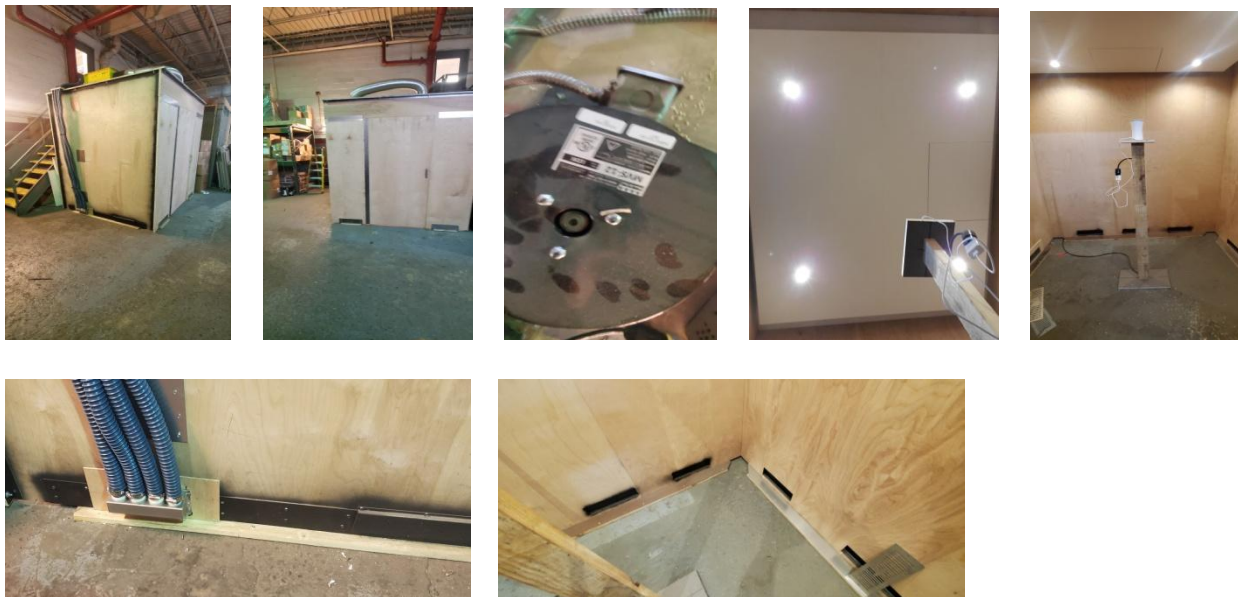
This test, conducted by CEC on 7/8/2020 was conducted to test, record and evaluate the performance of Sterilyft as compared to a standard passenger elevator exhaust fan in the removal of Total Volatile Organic Compounds (TVOC) and Particulate Matter 2.5 microns and less (PM2.5).

TESTING EQUIPMENT:

A mock elevator cab enclosure was constructed at CEC facility, 540 Manida Street, Bronx, NY in dimension to match a standard 3500 Lbs capacity interior volume including a standard drop ceiling (mounted 6" below canopy) and including standard escape hatch, exhaust fan cut out with Man D Tec standard MVS-12 exhaust fan, standard natural base ventilation and SoloBeam LED downlights. Cab doors were replaced by hinged wood door for sealing cab off from shop facility.

Sterilyft unit installed is standard Sterilyft base model air sterilizer with 1 ½" diameter exhaust duct and 6" intake duct with standard canopy start collar and base register installed at opposite corners of cab.

Sampling device is Uho Indoor Air Quality – 9 in 1 Smart Air Monitor which was mounted at center of elevator cab floor and at 5' above floor grade.



Simulated "sneeze" as produced by atomized vegetable glycerol with polyglycerin and artificial additives to produce vaporized particles to fill cab enclosure. VOC content consisted of vaporized ingredients listed above with expelled human exhaled air content. Particulate size of injected media is approximately .03 to 1 micron.

TESTING ENVIRONMENT:

Test cab is located in elevator cab manufacturing facility. Ambient average temperature 82.5 deg F, 64% relative humidity. VOCs include cleaning fluids, adhesives, paint fumes, wood dust, common dust, welding fumes and minor intermediate vehicle emissions as well as approximately 50 human occupants. Test cab is closed off from outside shop by wood door however, still open to outside air by way of natural ventilation at base. Test conducted midday during prime occupancy and activity in facility.

TEST 1 PROCEDURE:

Initial Air Sampling test is performed by recording of air monitor readings from with the closed cab enclosure, readings in intervals of 10 minutes for a period of 40 minutes. Test is conducted first on enclosure with only standard exhaust fan in use, second test is with Sterilyft unit in use.

TEST 1.1 (Air Quality sampling, fan only)

| | | EXHAUST FAN ONLY | | | | |
|--------------|-------|------------------|--------|-------|--------|--------|
| MEASUREMENT | UNITS | 2:30 | 2:40 | 2:50 | 3:00 | 3:10 |
| TEMPERATURE | DEG F | 82.2 | 82 | 81.9 | 81.9 | 81.7 |
| AIR PRESSURE | hPa | 1019.1 | 1019.1 | 1019 | 1019.1 | 1019.1 |
| TVOC | ppb | 310 | 260 | 270 | 160 | 65 |
| CO | ppm | 0 | 0 | 0 | 0 | 0 |
| OZONE | ppb | 15.6 | 15.2 | 15.2 | 16.1 | 16.7 |
| HUMIDITY | REL % | 60.5 | 61 | 60.8 | 61.2 | 61.6 |
| CO2 | ppm | 490 | 497 | 449 | 429 | 415 |
| PM2.5 | ug/m3 | 3 | 8 | 18 | 5 | 4 |
| NO2 | ppb | 140.8 | 136.1 | 136.5 | 150.2 | 161.6 |

TEST 1.2 (Air Quality sampling, Sterilyft in use)

| | | STERILYFT | | | | |
|--------------|-------|-----------|--------|--------|--------|--------|
| MEASUREMENT | UNITS | 3:20 | 3:30 | 3:40 | 3:50 | 4:00 |
| TEMPERATURE | DEG F | 81.9 | 82 | 81.9 | 82.2 | 82.2 |
| AIR PRESSURE | hPa | 1018.9 | 1018.8 | 1018.8 | 1018.5 | 1018.6 |
| TVOC | ppb | 128 | 107 | 122 | 209 | 145 |
| CO | ppm | 0 | 0 | 0 | 0 | 0 |
| OZONE | ppb | 16.5 | 16.6 | 16.8 | 15.6 | 16.6 |
| HUMIDITY | REL % | 61.6 | 61.3 | 61.3 | 60.6 | 61.4 |
| CO2 | ppm | 427 | 422 | 420 | 435 | 425 |
| PM2.5 | ug/m3 | 1 | 1 | 9 | 1 | 5 |
| NO2 | ppb | 157.1 | 157.5 | 162.4 | 141.8 | 157.3 |

TEST 1 ANALYSIS

It can be seen by averaging of data that Sterilyft shows a substantial improvement in air quality readings of decreased TVOC content (33.24% reduction) as well as PM2.5 content (55.26% reduction than in use of fan alone). This is substantial as the lowering of both VOCs and PMs helps reduce respiratory inhalation as well as the existence of possibly harmful particulates such as viruses, bacteria and germs.

| AIR SAMPLING - 40 MINUTE - 10 MIN INTERVALS | | | | |
|---|--------------|------------|--------------|----------------|
| AVERAGE | | | | |
| MEASUREMENT | UNITS | FAN | STERILYFT | % CHANGE |
| TEMPERATURE | DEG F | 81.94 | 82.04 | 0.12% |
| AIR PRESSURE | hPa | 1019.08 | 1018.72 | -0.04% |
| TVOC | ppb | 213 | 142.2 | -33.24% |
| CO | ppm | 0 | 0 | 0.00% |
| OZONE | ppb | 15.76 | 16.42 | 4.19% |
| HUMIDITY | REL % | 61.02 | 61.24 | 0.36% |
| CO2 | ppm | 456 | 425.8 | -6.62% |
| PM2.5 | ug/m3 | 7.6 | 3.4 | -55.26% |
| NO2 | ppb | 145.04 | 155.22 | 7.02% |

TEST 2 PROCEDURE:

VOC / PM2.5 Introduction and Evacuation test is performed by recording of air monitor readings from with the closed cab enclosure, readings in intervals of 3 minutes for a period of 21 minutes and final reading at 50 minutes after test initiation. Test is conducted first on enclosure with only standard exhaust fan in use, second test is with Sterilyft unit in use. Introduction of VOC / PM2.5 (simulated sneeze) is introduced at 2 minutes into test and recorded at first 3 minute interval.

TEST 2.1 (VOC/PM 2.5 Handling, fan only)

| VOC / PM2.5 INTRODUCTION AND EVACATION TEST - FAN ONLY | | | | | | | | | | |
|--|--------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| FAN ONLY | | 10:40 | 10:43 | 10:46 | 10:49 | 10:52 | 10:55 | 10:58 | 11:01 | 11:30 |
| MEASUREMENT | UNITS | START | INTRO | | | | | | | |
| TEMPERATURE | DEG F | 82.4 | 82.2 | 82.4 | 82.4 | 82.4 | 82.2 | 82.2 | 82.4 | 82.4 |
| AIR PRESSURE | hPa | 1016.5 | 1016.5 | 1016.5 | 1016.5 | 1016.5 | 1016.4 | 1016.4 | 1016.5 | 1016.4 |
| TVOC | ppb | 331 | 408 | 398 | 372 | 358 | 369 | 382 | 363 | 318 |
| CO | ppm | 0 | 0.9 | 0.9 | 1.2 | 0 | 0 | 0.9 | 0 | 0 |
| OZONE | ppb | 9.3 | 9.2 | 9.3 | 9.3 | 9.4 | 9.3 | 9.3 | 9.4 | 14.7 |
| HUMIDITY | REL % | 64 | 64.3 | 64.1 | 64 | 63.9 | 64.3 | 64.3 | 64.1 | 64.2 |
| CO2 | ppm | 491 | 503 | 500 | 500 | 495 | 482 | 490 | 496 | 474 |
| PM2.5 | ug/m3 | 6 | 25 | 12 | 18 | 17 | 19 | 10 | 22 | 18 |
| NO2 | ppb | 37.5 | 35.7 | 37 | 37.6 | 38.2 | 37.8 | 37.4 | 38.5 | 125 |

TEST 2.2 (VOC/PM 2.5 Handling, Sterilyft)

| VOC / PM2.5 INTRODUCTION AND EVACATION TEST - STERILYFT | | | | | | | | | | |
|---|--------------|------------|------------|------------|------------|------------|------------|------------|------------|-----------|
| STERILYFT | | 11:30 | 11:33 | 11:36 | 11:39 | 11:42 | 11:45 | 11:48 | 11:51 | 12:20 |
| MEASUREMENT | UNITS | START | INTRO | | | | | | | |
| TEMPERATURE | DEG F | 82.4 | 82.4 | 82.4 | 82.6 | 82.6 | 82.6 | 82.6 | 82.6 | 82.9 |
| AIR PRESSURE | hPa | 1016.5 | 1016.2 | 1016.3 | 1016.3 | 1016.3 | 1016.3 | 1016.2 | 1016.3 | 1015.8 |
| TVOC | ppb | 315 | 385 | 152 | 148 | 145 | 137 | 135 | 127 | 92 |
| CO | ppm | 0 | 0.5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| OZONE | ppb | 14.8 | 14.7 | 14.8 | 14.9 | 14.9 | 15.1 | 14.9 | 15 | 15.3 |
| HUMIDITY | REL % | 64.3 | 64.2 | 64 | 64 | 63.7 | 63.8 | 63.8 | 63.8 | 63.5 |
| CO2 | ppm | 485 | 474 | 482 | 485 | 484 | 476 | 475 | 473 | 463 |
| PM2.5 | ug/m3 | 8 | 24 | 9 | 10 | 5 | 8 | 3 | 5 | 1 |
| NO2 | ppb | 120 | 125 | 125.5 | 127.6 | 126.8 | 130.7 | 127 | 128.7 | 131.5 |

TEST 2 ANALYSES

It can be seen by comparison of test data that use of fan only exhibits a minimal result of removal of both TVOC and PM2.5 by showing of a circulation of air contaminants which remain in the enclosure. This shows an inability of a standard fan to effectively lift and remove airborne particles and contaminants from within the volume of air below. This is due to lesser CFM draw coupled by lack of introduction of forced air to push up the air volume. By use of higher air movement (710CFM) as well as looped circulation creating a distinct air flow, **Sterilyft's efficiency is by far more effective.** Variable from introduction of contaminant to enclosure to completion for fan is a reduction in VOC of 22.06% whereas Sterilyft is 76.10%, netting an increased evacuation efficiency of 54.06%. Variable from introduction of contaminant to enclosure to completion for fan is a reduction in PM 2.5 content of 28% whereas Sterilyft is 95.83%, netting an increased evacuation efficiency of 67.83%. Furthermore, variable from start of test to completion for fan is a reduction in VOC of 3.93% whereas Sterilyft is 70.79%, netting an increased evacuation efficiency of 66.86%. Variable from start of test to completion for fan is a INCREASE in PM 2.5 content of 200% whereas Sterilyft is reduced 87.5%, netting an increased evacuation efficiency of 287.5%. The data leads to a clear conclusion that the **Sterilyft system shows a substantially improved rate of circulation of the air within an elevator as well as in the removal of elevator cab enclosure contaminants within the air.** This coupled by UV-C irradiation should prove to effectively remove all or most of the contaminants and de-activate any remainder prior to providing clean air to the passengers within the cab.

| VOC / PM2.5 EVALUATION FAN ONLY | | | | | VOC / PM2.5 EVALUATION FAN ONLY | | | | |
|------------------------------------|--------|--------|---------|---------|------------------------------------|--------|--------|---------|---------|
| START | INTRO | COMPL | VAR S-C | VAR I-C | START | INTRO | COMPL | VAR S-C | VAR I-C |
| 82.4 | 82.2 | 82.4 | 0.00% | 0.24% | 82.4 | 82.4 | 82.9 | 0.61% | 0.61% |
| 1016.5 | 1016.5 | 1016.4 | -0.01% | -0.01% | 1016.5 | 1016.2 | 1015.8 | -0.07% | -0.04% |
| 331 | 408 | 318 | -3.93% | -22.06% | 315 | 385 | 92 | 70.79% | -76.10% |
| 0 | 0.9 | 0 | 0.00% | 100.00% | 0 | 0.5 | 0 | 0.00% | 100.00% |
| 9.3 | 9.2 | 14.7 | 58.06% | 59.78% | 14.8 | 14.7 | 15.3 | 3.38% | 4.08% |
| 64 | 64.3 | 64.2 | 0.31% | -0.16% | 64.3 | 64.2 | 63.5 | -1.24% | -1.09% |
| 491 | 503 | 474 | -3.46% | -5.77% | 485 | 474 | 463 | -4.54% | -2.32% |
| 6 | 25 | 18 | 200.00% | -28.00% | 8 | 24 | 1 | 87.50% | -95.83% |
| 37.5 | 35.7 | 125 | 233.33% | 250.14% | 120 | 125 | 131.5 | 9.58% | 5.20% |

CONCLUSION

Sterilyft is an obvious solution to circulating and sterilizing the air from within an elevator enclosure.