

#### Study Summary Article

## Efficacy of the M40 Air Purifier against a Broad Range of Respirable Microorganisms: *High Speed Broad Range Efficacy and Low Speed Select Species Efficacy*

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Aerosol Research and Engineering Laboratories, Inc. have no affiliations with, or involvement in any capacity, with Medify's financial interests such as; membership, employment, stock ownership, or other equity interest.

#### ABSTRACT

*Background:* Due to the high rate of infectious disease transmission through aerosol exposure to pathogenic microorganisms, systems designed to reduce the levels of airborne pathogens, and other bio particulates in room air, have been attracting significant attention. This in-vitro study characterized the efficacy of the M40 air purification device to reduce respirable bioaerosol levels for six broad-ranged species of microorganisms from room air. The species selected are recognized surrogates for more dangerous pathogenic organisms. In this study, the species tested were: MS2, a non-enveloped ssRNA virus that is a common surrogate for influenza viruses and is a tentative surrogate for SARS-CoV-2; Phi X 174, a non-enveloped DNA virus that is a surrogate for herpes and smallpox viruses; Methicillin Resistant *Staphylococcus epidermidis* (MRSE), a gram-positive bacterium that serves as a surrogate for many pathogenic gram-positive bacteria, including Methicillin Resistant *Staphylococcus aureus* (MRSA); *Escherichia coli*, a gram-negative bacterium that is a well-known pathogen itself; *Bacillus subtilis* endospores; which serve as a model for the many bacterial species that produce highly resistant endospores; and the spores from *Aspergillus brasiliensis*, one of the most common sources of toxic black mold.

This is a two part study designed to demonstrate the efficacy of the M40 and M50 air purifiers. In this part, the M40 was tested in its intended final commercial form. The results of that study are presented in this report. The M40 study was further divided into two phases;

*Phase I*: The highest level fan speed (Speed 3), which is anticipated to be the speed most used in routine use, was used for this phase of the testing. Additionally, a full contingent of six microorganisms were used to test the system. It consisted of a total of twenty-four (24) live bioaerosol trials; six species with three test trials and one control trial each. In addition to the microorganism tests an inert particles trial and control was performed to determine the reduction of PSL's (polystyrene latex microspheres) by the device in a sealed chamber.

*Phase II:* The lowest fan speed available on the unit (Speed 1), which is the setting with the lowest room turnover rate, was used for this phase of testing to assess two species, the MS2 bacteriophage (virus) and the endospores from *Bacillus subtilis.* These represented the most difficult to remove microbes. All bioaerosol trials were run in triplicate. In addition to the microorganism test at the lowest fan speed an inert particles trial was also performed to determine the reduction of PSL's (polystyrene latex microspheres) by the device in a sealed chamber.

*Methods:* Each microorganism was aerosolized into a sealed environmental bioaerosol chamber, containing the M40 air purifier, using a Collison 24-Jet Nebulizer or dry powder feeder. All the bioaerosols had a mass median aerodynamic diameter (MMAD) ranging from 0.7-4.0  $\mu$ m (species dependent). Bioaerosol samples were taken at multiple time points throughout each trial, in order to quantify the reduction rate capability of the air purification device. Impinger samples were serially diluted, plated, incubated, and enumerated in triplicate to yield viable bioaerosol concentrations for each sampling point. Chamber control trial data, or natural decay, was subtracted from the device trial data to yield the net LOG reduction for each of the bioaerosol challenges.

*Results:* Phase I – The M40 unit, set to 'Speed 3', was effective at reducing all six organisms by a net log of 4.09 or greater (equivalent to 99.99% or greater) within 30 minutes. *Results:* Phase II – The M40 unit, set to 'Speed 1', was effective at reducing both organisms by a net log of 4.0 or greater (equivalent to 99.99% or greater) within 90 minutes.

*Conclusions:* Based on the results of Phase I and Phase II testing, all fan speeds are effective in reducing airborne microorganisms within a short period of time. However, the higher fan speed achieved a >4.0 net log reduction in 30 minutes vs the lower fan speed which took 90 minutes.



#### Introduction

This study was conducted to evaluate the efficacy of the M40 room air purifier, manufactured by Medify, at reducing aerosolized bio organisms. The M40 device is an air filtration device, equipped with ozone free ionizer and a true HEPA filter. It is designed to reduce a broad range of gram-positive and gram-negative bacteria, RNA and DNA viruses including SARS-CoV-2, bacterial and mold fungal spores, and airborne particles in room air. The M40 device is designed for commercial and residential applications. The test plan incorporated challenging the M40 device, in a closed environmental chamber, to determine the reduction rate and extent of two separate aerosolized viruses, two separate aerosolized bacteria, and two types of spores. A picture of the M40 device is shown in Figure 1.



Figure 1: M40 Air System Device: Portable HEPA filtration with ozone free ionizer. Integrated pre-filter and carbon filter for further polishing of treated air. Multi-speed capable.

#### **Study Overview**

The effectiveness of the M40 device was evaluated against an RNA virus, a DNA virus, a gram negative bacteria, a gram positive bacteria, a spore forming bacteria, and a mold spore.

Testing was conducted to characterize a single M40 unit against six organism types to demonstrate the capability of the M40 device, when operating at its highest fan speed, to reduce viable bioaerosol concentrations, therefore theoretically reducing the chances of airborne infection. Two of these organisms, MS2 and *Bacillus subtilis* endospores, were tested at one additional fan speed, Speed 1, to demonstrate efficacy at multiple fan speeds.

#### Phase I: Speed 3, Broad Range Efficacy Testing:

The Phase I component consisted of testing all six species in the Speed 3 of the M40 device which is intended to be the most commonly used setting. A single trial and control were also performed to characterize the reduction of PSL's in a sealed room. This demonstrated the broad efficacy of the device.

#### Phase II: Speed 1 Efficacy Testing

Phase II of the testing consisted of running two selected species, MS2 and *B. subtilis* endospores, run with the device at Speed 1. These two organisms were chosen because of their hardiness and particle size. In addition, a single inert particle reduction trial was performed to characterize the device efficacy at removing non-living aerosolized particulates. Testing the efficacy of the device at different air flow rates demonstrated the device's overall capability.

#### **Test Device Description**

The M40 device is equipped with multi-step filtration including a pre-filter, carbon filter, HEPA filter, and an ionizer that increases kill efficiency. The pre-filter is used to captures large dust particles and other debris followed by an activated carbon filter intended to remove volatile organic compounds (VOC's). An integrated High Efficiency Particulate Air (HEPA) filter removes respirable particles (>0.1  $\mu$ m). The ionizer kills any microorganisms the get by the filter system. The device is equipped with four blower speeds: Speed 1, 2, and 3.



**Figure 2:** Stainless Steel Bioaerosol Test Chamber used for all M40 Testing. Chamber is equipped with HEPA in/out, multiple bioaerosol sampling ports, decontamination and pressure balance. Exterior picture.





General Large Chamber Bioaerosol Configuration

Figure 3: Bio-Aerosol Test Chamber Flow Diagram. Chamber includes bioaerosol induction, multiple bioaerosol sampling ports, Particle size monitoring, internal mixing fans, temperature and humidity controls. Main system HEPA Evacuation System not pictured.

#### **Bioaerosol Testing Chamber**

A large sealed aerosol test chamber was used to replicate a potentially contaminated room environment and to contain any potential release of aerosols into the surrounding environment. The aerosol test chamber is constructed of 304 stainless steel and is equipped with three viewing windows and an air-tight lockable chamber door for system setup and general ingress and egress. The test chamber internal dimensions are 9.1 ft x 9.1 ft x 7 ft, with a displacement volume of 579 cubic feet, or 16,000 liters. Figure 2 shows the bioaerosol chamber used for all testing in this study.

The chamber is equipped with filtered HEPA inlets, digital internal temperature and humidity monitors, heaters and humidifiers, lighting system, multiple sampling ports, aerosol mixing fans, and a HEPA filtered exhaust system that are operated with wireless remote control. For testing, the chamber is equipped with four 3/8-inch diameter stainless steel probes for aerosol sampling and a 1-inch diameter port for bio-aerosol dissemination into the chamber using a Collison 24-jet nebulizer or dry powder eductor for the aerosolization of the microorganisms and spores, respectively.

In order to avoid wall effects, all sample and dissemination ports were inserted approximately 18 inches in from the interior walls of the chamber and at a height of approximately 40 inches from the floor to avoid wall effects. The aerosol sampling and aerosol dissemination probes are stainless steel and bulk headed through the chamber walls to provide external remote access to the aerosol generator and samplers during testing. The test chamber is equipped with two high-flow HEPA filters for the introduction of filtered purified air into the test chamber during aerosol evacuation/purging of the system between test trials and a HEPA filtered exhaust blower with a 500 ft<sup>3</sup>/min rated flow capability for rapid evacuation of remaining bioaerosols. A Magnehelic gauge with a range of -0.5 to 0.5 inches of H<sub>2</sub>O (Dwyer instruments, Michigan City IN) was used to monitor and balance the system pressure during aerosol generation, aerosol purge and testing cycles.

#### **Environmental Controls**

For increased stability of bioaerosols, relative humidity inside the chamber is kept at 65% +/- 5% using a PID humidity controller in combination with an ultra-sonic humidifier to nebulize filtered DI water. Temperature controls maintain chamber trial conditions at typical ambient conditions of  $74^{\circ}F$  +/-  $2^{\circ}F$ .



#### **Bioaerosol Generation System**

All test bioaerosols were disseminated using a Collison 24-jet nebulizer (BGI Inc. Waltham MA), similar to the one shown in Figure 4, with the exception of the *A. brasiliensis* spores which were aerosolized using a dry powder eductor. The aerosolization of bioaerosols were driven by purified, filtered house air supply. A pressure regulator allowed for control of disseminated particle size, use rate and sheer force generated within the Collison nebulizer. Prior to testing, the Collison nebulizer flow rate and use rate were characterized using an air supply pressure of approximately 40-60 psi, which produced an output volumetric flow rate of 50-80 L/min with a fluid dissemination rate of approximately 1.25 mL/min. The flow of the Collison nebulizer was flow characterized by using a calibrated TSI model 4040 mass flow meter (TSI Inc., St Paul MN).



Figure 4. 6-Jet Collison nebulizer. Glass and 304 stainless steel construction, BGI Industries.

#### **Bioaerosol Sampling and Monitoring System**

Two AGI impingers (Ace Glass Inc. Vineland NJ) were used for bioaerosol collection of all biological aerosols to determine chamber concentrations. The two AGI Impingers were placed at opposite corners of the chamber in order to represent an entire room sample. The mixing fans inside the chamber worked to ensure a homogenous air mixture inside the chamber.



**Figure 5:** SKC Single Stage BioStage Viable Cascade Impactor used for bacterial and spore sampling for select time points during bioaerosol trials. LOD is >0.01 cfu/L.

The AGI-30 impinger vacuum source was maintained at a negative pressure of 18 inches of Hg during all characterization and test sampling to assure critical flow conditions. The AGI-30 sample impingers flows were characterized using a calibrated TSI model 4040 mass flow meter. A general flow diagram of the aerosol test system is shown above in Figure 3. During testing with less resilient organisms or those which fall out of the air more easily, sample collections were also obtained using a pair of viable cascade impactors. A viable cascade impactor (SKC Inc., Valley View, PA) is comprised of an inlet cone, a precision-drilled 400-hole impactor stage, and a base that holds a standard-size agar plate (Figure 5). A high flow pump pulls microorganisms in the air through the holes (jets) at 30 liters per minute, where they are collected directly onto the agar surface. This method is the most sensitive for the detection of organisms at low concentrations.

#### **TSI AERODYNAMIC PARTICLE SIZER**

A TSI Aerodynamic Particle Sizer (APS) model 3321 (TSI Inc., Shoreview, MN) was used to measure aerosol concentrations and particle size during trials. The APS provided real-time aerodynamic particle characterization with a size range from 0.54-20.0  $\mu$ m with 52 size bins of resolution. Sampling is continuous with a data export interval of 1 second. The APS has a continuous flow rate of 5 liters per minute (LPM). A picture of the APS is shown in Figure 6.



**Figure 6**. TSI Aerodynamic Particle Sizer (APS) model 3321 used to measure total particle concentration and particle size distribution of the challenge bioaerosol. Range  $0.54-20.0 \,\mu\text{m}$  aerodynamic diameter, with 1 particle/L detection limits.

#### **Species Selection**

Due to safety concerns for bioaerosol testing, organism selection was based on Biological Safety Level 1 (BSL1) species which served as surrogates for more dangerous pathogenic (BSL2 & BSL3) organisms.

#### Viral Challenges:

Virus MS2 is a viral single-stranded, non-enveloped RNA bacteriophage that has been used historically as a surrogate for influenza viruses. MS2 has also recently been used as a tentative surrogate for SARS-CoV-2 in numerous published bioaerosol studies. Phi-X174 ( $\Phi$ -X174) is a viral, single-stranded, non-enveloped, DNA bacteriophage traditionally used as a surrogate for viral species such as herpes simplex and smallpox.



The US FDA guidance document, *Enforcement Policy for Sterilizers, Disinfectant Devices, and Air Purifiers During the Coronavirus Disease 2019 (COVID-19) Public Health Emergency,* states that lipid enveloped viruses, such as coronaviruses, are the least resistant microorganisms to disinfectants. It is presumed that this susceptibility is similar for other chemical, physical and catalytic methods of destruction.

MS2 and Phi X 174 are non-enveloped viruses, which makes them more resistant to disinfection than lipid viruses, and therefore, should represent a "worst case scenario" when compared to actual lipid-enveloped RNA viruses like SARS-CoV-2. Figure 7 is a graphic from the FDA document, *COVID Sterilizers, Disinfectant Devices, and Air Purifiers Guidance*, demonstrating resistance to disinfection.



Figure 7: FDA graphic demonstrating general resistance to disinfection for various microorganisms. FDA, Guidance Enforcement Policy for Sterilizers, Disinfectant Devices, and Air Purifiers during the Coronavirus Disease 2019 (COVID-19). Pg. 7. March 2009. SARS-CoV-2 (lipid or medium-Sized Virus), MS2 (non-lipid small virus).

#### Vegetative Bacteria Challenges:

The vegetative bacteria organisms used for this study included Methicillin Resistant *Staphylococcus epidermidis* (MRSE) (ATCC 12228). *Staphylococcus epidermidis* is a grampositive bacterium and BSL1 simulant for a wider range of medically significant pathogens including Methicillin Resistant *Staphylococcus aureus* (MRSA).

*Escherichia coli* was selected as the gram-negative vegetative bacterium for this study. (ATCC 15597). *E. coli* is a bacterium commonly used in various forms of testing as it is a common pathogen found in a multiplicity of places, and it can survive on many surfaces, and it may cause serious illness (potentially lethal) itself.

#### Mold Spores and Bacterial Endospore Challenges:

Aspergillus brasiliensis (ATCC 16404), formerly known as A. niger, is one of the most common species of the genus Aspergillus. A. brasiliensis is routinely defined as a surrogate for various toxic black mold species such as Stachybotrys chartarum. Many respiratory problems found in infants, the elderly and immunocompromised individuals are attributed to mold. Purified A. brasiliensis spores were used in bulk, dry

powder form with an approximate concentration of 1 x  $10^9\,$  cfu/gram.

*Bacillus subtilis* (ATCC 49760), endospores were used as a surrogate for *Bacillus anthracis* (Anthrax), a biological agent used for bioterrorism/biowarfare research. It also serves as a surrogate for other pathogenic endospore forming species such as *Clostridioides difficile*, a common and difficult to eliminate hospital pathogen. *Bacillus subtilis*, a sub-species of *Bacillus atrophaeus*, is a gram-positive bacterium found in soil and in the gastrointestinal tract of ruminants and humans. B. *subtilis* is rod-shaped, and forms a tough, highly resistant endospore, which allows it to tolerate extreme environmental conditions.

#### **Challenge Bioaerosol Aerodynamic Diameter**

Bioaerosol particle size distributions were measured with a TSI Aerodynamic Particle Sizer model 3321 (APS) for all challenge species. The particle size distribution was taken shortly after aerosolization for each species via sampling through a sample probe into the test chamber. The APS has a dynamic measurement range of 0.54 to 20.0  $\mu$ m and was programmed to take consecutive real-time one-minute aerosol samples. Data were logged in real-time to an Acer laptop computer, regressed, and plotted.



**Figure 8:** Aerodynamic Particle Size Distribution of RNA virus MS2 and DNA virus PhiX-174 in the test chamber. MMAD for both viral species averaged approximately 0.7 µm.

The aerodynamic particle size distribution for all challenge bioaerosols are shown to be within the respirable range for regional alveolar tract deposition and show a low geometric standard deviation (GSD), indicating that a monodispersed aerosol was generated in the chamber for each of the challenge species. The aerodynamic particle size distributions for MS2 and Phi X174 can be found in Figure 8, shown above.

The bioaerosol particle size distributions for *S.epidermidis* and *E.coli* are shown in Figure 9. The particle size distribution for *A.brasiliensis* and *B.subtilis* are found in Figure 10.





**Figure 9:** Aerodynamic Particle Size Distribution of *S. epidermidis* and *E. coli* in the test chamber. MMAD for each species was approximately 2.4-2.6 µm.

The particle size distribution of the spore species are noticeably larger than that of the vegetative bacteria. This makes these species easier to filter out of the air, however they are much more resilient when it comes to physical destruction.



**Figure 10:** Aerodynamic Particle Size Distribution of *A. brasiliensis* and *B. subtilis* in the test chamber. MMAD for *B. subtilis* is approximately 2.4  $\mu$ m with *A. brasiliensis* having a MMAD of approximately 4.0  $\mu$ m.

#### **Viral Culture & Preparation**

Pure strain viral seed stock and host bacterium were obtained from ATCC. Host bacterium was grown in a similar fashion to the vegetative cells in an appropriate liquid media. The liquid media was infected during the logarithmic growth cycle with the specific bacteriophage. After an appropriate incubation time, the cells were lysed and the cellular debris separated by centrifugation. MS2 stock yields were greater than  $1 \times 10^{11}$  plaque forming units per milliliter (pfu/mL) with a single amplification procedure. This stock MS2 viral solution was then diluted with PBS to approximately  $1 \times 10^{10}$  plaque forming units per milliliter (pfu/mL) for use in the Collision nebulizer. The Phi-X174 stock was prepared in the same manner however, in order to achieve a high enough

concentration the Phi-X174 underwent a double amplification procedure.

#### **Vegetative Cells Culture & Preparation**

Pure strain seed stocks were purchased from ATCC (American Type Culture Collection, Manassas VA). For ATCC reference numbers see **Table 1** below on page 8. Working stock cultures were prepared using aseptic techniques in a class 2 biological safety cabinet and followed standard preparation methodologies. Approximately 250mL of each biological stock was prepared in tryptic soy liquid broth media, and incubated for 24-48 hours with oxygen infusion (1cc/min) at 37°C. Biological stock concentrations were around 1 x 10<sup>10</sup> cfu/ml.

Stock cultures were centrifuged for 10 minutes at 3000rpm in an LD-3 centrifuge in sterile 15mL conical tubes, growth media was removed, and the cells re-suspended in sterile PBS buffer for aerosolization. Aliquots of these suspensions were enumerated on tryptic soy agar plates (Hardy Diagnostics, Cincinnati OH) for viable counts and stock concentration calculation. For each organism, test working stocks were grown in sufficient volume to satisfy use quantities for all tests conducted using the same culture stock material.

#### **Fungal Spore Culture & Preparation**

A. brasiliensis fungal spores were obtained in purified bulk powder form at a concentration of  $1 \times 10^9$  cfu/g. To verify the bulk powder spore concentration, an aliquot of weighed dry powder was prepared in suspension in PBS + 0.005% Tween 80 at a mass: volume ratio to obtain a concentration of  $1 \times 10^9$  cfu/ml. This aliquoted spore suspension was plated prior to testing to verify concentration.

*Bacillus subtilis* freeze-dried spores were purchased from ATCC with a stock concentration of  $1 \times 10^{11}$  cfu/gram. One gram of dry spores was suspended in a 250mL solution of 50/50 91% Isopropyl alcohol and PBS + 5% Tween to assist in deagglomeration. This suspension was sonicated for 40 minutes in order to bring all powder into solution. This aliquoted spore suspension was plated prior to testing to verify concentration.

#### **Plating and Enumeration**

Impinger and stock biological cultures were serially diluted and plated in triplicate. (Multiple serial dilutions) using a standard spread plate assay technique onto tryptic soy agar plates. The plated cultures were incubated for 24-48 hours depending on the species and enumerated and recorded.





**Figure 11:** PSL Microspheres Chamber Trials for the Control and M40 Device at High Speed. First figure (Left) shows the net log reduction of four different inert particles normalized to 100% for T=0 sample for both control and M40 trials. Second figure (Right) show the log reduction of inert particles by the M40 unit.

When working with microorganisms at extremely low concentrations the viable cascade sampling was used. This method samples the chamber by pulling 30 liters per minute through the cascade device directly onto an agar plate. Enumeration of colonies grown depends on the concentration of the sample. Colony counts totaling up to 400 can then be adjusted using the positive conversion table. This table is based on the principle that, as the number of viable particles being impinged on a given plate increases, the probability of the next particle going into an "empty hole" decreases. This can be corrected statistically using the conversion formula of Feller, W (1950).

#### **Post-Testing Decontamination and Prep**

Following each test, the chamber was air flow evacuated/purged for a minimum of twenty minutes between tests and analyzed with the APS for particle concentration decrease to baseline levels between each test. The chamber was decontaminated at the conclusion of the trials with aerosol/vaporous hydrogen peroxide (35%). The Collison nebulizer and impingers were cleaned at the conclusion of each day of testing by soaking in a 5% bleach bath for 20 minutes. The nebulizer and impingers were then submerged in a DI water bath, removed, and spray rinsed 6x with filtered DI water until use.

#### **Data Analysis**

Results from the control trials were graphed and plotted to show natural viability loss over time in the chamber. These control runs served as the basis to determine the time required for the M40 device to achieve at least a 4 LOG (99.99%) reduction in viable bioaerosol above the natural losses from the control runs. The control and trial runs are plotted showing log reduction in viable bioaerosol for each organism. All data are normalized with time zero enumerated concentrations. Subsequent samples are normalized and plotted to show the loss of viability over time.

#### **Result: Inert Particle Characterization**

PSL microsphere trial data were used to estimate nebulization efficiencies, particle stability, determine sample collection times, and aerosol persistence prior to bioaerosol testing. In order to estimate total bioaerosol trial times, sampling frequency and sample duration for the bioaerosol challenges testing with the M40 device was conducted using PSL microspheres. The removal efficacy of polystyrene latex microspheres (PSL microspheres) were used to characterize simple particle capture efficiency.

Polydispersed PSL microspheres with aerodynamic diameters of  $0.5 - 4.0 \,\mu$ m were nebulized in PBS and chamber concentrations were recorded using the APS over time. The APS recorded individual particle count from 0.54 to  $20.0 \,\mu$ m in size with 52 separate size bins of resolution. Two pre-trials were conducted: a negative control with the test unit "off" and a single positive control with the test unit turned "on" after aerosolization. All trials were performed with chamber mixing fans "on" during the entirety of the trial. Results show a sharp drop in the particle number concentration with the M40 in operation (note the log scale of the y-axis). Figure 11 (left) shows the net log reduction for the unit and control trial, while Figure 11 (right) shows the LOG reduction for 0.5, 1.0, 2.0 and 4.0  $\mu$ m PSL microspheres.



Biologi	cal Test Mat	rix								
Trial	Run	Pathogenic Organism	Surrogate Species (gram, description)	ATCC Ref	Target Monodispersed Particle Size	Challenge Conc. (#/L)	Trial Time (min)	Sample Time (min)	Sampling	Plating and Enumeration
1	Control								ADG A	
2	Challenge	Patnogenic E.	Eschericia Coli	15597	2.5-3.0um	$10^4 - 10^6$	30	0, 10, 20, 30	APS, Impingers,	all samples in
3	Challenge	cou sp.	(-, vegetative)						viable Cascade	unplicate
4	Control	Mathiaillin								
6	Challenge	resistant	Stanhylococcus Enidermidis						APS Impingers	all samples in
7	Challenge	stanhylococcus	(+ vegetative)	12228	2.5-3.0um	$10^4 - 10^6$	30	0, 10, 20, 30	Viable Cascade	triplicate
8	Challenge	aureus	(1, regenitre)						Theore Cabeade	unpiloute
9	Control	Influenza,								
10	Challenge	(tentative	MS2 bacteriophage	15507 D1	.1.0	104 106	20	0 10 20 20	ADC Incharge	all samples in
11	Challenge	surrogate for	(E. coli phage)	1009/-B1	15597-B1 <1.0um	10'-10"	- 50	0, 10, 20, 30	APS, impiligers	triplicate
12	Challenge	Sars-cov2)								
13	Control									
14	Challenge	Herpes simplex	Phi X 174	13706-B1	<1.0um	$10^4 \ 10^6$	30	0 10 20 30	APS Impingers	all samples in
15	Challenge	and Smallpox	(E. coli phage)	15/00 11	<1.0um	10-10	50	0, 10, 20, 50	ru o, impiligero	triplicate
16	Challenge									
17	Control									
18	Challenge	Toxic Black	Aspergillus brasiliensis	16404	<5.0um	$10^4 - 10^6$	30	0, 10, 20, 30	APS, Impingers,	all samples in
19	Challenge	Molds (spore)	(mold, spore forming)						Viable Cascade	triplicate
20	Challenge	a 1100 11 0								
21	Control	C. difficile &								
22	Challenge	Bacillus	Bacuus subtilis endospore	49760	<3.5 um	$10^4 - 10^6$	30	0, 10, 20, 30	APS, Impingers	all samples in
23	Unallenge	aninracis	(Baculus Spores)		1		1	1		Implicate

Table 1: Phase I Test Matrix for the M40 air purification system.

#### Phase I Methods: Bioaerosol Efficacy Testing

#### Method Controls:

To accurately assess the M40 unit, test chamber pilot control trials were performed with all organisms over a 60minute time period to characterize the biological challenge aerosol delivery/collection efficiency, and viable concentration over time. Control testing was performed to provide baseline comparative data in order to assess the actual reduction from the M40 challenge testing and verify that viable bioaerosol concentrations persisted above the required concentrations over the entire pilot control test period. During control runs, two low velocity fans located in the corners of the bioaerosol test chamber was turned on for the duration of trial to ensure a homogenous aerosol concentration within the aerosol chamber. The mixing fan was used for all control runs and was turned off during M40 decontamination trials. The two impingers used for bioaerosol collection were pooled and mixed prior to plating and enumeration. A complete test matrix for Phase I bioaerosol trials can be found in Table I above.

#### Methods: M40 Testing

For each control and challenge test, the Collison nebulizer was filled with approximately 40 mL of biological stock and operated at 40 psi for a period of 20 minutes. Then, the impingers were filled with 20 mL of sterilized PBS with an addition of 0.005% v/v Tween 80 for bioaerosol collection. The addition of Tween 80 was used in order to increase the impinger collection efficiency and de-agglomeration of all microorganisms. The chamber mixing fan was turned on during bioaerosol dissemination to assure a homogeneous

bioaerosol concentration in the test chamber prior to taking the first impinger sample (T=0).

Following bioaerosol generation, baseline bioaerosol concentrations were established for each pilot control and M40 test by sampling simultaneously with two AGI-30 impingers located at opposite corners of the chamber. AGI samples were collected for 2 to 10 minutes at intervals of 10 or 30 minutes throughout the entire test period.

Collected impinger chamber samples were pooled and mixed at each sample interval for each test. Aliquots of impinger samples were collected and then used for plating. Impingers were rinsed 6x with sterile filtered water between each sampling interval, and re-filled with sterile PBS using sterile graduated pipettes for sample collection.

For M40 biological testing, the unit was turned on immediately following a time 0 baseline sample and operated for the entirety of the test. Subsequent impinger samples were taken at various time points throughout the trial. These samples were enumerated for viable concentration to measure the effective viable bioaerosol reduction during operation of the M40 device over time.

All samples were plated in triplicate on tryptic soy agar media over a minimum 3 log dilution range. Plates were incubated for 24-48 hours and enumerated for viable plaque forming units (pfu) or colony forming units (cfu) to calculate aerosol challenge concentrations in the chamber and reduction of viable microorganisms.



Figure 12: Phase I Net LOG Reduction for the M40.

#### Phase I Results – High Speed

Phase I of this study was performed to evaluate the M40 device efficacy at reduction of bioaerosols in a controlled room. Reduction of viable bioaerosols by a net 4 logs or 99.99% is the minimum requirement for FDA approved use. The species of organisms used were chosen specifically for their ability at gauging device efficacy against the most common encountered organisms.

When tested against the MS2 bacteriophage, the device showed a net log reduction of 5.26 + - 0.22 in 30 minutes. When tested against Phi X 174 the device achieved a net log reduction of 5.07 + - 0.27 in 30 minutes. When tested against

Staphylococcus epidermidis the device reached a net log reduction of 5.13 +/- 0.11 in 30 minutes. The other bacterial species tested *Escherichia coli* reached 5.23 +/- 0.16 in 30 minutes. The *Aspergillus brasiliensis* spores showed an average net reduction of 4.15 +/- 0.04 net logs in 30 minutes. The bacterial endospore from *Bacillus subtilis* reached a net log reduction of 4.15 +/- 0.13 net log in 30 minutes. Net log reduction data can be found above in Figure 12 and Table 2.

#### Phase I Conclusion

Overall, the Speed 3 yielded consistent reduction throughout, reaching a net 4 log reduction for all species. The duration of time needed to reach a net 4 log reduction was 30 minutes for all species.

Bioaerosol Type	Species (gram, description)	Number of Trials	Total Trial Time(minutes)	Data Type	Trial 1	Trial 2	Trial 3	Average	
Virus	MS2 bacteriophage			Net Log Reduction	-5.30	-5.46	-5.02	-5.26+/-0.22	
	(RNA E. coli phage Sars-CoV2 surrogate)	3	30	Net % Reduction	99.9995%	99.9997%	99.9991%	99.9994% +/- 0.0003%	
Maria	Phi X 174 bacteriophage	3	20	Net Log Reduction	-5.19	-5.26	-4.77	-5.07+/-0.27	
virus	(DNA E. coli phage)		30	Net % Reduction	99.9994%	99.9994%	99.9983%	99.999% +/- 0.0006%	
Pactorial	Staphylococcus Epidermidis	3	3 30	20	Net Log Reduction	-5.23	-5.14	-5.02	-5.13+/-0.11
Bacterial	(+, vegetative)		30	Net % Reduction	99.9994%	99.9993%	99.9990%	99.9992% +/- 0.0002%	
Destarial	Escherichia coli	2	20	Net Log Reduction	-5.41	-5.18	-5.09	-5.23+/-0.16	
Bacterial	(-, vegetative)	3	30	Net % Reduction	99.9996%	99.9993%	99.9992%	99.9994% +/- 0.0002%	
Destarial	Bacillus subtilis	2	20	Net Log Reduction	-4.08	-4.05	-4.14	-4.09+/-0.04	
Bacterial	(vegetative, spore forming)	3	30	Net % Reduction	99.9917%	99.9912%	99.9928%	99.9919% +/- 0.0008%	
Mold	Aspergillus brasiliensis	2	20	Net Log Reduction	-4.29	-4.13	-4.04	-4.15+/-0.127	
IVIOIO	(mold, spore forming)	3	30	Net % Reduction	99.9949%	99.9926%	99.9908%	99.9928% +/- 0.002%	

Average % NET Reduction and NET LOG Reduction of Viable BioAerosols

Table 2: Phase I Executive Summary



**Biological Test Matrix** 

Trial	Run	Fan Setting	Pathogenic Organism	Surrogate Species (gram, description)	ATCC Ref	Target Monodisperse d Particle Size	Challenge Conc. (#/L)	Trial Time (min)	Sample Time (min)	Sampling	Plating and Enumeration
1	Challenge		Influenza, (tentative surrogate	MS2 bacteriophage			4 6				all samples in
2	Challenge	Speed 1	for $Sars-cov^2$ )	(F coli nhage)	15597-B1	<1.0um	$10^{4}-10^{6}$	90	0, 30, 60, 90	APS, Impingers	triplicate
3	Challenge		101 54/3 2012 )	(E. con phage)							unpheate
4	Challenge			Descillere en heilig							-11
5	Challenge	Speed 1	C. afficile & Bacillus	Baculus subtilis	49760	<3.5 um	$10^4 - 10^6$	90	0, 30, 60, 90	APS, Impingers	triplicate
6	Challenge	-	anthracis (spore)	enaospore							

Table 3: Phase II Test Matrix for Multi-speed bioaerosol testing.

#### **Phase II Methods: Bioaerosol Efficacy Testing**

The second part of this study used the same methods as the first with the exception of the device fan speed setting being different. For the 'Speed 1' testing, a net 4 log reduction was reached in a longer amount of time probably due to the decreased rate of filtration by the device. The more air being pulled through the device the faster the air in the chamber is being cleared of bioaerosol and particulates. The test matrix for Phase II is picture above in Table 3.

#### Phase II Results- Speed 1

Phase II of this study was designed to test the efficacy of the device at different fan speeds. The device had a total of two speeds tested with two of the test organisms. MS2 and *Bacillus subtilis* endospores were chosen for the multi speed tests for their resilience to natural decay. Testing with hardier organisms was crucial in determining efficacy.

The MS2 bacteriophage tested on Speed 1 was observed to have a net reduction of 5.29 +/- 0.13 logs in 90 minutes.

Bacillus subtilis spores tested on Speed 1 were observed to have a net reduction of 4.37 +/- 0.11 logs after 90 minutes. When the device was tested with inert particles ranging from 0.5 to 4.0  $\mu$ m on Speed 1 there was a reduction of over 4 net log in 45 minutes. The results for inert particle reduction testing can be found in Figure 13 below.

Similar reductions across all fan speeds demonstrated a robust performance of the M40 device. Net log and net percent reductions are shown in Table 4 and Figure 14 on the following page.

#### Phase II Conclusion:

Phase II demonstrated consistent results achieving a net 4 log reduction of the two selected species of microorganisms. Speed 1 yielded an average reduction of net 4 log reduction in only 90 minutes. The effectiveness of the M40 device at two of the operating speeds was key to demonstrating the device's efficacy.



**Figure 13:** PSL Microspheres Chamber Trials for the Control and M40 Device at High Speed. First figure (Left) shows the net log reduction of four different inert particles normalized to 100% for T=0 sample for both control and M40 trials. Second figure (Right) show the log reduction of inert particles by the M40 unit.

Average % NET Reduction and NET LOG Reduction of Viable BioAerosols

Device Setting	Species (gram, description)	Number of Trials	Total Trial Time(minutes)	Data Type	Trial 1	Trial 2	Trial 3	Average
Speed 1	<i>MS2 bacteriophage</i> (DNA E. coli phage)	3	90	Net Log Reduction Net % Reduction	-5.41 99.9996%	-5.28 99.9995%	-5.16 99.999%	-5.29+/-0.13 99.9995% +/- 0.0002%
Speed 1	Bacillus subtilis (vegetative, spore forming)	3	90	Net Log Reduction Net % Reduction	-4.28 99.995%	-4.35 99.996%	-4.49 99.997%	-4.37+/-0.11 99.9957% +/- 0.001%

Table 4: Phase II Executive Summary Triplicate net reduction data from each trial performed

#### **Deviations and Data Analysis:**

No deviations from the protocol were noted throughout the trials.

Because of the nature of the data and the normal variation, there was no need to perform statistical analyses. All results were  $\leq 0.30$  standard deviations from the mean.

In accordance with ARE Labs standard practice and in compliance with GLPs, all data were verified for accuracy.

#### **Overall Study Summary:**

In conclusion, the M40 device achieved a net 4 log reduction of all bioaerosols within a relatively short period of time. The device proved to be highly effective in reducing the aerosol bioburden of a broad range of microbial species. It is anticipated that such a reduction should reduce the likelihood of individuals contracting airborne infectious diseases in any enclosed environment, medical or otherwise.

## M40 Low Speed vs. High Speed Trials: Net LOG Reduction Trial Averages





Figure 14: M40 device net log reduction of average triplicate at 'Speed 1' and 'Speed 3' of MS2 and B. subtilis



## References

Feller, W. (1950). An introduction to probability theory and its applications. Wiley.

T. Reponen, K. Willeke, V. Ulevicius et al. *Techniques of Dispersion of Microorganisms in Air.* Aerosol Science and Technology. 27: 1997. pp. 405-421.

Ding and Wing. *Effects of Sampling Time on the Total Recovery rate of AGI-30 Impingers for E. coli*. Aerosol and Air Quality Research, Vol. 1, No. 1, 2001, pp. 31-36.

U.S. Department of Health and Human Services Food and Drug Administration. *Enforcement Policy for Sterilizers, Disinfectant Devices, and Air Purifiers During the Coronavirus Disease 2019 (COVID-19) Public Health Emergency Guidance for Industry and Food and Drug Administration Staff.* March 2009



## **Analytical Testing Facility**

Aerosol Research and Engineering Labs, Inc. 15320 S. Cornice Street Olathe, KS 66062

## Project #

10940.10

## **Study Director**

Jamie Balarashti Aerosol Research and Engineering Laboratories

### **GLP Statement**

We, the undersigned, herby certify that the work described herein was conducted by Aerosol Research and Engineering Laboratories in compliance with FDA Good Laboratory Practices (GLP) as defined in 21 CFR, Part 58.

## **Conflict of Interest Statement**

Aerosol Research and Engineering Laboratories, Inc. have no affiliations with, or involvement in any capacity, with Medify's financial interests such as; membership, employment, stock ownership, or other equity interest.

Study Director:

Jamie Balarashti Study Director ARE Labs Inc.

**Principal Investigator:** 

Sean McLeød Principal Investigator ARE Labs, Inc.

8/9/2021 Date

8/9/2021 Date



# Phase I Additional Figures: Speed 3 LOG and Net LOG Reduction Graphs







## M40 *E. coli* High Speed Trials: Net LOG Reduction







Figure 3A: A.brasiliensis M40 LOG Reduction

## M40 A. brasiliensis High Speed Trials: Net LOG Reduction



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#### Figure 5A: B. subtilis M40 LOG Reduction

## M40 B. subtilis High Speed Trials: Net LOG Reduction





MS2 M40 High Speed Trials: Net LOG Reduction









## M40 PhiX 174 High Speed Trials: LOG Reduction





Figure 10A: Phi X 174 M40 net LOG Reduction





## M40 High Speed *Staph. epi.* Trials: Net LOG Reduction





# Phase II Results: Speed 1 Reduction Graphs by Organism



## MS2 M40 Low Speed Trials: LOG Reduction

MS2 M40 Low Speed Trials: Net LOG Reduction



## M40 B. subtilis Low Speed Trials: LOG



## M40 B. subtilis Low Speed Trials: Net LOG Reduction







## **Phase I Raw Data**



Trial Information	TRIAL LOG REDUCTION RE	SULTS
TEST DATE: Tuesday, July 20, 2021		
TRIAL PERFORMED BY: SMM	0.0	
TRIAL NUMBER: Control		
TEST ORGANSIM: Staph	-05	-0.52
TRIAL NAME ID (GRAPHS/TABLES): Staph		
Device Information	-1.0	
MANUFACTURER: Medify		
UNIT MODEL: M40	-1.5	
FAN SPEED (CFM):		
UNIT SERIAL #:		
FITER ID #:	<b>u</b> -2.0	
FILTER LOT #:	_ 2	
General Testing Conditions	-2.5	
TEST CHAMBER VOLUME (m <sup>3</sup> ):	_	
NEBULIZER CONDITIONS: 16	-3.0	
SAMPLING METHOD: Collison 24-Jet; approx. 20 min neb		
CHAMBER MIXING FAN: Impinger		
TEMP (F): yes	-3.5	
RH (%): 74		
OTHER INSTRUMENTS: 70	-4.0	
TRIAL COMMENTS/NOTES na	0 15	30
na	Time (min)	

BIOAEROSOL Sample ID and Summary Data	<b>S1</b>		<b>S2</b>	<b>S</b> 3
SAMPLING TIME (min)	0	10	20	30
IMPINGER USED (y / n)	У	У	У	У
VIABLE CASCADE USED (y / n)	n	n	n	n
CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air)	1.232E+06	5.920E+05	4.960E+05	3.733E+05
CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)				
IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)				
VIABLE CONSISTENCY CHECKS (% agreement)				
IMP & VIABLE CROSS CHECK (% agreement)				
CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	1.232E+06	5.920E+05	4.960E+05	3.733E+05
RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	48.0519%	40.2597%	30.3030%
RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	51.9481%	59.7403%	69.6970%
LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-0.32	-0.40	-0.52

#### Impinger Sampling Conditions

	SAMPLING TIME (min)	0		20	30
	IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	2.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-3	-3	-3	-3
	DROPLET SIZE (µl)	100	100	100	100
; #1		160	190	150	117
ange	ENTIMED ATED DI ATE COUNTS (# / drop)	155	180	155	124
n R		147	185	160	109
lutio					
Di	PLATE AVERAGE COUNT (# / drop)	154.00	185.00	155.00	116.67
	IMPINGER CONCENTRATION (cfu or pfu/ml)	1,540,000	1,850,000	1,550,000	1,166,667
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	1.23E+06	5.92E+05	4.96E+05	3.73E+05

Figure 1B: S. epidermidis Control



Trial Information		TRIAL LOG R	EDUCTION RI	ESULTS
TEST DATE: Tuesday, July 20, 2021				
TRIAL PERFORMED BY: SMM	0.0 💂			
TRIAL NUMBER: T1				
TEST ORGANSIM: Staph				
TRIAL NAME ID (GRAPHS/TABLES): Staph	-1.0			
Device Information	-2.0	26		
MANUFACTURER: Medify		X		
UNIT MODEL: M40				
FAN SPEED (CFM):	-3.0			
UNIT SERIAL #:	g			
FITER ID #:	5			
FILTER LOT #:	<mark>-4.0</mark>			– •– Linear
General Testing Conditions (Can Be User Defined)				Fit
TEST CHAMBER VOLUME (m <sup>3</sup> ): 16	-5.0			
NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb				-5.75
SAMPLING METHOD: Impinger				
CHAMBER MIXING FAN: yes	-6.0			
TEMP (F): 74				
RH (%): 70	-7.0			
OTHER INSTRUMENTS: na	0	10	20	30
TRIAL COMMENTS/NOTES na		т	ime (min)	
RIGAEROSOL Sample ID and Summary Data		\$2	\$3	<b>S</b> 4
	0	10	20	30
IMPINGER USED (v/n)	v	v	<b>2</b> 0 V	v
VIABLE CASCADE USED (y / n)	'n	'n	'n	'n
CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air)	1.280E+06	7.040E+03	8.640E+01	2.276E+00
CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)				
IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)				
VIABLE CONSISTENCY CHECKS (% agreement)				
IMP & VIABLE CROSS CHECK (% agreement)				
CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	1.280E+06	7.040E+03	8.640E+01	2.276E+00
RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	0.5500%	0.0068%	0.0002%
RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	99.4500%	99.9933%	99.9998%
LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-2.26	-4.17	-5.75
Impireur Sempling Conditions				
Impinger Sampling Conditions	•	10		

	SAMPLE TIME (min)	0	10	20	30
	IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-4	-2	0	0
	DROPLET SIZE (µl)	100	100	100	750
1# 0		18	24	29	3
ange	ENHMED ATED DI ATE COUNTS (# / drop)	24	24	23	7
n R:	ENUMERATED PLATE COUNTS (#7 drop)	30	18	29	6
lutio					
Di	PLATE AVERAGE COUNT (# / drop)	24.00	22.00	27.00	5.33
	IMPINGER CONCENTRATION (cfu or pfu/ml)	2,400,000	22,000	270	7
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	1.28E+06	7.04E+03	8.64E+01	2.28E+00
		· /· / ·· 14			

Figure 2B: S. epidermidis Trial 1



Trial Information		TRIAL LOG	REDUCTION	RESULTS
TEST DATE: Tuesday, July 20, 2021				
TRIAL PERFORMED BY: SMM	0.0			
TRIAL NUMBER: T1				
TEST ORGANSIM: Staph				
TRIAL NAME ID (GRAPHS/TABLES): Staph	-1.0			
	1			
Device Information	-2.0	20	)2	
MANUFACTURER: Medify	-2.0	Ĩ		
UNIT MODEL: M40	i			
FAN SPEED (CFM):	-3.0			
UNIT SERIAL #:	Rec			
FITER ID #:	v v v v v v v v v v v v v v v v v v v		3.93	
FILTER LOT #:	-4.0		Ň	-o- Linear
				Fit
General Testing Conditions (Can Be User Defined)	- 50			
TEST CHAMBER VOLUME (m <sup>3</sup> ): 16	-5.0			
NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb				-5.66
SAMPLING METHOD: Impinger	-6.0			
CHAMBER MIXING FAN: yes				
TEMP (F): 74				
RH (%): 70	-7.0			
OTHER INSTRUMENTS: na	C	0 10	) 20	30
TRIAL COMMENTS/NOTES na	•		Time (min)	
RIGAEROSOL Sample ID and Summary Data	<b>§</b> 1	\$2	53	S4
	171	52		54
SAMPLE TIME (mm)	0	10	20	30
SAMPLE 11ME (mn)	0	10	20	30
SAMPLE TIME (mm) IMPINGER USED (y / n) VIABLE CASCADE LISED (y / n)	0 y	<b>10</b> У	<b>20</b> y	<b>30</b> y
SAMPLE TIME (mm) IMPINGER USED (y / n) VIABLE CASCADE USED (y / n)	0 y n	<b>10</b> y n	<b>20</b> y n	<b>30</b> y n
SAMPLE TIME (mm) IMPINGER USED (y / n) VIABLE CASCADE USED (y / n) CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air) CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu pr pfu/L Air)	<b>0</b> y n 1.689E+06	<b>10</b> y n 3 1.600E+04	<b>20</b> y n 2.005E+02	<b>30</b> y n 3.698E+00
SAMPLE TIME (mm) IMPINGER USED (y / n) VIABLE CASCADE USED (y / n) CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air) CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) DIDINCER DIL LITION CONSISTENCY CUECKS (% concernent)	<b>0</b> y n 1.689E+06	<b>10</b> y n 5 1.600E+04	<b>20</b> y n 2.005E+02	<b>30</b> y n 3.698E+00
SAMPLE TIME (mm) IMPINGER USED (y / n) VIABLE CASCADE USED (y / n) CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air) CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) IMPINGER DILUTION CONSISTENCY CHECKS (% agreement) VIABLE CONSISTENCY CHECKS (% agreement)	<b>0</b> y n 1.689E+06	<b>10</b> y n 5 1.600E+04	<b>20</b> y n 2.005E+02	<b>30</b> y n 3.698E+00
SAMPLE TIME (mm) IMPINGER USED (y / n) VIABLE CASCADE USED (y / n) CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air) CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) IMPINGER DILUTION CONSISTENCY CHECKS (% agreement) VIABLE CONSISTENCY CHECKS (% agreement)	<b>0</b> y n 1.689E+06	<b>10</b> y n 5 1.600E+04	20 y n 2.005E+02	<b>30</b> y n 3.698E+00
SAMPLE TIME (mm), IMPINGER USED (y / n) VIABLE CASCADE USED (y / n) CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air) CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) IMPINGER DILUTION CONSISTENCY CHECKS (% agreement) VIABLE CONSISTENCY CHECKS (% agreement) IMP & VIABLE CROSS CHECK (% agreement)	0 y n 1.689E+06	<b>10</b> y n 5 1.600E+04	20 y n 2.005E+02	<b>30</b> y n 3.698E+00
SAMPLE TIME (mm), IMPINGER USED (y / n) VIABLE CASCADE USED (y / n) CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air) CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) IMPINGER DILUTION CONSISTENCY CHECKS (% agreement) VIABLE CONSISTENCY CHECKS (% agreement) IMP & VIABLE CROSS CHECK (% agreement) IMP & VIABLE CROSS CHECK (% agreement) CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	0 y n 1.689E+06	10 y n 5 1.600E+04	20 y n 2.005E+02 2.005E+02	30 y n 3.698E+00 3.698E+00
SAMPLE IIME (mm), IMPINGER USED (y / n) VIABLE CASCADE USED (y / n) CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air) CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) IMPINGER DILUTION CONSISTENCY CHECKS (% agreement) VIABLE CONSISTENCY CHECKS (% agreement) IMP & VIABLE CROSS CHECK (% agreement) IMP & VIABLE CROSS CHECK (% agreement) CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) RELATIVE PERCENT REMAINING FROM T=0 (%)	0 y n 1.689E+06 1.689E+06	10 y n 5 1.600E+04 5 1.600E+04 6 0.9474%	20 y n 2.005E+02 2.005E+02 0.0119%	30 y n 3.698E+00 0.0002%
SAMPLE IIME (mm), IMPINGER USED (y / n) VIABLE CASCADE USED (y / n) CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air) CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) IMPINGER DILUTION CONSISTENCY CHECKS (% agreement) VIABLE CONSISTENCY CHECKS (% agreement) IMP & VIABLE CROSS CHECK (% agreement) IMP & VIABLE CROSS CHECK (% agreement) CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) RELATIVE PERCENT REMAINING FROM T=0 (%) RELATIVE PERCENT REMOVAL FROM T=0 (%)	0 y n 1.689E+06 100.0000% 0.0000%	10 y n 5 1.600E+04 5 1.600E+04 6 0.9474% 99.0526%	20 y n 2.005E+02 0.0119% 99.9881%	30 y n 3.698E+00 0.0002% 99.9998%
SAMPLE IIME (mm), IMPINGER USED (y / n) VIABLE CASCADE USED (y / n) CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air) CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) IMPINGER DILUTION CONSISTENCY CHECKS (% agreement) VIABLE CONSISTENCY CHECKS (% agreement) IMP & VIABLE CROSS CHECK (% agreement) IMP & VIABLE CROSS CHECK (% agreement) CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) RELATIVE PERCENT REMAINING FROM T=0 (%) RELATIVE PERCENT REMOVAL FROM T=0 (log <sub>10</sub> )	0 y n 1.689E+06 100.000% 0.000% 0.00	10 y n 5 1.600E+04 5 1.600E+04 6 0.9474% 99.0526% -2.02	20 y n 2.005E+02 2.005E+02 0.0119% 99.9881% -3.93	30 y n 3.698E+00 0.0002% 99.9998% -5.66
IMPLE IIME (mm), IMPINGER USED (y / n) VIABLE CASCADE USED (y / n) CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air) CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) IMPINGER DILUTION CONSISTENCY CHECKS (% agreement) VIABLE CONSISTENCY CHECKS (% agreement) IMP & VIABLE CROSS CHECK (% agreement) IMP & VIABLE CROSS CHECK (% agreement) CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) RELATIVE PERCENT REMAINING FROM T=0 (%) LOG REDUCTION FROM T=0 (log <sub>10</sub> ) Impinger Sampling Conditions	0 y n 1.689E+06 100.0000% 0.0000% 0.000	10 y n 5 1.600E+04 5 1.600E+04 6 0.9474% 99.0526% -2.02	20 y n 2.005E+02 2.005E+02 0.0119% 99.9881% -3.93	30 y n 3.698E+00 0.0002% 99.9998% -5.66
IMPLE IIME (mm), IMPINGER USED (y / n) VIABLE CASCADE USED (y / n) CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) IMPINGER DILUTION CONSISTENCY CHECKS (% agreement) VIABLE CONSISTENCY CHECKS (% agreement) IMP & VIABLE CROSS CHECK (% agreement) IMP & VIABLE CROSS CHECK (% agreement) CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) RELATIVE PERCENT REMAINING FROM T=0 (%) LOG REDUCTION FROM T=0 (log <sub>10</sub> ) Impinger Sampling Conditions	0 y n 1.689E+06 100.0000% 0.0000% 0.000	10 y n 5 1.600E+04 5 1.600E+04 6 0.9474% 99.0526% -2.02 10	20 y n 2.005E+02 0.0119% 99.9881% -3.93	30 y n 3.698E+00 0.0002% 99.9998% -5.66 30

	SAMPLE TIME (min)	0	10	20	30
	IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-4	-2	0	0
	DROPLET SIZE (µl)	100	100	100	750
1#1		36	52	56	11
ange	ENUMERATED PLATE COUNTS (# / drop)	25	43	64	10
n R:		34	55	68	5
lutio					
Di	PLATE AVERAGE COUNT (# / drop)	31.67	50.00	62.67	8.67
	IMPINGER CONCENTRATION (cfu or pfu/ml)	3,166,667	50,000	627	12
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	1.69E+06	1.60E+04	2.01E+02	3.70E+00
	Eigene 2D. S. still	: J: . T: . 1. 2			

Figure 3B: S. epidermidis Trial 2



Trial Information		TRIAL LOG R	EDUCTION R	ESULTS
TEST DATE: Tuesday, July 20, 2021				
TRIAL PERFORMED BY: SMM	0.0 💂			
TRIAL NUMBER: T1				
TEST ORGANSIM: Staph				
TRIAL NAME ID (GRAPHS/TABLES): Staph	-1.0			
Device Information				
MANUFACTURER: Medify	<del>_</del> -2.0			
UNIT MODEL: M40	tio			
FAN SPEED (CFM):				
UNIT SERIAL #:	<b>ü</b>			Staph
FITER ID #:	2.0			
FILTER LOT #:			86	-O- Linear
General Testing Conditions (Can Be User Defined)	-4.0			Fit
TEST CHAMBER VOLUME (m <sup>3</sup> ): 16				
NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb				
SAMPLING METHOD: Impinger	-5.0			
CHAMBER MIXING FAN: yes				5.54
<b>TEMP</b> (F): 74				8
RH (%): 70	-6.0			
OTHER INSTRUMENTS: na	0	10	20	30
TRIAL COMMENTS/NOTES na		-	Time (min)	
BIOAEROSOL Sample ID and Summary Data	<u>S1</u>	<u>\$2</u>	<u>S3</u>	<u>S4</u>
SAMPLE TIME (min)	0	10	20	30
IMPINGER USED (y / n)	У	У	У	У
VIABLE CASCADE USED (y / n)	n	n	n	n
CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air)	1.476E+06	1.323E+04	2.059E+02	4.267E+00
CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)				
IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)				
VIABLE CONSISTENCY CHECKS (% agreement)				
IMP & VIABLE CROSS CHECK (% agreement)				
CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	1.476E+06	1.323E+04	2.059E+02	4.267E+00
RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	0.8964%	0.0140%	0.0003%
RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	99.1036%	99.9860%	99.9997%
LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-2.05	-3.86	-5.54
Impinger Sampling Conditions				

SAMPLE TIME (min)	0	10	20	30
IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0
IMPINGER SAMPLING TIME (min)	3.0	5.0	5.0	5.0
IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
DILUTION RATIO (10 <sup>x</sup> )	-4	-2	0	0
DROPLET SIZE (µl)	100	100	100	750
	28	48	76	11
ENHIMED ATED DI ATE COUNTS (# / drop)	25	42	60	11
ENOMERATED FLATE COOLITS (# / diop)	30	34	57	8
PLATE AVERAGE COUNT (# / drop)	27.67	41.33	64.33	10.00
IMPINGER CONCENTRATION (cfu or pfu/ml)	2,766,667	41,333	643	13
CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	1.48E+06	1.32E+04	2.06E+02	4.27E+00
	SAMPLE TIME (min) IMPINGER FILL VOL (ml) IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (pm) DILUTION RATIO (10 <sup>×</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	SAMPLE TIME (min) 0 IMPINGER FILL VOL (m) 20.0 IMPINGER SAMPLING TIME (min) 3.0 IMPINGER FLOW RATE (m) 12.5 DILUTION RATIO (10 <sup>x</sup> ) -4 DROPLET SIZE (µ) 100 28 28 25 30 PLATE AVERAGE COUNT (# / drop) 30 PLATE AVERAGE COUNT (# / drop) 27.67 IMPINGER CONCENTRATION (cfu or pfu/m) 2,766,667 1.48E+06	SAMPLE TIME (min)         0         10           IMPINGER FILL VOL (ml)         20.0         20.0           IMPINGER SAMPLING TIME (min)         3.0         5.0           IMPINGER FLOW RATE (pm)         12.5         12.5           DILUTION RATIO (10 <sup>N</sup> )         -4         -2           DROPLET SIZE (µl)         100         100           ENUMERATED PLATE COUNTS (#/ drop)         28         48           25         42         30         34           PLATE AVERAGE COUNT (#/ drop)         27.67         41.33         148           IMPINGER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)         1.488+06         1.32E+04	SAMPLE TIME (min)         0         10         20           IMPINGER FILL VOL (m)         20.0         20.0         20.0           IMPINGER SAMPLING TIME (min)         3.0         5.0         5.0           IMPINGER FLOW RATE (hpm)         12.5         12.5         12.5           DILUTION RATIO (10 <sup>x</sup> )         -4         -2         0           DROPLET SIZE (µt)         100         100         100           ENUMERATED PLATE COUNTS (# / drop)         28         48         76           25         422         60         30         34         57           PLATE AVERAGE COUNT (# / drop)         27.67         41.33         64.33         643           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/m)         1.48E+06         1.32E+04         2.06E+02

Figure 4B: S. epidermidis Trial 3



THE FORME PROVING PLANE           THAL INMUSE: Correl           THAL INMUSE: Correl           THAL INMUSE: Correl           Device Information           MARUER/CLARES. Local           Device Information           MARUER/CLARES. Local           Device Information           MARUER/CLARES. Local           Device Information           MARUER/CLARES. Local           Conditions (Can Be User Defined)           TIST CLAMERE WOLME (a): 16           TERM (P) ?4           TERM (P) ?4 <th>Trial</th> <th>Information</th> <th></th> <th>TRIAL LOG R</th> <th>EDUCTION RI</th> <th>ESULTS</th>	Trial	Information		TRIAL LOG R	EDUCTION RI	ESULTS		
TRAL PERFORMED BY 5 MM           TRAL NUMBER Control           TRAL NUMBER Control           TRAL NUMBER Control           Device Information           MANUACTURE: Machine           MANUACTURE: Machine           Ceneral Testing Conditions (Can Be User Defined)           TEST CRAMER VOLUME (m): 16           NIBULIZER CONDITIONS: Collino 24 bit spore. 20 min meb           NIBULIZER CONDITIONS: Collino 24 bit spore. 20 min meb           NIBULIZER CONDITIONS: Collino 24 bit spore. 20 min meb           NIBULIZER CONDITIONS: Collino 24 bit spore. 20 min meb           NIBULIZER CONDITIONS: Collino 24 bit spore. 20 min meb           NIBULIZER CONDITIONS: Collino 24 bit spore. 20 min meb           SAMPLE TIME (m)           O         10         20         30           TIME (COMMENTSNOTES na         51         S2         S3           SAMPLE TIME (m)         0         10         20         30           MINNORER DIL TIME (MSR DIL CONCENTRATION CRAMER)         7         7         7           MINNORER DIL TIME (MSR DIL CONCENTRATION CRAMER)         7         7         7           MINNORER DIL TIME (MSR DIL CONCENTRATION CRAS (S sporeer)         7         7         7           MINNORER DIL TIME (MSR DIL CONCENTRATION CRAS (S sporeer)         7         7		TEST DATE: Friday, July 16, 2021			E.coli			
TRIAL NUMBER: Control           TRIAL NUMBER: Control           TRIAL NUMBER: Control           TRIAL NUMEER: Control           Device Information           MANUMER: Control           MANUMER: Control           MANUMER: Control           TRIAL NUMEER: Control           TRIAL NUMEER: Control           TRIAL NUMEER: Control           TRIAL Control           TRIAL Control           TRIAL Control           TRIAL Control           TRIAL CONSTITUTION: Collision 24-de: approx. 20 min neb           SamMPLING INFO Control           TRIAL CONSTITUTION: Collision 24-de: approx. 20 min neb           SamMPLING INFO Control           TRIAL CONSTITUTION: Collision 24-de: approx. 20 min neb           SamMPLING CONSTIT		TRIAL PERFORMED BY: SMM	0.0 🥄					
TEST OR ANSINE E. coli           Produit ANSEED (GRAVINS / ALLES): E. coli           Device Information           MANUMECTORER: Media/ UNITY SOBILL // ENN SPEED (CTM): UNITY SOBILL // ENN SPEED (CTM): UNITY SOBILL // ENN SPEED (CTM): ENN SPEED (		TRIAL NUMBER: Control						
TRAL NAME ID CREAPEST FARESS E.coll           Device Information         0.0           Device Information         0.0           EVEN DEPERTIENT         0.0           FAN SPEED (CMB)         0.0           UNIT SERUAL #: TITER D #: TITER D #: TITER CONTINUES (Clinol 32-st; approx 20 min neb SAMPLINO METHOD: Impings & Cascade CHAMBER MINIOG FAN (%)         51         S2         S3           EDOAEROSOL Sample ID and Summary Data         S1         S2         S3           EDOAEROSOL Sample ID and Summary Data         S1         S2         S3           EDOAEROSOL Sample ID and Summary Data         S1         S2         S3           CHAMBER MINIOR BRIDDOR DOCONCONCENTRATION (dia pripin), MINIOR BRIDDOR DOCONCENTRATION (dia pripin), MINIOR BRI		TEST ORGANSIM: E.coli		-0.14	_			
Device Information         0.2 <th0.2< th="">         0.2         <th0.2< th=""></th0.2<></th0.2<>	TRI	AL NAME ID (GRAPHS/TABLES): E.coli						
Device Information         April           INVEXTURE: Medity         UNIT MOBE: Medity           UNIT MOBE: Medity         UNIT MOBE: Medity           UNIT MOBE: Medity         UNIT MOBE: Medity           UNIT MOBE: Medity         INVESTIGATION (Selicion 24 det approx. 20 min meb           SAMPLING METHOD: implight 6 (acade CHAMBER MUNING F.M. 19         -03           OTHER INSTRUMENTS: me         -03           TEMP (P): 7         81           MUNING COMMITING: majorities (Calcular 24 det approx. 20 min meb           SAMPLING METHOD: implight 6 (acade CHAMBER MUNING F.M. 19           OTHER INSTRUMENTS: me           TEMAL COMMITINES (Calcular 24 det approx. 20 min meb           SAMPLE: TIME (me)           OTHER INSTRUMENTS: me           TEMAL COMMISTINES (Calcular 24 det approx. 20 min meb           SAMPLE: TIME (me)           OTHER INSTRUMENTS: me           TEMAL COMMISTINES (Calcular 24 det approx. 20 min meb           SAMPLE: TIME (me)           OTHER INSTRUMENTS: me           TEMAL COMMISTINES (Calcular 24 det approx. 20 min meb           SAMPLE: TIME (me)           OTHER INSTRUMENTS: me           TEMAL COMMISTINES (CALCULAR CALCULAR DE MED (me)           MEMORER BORDOARDOSOL: CONCENTRATION (due ry fidd. MD)           MEMORER BORDOARDOSOL: CONCENTRATION (due ry fidd. MD)			-0.2					
MANUFERCTURER: Modify EAX SPEED (CFM) UNIT SERUAL #; HTTER ID #; HT	Devi	ce Information				-0.29		
UNIT MODEL MAG         UNIT MODEL MAG           UNIT SPERAL #: FITER DATA         FITER DATA           General Testing Conditions (Can Be User Defined)		MANUFACTURER: Medify	_					
FAX MPED (CM) HITTS NUM.4.# HITTS: D0 # HITTS: D0 # HIT		UNIT MODEL: M40	.04					
China Standard, F FITER ID 0: FLITER LOT #         F FILTER LOT #           General Testing Conditions (Can Be User Defined) ITEST CHAMBER VOLUME (m): 16 NEBALLIZER CONDITIONS: Colliso 24-84; approx. 20 min neb SAMPLET MR (M): 70 (CHAMBER MINNOR SCHER)		FAN SPEED (CFM):						
HILES D.F.#         9         0 <th< td=""><th></th><td>UNIT SERIAL #:</td><td>See 1</td><td></td><td></td><td></td></th<>		UNIT SERIAL #:	See 1					
Instructure           General Testing Colabions (Can Be User Defined)           TIST CHAMBER VOLUNE (m): 10         10         0         0         30         20         30           TIST CHAMBER VOLUNE (m): 10         SAMPLING METHOD impinger & Cascade         0         30         20         30           CHAMBER MINING FAX: yes         TRIM (%): 70         Trime (min)         0         10         20         30           BIOAEROSOL Sample ID and Summary Data         SI         S2         S3         0         10         20         30           BIOAEROSOL Sample ID and Summary Data         SI         S2         S3         0         10         20         30           BIOAEROSOL Sample ID and Summary Data         SI         S2         S3         0         10         20         30           UNABLE CONSCIENCY CHECKS (% agreement)         VABLE CONSCIENCY CHECKS (% agreement)         N # A VABLE CONSCIENCY CHECKS (% agreement)         4.053E+01		FILER ID #:	8					
General Testing Conditions (Can Be User Defined) TSTCTCHAMBER VOLUME (m): 16 NYBBLIZER CONTINUATES (clians 24-bit: approx. 20 min mb SAMPLEM METHOD: impinger & Cascade CHAMBER MIXING FAN: yes TRUE (v): 70 TRUE (v): 70 TRUE (v): 70 TRUE COMMINISTS rea TRUE COMMENSIONER v: TRUE TRUE TRUE TRUE TRUE TRUE TRUE TRUE		FILTER LOT #.	-0.6					
CHAMBER VOLUME ID/ ITST (CHAMBER VOLUME (m): 10         DO COLO VIEWS/ ISO (MARCH MARCH	Gen	eral Testing Conditions (Can Be User Defined)						
NBBUILZER CONDITIONS:         Collision 24-jet, approx. 20 min reb SAMPLIN METHOD: impinger & Cascade           CHAMBER MINING METHOD:         TEMP (P) 74 RF (%) 70 TEMP (P) 74 RF (%) 70         a         10         20         30           BIOAEROSOL Sample ID and Summary Data         S1         S2         S3         30         y </td <th>Ocin</th> <td>TEST CHAMBER VOLUME (m<sup>3</sup>): 16</td> <td></td> <td></td> <td></td> <td></td>	Ocin	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16						
SAMPLING METHOD: Impinger & Cascade CHAMBER MINNO FAN: yes TENP (P) 74 RH (%); 70 OTHER INSTRUMENTS: na TRIÁL COMMENTS.NOTES na TINIÉ (M); 70 OTHER INSTRUMENTS: na RH (%); 70		NEBULIZER CONDITIONS: Collison 24-let: approx. 20 min neb						
CHAMBER MIXING FAN (vg)           TEMP (F) 7           RI (%): 70           OTHER INSTRUMENTS: na           TRIAL COMMENTS NOTES na           BIOAEROSOL Sample ID and Summary Data         SI         S2         S3           BIOAEROSOL Sample ID and Summary Data         SAMPLE TIME (min)         0         TITIE (min)           BIOAEROSOL Sample ID and Summary Data         S1         S2         S3           TIME (CONCENTRATION (chop find, Arp)         0         TITIE (min)           IMPINGER BIOBIOAEROSOL CONCENTRATION (chop find, Arp)         7.898E-01         5.760E-01         4.693E-01         4.053E-01           MININGER BIOBIOAEROSOL CONCENTRATION (chop find, Arp)         7.898E-01         5.760E-01         4.693E-01         4.053E-01           MININGER BIOBIOAEROSOL CONCENTRATION (chop find, Arp)         7.898E-01         5.760E-01         4.693E-01         4.053E-01           MININGER BIOBIOAEROSOL CONCENTRATION (chop find, Arp)         7.2707%         9.20         2.20      <		SAMPLING METHOD: Impinger & Cascade	-0.8					
NUMBER UPU (P) 74 RH (%) 70 OTHER INSTRUMENTS: en TRIAL COMMENTS: en RIAL RUMERS: RIAL RUMERS: en RIAL RUMERS: RIAL RUMERS: en RIAL RUMERS: RIAL RUMERS: en RIAL RUMERS: RIAL RUMERS: en RIAL RUMERS: RUMERS: RUMERS: RUMERS: en RIAL RUMERS: RUMERS: RUMERS: RUMERS: en RIAL RUMERS: R		CHAMBER MIXING FAN: ves						
International internatinternational international international international i		TEMP (F): 74						
Image: control in the instruments: na instrument in the instruments: na instrument in the instruments: na instrument in		PH (%): 70						
TRIAL COMMENTISMOTES na           TIREAL COMMENTISMOTES na           BIOAEROSOL Sample ID and Summary Data         S1         S2         S3           BIOAEROSOL Sample ID and Summary Data         S1         S2         S3           BIOAEROSOL Sample ID and Summary Data         S1         S2         S3           MPINGER BIOBIOAEROSOL CONCENTRATION (chi or pfil. Ar)         7.8935-601         5.7606-801         4.6935-801           MPINGER BIOBIOAEROSOL CONCENTRATION (chi or pfil. Ar)         7.8935-601         5.7606-801         4.6935-801           MININGER DIUTION CONSISTENCY CHECKS (% agreenery)         VINTURE REGENT REMOVAL FROM T=0 (%)         0.00000%         7.2930%         59.4595%         51.3514%           MININGER DIUTION CONSISTENCY CHECKS (% agreenery)         0.000000%         7.2930%         59.4595%         51.3514%           MININGER BIOBIOAEROSOL CONCENTRATION (chi or pfil. Ar)         7.8935-401         5.7606-901         4.0595%         51.3514% <th colspan="2" mining<="" td=""><th></th><td>OTHER INSTRUMENTS: na</td><td>-1.0</td><td>10</td><td>20</td><td>30</td></th>	<th></th> <td>OTHER INSTRUMENTS: na</td> <td>-1.0</td> <td>10</td> <td>20</td> <td>30</td>			OTHER INSTRUMENTS: na	-1.0	10	20	30
Time (min)           BIOAEEOSOL Sample ID and Summary Data         S.I         S.2         S.3           SAMPLE TIME (min)         0         10         20         30           MENDAGER SIGUESD (r)         y         y         y         y         y         y           CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (clior pfil. Ar)         7.893E+01         5.760E+01         4.693E+01         4.053E+01           CHAMBER VIABLE EDBOAEROSOL CONCENTRATION (clior pfil. Ar)         7.893E+01         5.760E+01         4.693E+01         4.053E+01           IMPINGER BILLITION CONSISTENCY CHECKS (% agreement)         7.893E+01         5.760E+01         4.693E+01         4.053E+01           IMP & VIABLE CONSETTENCY CHECKS (% agreement)         7.893E+01         5.760E+01         4.693E+01         4.053E+01           IMP & VIABLE CONSETTENCY CHECKS (% agreement)         7.893E+01         5.760E+01         4.693E+01         4.053E+01           RELATIVE PERCENT REMONAL FROM T=0 (%)         0.0000         0         0.14         0.23         0.29           Impinger Sampling Conditions         SAMPLE TIME (min)         0         10         20         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0         20.0		TRIAL COMMENTS NOTES	-					
BIOAEROSOL Sample ID and Summary Data         S1         S2         S3           SAMPLE TIME (min) MININGER USED (y' n) VABLE CASCADE USED (y' n) VABLE CASCADE USED (y' n) VABLE CASCADE USED (y' n) N         y <th></th> <th>INIAE COMMENTS/NOTES na</th> <th></th> <th>T</th> <th>'ime (min)</th> <th></th>		INIAE COMMENTS/NOTES na		T	'ime (min)			
LICHE INCODE Comptee to and commany parts         SAMPLE TIME (min) MERNIGER USED (y /n) MERNIGER USED (y /n) N n         O         10         20         30           IMPRINGER USED (y /n) VABLE CASCADE USED (y /n) CHAMBER INDINGER BIOBIOAEROSOL CONCENTRATION (chir pful. LAY)         y <th>BIOA</th> <th>EROSOL Sample ID and Summary Data</th> <th><u>\$1</u></th> <th>\$2</th> <th></th> <th>\$3</th>	BIOA	EROSOL Sample ID and Summary Data	<u>\$1</u>	\$2		\$3		
Implified         Implified <thimplified< th=""> <thimplified< th=""> <th< th=""><th>DIOA</th><th></th><th>0</th><th>10</th><th>20</th><th>30</th></th<></thimplified<></thimplified<>	DIOA		0	10	20	30		
Immediate of the intervence of the interven		IMPINGER LISED (v / n)	U	IU V	20	30		
NUMERATED CONCENTRATION (chi priki Air)         n         <		VIABLE CASCADE USED (y/n)	y	y	y	ý		
Elemental non-involus biologrammed		CHAMPER IMPINGER BIORIGAEROSOL CONCENTRATION (65, 25// Air)	7 9025 101	11 E 760E 101	11	1 0525 101		
VIABLE RUNDIO/LEVOID CONSISTENCY CHECKS (% agreement)           VIABLE CONSISTENCY CHECKS (% agreement)           VIABLE CONSISTENCY CHECKS (% agreement)           CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)         7.833E+01         5.760E+01         4.693E+01         4.053E+01           CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)         7.833E+01         5.760E+01         4.693E+01         4.053E+01           CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)         7.833E+01         5.760E+01         4.693E+01         4.053E+01           CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)         7.833E+01         5.760E+01         4.693E+01         4.053E+01           RELATIVE PERCENT REMOVAL FROM T=0 (%)         0.000%         27.0270%         40.5405%         48.6486%           LOG REDUCTION FROM T=0 (%)         0.00         0.01         20.02         30           MPINGER SAMPLE TIME (min)         0         10         20.0         50.0         50.0         50.0           IMPINGER FILL VOL (min)         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0		CHAMBER INFINIOER BIOBIOAEROSOL CONCENTRATION (clupine All)	7.093E+01	5.760E+01	4.0932+01	4.053E+01		
IMPENDENDIATE CONSISTENCY C TERCE KS (% agreement) IMP & VIABLE CROSS CHECK (% agreement) RELATIVE PERCENT REMAINING (ROM T=0 (%) LOG REDUCTION FROM T=0 (%) LOG REDUCTION REM T=0 (%) LOG REDUCTION RET (%) LOG REDUCTION REM T=0 (%) LOG R		CHANDER VIABLE BIOBIOAEROSOL CONCENTRATION (cit of pluz All)						
NUMBLE CONSISTENCY CHIELES (% agreement)           IMPRAVIABLE CONSISTENCY (% agreement)           CHAMBER BIOBIOAEROSOL CONCENTRATION (chu or pfu/L Air) RELATIVE PERCENT REMAINING FROM T=0 (%) RELATIVE PERCENT REMOVAL FROM T=0 (%) RELATIVE PERCENT REMOVAL FROM T=0 (%) LOG REDUCTION FROM T=0 (%) LOG REDUCTION FROM T=0 (%) D.0000%         57.50E+.01         4.693E+.01         4.053E+.01           RELATIVE PERCENT REMOVAL FROM T=0 (%) LOG REDUCTION FROM T=0 (%) D.0000%         0.0000%         27.0270%         40.5405%         48.6486%           IMPINGE           SAMPLE TIME (min) DI LOG REDUCTION FROM T=0 (%) DI MPINGER FILL VOL (m) 20.0         <		WIADLE CONSISTENCY CHECKS (% agreement)						
Nor & VIABLE CROSS CHEAK (% agreement)           CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) RELATIVE PERCENT REMAINING FROM T=0 (%) LOG REDUCTION FROM T=0 (%) LOG REDUCTION FROM T=0 (%) LOG REDUCTION FROM T=0 (%) LOG REDUCTION FROM T=0 (%) D.000 -0.14 -0.23 -0.29           Impringer Sampling Conditions           SAMPLE TIME (min) DIMPINGER SAMPLE TIME (min)         0         10         20         30           IMPINGE SAMPLE TIME (min) DIMPINGER SAMPLE TIME (min)         0         10         20         30           IMPINGE REAL VOL (m)         0.0         0 <th< th=""><th></th><th>VIABLE CONSISTENCT CHECKS (% agreement)</th><th></th><th></th><th></th><th></th></th<>		VIABLE CONSISTENCT CHECKS (% agreement)						
Mail         Chamber Biolitotacosol. Covices Natation (clic or plot. Law)         7.893 ± 01         4.693 ± 01         4.693 ± 01         4.693 ± 01         4.693 ± 01           Relative PERCENT REMAINING FROM T=0 (%)         0.0000%         72.9730%         59.4595%         51.3514%           Relative PERCENT REMOVAL FROM T=0 (%)         0.0000%         27.9730%         59.4595%         48.6486%           LOG REDUCTION FROM T=0 (0g)         0.00         -0.14         -0.23         -0.29           Impinger Sampling Conditions         SAMPLE TIME (min)         0         10         20         30           IMPINGER FILL VOL (m)         20.0         2	_	IMP & VIABLE CROSS CHECK (% agreement)						
RELATIVE PERCENT REMOVAL FROM 1=0 (%)         100,000%         729/39%         53,3514%         53,3514%           RELATIVE PERCENT REMOVAL FROM 1=0 (%)         0.0000%         27,0270%         40,5405%         48,6486%           LOG REDUCTION FROM 1=0 (%)         0.000         -0.14         -0.23         -0.29           Impinger Sampling Conditions           IMPINGER FILL VOL (m)         0         10         20         30           IMPINGER SAMPLE TIME (min)         0         10         20.0		CHAMBER BIOBIOAEROSOL CONCENTRATION (ctu or pru/L Air)	7.893E+01	5.760E+01	4.693E+01	4.053E+01		
RELATIVE PERCENT REMOVAL PROM 1=0 (%) LOG REDUCTION FROM 1=0 (%) O.000 -0.14         40.5405% +0.23         48.6486% -0.23           Impinger Sampling Conditions         0.00         -0.14         -0.23         -0.29           Impinger Sampling Conditions         0.00         10         20         30           Impinger Sampling Conditions         0.00         10         20         30           Impinger Sampling Conditions         5.0         6.0         1.00 </td <th></th> <td>RELATIVE PERCENT REMAINING FROM 1=0 (%)</td> <td>100.0000%</td> <td>72.9730%</td> <td>59.4595%</td> <td>51.3514%</td>		RELATIVE PERCENT REMAINING FROM 1=0 (%)	100.0000%	72.9730%	59.4595%	51.3514%		
Index reduction from 1=0 (log_in)         0.00         -0.14         -0.23         -0.29           Impinger Sampling Conditions         SAMPLE TIME (min)         0         10         20         30           Impinger Sampling Conditions         SAMPLE TIME (min)         0         10         20.0         2		RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	27.0270%	40.5405%	48.6486%		
Implinger Sampling Conditions         SAMPLE TIME (min)         0         10         20         30           IMPINGER FILL VOL (mi)         20.0 <td< th=""><th></th><th>LOG REDUCTION FROM T=0 (log<sub>10</sub>)</th><th>0.00</th><th>-0.14</th><th>-0.23</th><th>-0.29</th></td<>		LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-0.14	-0.23	-0.29		
Image: Sample Time (min)         0         10         20         30           IMPINGER FILL VOL (m)         20.0	Impi	nger Sampling Conditions						
IMPINGER FILL VOL (m)         20.0         20.0         20.0         20.0           IMPINGER SAMPLING TIME (min)         5.0         5.0         5.0         5.0           IMPINGER FLOW RATE (pm)         12.5         12.5         12.5         12.5         12.5           Impinger FLOW RATE (pm)         0         0         0         0         0         0           Impinger FLOW RATE (pm)         100         100         100         100         100         100           Impinger FLOW RATE (pm)         25         22         15         15         15         13           ENUMERATED PLATE COUNTS (# / drop)         24.67         18.00         14.67         12.67           IMPINGER CONCENTRATION (cfu or pfu/m)         247         180         147         127           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/m)         247         180         14.69E+001         4.69E+001           IMPINGER CONCENTRATION (cfu or pfu/m)         7.89E+01         5.76E+01         4.69E+001         4.69E+001           Imponder Elization Ratio (10°)         -3         -2         -2         -2         -2           DROPLET SIZE (µ)         100         100         100         100         100         100		SAMPLE TIME (min)	0	10	20	30		
Implementation         Impleme		IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0		
IMPINGER FLOW RATE (hpm)12.512.512.512.5IMPINGER FLOW RATE (hpm)0000DILUTION RATIO (10°)0100100100PROPLET SIZE (µ)100100100100PROPLET SIZE (µ)100100100100PROPLET SIZE (µ)100100100100PROPLET SIZE (µ)25221515261715132415PROPLET SIZE (µ)246718.0014.6712.67PROPLET SIZE (µ)24.6718.0014.6712.67PROPLET SIZE (µ)7.894015.764014.094014.09401PROPLET SIZE (µ)100100100100PROPLET SIZE (µ)100100100100PLATE AVERAGE COUNT (# / drop)100100100100PLATE AVERAGE COUNT (# / drop)100100100100		IMPINGER SAMPLING TIME (min)	5.0	5.0	5.0	5.0		
Image: Note of the second se		IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5		
Image: Constraint of the image: Constraint of th			0	0	0	0		
Image: Constraint of the state		DILUTION RATIO (10)	100	100	100	100		
************************************	_	DROPLET SIZE (µi)	100	100	100	100		
Image: Properties of the second sec	ge #		25	22	15	15		
The second sec	Rang	ENUMERATED PLATE COUNTS (# / drop)	25	17	15	13		
Minimum         PLATE AVERAGE COUNT (# / drop)         24.67         18.00         14.67         12.67           IMPINGER CONCENTRATION (cfu or pfu/ml)         247         180         147         127           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)         7.89E+01         5.76E+01         4.69E+01         4.05E+01           DILUTION RATIO (l0 <sup>x</sup> )         -3         -2         -2         -2           DROPLET SIZE (µl)         100         100         100         100           PLATE AVERAGE COUNT (# / drop)         PLATE AVERAGE COUNT (# / drop)         UMPINGER CONCENTRATION (cfu or pfu/L)         -2         -2	lioi		24	15	14	10		
PLATE AVERAGE COUNT (#/drop)         24.67         18.00         14.67         12.67           IMPINGER CONCENTRATION (cfu or pfu/ml)         247         180         147         127           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)         7.89E+01         5.76E+01         4.69E+01         4.05E+01           DILUTION RATIO (10 <sup>x</sup> )         -3         -2         -2         -2           DROPLET SIZE (µl)         100         100         100         100           PLATE AVERAGE COUNT (# / drop)         PLATE AVERAGE COUNT (# / drop)         Implified         Implified         Implified         Implified         -2         -2           DROPLET SIZE (µl)         100         100         100         100         100         100           Implified         PLATE AVERAGE COUNTS (# / drop)         Implified	Dilut		24.57	40.55				
Implified Concentration (cfu or pfu/mi)     247     180     147     127       CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)     7.89E+01     5.76E+01     4.69E+01     4.05E+01       Dilution Ratio (lo <sup>x</sup> )     -3     -2     -2       DROPLET SIZE (µl)     100     100     100       ENUMERATED PLATE COUNTS (# / drop)     100     100     100	-	PLATE AVERAGE COUNT (# / drop)	24.67	18.00	14.67	12.67		
CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)     7.89E+01     5.76E+01     4.69E+01     4.05E+01       Image: transmission of transmission o		IMPINGER CONCENTRATION (cfu or pfu/ml)	247	180	147	127		
DILUTION RATIO (10 <sup>x</sup> )     -3     -2       DROPLET SIZE (µl)     100     100		CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	7.89E+01	5.76E+01	4.69E+01	4.05E+01		
DROPLET SIZE (µl)     100     100       Image: Strate of the strate of		DILUTION RATIO (10 <sup>x</sup> )	-3	-2		-2		
ENUMERATED PLATE COUNTS (# / drop)      PLATE AVERAGE COUNT (# / drop)      IMPINGEE CONCENTRATION (cluor ph/md)		DROPLET SIZE (μl)	100	100		100		
Str     ENUMERATED PLATE COUNTS (# / drop)       PLATE AVERAGE COUNT (# / drop)       IMPINGER CONCENTRATION (cluor ph/md)	1# 0							
PLATE AVERAGE COUNT (# / drop)      IMPINGER CONCENTRATION (cluor ph/m/l)	ange	ENTIMEDATED DI ATE COUNTS (# / drop)						
PLATE AVERAGE COUNT (# / drop)	n Ra	ENUMERATED PLATE COUN IS (# / drop)						
PLATE AVERAGE COUNT (# / drop)  IMPINGER CONCENTRATION (cfu or p5//ml)	utio							
IMPINGER CONCENTRATION (cft or pfi/ml)	Dil	PLATE AVERAGE COUNT (# / drop)						
		IMPINGER CONCENTRATION (cfu or pfu/ml)						
CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)								
Figure 5B: E cali Control		CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)						



Inal	Information TEST DATE: Manday, July 10, 2021			TRIA	L LOG REDUC	TION RESULT	S
	TELAL DEDECORMED BY: SMM						
	TRIAL PERFORMED B1: SMM		0.0				
	TRIAL NUMBER: 11						
TDI	AL NAME ID (CRADUS TADI ES) 5						
TRI	AL NAME ID (GRAPHS/TABLES): E. COII		-1.0				
2014	ico Information						
Jevi					$\mathbf{N}$		
	MANUFACTURER: Medity	_	-2.0				
	UNIT MODEL: M40	<u>e</u>			2.44		
	FAN SPEED (CFM):	n n n					
	UNIT SERIAL #:	- Second	-3.0				– E. coli
	FILER ID #:	8	-3.0			×	- E. COII
	FILTER LOT #.	<b>1</b>				-3.70 _0	- Linear Fit
on	eral Testing Conditions (Can Be User Defined)					<u> </u>	
Jen	TEST CHAMPER VOLUME (m <sup>3</sup> ): 16		-4.0				
	NERLI IZER CONDITIONS: Collicon 34 lot: approv. 30 min pob						
	SAMPLING METHOD: Implager						<b>\</b>
	SAMPLING METHOD: Impinger		-5.0				
	CHAMBER MIXING FAN: yes						
	TEMP (F): 74						
	RH (%): 70		-6.0				
	OTHER INSTRUMENTS: na			D	10	20	3(
	TRIAL COMMENTS/NOTES na				Time	(min)	
						()	
IOA	EROSOL Sample ID and Summary Data			S1	S2	S3	S4
	SAMPLE TI	ME (min	)	0	10	20	30
	IMPINGER US	ED (y / n	)	у	У	n	n
	VIABLE CASCADE US	ED (y / n	)	n	n	У	у
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu	ofu/L Air	9.9	956E+03	3.584E+01		
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or	pfu/L Air	)			2.000	0.020
	IMPINGER DILUTION CONSISTENCY CHECKS (% a	greement	)				
	VIABLE CONSISTENCY CHECKS (% a)	- vreement					
	IMP & VIABLE CROSS CHECK (% a	reement	5				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or n	fu/I Air		SECE . 02	2 5945 .01	2 000E .00	2 000E 0
	PEI ATIVE PERCENT REMAINING FROM	T-0 (%	10	0 0000%	0.3600%	0.0201%	0.0002-0
	RELATIVE FERCEATT REMAINING FROM	1-0 ( /0	/ ····	0.000070	0.000070	0.0201/0	
	RELATIVE PERCENT REMOVAL FROM	T-0 (%	0	0000%	99 6400%	99 9799%	99 9998
	RELATIVE PERCENT REMOVAL FROM	T=0 (%	0.	.0000%	99.6400% -2 44	99.9799% -3 70	99.9998%
	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T=	T=0 (% =0 (log <sub>10</sub>	) 0.	.0000% 0.00	99.6400% -2.44	99.9799% -3.70	99.9998% -5.70
npi	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions	T=0 (% =0 (log <sub>10</sub>	) 0.	.0000% 0.00	99.6400% -2.44	99.9799% -3.70	99.99989 -5.70
npi	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI	<b>T=0 (%</b> =0 (log <sub>10</sub> ME (min	) <b>0</b> . )	0000%	99.6400% -2.44 10	99.9799% -3.70 20	99.9998 -5.70 <b>30</b>
npi	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL	<b>T=0 (%</b> =0 (log <sub>10</sub> ME (min VOL (ml	) ) ) )	0000% 0.00 0 0 20.0	99.6400% -2.44 10 20.0	99.9799% -3.70 20.0	99.9998 -5.70 30 20.0
npi	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI	<b>T=0 (%</b> =0 (log <sub>10</sub> ME (min VOL (min ME (min	) <b>0</b> .	0000% 0.00 0 20.0 3.0	99.6400% -2.44 10 20.0 5.0	99.9799% -3.70 20 20.0 5.0	99.99989 -5.70 30 20.0 5.0
npi	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA	T=0 (% 0 (log <sub>10</sub> ME (min WOL (min ME (min NTE (lpm	) 0. ) ) )	0000% 0.00 20.0 3.0 12.5	99.6400% -2.44 10 20.0 5.0 12.5	99.9799% -3.70 20.0 5.0 12.5	99.9998 -5.70 30 20.0 5.0 12.5
npi	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER FLOW RA	T=0 (% =0 (log <sub>10</sub> ME (min VOL (ml ME (min ATE (lpm	) 0. ) ) ) )	0000% 0.00 20.0 3.0 12.5	99.6400% -2.44 10 20.0 5.0 12.5	99.9799% -3.70 20.0 5.0 12.5	99.9998 -5.70 30 20.0 5.0 12.5
npi	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RAT DEPORT ET DEPORT ET	T=0 (% =0 (log <sub>10</sub> ME (min VOL (min ME (min ATE (lpm TO (10 <sup>x</sup> )	) 0.	00000% 0.00 20.0 3.0 12.5 -3 100	99.6400% -2.44 10 20.0 5.0 12.5 0 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750
npi	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RAT DILUTION RAT DROPLET	T=0 (% =0 (log <sub>10</sub> ME (min WOL (min ME (min ME (min ME (10 <sup>x</sup> SIZE (µ1	) 0.	00000% 0.00 20.0 3.0 12.5 -3 100	99.6400% -2.44 10 20.0 5.0 12.5 0 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750
npi	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T Inger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RAT DILUTION RAT DROPLET	T=0 (% =0 (log <sub>10</sub> ME (min VOL (min ME (min ATE (lpm TO (10 <sup>x</sup> SIZE (µl	) 0.	0000% 0.00 20.0 3.0 12.5 -3 100	99.6400% -2.44 20.0 5.0 12.5 0 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750
Kange #1	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T INPINGER SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET : ENUMERATED PLATE COUNTS	T=0 (% =0 (log <sub>10</sub> ME (min VOL (ml ME (min ME (min ME (min SIZE (µl SIZE (µl (# / drop		0000% 0.00 20.0 3.0 12.5 -3 100	99.6400% -2.44 20.0 5.0 12.5 0 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750
	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T INGER SAMPLE TI SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S	T=0 (% =0 (log <sub>10</sub> ME (min WOL (min ME (min ME (min ME (pin ME (pin)	)     0.       )     )       )     )       )     )       )     )	0000% 0.00 20.0 3.0 12.5 -3 100	99.6400% -2.44 20.0 5.0 12.5 0 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 30 20.0 5.0 12.5 0 750
oilution Range #1 idu idu	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE Inger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RAT DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS	T=0 (% =0 (log10 ME (min VOL (min ME (min ME (min xTE (lpm TO (10 <sup>x</sup> ) SIZE (µl (# / drop		0000% 0.00 0 20.0 3.0 12.5 -3 100	99.6400% -2.44 10 20.0 5.0 12.5 0 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750
Dilution Range #1	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INGER SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET ENUMERATED PLATE COUNTS	T=0 (% =0 (log <sub>10</sub> ME (min VOL (min ME (min ME (min MTE (lpm TO (10 <sup>x</sup> ) SIZE (µl (# / drop (# / drop		0000% 0.00 20.0 3.0 12.5 -3 100	99.5400% -2.44 10 20.0 5.0 12.5 0 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 12.5 0 750
Dilution Range #1 dd dd	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INGER SAMPLE TI IMPINGER FILL IMPINGER FLOW RA DILUTION RAT DROPLET ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfu	T=0 (% =0 (log10 ME (min VOL (min ME (min ME (min ME (min ME (min))))))))))))))))))))))))))))))))))))		0000% 0.00 20.0 3.0 12.5 -3 100	99.6400% -2.44 20.0 5.0 12.5 0 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998° -5.70 20.0 5.0 12.5 0 750
Dilution Range #1	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T INPINGER SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET 2 ENUMERATED PLATE COUNTS IMPINGER CONCENTRATION (cfu CHAMBER BIOAEROSOL CONCETRATION (cfu or	T=0 (% 0 (log <sub>10</sub> ) ME (min VOL (min ME (min ME (min TT (lpm TT (lpm TT (lpm TT (lpm (# / drop (# / drop or pfu/ml Air		0000% 0.00 20.0 3.0 12.5 -3 100	99.6400% -2.44 20.0 5.0 12.5 0 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750
Dilution Range #1	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T INPINGER SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET : ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfu CHAMBER BIOAEROSOL CONCETRATION (cfu or DILUTION RAT	T=0 (% ME (min ME (min ME (min ME (min TTO (10 <sup>x</sup> ) SIZE (µ1 (# / drop (# / drop or pfu/LA Air TO (10 <sup>x</sup> )		.0000% 0.00 20.0 3.0 12.5 -3 100	99.6400% -2.44 10 20.0 5.0 12.5 0 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750 -2
Dilution Range #1	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INGER SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS IMPINGER CONCENTRATION (cfuor CHAMBER BIOAEROSOL CONCERTRATION (cfuor DILUTION RAT DROPLET S	T=0 (% T=0 (% ME (min ME (min ME (min TTO (10 <sup>8</sup> ) SIZE (µ1 (# / drop or pfu/L Air TO (10 <sup>8</sup> ) SIZE (µ1		0000% 0.00 20.0 3.0 12.5 -3 100	99.6400% -2.44 10 20.0 5.0 12.5 0 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750 -2 100
#1 Dilution Range #1 [] [d	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INGER SAMPLE TI IMPINGER SAMPLE TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS IMPINGER CONCENTRATION (cfu CHAMBER BIOAEROSOL CONCETRATION (cfu DILUTION RAT DROPLET S	T=0 (% •0 (log <sub>10</sub> ) •0 (log <sub>10</sub> ) ME (min ME		0000% 0.00 20.0 3.0 12.5 -3 100 -2 100 20	99.6400% -2.44 10 20.0 5.0 12.5 0 100 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750 750
nge#1 Dilution Range #1 d	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INGER SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER FLOW RA DILUTION RAT DROPLET ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETTATION (cfu or DILUTION RAT DROPLET S	T=0 (% •0 (log <sub>10</sub> •0 (log <sub>10</sub> ) •0 (log <sub>10</sub> •0 (log <sub>10</sub> ) •0 (log <sub>10</sub> ) •		.0000% 0.00 20.0 3.0 12.5 -3 100 -2 100 20 17	99.5400% -2.44 20.0 5.0 12.5 0 100 100 56	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750 750 -2 100
r Range #1 Dilution Range #1 d	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INPINGER SAMPLE TI IMPINGER FILL IMPINGER FLOW RA DILUTION RAT DROPLET T ENUMERATED PLATE COUNTS IMPINGER CONCENTRATION (cfuor CHAMBER BIOAEROSOL CONCETRATION (cfuor DILUTION RAT DRUTTON RAT DROPLET S	T=0 (% 0 (log10 ME (min ME (min ME (min TE (ppm TO (10 <sup>x</sup> SIZE (µl (# / drop (# / drop SIZE (µl (# / drop SIZE (µl (# / drop (# / drop (# / drop (# / drop (# / drop (# / drop		0000% 0.00 20.0 3.0 12.5 -3 100 -2 100 20 17 19	99.6400% -2.44 20.0 5.0 12.5 0 100 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998° -5.70 20.0 5.0 12.5 0 750 750
tion Range #1 Dilution Range #1 d	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INGER SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS IMPINGER CONCENTRATION (cfu CHAMBER BIOAEROSOL CONCETRATION (cfu CHAMBER BIOAEROSOL CONCETRATION (cfu DILUTION RAT DROPLET S	T=0 (% ME (min VOL (ml ME (min ME (min))))))))))))))))))))))))))))))))))))		0000% 0.00 20.0 3.0 12.5 -3 100 -2 100 20 17 19	99.6400% -2.44 20.0 5.0 12.5 0 100 100	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750 750 -2 100
Dilution Range #1 Dilution Range #1	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INGER SAMPLENT IMPINGER SAMPLENT IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS IMPINGER CONCENTRATION (cfilor CHAMBER BIOAEROSOL CONCENTRATION (cfilor DILUTION RAT DROPLET S	T=0 (% ME (min VOL (ml ME (min VOL (ml ME (min ME (min))))))))))))))))))))))))))))))))))))		0000% 0.00 20.0 3.0 12.5 -3 100 -2 100 20 17 19	99.6400% -2.44 20.0 5.0 12.5 0 100 100 500 56	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750 750
Dilution Range #1 Dilution Range #1 [] []	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INGER SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER FLOW RA DILUTION RAT DROPLET : ENUMERATED PLATE COUNTS IMPINGER CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCENTRATION (cfu or DILUTION RAT DROPLET : ENUMERATED PLATE COUNTS	T=0 (% ME (min WOL (min ME (min TIC (In SIZE (pl (# / drop or pfi/ml pfi/L Air TIC (10 <sup>8</sup> , SIZE (pl (# / drop gr pfi/ml (# / drop gr pfi/ml)		0000% 0.00 20.0 3.0 12.5 -3 100 -2 100 20 17 19	99.6400% -2.44 10 20.0 5.0 12.5 0 100 100 500 56 56	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750 750
Dilution Kange #1 Dilution Kange #1 ]	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INGER SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfu or DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS	T=0 (% ME (min WOL (ml ME (min TTE (lpm TO (10 <sup>×</sup> ) SIZE (µl (# / drop G) (10 <sup>×</sup> ) SIZE (µl (# / drop (# / drop (# / drop (# / drop) (# / drop)		0000% 0.00 20.0 3.0 12.5 -3 100 -2 100 20 17 19 18,67 18,67 18,67	99.5400% -2.44 10 20.0 5.0 12.5 0 100 100 500 56 56 56.00 112 2.55.00	99.9799% -3.70 20.0 5.0 12.5 -1 100 0 100	99.9998 -5.70 20.0 5.0 12.5 0 750 -2 100
	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INPINGER SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER FLOW RA DILUTION RAT DROPLET ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfuor DILUTION RAT DROPLET ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS FLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfuor CHAMBER BIOAEROSOL CONCENTRATION (cfuor	T=0 (% ME (min ME (min		0000% 0.00 20.0 3.0 12.5 -3 100 -2 100 20 17 19 18.67 18,667 18,667 19,966+03	99.6400% -2.44 10 20.0 5.0 12.5 0 100 100 56 56 5600 112 3.58E+01	99.9799% -3.70 20.0 5.0 12.5 -1 100	99.9998 -5.70 20.0 5.0 12.5 0 750 -2 100
	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INPINGER SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER FLOW RA DILUTION RAT DROPLET T ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfu CHAMBER BIOAEROSOL CONCETRATION (cfu PLATE AVERAGE COUNTS ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS (CHAMBER BIOAEROSOL CONCENTRATION (cfu CHAMBER BIOAEROSOL CONCENTRATION (cfu	T=0 (% ME (min ME (min ME (min TE (pm TO (10 <sup>x</sup> ) SIZE (µ1 (# / drop or pfu/mal SIZE (µ1 (# / drop (# / drop)) (# / drop (# / drop (# / drop)) (# / drop (# / drop)) (# / drop (# / drop)) (# / drop (# / drop)) (# / drop) (# / dro		0000% 0.00 20.0 3.0 12.5 -3 100 -2 100 20 17 19 18.67 18.667 18.667 -3	99.6400% -2.44 10 20.0 5.0 12.5 0 100 100 500 56 56 56 56 112 3.58E+01	99.9799% -3.70 20.0 5.0 12.5 -1 100 0 100	99.9998 -5.70 20.0 5.0 12.5 0 750 -2 100
g Dilution Kange #1 Dilution Range #1 d	RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INGER SAMPLENT IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS IMPINGER CONCENTRATION (cfu CHAMBER BIOAEROSOL CONCETRATION (cfu ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS IMPINGER CONCENTRATION (cfu CHAMBER BIOAEROSOL CONCENTRATION (cfu FLATE AVERAGE COUNTS IMPINGER CONCENTRATION (cfu CHAMBER BIOAEROSOL CONCENTRATION (cfu IMPINGER CONCENTRATION (cfu CHAMBER BIOAEROSOL CONCENTRATION (cfu	T=0 (% ME (min WE (min WOL (ml (ml (ml (ml (ml (ml (ml (ml		00000% 0.00 20.0 3.0 12.5 -3 100 -2 100 20 17 19 18.67 18,667 18,667 18,667 20 -2	99.6400% -2.44 10 20.0 5.0 12.5 0 100 100 56 56 56 56 112 3.58E+01	99.9799% -3.70 20.0 5.0 12.5 -1 100 0 100	99.9998 -5.70 20.0 5.0 12.5 0 750 750 -2 100

Viab	le Cascade Sampling Conditions **Statistical Correction A	Applied Autor	matically for co	unts>60	
	SAMPLE TIME (min)	0	10	20	30
	VIABLE CASCADE SAMPLING TIME (min)	1.0	2.0	1.0	5.0
_	VIABLE CASCADE FLOW RATE (lpm)	30	30	30	30
ascade #	ENUMERATED PLATE COUNTS (# / plate)			60	3
/iable C:	STATISTICALLY CORRECTED PLATE COUNTS (# / plate)			60	3
-	PLATE AVERAGE COUNT (# / plate)			60.00	3.00
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)			2.000	0.020
	Figure 6B. F	coli Trial	1		

#### Figure 6B: E. coli Trial 1



Trial	Information						
ma	TEST DATE: Monday, July 19, 2021	-		TRI	AL LOG REDUC	TION RESULT	rs
	TRIAL PERFORMED BY: SMM						
	TRIAL NUMBER: T2		0.0				
	TEST ORGANSIM: E. Coli						
TR	IAL NAME ID (GRAPHS/TABLES): E. coli						
			-1.0				
Dev	ice Information						
	MANUFACTURER: Medify						
	UNIT MODEL: M40	5	-2.0		23		
	FAN SPEED (CFM):	Ē					
	UNIT SERIAL #:	edt					
	FITER ID #:	2 ()	-3.0			$\rightarrow$	– E. coli
	FILTER LOT #:	ĕ					
Gen	eral Testing Conditions (Can Be User Defined)						- Linear Fit
Gen	TEST CHAMPER VOLUME (m <sup>3</sup> ): 16	-	-4.0				
	NERUI IZER CONDITIONS: Collison 24-let: approx. 20 min neh						
	SAMPLING METHOD: Impinger						
	CHAMBER MIXING FAN: ves		-5.0				
	TEMP (E): 74						5.47
	RH (%): 70						P I
	OTHED INSTRUMENTS: no		-6.0				
	TPIAL COMMENTS NOTES		C	)	10	20	30
	TRIAL COMMENTIS/NOTES na	-			Time	(min)	
BIO	FROSOL Sample ID and Summary Data			<b>S</b> 1	<b>S</b> 2	<b>S</b> 3	<u>\$4</u>
	SAMPLE TI	ME (min)		0	10	20	30
	IMPINGER USI	ED (y / n)		v	v	n	n
	VIABLE CASCADE USI	ED (y / n)		'n	ņ	v	v
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu	ofu/L Air)	1.3	87E+04	6.453E+01	,	,
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or p	ofu/L Air)				2.611	0.047
	IMPINGER DILUTION CONSISTENCY CHECKS (% as	greement)	2	6.67%	48.75%		
	VIABLE CONSISTENCY CHECKS (% as	meennent)					
		(icclicit)					
	IMP & VIABLE CROSS CHECK (% as	reement)					
	IMP & VIABLE CROSS CHECK (% ag CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p	greement) fu/L Air)	1.3	87E+04	6.453E+01	2.611E+00	4.667E-02
	IMP & VIABLE CROSS CHECK (% ag CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM	greement) fu/L Air) T=0 (%)	1.3 100	87E+04	6.453E+01 0.4654%	2.611E+00 0.0188%	4.667E-02 0.0003%
	IMP & VIABLE CROSS CHECK (% ag CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM	greement) fu/L Air) T=0 (%) T=0 (%)	1.3 100 0.0	87E+04 0.0000%	6.453E+01 0.4654% 99.5346%	2.611E+00 0.0188% 99.9812%	4.667E-02 0.0003% 99.9997%
	IMP & VIABLE CROSS CHECK (% ag CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T=	greement) fu/L Air) T=0 (%) T=0 (%) :0 (log <sub>10</sub> )	1.3 100 0.0	87E+04 0.0000% 0000% 0.00	6.453E+01 0.4654% 99.5346% -2.33	2.611E+00 0.0188% 99.9812% -3.73	4.667E-02 0.0003% 99.9997% -5.47
	IMP & VIABLE CROSS CHECK (% ag CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T=	greement) fu/L Air) T=0 (%) T=0 (%) 0 (log <sub>10</sub> )	1.3 100 0.0	87E+04 0.0000% 0000% 0.00	6.453E+01 0.4654% 99.5346% -2.33	2.611E+00 0.0188% 99.9812% -3.73	4.667E-02 0.0003% 99.9997% -5.47
Impi	IMP & VIABLE CROSS CHECK (% ag CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= inger Sampling Conditions	greement) fu/L Air) T=0 (%) T=0 (%) 0 (log <sub>10</sub> )	1.3 100 0.0	87E+04 0.0000% 0.000 0.00	6.453E+01 0.4654% 99.5346% -2.33	2.611E+00 0.0188% 99.9812% -3.73	4.667E-02 0.0003% 99.9997% -5.47
Impi	IMP & VIABLE CROSS CHECK (% or p CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= Inger Sampling Conditions SAMPLE TI	greement) fu/L Air) T=0 (%) T=0 (%) :0 (log <sub>10</sub> ) ME (min) WOL (min)	1.3 100 0.0	87E+04 0.0000% 0.000 0.00	6.453E+01 0.4654% 99.5346% -2.33 10	2.611E+00 0.0188% 99.9812% -3.73 20	4.667E-02 0.0003% 99.9997% -5.47 30
Impi	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= Inger Sampling Conditions SAMPLE TI IMPINGER FILL '	greement) fu/L Air) T=0 (%) T=0 (%) 0 (log <sub>10</sub> ) ME (min) VOL (ml)	1.3 100 0.0	87E+04 .0000% 0000% 0.00 0.00	6.453E+01 0.4654% 99.5346% -2.33 10 20.0	2.611E+00 0.0188% 99.9812% -3.73 20 20.0	4.667E-02 0.0003% 99.9997% -5.47 30 20.0
Impi	IMP & VIABLE CROSS CHECK (% of CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= inger Sampling Conditions SAMPLE TI IMPINGER FILL ' IMPINGER SAMPLING TI DURNICER FLOUX D	greement) fu/L Air) T=0 (%) T=0 (%) (0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) TE (here)	1.3 100 0.0	87E+04 00000% 0000% 0.00 0 20.0 3.0	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 125	2.611E+00 0.0188% 99.9812% -3.73 20.0 5.0	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0
Impi	IMP & VIABLE CROSS CHECK (% ag CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= inger Sampling Conditions SAMPLE TI IMPINGER FILL ' IMPINGER SAMPLING TI IMPINGER FLOW RA	greement) <b>fu/L Air</b> ) <b>T=0 (%)</b> <b>T=0 (%)</b> <b>:0 (log<sub>10</sub>)</b> ME (min) VOL (ml) ME (min) TE (lpm)	1.3 100 0.0	87E+04 .0000% 0.00 0 0 20.0 3.0 12.5	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5	2.611E+00 0.0188% 99.9812% -3.73 20 20.0 5.0 12.5	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5
Impi	IMP & VIABLE CROSS CHECK (% ag CHAMBER BIOBIOAEROSOL CONCENTRATION (¢tu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T Inger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA	greement) <b>fu/L Air</b> ) <b>T=0</b> (%) <b>T=0</b> (%) <b>:0</b> (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) TE (lpm) <b>TO</b> (10 <sup>x</sup> )	1.3 100 0.0	87E+04 00000% 0000% 0.00 20.0 3.0 12.5 -3	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0	2.611E+00 0.0188% 99.9812% -3.73 20.0 20.0 5.0 12.5 -1	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0
Impi	IMP & VIABLE CROSS CHECK (% ag CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= inger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RAT DILUTION RAT DROPLET S	greement) <b>fu/L Air</b> ) <b>T=0 (%)</b> <b>T=0 (%)</b> <b>r=0 (log<sub>10</sub>)</b> ME (min) VOL (ml) ME (min) TE (lpm) <b>TO (10<sup>x</sup>)</b> <b>SIZE (µl)</b>	1.3 100 0.0	87E+04 00000% 0.000 0.00 20.0 3.0 12.5 -3 12.5	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100	2.611E+00 0.0188% 99.9812% -3.73 20.0 20.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750
Impi	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER FLOW RA DILUTION RAT DROPLET S	greement) <b>fu/L Air</b> ) <b>T=0 (%)</b> <b>T=0 (%)</b> <b>:0 (log<sub>10</sub>)</b> ME (min) VOL (ml) ME (min) TE (lpm) <b>IO (10<sup>x</sup>)</b> <b>SIZE (µl)</b>	1.3 100 0.0	87E+04 .0000% 0000% 0.00 20.0 3.0 12.5 -3 100 5	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100 11	2.611E+00 0.0188% 99.9812% -3.73 20.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750
tange #1	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= INGER SAMPLING TO IMPINGER FILL ' IMPINGER SAMPLING TO IMPINGER FLOW RA DILUTION RAT DROPLET S	greement) fu/L Air) T=0 (%) T=0 (%) :0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) TE (lpm) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop)	1.3.100	87E+04 .0000% 0000% 0.00 20.0 3.0 12.5 -3 100 5 1	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100 11 15	2.611E+00 0.0188% 99.9812% -3.73 200 20.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750
id Range #1	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= INGER SAMPLING TO IMPINGER FILL MPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS (	greement) fu/L Air) T=0 (%) T=0 (%) *0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) TE (lpm) TE (lpm) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop)	1.3 100 0.0	87E+04 .0000% 0000% 0.00 20.0 3.0 12.5 -3 100 5 1 3	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100 11 15 15	2.611E+00 0.0188% 9-3812% -3.73 20 200 5.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750
bilution Range #1	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= inger Sampling Conditions SAMPLE TI IMPINGER FILL ' IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS (	greement) fu/L Air) T=0 (%) T=0 (%) 0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) TE (lpm) TE (lpm) (# / drop)	1.3 100 0.0	87E+04 .0000% 0000% 0.00 20.0 3.0 12.5 -3 100 5 1 3	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100 11 15 15	2.611E+00 0.0188% 99.9812% -3.73 20 20.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750
Dilution Range #1	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= inger Sampling Conditions SAMPLE TI IMPINGER FILL ' IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( PLATE AVERAGE COUNT /	greement) fu/L Air) T=0 (%) T=0 (%) 0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) TTE (lpm) TO (10 <sup>*</sup> ) SIZE (µl) (# / drop)	1.3 100 0.0	87E+04 0000% 0000% 20.0 3.0 12.5 -3 100 5 1 3.0 3.00	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100 11 15 15 15	2.611E+00 0.0188% 99.9812% -3.73 20.0 20.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750
Dilution Range #1	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= inger Sampling Conditions SAMPLE TI IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( IMPINGER CONCENTRATION (cfu	greement) fu/L Airp) TT=0 (%) 0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) VOL (ml) ME (min) TT (pm) TT (pm) TT (pm) (# / drop) (# / drop) (# / drop)	1.3 100 0.0	87E+04 0000% 0000% 20.0 3.0 12.5 -3 100 5 1 3.0 3.00 30,000	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100 11 15 15 15 13.67 137	2.611E+00 0.0188% 99.9812% -3.73 20.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750
Dilution Range #1	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= inger Sampling Conditions SAMPLE TI IMPINGER FILL ' IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( IMPINGER CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or	geeman) <b>fu/L Air</b> ) <b>T=0 (%)</b> <b>0 (log<sub>10</sub>)</b> <b>0 (log<sub>10</sub>)</b> <b>0 (log<sub>10</sub>)</b> <b>0 (log<sub>10</sub>)</b> <b>0 (log<sub>10</sub>)</b> <b>1 (log<sub>10</sub>) <b>1 (log<sub>10</sub>) <b>1 (log<sub>10</sub>)</b> <b>1 (log<sub>10</sub>) <b>1 (log<sub>10</sub>) <b>1 (log<sub>10</sub>)</b> <b>1 (log<sub>10</sub>) <b>1 </b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b></b>	1.3 100 0.0	87E+04 0000% 0000% 0.00 20.0 3.0 12.5 -3 100 5 1 3 3.00 30,000 60E+04	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100 111 15 15 15 15 1367 137 4.37F01	2.611E+00 0.0188% 99.9812% -3.73 20.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750
Dilution Range #1	IMP & VIABLE CROSS CHECK (% or CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM Te inger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( IMPINGER CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or	geeman) geeman) T=0 (%) 0 (10g <sub>10</sub> ) WE (min) WOL (mi) WOL (mi) WOL (mi) WOL (mi) WTE (pm) TTE (pm) TTE (pm) (# / drop) (# / drop) (# / drop) (# / drop) TTE (transfer	1.3 100 0.1	87E+04 0000% 0000% 0.00 20.0 3.0 12.5 -3 100 5 1 3.0 3.00 60E+04 -2	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100 111 15 15 15 15 13.67 137 4.37E+01	2.611E+00 0.0188% 99.9812% -3.73 20.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750
Dilution Range #1	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= INGER SAMPLIE TI IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or DILUTION RAT DROPLET S	(# / drop) (# / d	1.3 100 0.0	87E+04 .0000% 0000% 0.00 20.0 3.0 12.5 -3 100 5 1 3 3.00 30,000 60E+04 -2 100	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100 111 15 15 15 15 13.67 137 4.37E+01	2.611E+00 0.0188% 99.9812% -3.73 20.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 20.0 5.0 12.5 0 750 750
e #1 Dilution Range #1 idul	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= inger Sampling Conditions SAMPLE TI IMPINGER FLOW RA IMPINGER FLOW RA DILUTION RAT DROPLET S PLATE AVERAGE COUNTS (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or DILUTION RAT DROPLET S	(# (min)) ME (min) ME (min) WOL (mi) ME (min) WOL (mi) ME (min) ME (min) (	1.3 100 0.0	87E+04 .0000% 0000% 0.00 20.0 3.0 12.5 -3 100 5 1 3 3.00 30,000 60E+04 -2 100 24	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100 111 15 15 15 1367 137 4.37E+01 100 2	2.611E+00 0.0188% 99.9812% -3.73 20.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750 750
ange #1 Dilution Range #1 idul	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= inger Sampling Conditions SAMPLE TI IMPINGER FLU IMPINGER SAMPLING TI IMPINGER FLU MININGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( CHAMBER BIOAEROSOL CONCETRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or DILUTION RAT DROPLET S	gernman) furL Airp' T=0 (%) 0 (log <sub>10</sub> ) ME (min) ME (min) ME (min) ME (min) ME (min) ME (min) (mi	1.3 100 0.0	87E+04 .0000% 0000% 0.00 20.0 3.0 12.5 -3 100 5 1 3.00 5 1 3.00 60E+04 -2 100 24 21	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100 11 15 15 15 13.67 137 4.37E+01 100 2 3	2.611E+00 0.0188% 99.9812% -3.73 200 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750 750
n Range #1 Dilution Range #1 ddl	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= inger Sampling Conditions SAMPLE TI IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( CHAMBER BIOAEROSOL CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS (	(i) (ii) (iii) (ii	1.3 100 0.0	87E+04 .0000% 0000% 0.00 20.0 3.0 12.5 -3 100 5 1 3 3.00 30,000 60E+04 -2 100 24 21	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100 11 15 15 15 15 15 15 15 15 15	2.611E+00 0.0188% 99.9812% -3.73 20.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750 750
Intion Range #1	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= inger Sampling Conditions SAMPLE TI IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( CHAMBER BIOAEROSOL CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS (	geennen) furL Airp' T=0 (%) ME (min) WOL (mi) ME (min) WOL (mi) ME (min) ME (m	1.3 100 0.0	87E+04 0000% 0000% 000 20.0 3.0 12.5 -3 100 5 1 3 3.00 30,000 60E+04 -2 100 24 21 21	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 100 11 15 15 15 15 15 15 15 15 15 15 15 15	2.611E+00 0.0188% 99.9812% -3.73 20.0 5.0 12.5 -1 100 0 100	4.667E-02 0.0003% 99.9997% -5.47 20.0 5.0 12.5 0 750 750
Dilution Range #1 Dilution Range #1 dilution Range #1	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= inger Sampling Conditions SAMPLE TI IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( CHAMBER BIOAEROSOL CONCENTRATION (cfu or f DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( CHAMBER BIOAEROSOL CONCENTRATION (cfu or f DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( CHAMBER BIOAEROSOL CONCENTRATION (cfu or f DILUTION RAT DROPLET S	<pre>gennet() fu7L Air) T=0 (%) T=0 (%) 0 (00g10) ME (min) VOL (ml) ME (min) ME (min) TE (pm) ME (min) ME (min)</pre>	1.3 100 0.0	87E+04 0000% 0000% 0.00 20.0 3.0 12.5 -3 100 5 1 3.00 30,000 60E+04 -2 100 24 21 21 22.00	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 12.5 0 1100 11 15 15 15 15 15 15 13 7 4.37E+01 2 3 3 3	2.611E+00 0.0188% 99.9812% -3.73 20.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750 750
Dilution Range #1 Dilution Range #1 IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	IMP & VIABLE CROSS CHECK (% a CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T inger Sampling Conditions SAMPLE TI IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( CHAMBER BIOAEROSOL CONCENTRATION (cfu or DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( CHAMBER BIOAEROSOL CONCENTRATION (cfu or PLATE AVERAGE COUNTS ( CHAMBER BIOAEROSOL CONCENTRATION (cfu or PLATE AVERAGE COUNTS ( CHAMBER BIOAEROSOL CONCENTRATION (cfu or DILUTION RAT DROPLET S	<pre>gennet() fu/L Air) T=0 (%) ME (min) WOL (mi) WOL (mi) WOL (mi) WOL (mi) ME (min) TE (pm) ME (min) ME (min)</pre>	1.3 100 0.0	87E+04 0000% 0000% 0.00 20.0 3.0 12.5 -3 100 5 1 3 3.00 30,000 60E+04 -2 100 24 21 21 22.00 22,000	6.453E+01 0.4654% 99.5346% -2.33 10 20.0 5.0 12.5 0 12.5 0 100 111 15 15 15 15 15 15 15 15 15 15 15 15	2.611E+00 0.0188% 99.9812% -3.73 20.0 5.0 12.5 -1 100	4.667E-02 0.0003% 99.9997% -5.47 30 20.0 5.0 12.5 0 750 750

## Viable Cascade Sampling Conditions \*\*Statistical Correction Applied Automatically for counts>60 SAMPLE TME (min) 0 10 20

	SAMPLE TIME (mn)	U	10	20	30
	VIABLE CASCADE SAMPLING TIME (min)	1.0	2.0	1.0	5.0
1	VIABLE CASCADE FLOW RATE (lpm)	30	30	30	30
ascade #	ENUMERATED PLATE COUNTS (# / plate)		(	75	7
/iable C:	STATISTICALLY CORRECTED PLATE COUNTS (# / plate)			78	7
-	PLATE AVERAGE COUNT (# / plate)			78.34	7.00
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)			2.611	0.047
	Figure 7B: E.	<i>coli</i> Trial	2		

#### ARE Labs Inc. 2021



Trial	Information			TRL	ALLOG REDUC	TION RESILLT	s
	TEST DATE: Monday, July 19, 2021					NON REJULI	
	TRIAL PERFORMED BY: SMM		0.0-				
	TRIAL NUMBER: T3		0.0 (				
	TEST ORGANSIM: E. Coli						
TR	IAL NAME ID (GRAPHS/TABLES): E. coli						
			-1.0				
Dev	ice Information						
	MANUFACTURER: Medify	1					
	UNIT MODEL: M40	Ę	-2.0		2.		
	FAN SPEED (CFM):	÷					
	UNIT SERIAL #:	Ę					
	FITER ID #:	2	-3.0				– E. coli
	FILTER LOT #:	8					
							- Linear Fit
Gen	eral Testing Conditions (Can Be User Defined)		-4.0				
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16						
	NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb						
	SAMPLING METHOD: Impinger						
	CHAMBER MIXING FAN: yes		-5.0				5.38
	TEMP (F): 74						8
	RH (%): 70						
	OTHER INSTRUMENTS: na		-6.0				
	TRIAL COMMENTS/NOTES an			0	10	20	30
	10				Time	(min)	
BIO	EROSOL Sample ID and Summary Data			<b>S</b> 1	S2	<b>S</b> 3	<b>S4</b>
	SAMPLE TI	ME (min	I)	0	10	20	30
	IMPINGER US	ED (y/n	i)	v	v	n	n
	VIABLE CASCADE US	ED (y / n	0	n	n	у	У
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu	- ofu/L Air	) 7.9	911E+03	4.480E+01		
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or	ofu/L Air	)			1.733	0.033
	IMPINGER DILUTION CONSISTENCY CHECKS (% a	greement		22.00%	9.09%		
	VIABLE CONSISTENCY CHECKS (% a	- greement	)				
	IMP & VIABLE CROSS CHECK (% a	reement	)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or n	fu/L. Air	) 71	011E+03	4 480E+01	1 723E+00	3 333E-02
	RELATIVE PERCENT REMAINING FROM	T=0 (%	10	0 0000%	0.5663%	0.0219%	0.0004%
	RELATIVE PERCENT REMOVAL FROM	T=0 (%	0	0000%	99 4337%	99 9781%	99 9996%
	LOC REDUCTION FROM T-	-0 (log		0.00	-2 25	-3.66	-5 38
	LOG REDUCTION FROM 1-	-0 (10g1(	/	0.00	-2.25	-3.00	-5.50
Impi	nger Sampling Conditions						
	SAMPLE TI	ME (min	.)	0	10	20	30
	IMPINGER FILL	VOL (m	.)	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TI	ME (min	.)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RA	ATE (lpn	)	12.5	12.5	12.5	12.5
	DILUTION RAT	IO (10 <sup>x</sup>	)	-3	0	-1	0
	DROPLET	SIZE (µl	)	100	100	100	750
I#				2	14		
mge				2	16		
ı Ra	ENUMERATED PLATE COUNTS	(# / drop	"	1	14		
utior			1				
Dil	PLATE AVERAGE COUNT	(# / drop	)	1.67	14.67	*	۲
	IMPINGER CONCENTRATION (cfu	or pfu/m	)	16,667	147		
	CHAMBER BIOAEROSOL CONCETRATION (cfu or )	pfu/L Air	) 8	3.89E+03	4.69E+01		
	DILITION RAT	IO (10 <sup>x</sup>		-2	-1	0	-2
	DROPLET	SIZE (µl	0	100	100	100	100
I#			1	14	1		
1ge				10	2		
				13	3		
ı Raı	ENUMERATED PLATE COUNTS	(# / drop	)	6	0		

ution Kange #1	ENUMERATED PLATE COUNTS (# / drop)	14 19 6	1 3 0	
Dil	PLATE AVERAGE COUNT (# / drop)	13.00	1.33	
	IMPINGER CONCENTRATION (cfu or pfu/ml)	13,000	133	
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	6.93E+03	4.27E+01	

Viabl	e Cascade Sampling Conditions **Statistical Correction A	pplied Au	tomatically for o	counts	>60		
	SAMPLE TIME (min)	0	10		20	30	
	VIABLE CASCADE SAMPLING TIME (min)	1.0	2.0		1.0	5.0	
1	VIABLE CASCADE FLOW RATE (lpm)	30	30		30	30	
scade #	ENUMERATED PLATE COUNTS (# / plate)				52	5	
∕iable C:	STATISTICALLY CORRECTED PLATE COUNTS (# / plate)				52	5	
-	PLATE AVERAGE COUNT (# / plate)				52.00	5.00	
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)				1.733	0.033	
			1.0				

Figure 8B: E. coli Trial 3



Inal	Information		TRIAL LOG RE	DUCTION RE	SULTS
	TEST DATE: Monday, July 19, 2021		Asper	gillus brasiliensis	;
	TRIAL PERFORMED BY: SMM	0.0 🔍			
	TRIAL NUMBER: Control		0 21		
	TEST ORGANSIM: Aspergillus brasiliensis	-0.2			
TR	IAL NAME ID (GRAPHS/TABLES): Aspergillus brasiliensis			-0.39	
		-0.4			-0 53
Dev	ice Information				••••
	MANUFACTURER: Medify	-0.6			
	UNIT MODEL: M40				
	FAN SPEED (CFM):	<b>5</b> -0.8			
	UNIT SERIAL #:				
	FITER ID #:	<b>5</b> -1.0			
	FILTER LOT #:	2			
		-1.2			
Gen	eral Testing Conditions				
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16	-1.4			
	NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb				
	SAMPLING METHOD: Impinger	-1.6			
	CHAMBER MIXING FAN: yes	_1.9			
	TEMP (F): 74	-1.0			
	RH (%): 70	-2.0			
	OTHER INSTRUMENTS: na	0	10	20	30
	TRIAL COMMENTS/NOTES an				
_	India Communication (12)		Ti	me (min)	
	AEPOSOL Sample ID and Summary Data	<b>S</b> 1	52	<b>S</b> 2	<b>S</b> 4
ыол		0	10	20	20
		U	10	20	30
	IMPINGER USED (y/n)	У	У	У	У
	VIABLE CASCADE USED (y / n)	n	n	n	n
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air)	2.267E+03	1.387E+03	9.280E+02	6.720E+02
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	_			
	IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)	30.00%			
	VIABLE CONSISTENCY CHECKS (% agreement)				
	IMP & VIABLE CROSS CHECK (% agreement)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	2.267E+03	1.387E+03	9.280E+02	6.720E+02
	RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	61.1765%	40.9412%	29.6471%
	RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	38.8235%	59.0588%	70.3529%
	LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-0.21	-0.39	-0.53
Impi	inger Sampling Conditions		40		
	SAMPLING TIME (min)	U	10	20	30
	IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0
					20.0
	IMPINGER SAMPLING TIME (min)	2.0	5.0	5.0	5.0
	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (pm)	2.0 12.5	5.0 12.5	5.0 12.5	5.0 12.5
	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (pm) DILUTION RATIO (10 <sup>x</sup> )	2.0 12.5 -2	5.0 12.5 <b>-2</b>	5.0 12.5 <b>-1</b>	5.0 12.5 -1
	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (pm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl)	2.0 12.5 -2 100	5.0 12.5 -2 100	5.0 12.5 -1 100	5.0 12.5 -1 100
41	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (pm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl)	2.0 12.5 -2 100 4	5.0 12.5 -2 100 5	5.0 12.5 -1 100 30	5.0 12.5 -1 100 22
nge #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (pm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl)	2.0 12.5 -2 100 4 1	5.0 12.5 -2 100 5 6	5.0 12.5 -1 100 30 25	20.0 5.0 12.5 -1 100 22 25
Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (pm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (μl) ENUMERATED PLATE COUNTS (# / drop)	2.0 12.5 -2 100 4 1 2	5.0 12.5 -2 100 5 6 2	5.0 12.5 -1 100 30 25 32	2000 5.0 12.5 -1 100 22 25 16
tion Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (μl) ENUMERATED PLATE COUNTS (# / drop)	2.0 12.5 -2 100 4 1 2	5.0 12.5 <b>-2</b> 100 5 6 2	5.0 12.5 -1 100 30 25 32	200 5.0 12.5 -1 100 22 25 16
Dilution Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (μl) ENUMERATED PLATE COUNTS (# / drop)	2.0 12.5 -2 100 4 1 2	5.0 12.5 -2 100 5 6 2	5.0 12.5 -1 100 30 25 32	200 5.0 12.5 -1 100 22 25 16
Dilution Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (pm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop)	2.0 12.5 -2 100 4 1 2 2.33 2.33	5.0 12.5 -2 100 5 6 2 2 4.33	5.0 12.5 -1 100 30 25 32 29.00	200 5.0 12.5 -1 100 22 25 16 21.00
Dilution Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml)	2.0 12.5 -2 100 4 1 2 2.33 2.333 1 DTC 62	5.0 12.5 -2 100 5 6 2 4.33 4,333 1 25.00	5.0 12.5 -1 100 30 25 32 29.00 2,900	2000 5.0 12.5 -1 100 22 25 16 21.00 2,100
Dilution Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	2.0 12.5 -2 100 4 1 2 2.33 2,333 1.87E+03	5.0 12.5 -2 100 5 6 2 4.33 4,333 1.39E+03	29.00 2.900 2.900 2.900	200 5.0 12.5 -1 100 22 25 16 21.00 2,100 6.72E+02
Dilution Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µ1) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/r Air) DILUTION RATIO (10 <sup>x</sup> )	2.0 12.5 -2 100 4 1 2 2.33 2.333 1.87E+03 -3	5.0 12.5 -2 100 5 6 2 4.33 4,333 1.39E+03 -2	29.00 2.900 2.900 2.900 2.900 2.900 2.900	2000 5.0 12.5 -1 100 22 25 16 21.00 2,100 6.72E+02 0
Dilution Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/r Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl)	2.0 12.5 -2 100 4 1 2 2.33 2.333 1.87E+03 -3 100	5.0 12.5 -2 100 5 6 2 4.33 4,333 1.39E+03 -2 100	29.00 2.9000 2.9000 2.9000 2.9000 2.9000 2.9000 2.9000 2.9000 2.9000 2.90000 2.90000 2.90000 2.9000000 2.90000000000	2000 5.0 12.5 -1 100 22 25 16 21.00 2,100 6.72E+02 0 100
#1 Dilution Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl)	2.0 12.5 -2 100 4 1 2 2.33 2.333 1.87E+03 -3 100 1	5.0 12.5 -2 100 5 6 2 4.33 4,333 1.39E+03 -2 100	29.00 2,900	2000 5.0 12.5 -1 100 22 25 16 21.00 2,100 6.72E+02 0 100
nge #1 Dilution Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl)	2.0 12.5 -2 100 4 1 2 2.33 2.333 1.87E+03 -3 100 1 0	5.0 12.5 -2 100 5 6 2 4.33 4,333 1.39E+03 -2 100	5.0 12.5 -1 100 30 25 32 29.00 2,900 9.28E+02 -2 100	200 5.0 12.5 -1 100 22 25 16 21.00 2,100 6.72E+02 0 100
Range #1 Dilution Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µ) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/r Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µ) ENUMERATED PLATE COUNTS (# / drop)	2.0 12.5 -2 100 4 1 2 2.33 2.333 1.87E+03 -3 100 1 0 0	5.0 12.5 -2 100 5 6 2 4.33 4,333 1.39E+03 -2 100	5.0 12.5 -1 100 30 25 32 29.00 2,900 9.28E+02 -2 100	200 5.0 12.5 -1 100 22 25 16 21.00 2,100 6.72E+02 0 100
tion Range #1 Dilution Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µ) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/r Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µ) ENUMERATED PLATE COUNTS (# / drop)	2.0 12.5 -2 100 4 1 2 2.33 2.333 1.87E+03 -3 100 1 0 0	5.0 12.5 -2 100 5 6 2 4.33 4,333 1.39E+03 -2 100	5.0 12.5 -1 100 30 25 32 29.00 2,900 9.28E+02 -2 100	20.0 5.0 12.5 10 22 25 16 21.00 2,100 6.72E+02 0 100
Dilution Range #1 Dilution Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/rml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/rml) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop)	2.0 12.5 -2 100 4 1 2 2.33 2.333 1.87E+03 -3 100 1 0 0	5.0 12.5 -2 100 5 6 2 4.33 4,333 1.39E+03 -2 100	5.0 12.5 -1 100 30 25 32 29.00 2,900 2,900 9.28E+02 -2 100	20.0 5.0 12.5 -1 100 22 25 16 21.00 2,100 6.72E+02 0 100
Dilution Range #1 Dilution Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) PLATE AVERAGE COUNT (# / drop) MPINGER CONCENTRATION (cfu or pfu/T)	2.0 12.5 -2 100 4 1 2 2.33 2.333 1.87E+03 -3 100 1 0 0 0 0 333 3.333	5.0 12.5 -2 100 5 6 2 4.33 4,333 1.39E+03 -2 100	5.0 12.5 -1 100 30 25 32 29.00 2,900 9.28E+02 -2 100	20.0 5.0 12.5 -1 100 22 25 16 21.00 2,100 6.72E+02 0 100
Dilution Range #1 Dilution Range #1	IMPINGER SAMPLING TIME (min) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/L Air) PLATE AVERAGE COUNTS (# / drop) IMPINGER CONCENTRATION (cfu or pfu/m) CHAMBER BIOAEROSOL CONCENTRATION (cfu or pfu/m)	2.0 12.5 -2 100 4 1 2 2.33 2.333 1.87E+03 -3 100 1 0 0 0 0 0 3 3,333 2.57E-02	5.0 12.5 -2 100 5 6 2 4.33 4,333 1.39E+03 -2 100	29.00 2,900	20.0 5.0 12.5 -1 100 22 25 16 21.00 2,100 6.72E+02 0 100

Figure 9B: A. brasiliensis Control



	Information			TRIA	L LOG REDUC	TION RESULT	S
	TEST DATE: Monday, July 19, 2021						
	TRIAL PERFORMED BY: SMM		0.0	٩			
	TRIAL NUMBER: T1						
	TEST ORGANSIM: Aspergillus brasiliensis						
TRIA	AL NAME ID (GRAPHS/TABLES): Aspergillus brasiliensis		-1.0				
Devio	ce Information						
	MANUFACTURER: Medify		20				
	UNIT MODEL: M40	<u>io</u>	-2.0		2.37		
	FAN SPEED (CFM):	rct					
	UNIT SERIAL #:	e					– Asnergillu
	FITER ID #:	5	-3.0			-3.42	S
	FILTER LOT #:	2					brasiliensi
Gene	eral Testing Conditions (Can Be User Defined)		-4.0				\$
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16						
	NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb						-4.8
	SAMPLING METHOD: Impinger		-5.0				
	CHAMBER MIXING FAN: yes						
	TEMP (F): 74						
	RH (%): 70		6.0-				
	OTHER INSTRUMENTS: na		-6.0	0	10	20	3(
	TRIAL COMMENTS/NOTES na				Time	(min)	
				61	Sa	(11111)	64
SIUA		ME (min		0	<u> </u>	33	20
	MINICED LICI		,	U	10	20	30
		ED (y/ II	,	у	у	У	У
	VIABLE CASCADE USI	ED (y/n	ή	n 	n	n	у
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (ctu p	otu/L Air	9.	333E+03	3.947E+01	3.556E+00	1.422E-0
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (ctu or p	otu/L Air					
	IMPINGER DILUTION CONSISTENCY CHECKS (% ag	greement	· •	25.00%	15.00%		
	VIABLE CONSISTENCY CHECKS (% ag	greement	2				
	IMP & VIABLE CROSS CHECK (% ag	greement	)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p	fu/L Air					
			9.	333E+03	3.947E+01	3.556E+00	1.422E-0
	RELATIVE PERCENT REMAINING FROM	T=0 (%	9. 10	333E+03 0.0000%	3.947E+01 0.4229%	3.556E+00 0.0381%	1.422E-0 0.0015%
	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM	T=0 (% T=0 (%	9. 10 0	333E+03 0.0000% .0000%	3.947E+01 0.4229% 99.5771%	3.556E+00 0.0381% 99.9619%	1.422E-0 0.0015% 99.9985%
	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T=	T=0 (% T=0 (% =0 (log <sub>10</sub>	) 9. ) 10 ) 0	333E+03 0.0000% .0000% 0.00	3.947E+01 0.4229% 99.5771% -2.37	3.556E+00 0.0381% 99.9619% -3.42	1.422E-0 0.0015% 99.9985% -4.82
mpir	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T=	T=0 (% T=0 (% =0 (log <sub>10</sub>	9. 10 0	333E+03 0.0000% .0000% 0.00	3.947E+01 0.4229% 99.5771% -2.37	3.556E+00 0.0381% 99.9619% -3.42	1.422E-0 0.0015% 99.9985% -4.82
npir	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI	T=0 (% T=0 (% =0 (log <sub>10</sub> ME (min	) 9. ) 10 ) 0	333E+03 0.0000% .0000% 0.00 0.00	3.947E+01 0.4229% 99.5771% -2.37 10	3.556E+00 0.0381% 99.9619% -3.42 20	1.422E-0 0.0015% 99.9985% -4.82 <b>30</b>
npir	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL V	<b>T=0 (%</b> <b>T=0 (%</b> =0 (log <sub>10</sub> ME (min VOL (ml	) 9. ) 10 ) 0	333E+03 0.0000% 0.00 0.00 0.00	3.947E+01 0.4229% 99.5771% -2.37 10 20.0	3.556E+00 0.0381% 99.9619% -3.42 20 20.0	1.422E-0 0.0015% 99.9985% -4.82 30 20.0
mpir	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL V IMPINGER SAMPLING TI	<b>T=0 (%</b> <b>T=0 (%</b> <b>0 (log<sub>10</sub></b> ME (min ME (min	) 9. ) 10 ) 0 )	333E+03 0.0000% 0.00 0.00 0.00	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0	3.556E+00 0.0381% 99.9619% -3.42 20.0 5.0	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0
npir	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL V IMPINGER SAMPLING TI IMPINGER FLOW RA	T=0 (% T=0 (% =0 (log <sub>10</sub> ME (min WOL (mi ME (min TE (lpm	) 9. ) 10 ) 0 )	333E+03 0.0000% 0.000 20.0 20.0 3.0 12.5	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5	3.556E+00 0.0381% 99.9619% -3.42 20.0 5.0 12.5	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5
mpir	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL V IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT	T=0 (% T=0 (% 0 (log <sub>10</sub> ME (min VOL (mi ME (min ATE (lpm TO (10 <sup>x</sup>	) 9. ) 10 ) 0 )	333E+03 0.0000% 0.00 0.00 20.0 3.0 12.5 -3	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0	3.556E+00 0.0381% 99.9619% -3.42 200 20.0 5.0 12.5 0	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0
mpir	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL V IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S	T=0 (% T=0 (% 0 (log <sub>10</sub> ME (min ME (min ME (min TE (lpm TO (10 <sup>x</sup> ) SIZE (µ)	) 9. ) 10 ) 0 )	333E+03 0.0000% 0.0000% 0.00 20.0 3.0 12.5 -3 100	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100	3.556E+00 0.0381% 99.9619% -3.42 20.0 5.0 12.5 0 750	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750
mpir	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL V IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S	T=0 (% T=0 (% 0 (log <sub>10</sub> ME (min VOL (ml ME (min ME (min TO (10 <sup>x</sup> ] SIZE (µl	9.9.10       100       0	333E+03 0.0000% 0.0000% 0.00 20.0 3.0 12.5 -3 100 1	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 11	3.556E+00 0.0381% 99.9619% -3.42 20.0 5.0 12.5 0 750 9	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0
mge #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL V IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S	T=0 (% T=0 (% 0 (log <sub>10</sub> ME (min VOL (mi ME (min TE (lpm TO (10 <sup>x</sup> ) SIZE (µl		333E+03 0.0000% 0.0000% 0.00 20.0 3.0 12.5 -3 100 1 2	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 111 15	3.556E+00 0.0381% 99.9619% -3.42 20.0 5.0 12.5 0 750 9 9	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0 0
Range #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL V IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S	T=0 (% T=0 (% 0 (log <sub>10</sub> ME (min VOL (min NTE (lpm TO (10 <sup>x</sup> ) SIZE (µl		333E+03 0.0000% 0.0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2 3	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 11 15 8	3.556E+00 0.0381% 99.9619% -3.42 20.0 5.0 12.5 0 750 9 9 9 7	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0 0 0 1
tion Range #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL V IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S	T=0 (% T=0 (% :0 (log <sub>10</sub> ME (min VOL (ml ME (min ME (min ME (min ME (pm TO (10 <sup>x</sup> ) SIZE (µl		333E+03 0.0000% 0.0000% 0.00 20.0 3.0 12.5 -3 100 1 2 3	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 11 15 8	3.556E+00 0.0381% 99.9619% -3.42 20.0 5.0 12.5 0 750 9 9 9 7	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0 0 0 1
Dilution Range #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL V IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS (	T=0 (% T=0 (% -0 (log <sub>10</sub> ME (min VOL (min ME (min ATE (lpm TO (10 <sup>x</sup> ) SIZE (µl (# / drop		333E+03 0.0000% 0.0000% 0.00 20.0 3.0 12.5 -3 100 1 2 3 3	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 11 15 8	3.556E+00 0.0381% 99.9619% -3.42 200 20.0 5.0 12.5 0 750 9 9 7 7	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0 0 1 1
Dilution Range #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL V IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( DILUTION CONCENTRATION (CONCENTRATION (CO	T=0 (% T=0 (% 0 (log <sub>10</sub> ME (min VOL (mi ME (min ATE (lpm TO (10 <sup>x</sup> ) SIZE (µl (# / drop		333E+03 0.0000% 0.0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2 3 2.00	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 110 15 8 *	3.556E+00 0.0381% 99.9619% -3.42 200 20.0 5.0 12.5 0 750 9 9 9 7 7	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0 0 0 1 1
Dilution Range #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL V IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( IMPINGER CONCENTRATION (cfr)	T=0 (% T=0 (% ME (min ME (min TE (lpm TO (10 <sup>x</sup> ) SIZE (µ1 (# / drop r pfi/m)		333E+03 0.0000% 0.0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2.0 20,000 20,000	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 110 15 8 11.33 113	3.556E+00 0.0381% 99.9619% -3.42 200 20.0 5.0 12.5 0 750 9 9 9 7 7 8.33 11	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0 0 0 1 1 3 0 0 1 2 3 0
Dilution Range #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T anger Sampling Conditions SAMPLE TI IMPINGER FILL ' IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( PLATE AVERAGE COUNT ( IMPINGER CONCENTRATION (cfu or p	T=0 (% T=0 (% ME (min ME (min ME (min ME (min ME (min ME (min STE (pn ME (min (m / drop		333E+03 0.0000% 0.0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2.00 20,000 1,07E+04	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 11 15 8 11.33 113 3.63E+01	3.556E+00 0.0381% 99.9619% -3.42 200 20.0 5.0 12.5 0 750 9 9 9 7 7 8.33 11 3.56E+00	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0 0 0 1 2.5 0 12.5 0 12.5 0 12.5 0 12.5 0 142E-01
Dilution Range #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T ager Sampling Conditions SAMPLE TI MPINGER FILL IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( PLATE AVERAGE COUNT ( IMPINGER CONCENTRATION (cfu or p CHAMBER BIOAEROSOL CONCETRATION (cfu or p	T=0 (% T=0 (% ME (min ME (min))))))))))))))))))))))))))))))))))))		333E+03 0.0000% 0.0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2.00 20,000 1.07E+04 -2	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 11 15 8 11 35 8 11.33 113 3.63E+01	3.556E+00 0.0381% 99.9619% -3.42 200 20.0 5.0 12.5 0 750 9 9 9 7 7 8.33 11 3.56E+00 0	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0 0 0 1 2.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 12.5 12.5 12.5 12.5 12.5 12.5 12.5
Dilution Range #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T ager Sampling Conditions SAMPLE TI MPINGER FILL IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( PLATE AVERAGE COUNT ( IMPINGER CONCENTRATION (cfu or J CHAMBER BIOAEROSOL CONCETRATION (cfu or J DILUTION RAT DROPLET S	T=0 (% T=0 (% ME (min ME (min))))))))))))))))))))))))))))))))))))		333E+03 0.0000% 0.0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2.00 20,000 1.07E+04 -2 100	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 11 15 8 11.33 113 3.63E+01 -1 100	3.556E+00 0.0381% 99.9619% -3.42 200 20.0 5.0 12.5 0 750 9 9 9 7 7 8.33 11 3.56E+00 0 100	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0 0 1 2.5 0 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 12.5 12.5 12.5 12.5 12.5 12.5 12.5
#1 Dilution Range #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T ager Sampling Conditions SAMPLE TI MPINGER FILL IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( PLATE AVERAGE COUNT ( IMPINGER CONCENTRATION (cfu or J DILUTION RAT DILUTION RAT DILUTION RAT	T=0 (% T=0 (% ME (min ME (min))))))))))))))))))))))))))))))))))))		333E+03 0.0000% 0.0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2.00 20,000 1.07E+04 -2 100 12	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 11 15 8 11.33 113 3.63E+01 -1 100 2	3.556E+00 0.0381% 99.9619% -3.42 200 20.0 5.0 12.5 0 750 9 9 9 7 7 8.33 11 3.56E+00 0 100	1.422E-0 0.0015% 99.99859 -4.82 30 20.0 5.0 12.5 0 750 0 0 1 2.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 12.5 12.5 12.5 12.5 12.5 12.5 12.5
inge #1 Dilution Range #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T ager Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( PLATE AVERAGE COUNT ( IMPINGER CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or DILUTION RAT DROPLET S	T=0 (% T=0 (% ME (min WE (min WOL (min ME (min))))))))))))))))))))))))))))))))))))		333E+03 0.0000% 0.0000% 0.00 20.0 3.0 12.5 -3 100 1 2.00 20,000 1.07E+04 -2 100 12 14	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 11 15 8 11.33 113 3.63E+01 -1 100 2 1	3.556E+00 0.0381% 99.9619% -3.42 200 20.0 5.0 12.5 0 750 9 9 9 7 7 8.33 11 3.56E+00 0 100	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0 0 1 2.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 0 12.5 10 0 12.5 10 10 10 10 10 10 10 10 10 10 10 10 10
n Range #1 Dilution Range #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T ager Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( CHAMBER BIOAEROSOL CONCENTRATION (cfu or DILUTION RAT DROPLET S	T=0 (% T=0 (% ME (min VOL (ml ME (min XTE (pm ME (pm))))))))))))))))))))))))))))))))))))		333E+03 0.0000% 0.0000% 0.00 20.0 20.0 3.0 12.5 -3 100 1 2.00 20.000 1.07E+04 -2 100 12 14 19	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 11 15 8 11.33 113 3.63E+01 -1 100 2 1 1	3.556E+00 0.0381% 99.9619% -3.42 20.0 5.0 12.5 0 750 9 9 9 7 7 8.33 11 3.56E+00 0 100	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0 0 1 2.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 12.5 12.5 12.5 12.5 12.5 12.5 12.5
ution Range #1 Dilution Range #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T ager Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( CHAMBER BIOAEROSOL CONCETRATION (cfu or p DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS (	T=0 (% T=0 (% ME (min WOL (min WOL (min ME (mi		333E+03 0.0000% 0.0000% 0.00 20.0 20.0 3.0 12.5 -3 100 1 2 2.00 20,000 L07E+04 -2 100 12 14 19	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 100 11 15 8 111.33 113 3.63E+01 -1 100 2 1 1 100	3.556E+00 0.0381% 99.9619% -3.42 200 20.0 5.0 12.5 0 750 9 9 9 7 7 8.33 11 3.56E+00 0 100	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0 0 1 2.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 0 12.5 0 0 0 12.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Dilution Range #1 Dilution Range #1 Jill Dilution Range #1	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM Te ager Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( CHAMBER BIOAEROSOL CONCETRATION (cfu or J DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS (	T=0 (% T=0 (% ME (min VOL (ml ME (min TE (pm ME (min TE (pm ME (min TE (pm ME (min TE (pm ME (min TE (pm ME (min SIZE (µl G) (10 <sup>x</sup> ) SIZE (µl G) (10 <sup>x</sup> ) SIZE (µl G) (10 <sup>x</sup> ) SIZE (µl G) (10 <sup>x</sup> )		333E+03 0.0000% 0.0000% 0.00 20.0 20.0 3.0 12.5 -3 100 1 2 2.00 20,000 1.07E+04 -2 100 12 14 19	3.947E+01 0.4229% 99.5771% -2.37 10 20.0 5.0 12.5 0 12.5 0 11.3 13 3.63E+01 1 100 2 1 1 100 2 1 1 1 3.63E+01 1	3.556E+00 0.0381% 99.9619% -3.42 200 20.0 5.0 12.5 0 750 9 9 9 7 7 8.33 11 3.56E+00 0 100	1.422E-0 0.0015% 99.9985% -4.82 30 20.0 5.0 12.5 0 750 0 0 1 2.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 12.5 0 0 0 12.5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

 CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)
 8.00E+03
 4.3

 Figure 10B: A. brasiliensis Trial 1

4.27E+01



	Information			TRIAL	LOG REDUC	TION RESULT	S
	TEST DATE: Monday, July 19, 2021	1					
	TRIAL PERFORMED BY: SMM		0.0				
	TRIAL NUMBER: T2			$\mathbf{N}$			
	TEST ORGANSIM: Aspergillus brasiliensis						
TRI	AL NAME ID (GRAPHS/TABLES): Aspergillus brasiliensis		10				
			-1.0				
Devi	ice Information			`			
	MANUFACTURER: Medify						
	UNIT MODEL: M40	8	-2.0		2.18		
	FAN SPEED (CFM):	8					
	UNIT SERIAL #:						
	FITER ID #:	č.	-3.0				- Aspergillu
	FILTER LOT #:	ğ					s brasiliensi
							S
Gen	eral Testing Conditions (Can Be User Defined)		-4.0				
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16						
	NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb						
	SAMPLING METHOD: Impinger		-5.0				`
	CHAMBER MIXING FAN: yes						
	TEMP (F): 74						
	RH (%): 70						
	OTHER INSTRUMENTS: na			)	10	20	30
	TRIAL COMMENTS/NOTES na						
					Time	(min)	
	EROSOL Sample ID and Summary Data			<b>S</b> 1	<b>S</b> 2	83	<b>S4</b>
	SAMPLE TI	ME (min)		0	10	20	30
	IMPINGER US	ED (v / n)		v	v	20 V	v
	VIARI E CASCADE US	ED (v / n)		, n	,	,	y
	CHAMPER IMPINGER BIORICAEROSOL CONCENTRATION (cfu	afa/I Air)			6 560E 101	4 4005 100	y 1 400E 01
	CHAMBER WARDER BIORIOAEROSOL CONCENTRATION (cf. and	GUL AII)	9.8	50E+03	0.300E+01	4.409E+00	0.205
	INTRICED DI LITION CONSISTENCY CHECKS (W	JUL AII)		2 220/	A 70%		0.295
	MADE CONSISTENCY CHECKS (% a	greement)	· ·	3.33%	4.70%		
	VIABLE CONSISTENCY CHECKS (% a	greement)					<b>_ _ _ _ _ _ _ _ _ _</b>
	IMP & VIABLE CROSS CHECK (% a	greement)					51.75%
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p	tu/L Air)	9.9	956E+03	6.560E+01	4.409E+00	2.185E-01
	RELATIVE PERCENT REMAINING FROM	1=0 (%)	10	0.0000%	0.6589%	0.0443%	0.0022%
	RELATIVE PERCENT REMOVAL FROM	T=0 (%) T=0 (%)	100 0.	0.0000% .0000%	0.6589% 99.3411%	0.0443% 99.9557%	0.0022% 99.9978%
	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T=	T=0 (%) T=0 (%) =0 (log <sub>10</sub> )	100 0.	0.0000% 0000% 0.00	0.6589% 99.3411% -2.18	0.0443% 99.9557% -3.35	0.0022% 99.9978% -4.66
mpi	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T=	T=0 (%) T=0 (%) =0 (log <sub>10</sub> )	100 0.	0.0000% 0000% 0.00	0.6589% 99.3411% -2.18	0.0443% 99.9557% -3.35	0.0022% 99.9978% -4.66
mpi	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI	1=0 (%) T=0 (%) =0 (log <sub>10</sub> ) ME (min)	100	0.0000% 0000% 0.00	0.6589% 99.3411% -2.18 10	0.0443% 99.9557% -3.35 <b>20</b>	0.0022% 99.9978% -4.66 30
mpi	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL	1=0 (%) T=0 (%) 0 (log <sub>10</sub> ) ME (min) VOL (ml)	10	0.0000% 0000% 0.00 0 0 20.0	0.6589% 99.3411% -2.18 10 20.0	0.0443% 99.9557% -3.35 20 20.0	0.0022% 99.9978% -4.66 30 20.0
mpi	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T INGER SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI	1=0 (%) T=0 (%) 0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min)	100	00000% 0000% 0.00 0 20.0 3.0	0.6589% 99.3411% -2.18 10 20.0 5.0	0.0443% 99.9557% -3.35 20 20.0 5.0	0.0022% 99.9978% -4.66 30 20.0 5.0
mpi	RELATIVE PERCENT REMAINING FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA	1=0 (%) T=0 (%) =0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) ATE (lpm)	100	0.0000% 0.000 0.00 0.00 0 20.0 3.0 12.5	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5	0.0443% 99.9557% -3.35 20 20.0 5.0 12.5	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5
npi	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RAT	<b>1=0</b> (%) <b>T=0</b> (%) <b>0</b> (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) TE (lpm) <b>TO (10<sup>x</sup>)</b>	10(	0.0000% 0.000 0.00 0.00 20.0 3.0 12.5 -3	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0	0.0443% 99.9557% -3.35 20 20.0 5.0 12.5 0	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0
npi	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T INPINGER SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET	1=0 (%) T=0 (%) 0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) ATE (lpm) TO (10 <sup>x</sup> )	100	0.0000% 0.000 0.00 20.0 3.0 12.5 -3 100	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100	0.0443% 99.9557% -3.35 20.0 5.0 12.5 0 750	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750
npi	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S	1=0 (%) T=0 (%) 0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) ATE (lpm) TO (10 <sup>x</sup> ) SIZE (µl)		00000% 0000% 0.00 20.0 3.0 12.5 -3 100 1	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19	0.0443% 99.9557% -3.35 20.0 5.0 12.5 0 750 12	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0
mpi	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S	1=0 (%) T=0 (%) =0 (log <sub>10</sub> ) ME (min) ME (min) ME (min) ATE (lpm) TO (10 <sup>x</sup> ) SIZE (µl)		0.0000% 0.000 0.00 20.0 3.0 12.5 -3 100 1 2 2	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26	0.0443% 99.9557% -3.35 200 20.0 5.0 12.5 0 750 12 11	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0
Range #1	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T IMPINGER SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S	1=0 (%) T=0 (%) =0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) ME (min) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop)		00000% 0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26	0.0443% 99.9557% -3.35 20.0 5.0 12.5 0 750 12 11	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 0
tion Range #1	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE IMPINGER SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER FLOW RA DILUTION RAT DROPLET S	1=0 (%) T=0 (%) 0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) ME (min) ME (пр) 4 TO (10 <sup>x</sup> ) SIZE (µl) (# / drop)		00000% 0000% 0.00 20.0 3.0 12.5 -3 100 1 2 3	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26 18	0.0443% 99.9557% -3.35 20 20.0 5.0 12.5 0 750 12 11 8	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 0 1
Dilution Range #1	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INGER SAMPLING TO IMPINGER SAMPLING TO IMPINGER FILL' IMPINGER FLOW RA DILUTION RAT DROPLET S	1=0 (%) T=0 (%) 0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) ME (pm) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop)		00000% 0000% 0.00 20.0 3.0 12.5 -3 100 1 2 3	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26 18	0.0443% 99.9557% -3.35 20 20.0 5.0 12.5 0 750 12 11 8	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 0 1
Dilution Range #1	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T IMPINGER SAMPLE TI IMPINGER SAMPLING TI DEVELOPMENT TO THE SAMPLING TO THE SAMPLING TO THE SAMPLING TI DEVELOPMENT TO THE SAMPLING TO THE SAMPLING TO THE SAMPLING TI IMPINGER SAMPLING TI IMPINGER SAMPL	1=0 (%) T=0 (%) =0 (log <sub>10</sub> ) ME (min) WOL (ml) ME (min) ΔΤΕ (lpm) TO (10 <sup>x</sup> ) SIZE (μl) (# / drop) (# / drop)		00000% 0000% 0.00 20.0 3.0 12.5 -3 100 1 2 3 3	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26 18 21.00	0.0443% 99.9557% -3.35 200 20.0 5.0 12.5 0 750 12 11 8 8	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 0 1 1
Dilution Range #1	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T INPINGER SAMPLE T IMPINGER SAMPLE T IMPINGER SAMPLING T IMPINGER SAMPLING T IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfu	1=0 (%) T=0 (%) 0 (log <sub>10</sub> ) ME (min) WOL (ml) ME (min) ME (min) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop) (# / drop) or pfu/ml)		00000% 0000% 0.00 20.0 3.0 12.5 -3 100 1 2 3 3 2.00 20,000	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26 18 18 21.00 210	0.0443% 99.9557% -3.35 200 20.0 5.0 12.5 0 750 12 11 8 9 10.33 14	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 1 1 0 3 3 0 3 3 0
Dilution Range #1	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T IMPINGER SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET : ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfuor CHAMBER BIOAEROSOL CONCETRATION (cfuor	H=0 (%)           T=0 (%)           T=0 (%)           T=0 (%)           ME (min)           VOL (ml)           ME (min)           VTE (lpm)           TO (10 <sup>x</sup> )           SIZE (µl)           (# / drop)           or fu/ nl)		00000% 0000% 0.00 20.0 3.0 12.5 -3 100 1 2 3 2.00 20,000 .07E+04	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26 18 21.00 210 6.72E+01	0.0443% 99.9557% -3.35 200 20.0 5.0 12.5 0 750 12 11 8 10.33 14 4.41E+00	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 1 1 1 0 33 0 1.42E-01
Dilution Range #1	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE IMPINGER SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfu CHAMBER BIOAEROSOL CONCETRATION (cfu OILUTION RAT	1=0 (%)         X           T=0 (%)         X           ME (min,)         X           VOL (m)         X           ME (min,)         X           SIZE (µ)         X           (# / drop)         X           U(# / drop)         X <td></td> <td>00000% 0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2.00 20,000 .07E-04 -2</td> <td>0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26 18 21.00 210 6.72E+01 -1</td> <td>0.0443% 99.9557% -3.35 200 20.0 5.0 12.5 0 750 12 11 18 8 10.33 14 4.41E+00 0</td> <td>0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 1 1 3 0 1 4 2 5.0 12.5 10 750 0 1 1 750 0 1 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2</td>		00000% 0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2.00 20,000 .07E-04 -2	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26 18 21.00 210 6.72E+01 -1	0.0443% 99.9557% -3.35 200 20.0 5.0 12.5 0 750 12 11 18 8 10.33 14 4.41E+00 0	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 1 1 3 0 1 4 2 5.0 12.5 10 750 0 1 1 750 0 1 1 2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2
Dilution Range #1	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM T IMPINGER SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER FILL IMPINGER FILL IMPINGER FILL DILUTION RAT DROPLET : PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfu CHAMBER BIOAEROSOL CONCETRATION (cfu DILUTION RAT DROPLET :	1=0 (%) T=0 (%) 0 (log <sub>10</sub> ) (%) 0	100	0.0000% 0000% 0.00 20.0 12.5 -3 100 1 2 3 2.00 20.000 20.000 0.07E+04 -2 100	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26 18 21.00 210 6.72E+01 -1 100	0.0443% 99.9557% -3.35 20 20.0 5.0 12.5 0 750 12 11 8 * 10.33 14 4.41E+00 0 100	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 1 1.5 750 0 1 3 3 0 1.42E-01 -2 100
e#1 Dilution Range#1 dd	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE IMPINGER SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER FILL IMPINGER FILL IMPINGER FILL ENUMERATED PLATE COUNTS FLATE AVERAGE COUNTS PLATE AVERAGE COUNTS IMPINGER CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or DROPLET S	1=0 (%) T=0 (%) ME (min) ME (min)	100	0.0000% 0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2.00 20,000 .07E+04 -2 100 20	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26 18 21.00 210 6.72E401 -1 100 2	0.0443% 99.9557% -3.35 20 20.0 5.0 12.5 0 750 12 11 8 10.33 14 4.41E+00 0 100	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 0 1 1 3 0 1.42E-01 -2 100
ange #1 Dilution Range #1 di	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INPINGER SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FILL DILUTION RAT DROPLET T PLATE AVERAGE COUNTS IMPINGER CONCENTRATION (cfuor CHAMBER BIOAEROSOL CONCENTRATION (cfuor DILUTION RAT DROPLET S	1=0 (%) T=0 (%) ME (min) ME (min)	100	0.0000% 0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2.00 20.000 .07E+04 20 16	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 0 100 19 26 18 21.00 21.0 6.72E+01 -1 100 2 2 1	0.0443% 99.9557% -3.35 200 20.0 5.0 12.5 0 750 12 11 8 10.33 14 4.41E+00 0 100	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 0 0 0 12.5 0 0 0 12.5 0 0 0 1 2.5 0 12.5 12.5 0 0 0 1 2.5 0 1 2.5 10 0 1 42E-01 100
n Range #1 Dilution Range #1 di	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE IMPINGER SAMPLE TI IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS CHAMBER BIOAEROSOL CONCETRATION (cfu or DILUTION RAT DROPLET S	1=0 (%) T=0 (%) ME (min) ME (min)	100	0.0000% 0000% 0.00 20.0 3.0 12.5 -3 100 1 2 3 3 2.00 20.00 20.00 20.00 20.00 20.00 20 16 16	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 100 19 26 18 21.00 210 6.72E+01 -1 100 2 1 3	0.0443% 99.9557% -3.35 20.0 5.0 12.5 0 12.5 12 11 8 10.33 14 4.41E+00 0 100	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 1 3 0 1 1 2 2 3 0 1 2 2 3 0 1 2 2 3 0 1 2 3 3 0 1 4 2 2 0 1 3 3 0 0 1 4 2 3 1 2 3 1 2 3 1 2 3 1 3 1 3 1 3 1 3 1
ution Range #1 Dilution Range #1 d	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE IMPINGER SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS CHAMBER BIOAEROSOL CONCENTRATION (cfu CHAMBER BIOAEROSOL CONCENTRATION (cfu DILUTION RAT DROPLET S	1=0 (%) T=0 (%) ME (min), WOL (ml), ME (min), TE (pm) TO (10 <sup>*</sup> ) SIZE (µl) (# / drop) SIZE (µl) (# / drop) SIZE (µl) (# / drop) (# / drop) (# / drop)	100	00000% 0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2 3 2 2.00 20,000 -2 20,000 20,000 16 16 16	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26 18 21.00 210 6.72E+01 -1 100 2 1 3	0.0443% 99.9557% -3.35 20.0 5.0 12.5 11 12 11 8 10.33 14 4.41E+00 0 100	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 1 1 3 0 1 1 4 2 5.0 12.5 10 0 1 1 1 1 1 1 1 2 10 10 10 10 10 10 10 10 10 10 10 10 10
Dilution Range #1 Dilution Range #1 d	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE IMPINGER SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER FILL IMPINGER FILL IMPINGER FILL ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT IMPINGER DIOAEROSOL CONCETRATION (cfu CHAMBER BIOAEROSOL CONCETRATION (cfu	1=0 (%) T=0 (%) 0 (log <sub>10</sub> ) ME (min) WOL (ml) ME (min) TO (10 <sup>x</sup> ) SIZE (µ1) (# / drop) SIZE (µ1) (# / drop) SIZE (µ1) (# / drop) (# / drop) (# / drop) (# / drop) (# / drop) (# / drop) (# / drop)	100	0.0000% 0000% 0.00 20.0 12.5 -3 100 1 2 3 2.00 20,000 .07E+04 -2 100 20 16 16 16	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26 18 21.00 210 6.72E+01 -1 100 2 1 3 3	0.0443% 99.9557% -3.35 20 20.0 5.0 12.5 0 750 12 11 8 3 10.33 14 4.41£+00 0 100	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 1 1 3 0 1 4 2E-01 -2 100
Dilution Range #1 Dilution Range #1 d	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE IMPINGER SAMPLE TI IMPINGER FILL IMPINGER FILL IMPINGER FILL IMPINGER FILL ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfu or DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS	1=0 (%) T=0 (%) 0 (log <sub>10</sub> ) ME (min) ME (m	100	0.0000% 0000% 0.00 20.0 12.5 -3 100 1 2 3 2.00 20,000 .07E+04 -2 100 20 16 16 16	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26 18 21.00 210 6.72E+01 -1 100 2 1 3 3	0.0443% 99.9557% -3.35 20 20.0 5.0 12.5 0 750 12 11 8 10.33 14 4.41E+00 0 100	0.0022% 99.9978% -4.66 30 20.0 5.0 12.5 0 750 0 0 0 1 1 .425-01 -2 100
Dilution Range #1 Dilution Range #1 dd	RELATIVE PERCENT REMOVAL FROM RELATIVE PERCENT REMOVAL FROM LOG REDUCTION FROM TE INPINGER SAMPLE TI IMPINGER SAMPLENG TI IMPINGER FILL' IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT MPINGER CONCENTRATION (cfu or DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS PLATE AVERAGE COUNTS PLATE AVERAGE COUNTS	1=0 (%) T=0 (%) 60 (log <sub>10</sub> ) ME (min), ME (min), ME (min), TT (lpm) TT (lpm) TT (lpm) TT (lpm), TT (		0.0000% 0000% 0.00 20.0 3.0 12.5 -3 100 1 2 2.00 20,000 .07E-04 20 16 16 16 16 17.33 17,333 .22E+03	0.6589% 99.3411% -2.18 10 20.0 5.0 12.5 0 100 19 26 18 21.00 210 6.72E+01 2 1 3 2 2 1 3 2 2.00 200 6.40E+01	0.0443% 99.9557% -3.35 200 20.0 5.0 12.5 0 750 12 11 8 10.33 14 4.41E+00 0 1000	0.0022% 99.9978% -4.66 20.0 5.0 12.5 0 0 0 0 1 1 2.5 0 0 1 2.5 12.5 10 0 0 1 1 2.5 10 1 1 2 2 100

VIADI	Table Cascade Sampling Conditions Statistical Correction Applied Automatically for Courts>60							
	SAMPLE TIME (min)	0	10	20	30			
	VIABLE CASCADE SAMPLING TIME (min)	1.0	2.0	1.0	5.0			
_	VIABLE CASCADE FLOW RATE (lpm)	30	30	30	38			
ascade #	ENUMERATED PLATE COUNTS (# / plate)				56			
iable Ca	STATISTICALLY CORRECTED PLATE COUNTS (# / plate)				56			
-	PLATE AVERAGE COUNT (# / plate)				56.00			
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)				0.295			
	Figure 11B: A. brasiliensis Trial 2							



Trial Information	_	_	TRIA	AL LOG REDUCT	TION RESUL	TS
TEST DATE: Monday, July 19, 2021						
TRIAL PERFORMED BY: SMM		0.0	•			
TRIAL NUMBER: T3						
TEST ORGANSIM: Aspergillus brasiliensis						
TRIAL NAME ID (GRAPHS/TABLES): Aspergillus brasiliensis		-1.0				
Device Information						
MANUFACTURER: Medify				200		
UNIT MODEL: M40	5	-2.0				
FAN SPEED (CFM):	Ē					
UNIT SERIAL #:	ğ					
FITER ID #:	ĕ	-3.0		<b>`</b>		Aspergillu
FILTER LOT #:	ğ				-3.52	s brasiliensi
						S
General Testing Conditions (Can Be User Defined)		-4.0				
TEST CHAMBER VOLUME (m <sup>3</sup> ): 16						-4.57
NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb						
SAMPLING METHOD: Impinger		-5.0				<u>`</u>
CHAMBER MIXING FAN: yes		-3.0				
TEMP (F): 74						
RH (%): 70		-6.0				
OTHER INSTRUMENTS: na		-0.0	0	10	20	30
TRIAL COMMENTS/NOTES na				Time	(min)	
				mine	()	
BIOAEROSOL Sample ID and Summary Data			S1	S2	S3	S4
SAMPLE TI	ME (min	1)	0	10	20	30
IMPINGER US	ED (y / n	1)	у	У	У	У
VIABLE CASCADE US	ED (y / n	)	n	n	n	У
CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu p	fu/L Air	) 1.	067E+04	1.056E+02	2.560E+00	2.844E-01
CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or p	ofu/L Air	)				0.295
IMPINGER DILUTION CONSISTENCY CHECKS (% ag	reement	) 🔵 🗄	28.57%	20.00%		
VIABLE CONSISTENCY CHECKS (% ag	reement	:)				
IMP & VIABLE CROSS CHECK (% ag	reement	.)				3.49%
CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p	u/L Air	) 1.	067E+04	1.056E+02	2.560E+00	2.896E-01
RELATIVE PERCENT REMAINING FROM	Г=0 (%	) 10	0.0000%	0.9900%	0.0240%	0.0027%
RELATIVE PERCENT REMOVAL FROM	Г=0 (%	) (	.0000%	99.0100%	99.9760%	99.9973%
LOG REDUCTION FROM T=	0 (log <sub>10</sub>	)	0.00	-2.00	-3.62	-4.57
Impinger Sampling Conditions			•			

	SAMPLE TIME (min)	0	10	20	30
IMPINGER FILL VOL (ml) IMPINGER SAMPLING TIME (min)		20.0	20.0	20.0	20.0
		3.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-3	0	0	0
	DROPLET SIZE (µl)	100	100	750	750
I#		4	31	8	0
ange	ENUMERATED PLATE COUNTS (# / drop)	1	32	3	1
n Rá		2	25	7	1
lutio					
Dil	PLATE AVERAGE COUNT (# / drop)	2.33	29.33	6.00	0.67
	IMPINGER CONCENTRATION (cfu or pfu/ml)	23,333	293	8	1
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	1.24E+04	9.39E+01	2.56E+00	2.84E-01
	DILUTION RATIO (10 <sup>x</sup> )	-2	-1	0	-2
	DROPLET SIZE (µl)	100	100	100	100
1#		18	2		
nge	ENUMED ATTED DI ATTE COUNTS (# ( door)	17	4		
n Rá	ENUMERATED PLATE COUNTS (#7 diop)	15	5		
lutio					
Di	PLATE AVERAGE COUNT (# / drop)	16.67	3.67		
	IMPINGER CONCENTRATION (cfu or pfu/ml)	16,667	367		
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	8.89E+03	1.17E+02		

Viab	Viable Cascade Sampling Conditions **Statistical Correction Applied Automatically for counts>60							
	SAMPLE TIME (min)	0	10	20	30			
	VIABLE CASCADE SAMPLING TIME (min)	1.0	2.0	1.0	5.0			
-	VIABLE CASCADE FLOW RATE (lpm)	30	30	30	38			
iable Cascade #1	ENUMERATED PLATE COUNTS (# / plate)				56			
	STATISTICALLY CORRECTED PLATE COUNTS (# / plate)				56			
-	PLATE AVERAGE COUNT (# / plate)				56.00			
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)				0.295			

Figure 12B: A. brasiliensis Trial 3



Trial	Information	TRIAL LOG REDUCTION RESULTS			SULTS
	TEST DATE: Friday, July 30, 2021		-0	B. subtilis	
	TRIAL PERFORMED BY: ZC	0.0 👇 🗕	-0.06	-0,16	-0.20
	TRIAL NUMBER: T1				•
	TEST ORGANSIM: B. subtilis				
TR	IAL NAME ID (GRAPHS/TABLES): B. subtilis				
Dev	ice Information	-1.0			
	MANUFACTURER: Medify	_			
	UNIT MODEL: M40	<u>i</u>			
	FAN SPEED (CFM):	p p			
	UNIT SERIAL #:	-2.0			
	FILER ID #:	8			
	FILIER LUI #.				
Gen	eral Testing Conditions (Can Be User Defined)				
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16	2.0			
	NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb	-3.0			
	SAMPLING METHOD: Impinger				
	CHAMBER MIXING FAN: yes				
	TEMP (F): 74				
	RH (%): 70	-4.0			
	OTHER INSTRUMENTS: na	0	10	20	30
	TRIAL COMMENTS/NOTES na		т	ime (min)	
BIO	EROSOL Sample ID and Summary Data	S1		S2	<b>S</b> 3
	SAMPLE TIME (min)	0	10	20	30
	IMPINGER USED (y / n)	У	У	У	У
	VIABLE CASCADE USED (y / n)	n	n	n	n
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air)	7.253E+05	6.293E+05	5.013E+05	4.587E+05
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)				
	IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)				
	VIABLE CONSISTENCY CHECKS (% agreement)				
_	IMP & VIABLE CROSS CHECK (% agreement)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	7.253E+05	6.293E+05	5.013E+05	4.587E+05
	RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	86.7647%	69.1176%	63.2353%
	<b>RELATIVE PERCENT REMOVAL FROM T=0 (%)</b>	0.0000%	13.2353%	30.8824%	36.7647%
	LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-0.06	-0.16	-0.20
Impi	nger Sampling Conditions				
	SAMPLE TIME (min)	0		20	30
	IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	5.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-4	-4	-4	-4
	DROPLET SIZE (µl)	100	100	100	100
#1		20	18	18	18
inge		23	21	14	16
n Ra	ENUMERATED PLATE COUNTS (# / drop)	25	20	15	9
6					
Ē					
Diluti	PLATE AVERAGE COUNT (# / drop)	22.67	19.67	15.67	14.33
Diluti	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml)	22.67 2,266,667	19.67 1,966,667	15.67 1,566,667	14.33 1,433,333

Figure 13B: B. subtilis Control



Trial	Information			TRIAL LOG REE	DUCTION RESU	ITS
	TEST DATE: Friday, July 30, 2021					1.5
	TRIAL PERFORMED BY: ZC		0.0 🔍 —			
	TRIAL NUMBER: T1		•			
	TEST ORGANSIM: B. subtilis		-0.5			
TRI	AL NAME ID (GRAPHS/TABLES): B. subtilis					
Πονί	ce Information		-1.0			
Devi	MANUFACTURER: Medify		-1.5			
	UNIT MODEL: M40	u u		205		
	FAN SPEED (CFM):	ctic	-2.0	<b>`</b> \		
	UNIT SERIAL #:	adu				
	FITER ID #:	3 R	-2.5		$\mathbf{h}$	-•-B. subtilis
	FILTER LOT #:	ľ				O Lincon Fit
_			-3.0			-O- Linear Fit
Gen	eral Testing Conditions (Can Be User Defined)		-25		-3.61	
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16		-3.5			
	NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb		-4.0			
	SAMPLING METHOD: Impinger					-4.28
	CHAMBER MIXING FAN: yes		-4.5			
	TEMP (F): 74					Ĩ,
	RH (%): 70		-5.0			
	OTHER INSTRUMENTS: na		0	10	20	30
	TRIAL COMMENTS/NOTES na			т	ime (min)	
	EPOSOL Sample ID and Summary Data		S1	52		<u>\$4</u>
5104		ME (min)	0	1 52	20	30
	IMPINGER USI	ED (v / n)	v	v	v	v
	VIABLE CASCADE US	ED(v/n)	'n	, n	'n	y
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu	ofu/L Air)	4.382E	E+05 6.187E+0	3 1.088E+02	2.304E+01
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or t	ofu/L Air)				
	IMPINGER DILUTION CONSISTENCY CHECKS (% as	reement)	0 10.38	3%		
	VIABLE CONSISTENCY CHECKS (% as	reement)				
	IMP & VIABLE CROSS CHECK (% as	reement)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p	fu/L Air)	4 382	05 6 187E-0	3 1.088E±02	2 304E±01
	RELATIVE PERCENT REMAINING FROM	T=0 (%)	100.00	00% 1.4118%	0.0248%	0.0053%
	RELATIVE PERCENT REMOVAL FROM	T=0 (%)	0.000	0% 98.5882%	6 99.9752%	99.9947%
	LOG REDUCTION FROM T=	0 (log <sub>10</sub> )	0.0	0 -1.85	-3.61	-4.28
mpi	nger Sampling Conditions	ME (min)	0	10	20	20
	IMPINGER EILL I	VIL (IIII)	20	0 20.0	20	20.0
	IMPINGER SAMPLING TI	ME (min)	20.	0 <u>20.0</u>	5.0	5.0
	IMPINGER ELOW RA	TE (hom)	12	5 <u>12</u> 5	12.5	12.5
		TL (ipiii)	12.	-	12.0	12.0
	DILUTION RAT	$IO(10^{x})$	-4	-2	0	0
1	DROPLETS	SIZE (µI)	10	J 100	100	500
ge #			/	15	33	36
Ran	ENUMERATED PLATE COUNTS (	# / drop)	8	21	33	
ion			11	22	36	
Dilut	PLATE AVERAGE COUNT	# / drop)	9.6	7 10.22	24.00	26.00
-	IMDINGED CONCENTRATION (65)	# / utop)	0.0	7 19.55 :67 10.222	34.00	50.00
			4 626	10, 19,555	1.005+03	2 205+01
	CHAMBER BIOAEROSOL CONCEIRATION (cft) or p	ofu/LAir)	4.020	-05 0.19E+05	1.052+02	2.500+01
	DILUTION RAT	IO $(10^x)$	-3	-1	0	-2
I	DROPLETS	SIZE (µl)	10	D 100	100	100
nge #1			80			
Ra	ENUMERATED PLATE COUNTS (	# / drop)	71			
ttion			, ,			
Dilt	PLATE AVERAGE COUNT	# / drop)	77.6	57	•	
	IMPINGER CONCENTRATION (cfu	or pfu/ml)	776,6	67		
	CHAMBER BIOAEROSOL CONCETRATION (cfu or r	ofu/L Air)	4.14E	+05		

Figure 14B: B. subtilis Trial 1



Trial	Information		TDIAL			s
1114	TEST DATE: Friday, July 30, 2021		TRIAL	LUG REDUC	HON RESULT	<b>.</b>
	TRIAL PERFORMED BY: ZC		0.0			
	TRIAL NUMBER: T2					
	TEST ORGANSIM: B. subtilis		-0.5			
TR	IAL NAME ID (GRAPHS/TABLES): B. subtilis					
Dev	ice Information		-1.0			
Dev	MANUFACTURER: Medify		-1.5			
	UNIT MODEL: M40	u u		1039		
	FAN SPEED (CFM):	ctic	-2.0			
	UNIT SERIAL #:	adu				
	FITER ID #:	B R	-2.5			– B. subtilis
	FILTER LOT #:	ΓŎ				
Gen	eral Testing Conditions (Can Be User Defined)		-3.0			- Linear Fit
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16		-3.5		-3.61	
	NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb					
	SAMPLING METHOD: Impinger		-4.0			-4.25
	CHAMBER MIXING FAN: yes					
	TEMP (F): 74		-4.5			
	RH (%): 70		5.0			
	OTHER INSTRUMENTS: na		-5.0	10	20	30
	TRIAL COMMENTS/NOTES na					
				lime	(min)	
BIO	AEROSOL Sample ID and Summary Data		<u>S1</u>	S2	<b>S3</b>	S4
	SAMPLE TI	ME (min)	0	10	20	30
	IMPINGER USI	±D (y / n)	У	У	У	У
	VIABLE CASCADE USI	£D (y / n)	n 5.0705 oc	n a ana⊑ aa	n 1 aaa E aa	у
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cft p	on/L Air)	5.378E+05	6.933E+03	1.333E+02	3.008E+01
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (CRUOT J	m/L Air)	22.06%			
	MADE CONSISTENCY CHECKS (% ag	(reement)	22.06%			
	MABLE CONSISTENCT CHECKS (% ag	greennenit)				
	CHAMPED BIODIOAEDOSOL CONCENTRATION (of a gr	fu/T Air	5 070F . 05	C 000E . 00	4 000 5 .00	0.0005.04
	RELATIVE PERCENT REMAINING FROM	T-0 (%)	5.378E+05	0.933⊑+03 1 2893%	0.0248%	0.0056%
	RELATIVE PERCENT REMOVAL FROM	T-0 (%)	0.0000%	98 7107%	99 9752%	99 9944%
	LOG REDUCTION FROM T	0 (log <sub>10</sub> )	0.00	-1.89	-3.61	-4.25
		010/				
Impi	nger Sampling Conditions	ME (min)	0	10	20	30
	IMPINGER FILL	/OL (ml)	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TI	ME (min)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RA	TE (lpm)	12.5	12.5	12.5	12.5
		IO (10 <sup>x</sup> )	-1	_2	٥	٥
	DILUTION KAT	10 (10-) 17F (al)	-4	-2	100	500
=	DROILET	9122E (µ1)	100	16	100	47
ge #			10	10	42	47
Ran	ENUMERATED PLATE COUNTS	# / drop)	13	23	52	
tion			11	20	51	
Dilu	PLATE AVERAGE COUNT	# / dron)	11 33	21.67	41 67	47.00
	IMPINGER CONCENTRATION (cfu	or pfu/ml)	1,133.333	21.667	417	94
	CHAMBER BIOAFROSOL CONCETRATION (cfu or t	fu/L Air)	6.04E+05	6.93E+03	1.33E+02	3.01E+01
			_3	_1	0	
	DROPLET S	SIZE (ul)	-5 100	100	100	100
1#		(11)	85			
nge			89			
ı Ra	ENUMERATED PLATE COUNTS (	# / drop)	91			
utior						
Dił	PLATE AVERAGE COUNT	# / drop)	88.33	•	•	
	IMPINGER CONCENTRATION (cfu	or pfu/ml)	883,333			

Figure 15B: B. subtilis Trial 2



Trial	Information			TRIAL LOG REDUC	TION RESULT	S
	TEST DATE: Friday, July 30, 2021					
	TRIAL PERFORMED BY: SMM		0.0			
	TRIAL NUMBER: T3					
	TEST ORGANSIM: B. subtilis		-0.5			
TR	AL NAME ID (GRAPHS/TABLES): B. subtilis					
_			-1.0			
Dev	ice Information			1.56		
	MANUFACTURER: Medify	_	-1.5	X		
	UNIT MODEL: M40	tion	2.0			
	FAN SPEED (CFM):	huc	-2.0			
	UNII SERIAL #:	Red	-25			B subtilis
	FILER ID #:	Q	-2.5		$\backslash \setminus$   $\square$	- B. Subtilis
	FILTER LOT #.	F	-3.0			– Linear Fit
Gon	eral Testing Conditions (Can Be User Defined)					
Jen	TEST CHAMPER VOLUME (m <sup>3</sup> ): 16		-3.5		3.62	
	NEPLILIZER CONDITIONS: Collicon 24 lat: approv. 20 min nob					
	CAMPLING METHOD: Implages		-4.0			
	CHAMPER MINING FANL					-4.34
	CHAMBER MIXING FAN: yes		-4.5			
	TEMP (F): 74					0
	RH (%): 70		-5.0			
	OTHER INSTRUMENTS: na		0	10	20	30
	TRIAL COMMENTS/NOTES na			Time	e (min)	
			G1		Ga	<u> </u>
3107		ME (min)	81	<u> </u>	83	<u>84</u>
	SAMPLE III	VIE (IIIII) 7D (v. / m)	U	10	20	30
		SD (y / II)	У	У	У	У
	VIABLE CASCADE USE	5D (y / n)	n	n	n	У
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (ctu p	m/L Air)	2.329E	+05 6.400E+03	5.547E+01	1.067E+01
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (ctu or p	otu/L Air)	<u> </u>			
	IMPINGER DILUTION CONSISTENCY CHECKS (% ag	greement)	36.25	%		
	VIABLE CONSISTENCY CHECKS (% ag	greement)				
	IMP & VIABLE CROSS CHECK (% ag	greement)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p	fu/L Air)	2.329E	+05 6.400E+03	5.547E+01	1.067E+01
	RELATIVE PERCENT REMAINING FROM	T=0 (%)	100.000	0% 2.7481%	0.0238%	0.0046%
	RELATIVE PERCENT REMOVAL FROM	T=0 (%)	0.0000	% 97.2519%	99.9762%	99.9954%
	LOG REDUCTION FROM T=	0 (log <sub>10</sub> )	0.00	-1.56	-3.62	-4.34
mni	nger Sampling Conditions					
	SAMPLE TI	ME (min)	0	10	20	30
	IMPINGER FILL	VOL (ml)	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TI	ME (min)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RA	TE (lpm)	12.5	12.5	12.5	12.5
_		(T)				
	DILUTION RAT	IO $(10^x)$	-4	-2	0	0
	DROPLET S	siZE (μl)	100	100	100	750
ie #1			7	22	22	25
tang	ENUMERATED PLATE COUNTS (	# / drop)	4	21	12	
n R		(P)	5	17	18	
llutic						
D	PLATE AVERAGE COUNT (	# / drop)	5.33	20.00	17.33	25.00
	IMPINGER CONCENTRATION (cfu d	or pfu/ml)	533,33	3 20,000	173	33
	CHAMBER BIOAEROSOL CONCETRATION (cfu or p	ofu/L Air)	2.84E+	05 6.40E+03	5.55E+01	1.07E+01
	DILUTION RAT	IO (10 <sup>x</sup> )	-3	-1	0	-2
	DROPLET S	SIZE (µl)	100	100	100	100
#1			35			
unge			29			
n Rs	ENUMERATED PLATE COUNTS (	# / drop)	38			
utio						
Dilt	PLATE AVERAGE COUNT (	# / drop)	34.00		•	
	IMPINGER CONCENTRATION (cfu	or pfu/ml)	340,00	0		
	CHAMBER BIOAEPOSOL CONCETRATION (cfu or r	fu/L Air)	1.81E+	05		
	CHAMBER DIOALRODOL CONCLURATION CONTRACTOR	nu L Au				

Figure 16B: B. subtilis Trial 3



Trial Information	
TEST DATE: Wednesday, July 21, 2021	TRIAL LOG REDUCTION RESULTS
TRIAL PERFORMED BY: SMM	
TRIAL NUMBER: Control	
TEST ORGANSIM: MS2	-0.1
TRIAL NAME ID (GRAPHS/TABLES): MS2 T1	-0.19
	-0.2
Device Information	-0.29
MANUFACTURER: Medify	0.3
UNIT MODEL: M40	
FAN SPEED (CFM):	<u>9</u> 0.4
UNIT SERIAL #:	
FITER ID #:	<b>0.5</b>
FILTER LOT #:	<b>9</b>
	-0.0
General Testing Conditions	-0.7
TEST CHAMBER VOLUME (m <sup>3</sup> ): 16	
NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb	-0.8
SAMPLING METHOD: Impinger	
CHAMBER MIXING FAN: yes	-0.9
TEMP (F): 74	
RH (%): 70	-1.0
OTHER INSTRUMENTS: na	<u> </u>
TRIAL COMMENTS/NOTES na	Time (min)

BIOAEROSOL Sample ID and Summary Data	<b>S1</b>		<b>S2</b>	<b>S</b> 3
SAMPLING TIME (min)	0	10	20	30
IMPINGER USED (y / n)	У	У	У	У
VIABLE CASCADE USED (y / n)	n	n	n	n
CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air)	1.440E+06	1.120E+06	9.280E+05	7.360E+05
CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)				
IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)				
VIABLE CONSISTENCY CHECKS (% agreement)				
IMP & VIABLE CROSS CHECK (% agreement)				
CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	1.440E+06	1.120E+06	9.280E+05	7.360E+05
RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	77.7778%	64.4444%	51.1111%
RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	22.2222%	35.5556%	48.8889%
LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-0.11	-0.19	-0.29

Impinger	Sampling	Conditions

	SAMPLING TIME (min)	0		15	30			
IMPINGER FILL VOL (ml)		20.0	20.0	20.0	20.0			
	IMPINGER SAMPLING TIME (min)	2.0	5.0	5.0	5.0			
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5			
	DILUTION RATIO (10 <sup>x</sup> )	-4	-4	-4	-4			
	DROPLET SIZE (µl)	50	50	50	50			
1# 0		12	18	10	12			
ution Range	ENUMERATED PLATE COUNTS (# / drop)	6	17	19	11			
Dil	PLATE AVERAGE COUNT (# / drop)	9.00	17.50	14.50	11.50			
	IMPINGER CONCENTRATION (cfu or pfu/ml)	1,800,000	3,500,000	2,900,000	2,300,000			
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	1.44E+06	1.12E+06	9.28E+05	7.36E+05			
	Figure 17B: MS2 Control							



Trial	Information		TRIAL LOG R		ESULTS
	TEST DATE: Wednesday, July 21, 2021				
	TRIAL PERFORMED BY: SMM	0.0 🧕			
	TRIAL NUMBER: T1				
	TEST ORGANSIM: MS2				
TR	AL NAME ID (GRAPHS/TABLES): MS2 T1	-1.0			
_					
Dev	ice Information	-2.0	2,19		
	MANUFACTURER: Medify	<b>_</b>	×,		
	UNIT MODEL: M40	l i			
	FAN SPEED (CFM):	-3.0			
	UNIT SERIAL #:	<b>B</b> e			MS2 T1
	FILER ID #:	8		4,02	o linear
	FILTER LOT #.	4.0			-0- Linear Fit
Gen	eral Testing Conditions (Can Be User Defined)				
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16	-5.0			
	NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb				-5.59
	SAMPLING METHOD: Impinger				8
	CHAMBER MIXING FAN: yes	-6.0			
	TEMP (F): 74				
	RH (%): 70	7.0			
	OTHER INSTRUMENTS: na	-7.0	10	20	30
	TRIAL COMMENTS/NOTES				
	INIGE COMMENTS/INO IES N3		1	ime (min)	
BIO	EROSOL Sample ID and Summary Data	S1	<b>S</b> 2	\$3	<u>84</u>
	SAMPLE TIME (min)	0	10	20	30
	IMPINGER USED $(y/n)$	v	v	v	V
	VIABLE CASCADE USED (v/n)	ņ	ņ	n	ņ
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air)	9 956E+05	6 400E+03	9.600E+01	2 560E+00
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfil or pfu/L Air)				
	IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)	<b>40.00%</b>		0.00%	
	VIABLE CONSISTENCY CHECKS (% agreement)				
	IMP & VIABLE CROSS CHECK (% agreement)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or nfu/L Air)	9.956F±05	6.400F±03	9.600F+01	2.560F±00
	RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	0.6429%	0.0096%	0.0003%
	RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	99.3571%	99.9904%	99,9997%
	LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-2.19	-4.02	-5.59
_					
Impi	nger Sampling Conditions	-			
	SAMPLE TIME (min)	0	10	20	30
	IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-5	-2	-1	0
	DROPLET SIZE (µl)	100	100	100	750
e #1		2	24	2	6
ang	ENUMERATED PLATE COUNTS (# / drop)	2	20	2	
on R		3	16	5	
iluti			•	·	۳
D	PLATE AVERAGE COUNT (# / drop)	2.33	20.00	3.00	6.00
	IMPINGER CONCENTRATION (cfu or pfu/ml)	2,333,333	20,000	300	8
		1.24E+06	6.40E+03	9.60E+01	2.56E+00
	CHAMBER BIOAEROSOL CONCEIRATION (cfu or pfu/L Air)				2
	CHAMBER BIOAEROSOL CONCEINATION (crit of pit/L Air)	-4	-1	0	-2
	CHAMBER BIOAEROSOL CONCETRATION (cfu of prwl Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl)	-4 100	-1 100	0 100	-2 100
1#	DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl)	-4 100 12	-1 100	0 100 32	-2 100
nge #1	DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl)	-4 100 12 12	-1 100	0 100 32 30	-2 100
ı Range #1	CHAMBER BIOAEROSOL CONCETRATION (ctu of pru/LAir) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (μl) ENUMERATED PLATE COUNTS (# / drop)	-4 100 12 12 18	-1 100	0 100 32 30 28	100
tion Range #1	CHAMBER BIOAEROSOL CONCETRATION (ctu of pru'L Air) DILUTION RATIO (10 <sup>*</sup> ) DROPLET SIZE (μ) ENUMERATED PLATE COUNTS (# / drop)	-4 100 12 12 18	-1 100	0 100 32 30 28	-2 100
Dilution Range #1	CHAMBER BIOAEROSOL CONCETRATION (ctu of pru/L Air) DILUTION RATIO (10 <sup>*</sup> ) DROPLET SIZE (μ) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop)	-4 100 12 12 18 14.00	-1 100	0 100 32 30 28 30.00	-2 100
Dilution Range #1	CHAMBER BIOAEROSOL CONCETRATION (ctu of pfu/L Air) DILUTION RATIO (10 <sup>*</sup> ) DROPLET SIZE (μ) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/m)	-4 100 12 12 18 14.00 1,400,000	-1 100	0 100 32 30 28 30.00 300	100
Dilution Range #1	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>*</sup> ) DROPLET SIZE (μ) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/m) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/m)	-4 100 12 12 12 18 14.00 1,400,000 7,47E+05	-1 100	0 100 32 30 28 30.00 30.00 300 9,60F+01	100

Figure 18B: MS2 Trial 1



<u>Tria</u> l	Information		TRIAL LOG R	EDUCTION R	ESULTS
	TEST DATE: Wednesday, July 21, 2021				
	TRIAL PERFORMED BY: SMM	0.0 🤦			
	TRIAL NUMBER: T2	₹ N			
	TEST ORGANSIM: MS2				
TRI	AL NAME ID (GRAPHS/TABLES): MS2 T2	-1.0			
Devi	ice Information	-2.0			
	MANUFACTURER: Medify		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		
	UNIT MODEL: M40	l ig	$\sim$		
	FAN SPEED (CFM):	-3.0			
	UNIT SERIAL #:	ge			
	FITER ID #:	5			
	FILTER LOT #:	-4.0			–•– Linear
					Fit
Gen	eral Testing Conditions (Can Be User Defined)				
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16	-5.0			
	NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb				-5.75
	SAMPLING METHOD: Impinger				
	CHAMBER MIXING FAN: yes	-6.0			
	TEMP (F): 74				
	RH (%): 70	-7.0			
	OTHER INSTRUMENTS: na	0	10	20	30
	TRIAL COMMENTS/NOTES na				
				lime (min)	
	FROSOL Sample ID and Summary Data	<b>S</b> 1	\$2	\$3	<b>S</b> 4
	SAMPLE TIME (min)	0	10	20	30
	IMPINGER USED (v/n)	v	v	v	v
		,	, ,	,	,
	VIABLE CASCADE USED (97 II)	1 0005 . 00	11	0.5005.01	0.4005.00
	CHAINDER INPINOER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air)	1.209E+06	5.333E+03	8.533E+01	2.133E+00
	CHAVIBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)				
	IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)	5.71%			
	VIABLE CONSISTENCY CHECKS (% agreement)				
	IMP & VIABLE CROSS CHECK (% agreement)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	1.209E+06	5.333E+03	8.533E+01	2.133E+00
	RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	0.4412%	0.0071%	0.0002%
	RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	99.5588%	99.9929%	99.9998%
	LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-2.36	-4.15	-5.75
mpi		0	10	20	20
	MUNCED ET L VOL (	20.0	20.0	20.0	20.0
		20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-5	-2	-1	0
	DROPLET SIZE (µl)	100	100	100	750
je #1		5	18	6	6
ang	ENUMERATED PLATE COUNTS (# / drop)	1	16	1	4
n R		1	16	1	
lutic					
Di	PLATE AVERAGE COUNT (# / drop)	2.33	16.67	2.67	5.00
	IMPINGER CONCENTRATION (cfu or pfu/ml)	2,333,333	16,667	267	7
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	1.24E+06	5.33E+03	8.53E+01	2.13E+00
_		-4	-1	0	-2
	DILUTION KATIO (10)	-4	100	100	100
	DROPLET SIZE (11)	100			100
I.	DROPLET SIZE (µl)	28			
lge #1	DROPLET SIZE (µl)	28			
Range #1	DROPLET SIZE (μl) ENUMERATED PLATE COUNTS (# / drop)	28 20			
ion Range #1	DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop)	28 20 18			
bilution Range #1	DROPLET SIZE (μl) ENUMERATED PLATE COUNTS (# / drop)	28 20 18			
Dilution Range #1	DROPLET SIZE (μl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop)	28 20 18 22.00	,	-	
Dilution Range #1	DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml)	28 20 18 22.00 2,200,000			
Dilution Range #1	DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rl) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	28 20 18 22.00 2,200,000 1.17E+06			

Figure 19B: MS2 Trial 2



Trial	Information		TRIAL LOG R	EDUCTION R	ESULTS
	TEST DATE: Wednesday, July 21, 2021				
	TRIAL PERFORMED BY: SMM	0.0 🤦			
	TRIAL NUMBER: T3	$\sim$			
	TEST ORGANSIM: MS2				
TR	IAL NAME ID (GRAPHS/TABLES): MS2 T3	-1.0			
		2.00			
Dev	ice Information				
	MANUFACTURER: Medify	2.0	2,08		
	UNIT MODEL: M40	<u> </u>	N N		
	FAN SPEED (CFM):	<u> </u>			
	UNIT SERIAL #:	edt			
	FITER ID #:	-3.0			IVIS2 13
	FILTER LOT #:	ğ			● Linear
				200	Fit
Gen	eral Testing Conditions (Can Be User Defined)	-4.0		<u> </u>	
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16				
	NEBLILIZER CONDITIONS: Collison 24-let: approx 20 min neb				
	SAMPLING METHOD: Impinger				
		-5.0			-5.31
	CHAMBER MIXING FAN: yes				8
	TEMP (F): 74				
	RH (%): 70	-6.0			
	OTHER INSTRUMENTS: na	0	10	20	30
	TRIAL COMMENTS/NOTES na		т	ime (min)	
				()	
BIOA	AEROSOL Sample ID and Summary Data	<b>S1</b>	<b>S2</b>	<b>S</b> 3	S4
	SAMPLE TIME (min)	0	10	20	30
	IMPINGER USED (y / n)	У	У	У	У
	VIABLE CASCADE USED (y / n)	n	n	n	n
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L, Air)	2 551E+06	2 144F+04	3 307E+02	1 237E+01
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)				
	IMDINGED DILUTION CONSISTENCY CHECKS (% agroups)	31 18%			
	MADE CONSISTENCY CHECKS (% agreement)	51.10%			
	VIABLE CONSISTENCY CHECKS (% agreement)				
_	IMP & VIABLE CROSS CHECK (% agreement)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	2.551E+06	2.144E+04	3.307E+02	1.237E+01
	RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	0.8404%	0.0130%	0.0005%
	RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	99.1596%	99.9870%	99.9995%
	LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-2.08	-3.89	-5.31
lue est	in war Campling Can differen				
Impi		0	40	00	20
	SAMPLE TIME (mn)	U	10	20	30
	IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-5	-2	-1	0
	DROPLET SIZE (µl)	100	100	100	750
1#		6	66	10	29
ige ;		6	70	10	
Rar	ENUMERATED PLATE COUNTS (# / drop)	E	65	10	
~			00	11	
ion		-			
Dilution					
Dilution	PLATE AVERAGE COUNT (# / drop)	5.67	67.00	10.33	29.00
Dilution	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml)	5.67 5,666,667	67.00 67,000	10.33 1,033	29.00 39
Dilution	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	5.67 5,666,667 <b>3.02E+06</b>	67.00 67,000 <b>2.14E+04</b>	10.33 1,033 <b>3.31E+02</b>	29.00 39 <b>1.24E+01</b>
Dilution	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>8</sup> )	5.67 5,666,667 <b>3.02E+06</b> -4	67.00 67,000 <b>2.14E+04</b> -1	10.33 1,033 <b>3.31E+02</b>	29.00 39 <b>1.24E+01</b> -2
Dilution	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>8</sup> ) DROPLET SIZE (ul)	5.67 5,666,667 <u>3.02E+06</u> -4 100	67.00 67,000 2.14E+04 -1 100	10.33 1,033 <b>3.31E+02</b> 0 100	29.00 39 1.24E+01 -2 100
#1 Dilution	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>8</sup> ) DROPLET SIZE (μl)	5.67 5,666,667 <u>3.02E+06</u> -4 100 46	67.00 67,000 2.14E+04 -1 100	10.33 1,033 <b>3.31E+02</b> 0 100	29.00 39 <u>1.24E+01</u> -2 100
ge #1 Dilution	PLATE A VERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>s</sup> ) DROPLET SIZE (μl)	5.67 5,666,667 3.02E+06 -4 100 46 37	67.00 67,000 2.14E+04 -1 100	10.33 1,033 3.31E+02 0 100	29.00 39 1.24E+01 -2 100
Range #1 Dilution	PLATE A VERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>\$</sup> ) DROPLET SIZE (µ) ENUMERATED PLATE COUNTS (# / drop)	5.67 5,666,667 3.02E+06 -4 100 46 37 21	67.00 67,000 2.14E+04 -1 100	10.33 1,033 3.31E+02 0 100	29.00 39 1.24E+01 -2 100
ion Range #1 Dilution	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>°</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop)	5.67 5,666,667 3.02E+06 -4 100 46 37 34	67.00 67,000 2.14E+04 -1 100	10.33 1,033 3.31E+02 0 100	29.00 39 1.24E+01 -2 100
vilution Range #1 Dilution	PLATE A VERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>s</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop)	5.67 5,666,667 3.02E+06 -4 100 46 37 34	67.00 67,000 2.14E+04 -1 100	10.33 1,033 3.31E+02 0 100	29.00 39 1.24E+01 -2 100
Dilution Range #1 Dilution	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>s</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop)	5.67 5,666,667 3.02E+06 -4 100 46 37 34 39.00	67.00 67,000 2.14E+04 -1 100	10.33 1,033 3,31E+02 0 100	29.00 39 1.24E+01 -2 100
Dilution Range #1 Dilution	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>*</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml)	5.67 5,666,667 <b>3.02E+06</b> -4 100 46 37 34 39.00 3,900,000	67.00 67,000 2.14E+04 -1 100	10.33 1,033 <b>3.31E+02</b> 0 100	29.00 39 1.24E+01 -2 100
Dilution Range #1 Dilution	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>*</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	5.67 5,666,667 3.02E+06 -4 100 46 37 34 39.00 3,900,000 2.08E+06	67.00 67,000 2.14E+04 -1 100	10.33 1,033 <b>3.31E+02</b> 0 100	29.00 39 1.24E+01 -2 100

Figure 20B: MS2 Trial 3



Trial	Information		TRIAL LOG R	EDUCTION F	ESULTS
	TEST DATE: Thursday, July 22, 2021				
	TRIAL PERFORMED BY: SMM	0.0 👞	0 12		
	TRIAL NUMBER: Control		-0.12		
	TEST ORGANSIM: PhiX-174	-0.2		-0.28	
TR	IAL NAME ID (GRAPHS/TABLES): Phix-174				-0.36
		-0.4			
Dev	ice Information	-0.6			
	MANUFACTURER: Medify	s i i			
	UNIT MODEL: M40	-0.8			
	FAN SPEED (CFM):	d d d			
	UNIT SERIAL #:	2 -1.0			
	FITER ID #:	8			
	FILTER LOT #:	-1.2			
Gon	oral Tasting Conditions (Can Bo Usor Defined)				174
Gen	TEST CHAMPER VOLUME (m <sup>3</sup> ) 16	-1.4			-•- Linear
	NEDULIZER CONDITIONS: Collison 24 lat: approv. 20 min pab				Fit
	ALLER CONDITIONS: Conison 24-Jet, approx. 20 min ned	-1.6			
	SAMPLING METHOD: Impinger				
	CHAMBER MIXING FAN: yes	-1.8			
	TEMP (F): 74				
	RH (%): 70	-2.0	10	20	20
	OTHER INSTRUMENTS: na	0	10	20	30
	TRIAL COMMENTS/NOTES na			Time (min)	
BIO	EPOSOL Sample ID and Summary Data	<b>C1</b>			62
ыол	SAMPLE TIME (min)	0	10	20	30
	IMPINGER LISED (v / n)	v	v		v
		,	, S	,	,
	VIABLE CASCADE USED (97 ii)	1 2075 - 05	0.0205.04	00005.04	II E CE2E - 04
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cit pitte Ait)	1.307E+05	9.920E+04	6.933E+04	5.053E+04
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (ctu or ptu/L Air)	1.000/			
	IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)	4.00%			
	VIABLE CONSISTENCY CHECKS (% agreement)				
	IMP & VIABLE CROSS CHECK (% agreement)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	1.307E+05	9.920E+04	6.933E+04	5.653E+04
	RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	75.9184%	53.0612%	43.2653%
	RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	24.0816%	46.9388%	56.7347%
	LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-0.12	-0.28	-0.36
Impi	nger Sampling Conditions				
	SAMPLE TIME (min)	0		20	30
	IMPINGER FILL VOL (ml)	20.0	20.0		00.0
			20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	2.0	5.0	20.0 5.0	20.0
	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (pm)	2.0 12.5	5.0 12.5	20.0 5.0 12.5	20.0 5.0 12.5
	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (bm) DILUTION RATIO (10 <sup>8</sup> )	2.0 12.5 <b>-4</b>	5.0 12.5 -3	20.0 5.0 12.5 -3	20.0 5.0 12.5 -3
Γ	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl)	2.0 12.5 -4 100	5.0 12.5 -3 100	20.0 5.0 12.5 -3 100	20.0 5.0 12.5 -3 100
#1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (φm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (μl)	2.0 12.5 -4 100 3	5.0 12.5 -3 100 30	20.0 5.0 12.5 -3 100 20	20.0 5.0 12.5 -3 100 15
mge #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (φm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (μl)	2.0 12.5 -4 100 3 1	5.0 12.5 -3 100 30 30	20.0 5.0 12.5 -3 100 20 21	20.0 5.0 12.5 -3 100 15 20
n Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop)	2.0 12.5 -4 100 3 1 1	5.0 12.5 <b>-3</b> 100 30 30 33	20.0 5.0 12.5 -3 100 20 21 24	20.0 5.0 12.5 <b>-3</b> 100 15 20 18
ution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop)	2.0 12.5 -4 100 3 1 1	5.0 12.5 <b>-3</b> 100 30 30 33 33	20.0 5.0 12.5 -3 100 20 21 24	20.0 5.0 12.5 <b>-3</b> 100 15 20 18
Dilution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop)	2.0 12.5 -4 100 3 1 1 1.67	20.0 5.0 12.5 -3 100 30 30 33 33	20.0 5.0 12.5 -3 100 20 21 24 21.67	20.0 5.0 12.5 -3 100 15 20 18 17.67
Dilution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml)	2.0 12.5 -4 100 3 1 1 1.67 1.66,667	20.0 5.0 12.5 -3 100 30 30 33 31,00 310,000	20.0 5.0 12.5 -3 100 20 21 24 21.67 216,667	20.0 5.0 12.5 -3 100 15 20 18 17.67 176,667
Dilution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	2.0 12.5 -4 100 3 1 1 1.67 1.66,667 1.33E+05	20.0 5.0 12.5 -3 100 30 30 33 31.00 310,000 9.92E+04	20.0 5.0 12.5 -3 100 20 21 24 21.67 216,667 6.93E+04	20.0 5.0 12.5 -3 100 15 20 18 17.67 176,667 5.65E+04
Dilution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	2.0 12.5 -4 100 3 1 1 1 1.67 166,667 1.33E+05	20.0 5.0 12.5 -3 100 30 30 33 31 31.00 310,000 9.92E+04	20.0 5.0 12.5 -3 100 20 21 24 21.67 216,667 6.93E+04	20.0 5.0 12.5 -3 100 15 20 18 17.67 176,667 5.65E+04
Dilution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (u)	2.0 12.5 -4 100 3 1 1 1 1.67 1.66,667 1.33E+05 -3 100	20.0 5.0 12.5 -3 100 30 30 33 31.00 310,000 9.92E+04	20.0 5.0 12.5 -3 100 20 21 24 21.67 216,667 6.93E+04	20.0 5.0 12.5 -3 100 15 20 18 17.67 176,667 5.65E+04 -2 100
1 Dilution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl)	2.0 12.5 -4 100 3 1 1 1 1.67 166,667 1.33E+05 -3 1000	20.0 5.0 12.5 -3 100 30 30 33 31 31.00 310,000 9.92E+04	20.0 5.0 12.5 -3 100 20 21 24 21.67 216,667 6.93E+04	20.0 5.0 12.5 -3 100 15 20 18 17.67 176,667 5.65E+04 -2 100
ge #1 Dilution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl)	2.0 12.5 -4 100 3 1 1 1 1.67 1.66,667 1.33E+05 -3 100 16 14	20.0 5.0 12.5 -3 100 30 30 33 31,00 310,000 9.92E+04	20.0 5.0 12.5 -3 100 20 21 24 21.67 216,667 6.93E+04	20.0 5.0 12.5 -3 100 15 20 18 17.67 176,667 5.65E+04 -2 100
Range #1 Dilution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop)	2.0 12.5 -4 100 3 1 1 1 1 1.67 1.66,667 1.33E+05 -3 100 16 14	20.0 5.0 12.5 -3 100 30 30 33 31,00 310,000 9.92E+04	20.0 5.0 12.5 -3 100 20 21 24 21.67 216,667 6.93E+04	20.0 5.0 12.5 -3 100 15 20 18 17.67 176,667 5.65E+04 -2 100
ion Range #1 Dilution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop)	2.0 12.5 -4 100 3 1 1 1 1 1.67 1.66,667 1.33E+05 -3 100 16 14 18	20.0 5.0 12.5 -3 100 30 30 33 31 31.00 310,000 9.92E+04	20.0 5.0 12.5 -3 100 20 21 24 21.67 216,667 6.93E+04	20.0 5.0 12.5 -3 100 15 20 18 17.67 176,667 5.65E+04 -2 100
Dilution Range #1 Dilution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rm) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/r Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop)	2.0 12.5 -4 100 3 1 1 1 1.67 166,667 1.33E+05 -3 100 16 14 18	20.0 5.0 12.5 -3 100 30 30 33 31.00 310,000 9.92E+04	20.0 5.0 12.5 -3 100 20 21 24 21.67 216,667 6.93E+04	20.0 5.0 12.5 -3 100 15 20 18 17.67 176,667 5.65E+04 -2 100
Dilution Range #1 Dilution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rm) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/r Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop)	2.0 12.5 -4 100 3 1 1 1 1.67 166,667 1.33E+05 -3 100 16 14 18 18	20.0 5.0 12.5 -3 100 30 30 33 31.00 310,000 9.92E+04	20.0 5.0 12.5 -3 100 20 21 24 21.67 216,667 6.93E+04	20.0 5.0 12.5 -3 100 15 20 18 17.67 176,667 5.65E+04 -2 100
Dilution Range #1 Dilution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/ml) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml)	2.0 12.5 -4 100 3 1 1 1 1 1.67 166,667 1.33E+05 -3 100 16 14 18 18 16,00 160,000	20.0 5.0 12.5 -3 100 30 30 33 31,00 310,000 9.92E+04	20.0 5.0 12.5 -3 100 20 21 24 21.67 216,667 6.93E+04	20.0 5.0 12.5 -3 100 15 20 18 17.67 176,667 5.65E+04 -2 100
Dilution Range #1 Dilution Range #1	IMPINGER SAMPLING TIME (mm) IMPINGER FLOW RATE (lpm) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/rml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/rml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/rml)	2.0 12.5 -4 100 3 1 1 1 1.67 166,667 1.33E+05 -3 100 16 14 18 18 16.00 160,000 1.28E+05	20.0 5.0 12.5 -3 100 30 30 33 31.00 310,000 9.92E+04	20.0 5.0 12.5 -3 100 20 21 24 21.67 216,667 6.93E+04	20.0 5.0 12.5 -3 100 15 20 18 17.67 176,667 5.655±04 -2 100

Figure 21B: Phi X Control



Trial	Information		TRIAL LOG R	EDUCTION R	ESULTS
	TEST DATE: Thursday, July 22, 2021				
	TRIAL PERFORMED BY: SMM	0.0 👤			
	TRIAL NUMBER: T1	Ň			
	TEST ORGANSIM: Phix-174				
TR	AL NAME ID (GRAPHS/TABLES): Phix-174	1.0			
		-1.0			
Dev	ice Information				
	MANUFACTURER: Medify		2.06		
	UNIT MODEL: M40	<b>-2.0</b>	Ň		
	FAN SPEED (CFM):	E			
	UNIT SERIAL #	l g			
	FITER ID #	-3.0			PhiX-
	EII TER LOT #-	8			1/4
					Fit
Gon	eral Testing Conditions (Can Be User Defined)	-4.0		<b>X</b>	
Gen	TEST CHAMPED VOLUME (m <sup>3</sup> ) 16				
	NEDULIZED CONDITIONS: Calling 24 late approve 20 min and				
	NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb				
	SAMPLING METHOD: Impinger	-5.0			
	CHAMBER MIXING FAN: yes				5.56
	TEMP (F): 74				8
	RH (%): 70	-6.0			
	OTHER INSTRUMENTS: na	0	10	20	30
	TRIAL COMMENTS/NOTES na		_		
				nine (min)	
BIO	EROSOL Sample ID and Summary Data	<b>S</b> 1	<b>S</b> 2	\$3	<b>S4</b>
	SAMPLE TIME (min)	0	10	20	30
	IMPINGER LISED (v / n)	v	N N	20	× ×
		y 7	y 7	y 7	y
	VIABLE CASCADE USED (y/n)	n	n	n	n
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (ctu ptu/L Arr)	2.311E+05	2.027E+03	2.400E+01	6.400E-01
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)				
	IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)			26.92%	
	VIABLE CONSISTENCY CHECKS (% agreement)				
	IMP & VIABLE CROSS CHECK (% agreement)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	2.311E+05	2.027E+03	2.400E+01	6.400E-01
	RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	0.8769%	0.0104%	0.0003%
	RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	99.1231%	99.9896%	99.9997%
	LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-2.06	-3.98	-5.56
_					
Impi	nger Sampling Conditions				
	SAMPLE TIME (min)	0	10	20	30
	IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
		4	2	٥	0
	DILUTION KATIO (10)	-4	-2	100	750
_	DROPLET SIZE (µi)	100	100	100	750
ie #1		4	9	8	1
ang	ENUMERATED PLATE COUNTS (# / drop)	3	6	3	2
n R		6	4	8	
lutio					
					4.50
Ä	PLATE AVERAGE COUNT (# / drop)	4.33	6.33	6.33	1.50
ũ	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml)	4.33 433,333	6.33 6,333	6.33 63	2
Ä	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	4.33 433,333 <b>2.31E+05</b>	6.33 6,333 <b>2.03E+03</b>	6.33 63 <b>2.03E+01</b>	2 6.40E-01
D	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	4.33 433,333 <b>2.31E+05</b>	6.33 6,333 <b>2.03E+03</b>	6.33 63 <b>2.03E+01</b>	2 6.40E-01
Ĩ	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>8</sup> )	4.33 433,333 <b>2.31E+05</b> -3	6.33 6,333 <b>2.03E+03</b>	6.33 63 2.03E+01 0	2 6.40E-01 -2
Ĩ	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu'ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu'L Air) DILUTION RATIO (10 <sup>x</sup> ) DROPLET SIZE (µl)	4.33 433,333 2.31E+05 -3 100	6.33 6,333 2.03E+03 0 500	6.33 63 2.03E+01 0 750	2 6.40E-01 -2 100
e#1 Di	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu'ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu'L Air) DILUTION RATIO (10 <sup>s</sup> ) DROPLET SIZE (μl)	4.33 433,333 2.31E+05 -3 100 TNTC	6.33 6,333 2.03E+03 0 500	6.33 63 2.03E+01 0 750 65	2 6.40E-01 -2 100
ange #1 Di	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu'ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu'L Air) DILUTION RATIO (10 <sup>s</sup> ) DROPLET SIZE (μ)	4.33 433,333 2.31E+05 -3 100 TNTC	6.33 6,333 2.03E+03 0 500	6.33 63 2.03E+01 0 750 65	2 6.40E-01 -2 100
n Range #1 Di	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu'ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu'L Air) DILUTION RATIO (10 <sup>*</sup> ) DROPLET SIZE (μ) ENUMERATED PLATE COUNTS (# / drop)	4.33 433,333 2.31E+05 -3 100 TNTC	6.33 6,333 2.03E+03 0 500	6.33 63 2.03E+01 0 750 65	2 6.40E-01 -2 100
ution Range #1 Di	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu'ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu'L Air) DILUTION RATIO (10 <sup>*</sup> ) DROPLET SIZE (μ) ENUMERATED PLATE COUNTS (# / drop)	4.33 433,333 2.31E+05 -3 100 TNTC	6.33 6,333 2.03E+03 0 500	6.33 63 2.03E+01 0 750 65	2 6.40E-01 -2 100
Dilution Range #1 Di	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/m) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>*</sup> ) DROPLET SIZE (μ) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop)	4.33 433,333 2.31E+05 -3 100 TNTC	6.33 6,333 2.03E+03 0 500	6.33 63 2.03E+01 0 750 65	2 6.40E-01 -2 100
Dilution Range #1 Di	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10 <sup>*</sup> ) DROPLET SIZE (μl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml)	4.33 433,333 2.31E+05 -3 100 TNTC	6.33 6,333 2.03E+03 0 500	6.33 63 2.03E+01 0 750 65 65	-2 100
Dilution Range #1 Di	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu'ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) DILUTION RATIO (10*) DROPLET SIZE (µl) ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu'ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu'ml)	4.33 433,333 2.31E+05 -3 100 TNTC	6.33 6,333 2.03E+03 0 500	6.33 63 2.03E+01 0 750 65 65 65 87 2,77F+01	-2 100

Figure 22B: Phi X Trial 1



Trial	Information		TRIAL LOG F	REDUCTION R	ESULTS
	TEST DATE: Thursday, July 22, 2021				
	TRIAL PERFORMED BY: SMM	0.0 🔍			
	TRIAL NUMBER: T2				
	TEST ORGANSIM: PhiX-174				
TR	AL NAME ID (GRAPHS/TABLES): PhiX-174	-1.0			
Dev	ice Information				
	MANUFACTURER: Medify	2.0			
	UNIT MODEL: M40				
	FAN SPEED (CFM):	t t			
	UNIT SERIAL #:	eq			
	FITER ID #:	-3.0			174
	FILTER LOT #:	<u>9</u>			-•- Linear
				3.86	Fit
Gen	eral Testing Conditions (Can Be User Defined)	-4.0		<b>\</b>	
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16				
	NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb				
	SAMPLING METHOD: Impinger	-5.0			
	CHAMBER MIXING FAN: yes				
	TEMP (F): 74				
	BH (%): 70	6.0			Ĭ
	OTHER INSTRUMENTS: na	-6.0	10	20	30
	TDIAL COMMENTS/NOTES				
	IRIAL COMMENTS/NOTES na			Time (min)	
PIO	EPOSOL Sample ID and Summary Data	<b>S</b> 1	52	<b>S</b> 2	<b>S</b> 4
ыол		0	10	20	30
	IMPINGER LISED (V / n)	v	IU V	20	50
	$\mathbf{W} = \mathbf{A} \mathbf{C} \mathbf{A} \mathbf{C} \mathbf{C} \mathbf{A} \mathbf{D} \mathbf{E} \mathbf{U} \mathbf{C} \mathbf{A} \mathbf{C} \mathbf{A} \mathbf{D} \mathbf{U} \mathbf{U} \mathbf{U} \mathbf{U} \mathbf{U} \mathbf{U} \mathbf{U} U$	y	y	y	y
	VIABLE CASCADE USED (y/ n)		n o too⊑ oo		n 1 aart al
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cru pri/L Air)	1.778E+05	2.133E+03	2.464E+01	4.267E-01
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (ctu or ptu/L Air)				
	IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)			28.89%	
	VIABLE CONSISTENCY CHECKS (% agreement)				
	IMP & VIABLE CROSS CHECK (% agreement)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	1.778E+05	2.133E+03	2.464E+01	4.267E-01
	RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	1.2000%	0.0139%	0.0002%
	RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	98.8000%	99.9861%	99.9998%
	LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-1.92	-3.86	-5.62
Imni	nger Sampling Conditions				
inp		0	10	20	30
		20.0	20.0	20.0	20.0
		20.0	20.0	20.0	20.0
	IMPINOER SAMPLING TIME (IIII)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (Ipm)	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-4	-2	0	0
	DROPLET SIZE (µl)	100	100	100	750
e #1		4	7	7	1
ang	ENLIMERATED PLATE COUNTS (# / drop)	3	6	11	1
n R		3	7	9	
lutio					
Di	PLATE AVERAGE COUNT (# / drop)	3.33	6.67	9.00	1.00
	IMPINGER CONCENTRATION (cfu or pfu/ml)	333,333	6,667	90	1
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	1.78E+05	2.13E+03	2.88E+01	4.27E-01
		_9	4	0	.0
	DILUTION KATIO (10*)	-5	100	750	-2
		TNTC	TNTC	54	100
ge #		INTO	inite	12	
Ran	ENUMERATED PLATE COUNTS (# / drop)			42	
2					
0					
)ilutio					
Dilutio	PLATE AVERAGE COUNT (# / drop)			48.00	
Dilutio	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml)			48.00 64	
Dilutio	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu'ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)			48.00 64 <b>2.05E+01</b>	

### Figure 23B: Phi X Trial 2



Trial	Information		TRIAL LOG R	EDUCTION R	ESULTS
	TEST DATE: Thursday, July 22, 2021				
	TRIAL PERFORMED BY: SMM	0.0 🔔			
	TRIAL NUMBER: T3	· · · · · · · · · · · · · · · · · · ·			
	TEST ORGANSIM: Phix-174				
TR	AL NAME ID (GRAPHS/TABLES): Phix-174	10			
		-1.0			
Dev	ice Information				
	MANUFACTURER: Medify				
	UNIT MODEL: M40	<b>5</b> -2.0			
	FAN SPEED (CFM):	i pi			
	UNIT SERIAL #:	equ			
	FITER ID #:	-3.0			174
	FILTER LOT #:	ğ		3.66	-O- Linear
				No.	Fit
Gen	eral Testing Conditions (Can Be User Defined)	-4.0			
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16				
	NEBLILIZER CONDITIONS: Collison 24-let: approx. 20 min.neb				
	SAMPLING METHOD: Impigger				-5.13
	CHANDED NUMBER OF AN	-5.0			
	CHAMBER MIXING FAN: yes				Ĭ
	TEMP (F): 74				
	RH (%): 70	-6.0			
	OTHER INSTRUMENTS: na	0	10	20	30
	TRIAL COMMENTS/NOTES na		1	ime (min)	
BIOA	EROSOL Sample ID and Summary Data	<b>S1</b>	S2	<b>S</b> 3	<b>S4</b>
	SAMPLE TIME (min)	0	10	20	30
	IMPINGER USED (y / n)	У	у	у	У
	VIABLE CASCADE USED (y / n)	n	n	n	n
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air)	2.311E+05	2.987E+03	5.013E+01	1.707E+00
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)				
_	IMPINGER DILLITION CONSISTENCY CHECKS (% agreement)				
	WADE CONSISTENCY CHECKS (% agreement)				
	VIABLE CONSISTENCY CHECKS (% agreement)				
	IMP & VIABLE CROSS CHECK (% agreement)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	2.311E+05	2.987E+03	5.013E+01	1.707E+00
	RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	1.2923%	0.0217%	0.0007%
	RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	98.7077%	99.9783%	99.9993%
	LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-1.89	-3.66	-5.13
Imni	nger Sampling Conditions				
Imp		0	10	20	20
	SAMPLE HME (mm)	U	10	20	30
	IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-4	-2	0	0
	DROPLET SIZE (µl)	100	100	100	750
II		4	10	16	4
ıge		5	8	15	
Raı	ENUMERATED PLATE COUNTS (# / drop)	4	10	16	
tion		-	10	10	
Dilu		4.33	0.22	15.07	4.00
_	PLATE AVERAGE COUNT (#/ drop)	4.33	9.33	15.67	4.00
	IMPINGER CONCENTRATION (cfù or pfù/ml)	433,333	9,333	157	5
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	2.31E+05	2.99E+03	5.01E+01	1.71E+00
	DILUTION RATIO (10 <sup>x</sup> )	-3	-1	0	-2
	DROPLET SIZE (µl)	100	100	750	100
1#	- 47	TNTC	TNTC		
ige					
Rar	ENUMERATED PLATE COUNTS (# / drop)				
ion					
Dilut				-	
	PLATE AVERAGE COUNT (# / drop)				
	IMPINGER CONCENTRATION (cfu or pfu/ml)				
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)				

### Figure 24B: Phi X Trial 3



## **Phase II Raw Data**



Trial Information				DECLUS
TEST DATE: Monday, July 19, 2021		TRIAL LOG	REDUCTION	RESULTS
TRIAL PERFORMED BY: SMM	0.0			
TRIAL NUMBER: Control	0.0	-0.29		
TEST ORGANSIM: MS2			-0.45	-0.57
TRIAL NAME ID (GRAPHS/TABLES): Control	-0.5			
Device Information	-1.0			
MANUFACTURER: Medify				
UNIT MODEL: M40				
FAN SPEED (CFM):				
UNIT SERIAL #: na	See.			
FITER ID #: na	<b>2</b> .0			
FILTER LOT #: na	2			
	-2.5		·	
General Testing Conditions				
TEST CHAMBER VOLUME (m <sup>3</sup> ): 16	-3.0			
NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb				
SAMPLING METHOD: Impingers	25			
CHAMBER MIXING FAN: yes	-5.5			
TEMP (F): 74				
RH (%): 70	-4.0	30	60	90
OTHER INSTRUMENTS: Na				
TRIAL COMMENTS/NOTES normal speed		Time	e (min)	

BIOAEROSOL Sample ID and Summary Data	<b>S1</b>	<b>S3</b>	<b>S</b> 5	<b>S6</b>
SAMPLING TIME (min)	0	30	60	90
IMPINGER USED (y / n)	У	У	У	У
VIABLE CASCADE USED (y / n)	n	n	n	n
CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air)	1.440E+06	7.360E+05	5.120E+05	3.840E+05
CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)				
IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)				
VIABLE CONSISTENCY CHECKS (% agreement)				
IMP & VIABLE CROSS CHECK (% agreement)				
CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	1.440E+06	7.360E+05	5.120E+05	3.840E+05
RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	51.1111%	35.5556%	26.6667%
RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	48.8889%	64.4444%	73.3333%
LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-0.29	-0.45	-0.57

#### **Impinger Sampling Conditions** SAMPLING TIME (min) 30 60 90 0 IMPINGER FILL VOL (ml) 20.0 20.0 20.0 20.0 IMPINGER SAMPLING TIME (min) 2.0 5.0 5.0 5.0 IMPINGER FLOW RATE (lpm) 12.5 12.5 12.5 12.5 -4 -4 -4 -4 DILUTION RATIO (10<sup>x</sup>) DROPLET SIZE (µl) 50 50 50 50 12 12 8 6 Dilution Range #1 8 6 6 11 ENUMERATED PLATE COUNTS (# / drop) PLATE AVERAGE COUNT (# / drop) 9.00 11.50 8.00 6.00 IMPINGER CONCENTRATION (cfu or pfu/ml) 1,800,000 2,300,000 1,600,000 1,200,000 CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) 1.44E+06 7.36E+05 5.12E+05 3.84E+05 Figure 1C: MS2 Control



Trial	Information		TRIAL LOG R		ESULTS
	TEST DATE: Wednesday, July 21, 2021				
	TRIAL PERFORMED BY: SMM	0.0 🗨			
	TRIAL NUMBER: T1		$\mathbf{x}$		
	TEST ORGANSIM: MS2				
TR	IAL NAME ID (GRAPHS/TABLES): MS2 T1	-1.0			
_					
Dev	ice Information	-2.0			
	MANUFACTURER: Medify	_			
	UNIT MODEL: M40	l <mark>e</mark> l	2.92		
	FAN SPEED (CFM):	-3.0	<b>`</b>		
	UNII SERIAL #:	Re	`		
	FILER I.D.T #-	8			
				-4,45	Fit
Gen	eral Testing Conditions (Can Be User Defined)				
0011	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16	-5.0			
	NEBULIZER CONDITIONS: Collison 24-Jet; approx, 20 min neb				
	SAMPLING METHOD: Impinger				-5.99
	CHAMBER MIXING FAN: ves	-6.0			<b>`</b>
	TEMD (E): 74				•
	PU (%): 70				
	OTHER INSTRUMENTS: na	-7.0 -	30	60	90
	TDIAL COMMENTS NOTES	Ŭ			
	IRIAL COMMENTS/NOTES na			Time (min)	
BIO	AFROSOL Sample ID and Summary Data	<u>S1</u>	<b>S</b> 2	\$3	<u>84</u>
	SAMPLE TIME (min)	0	30	60	90
	IMPINGER USED $(y/n)$	v	v	v	v
	VIABLE CASCADE USED (v / n)	ņ	n	ņ	ņ
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air)	1 244E+06	1 493E+03	4 373E+01	1 280E+00
	CHAMBER VIABLE BIOBIO AFROSOL CONCENTRATION (cfu or pfu/L Air)	1.2442100	1.4002100	4.0702101	1.2002100
	IMPINGER DILLITION CONSISTENCY CHECKS (% agreement)	25.00%			
	VIABLE CONSISTENCY CHECKS (% agreement)	20.0070			
	IMD & VIADLE CONSISTENCE I CHECKS (% agreement)				
	CHAMPED BIODIOAEDOSOL CONCENTRATION (of a proful Air)	4.0445.00	4 400 5 .00	4.0705.04	4 0005 .00
	DELATIVE DED CENT DEMAINING ED OM T-0 (%)	1.244E+06	1.493E+03	4.373E+01	1.280E+00
	RELATIVE FERCENT DEMONAL ED OM T=0 ( $70$ )	0.0000%	0.1200 %	0.0033 %	0.0001 /8
	LOG REDUCTION FROM T=0 (70)	0.0000 /8	-2 92	-4 45	-5 99
_		0.00			0.00
Impi	nger Sampling Conditions				
	SAMPLE TIME (min)	0	30	60	90
	IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-5	-2	0	0
	DROPLET SIZE (µl)	100	100	100	750
1#		3		15	3
mge		2		10	
n Rs	ENUMERATED PLATE COUNTS (#/ drop)	3		16	
utio					
Dil	PLATE AVERAGE COUNT (# / drop)	2.67		13.67	3.00
	IMPINGER CONCENTRATION (cfu or pfu/ml)	2,666,667		137	4
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	1.42E+06		4.37E+01	1.28E+00
		-4	-1	-2	-2
	DILUTION KATIO (10°) DROPI ET SIZE (41)	100	100	100	100
#		20	47	100	100
ige ∌		17	יד 17		
Ran	ENUMERATED PLATE COUNTS (# / drop)	11 22	41		
tion		20	40		
Dilut	DI ATE AVERAGE COINT (# / down)	20.00	16.67	•	
	$E \cup A \cup \Box A \vee E B A \cup E \cup U \cup U \cup U \cup (\# / (I \cap D))$	20.00	40.07		
	MININGER CONCENTRATION (	2 000 000	A CC7		
	IMPINGER CONCENTRATION (cfu or pfu/ml)	2,000,000	4,667		

## Figure 2C: MS2 Speed 1 Trial 1



Trial	Information		TRIAL LOG	REDUCTION F	RESULTS
	TEST DATE: Thursday, July 22, 2021				
	TRIAL PERFORMED BY: SMM	0.0 🗨			
	TRIAL NUMBER: T2		<b>\</b>		
	TEST ORGANSIM: MS2	<u> </u>	$\lambda$		
TR	IAL NAME ID (GRAPHS/TABLES): MS2 T2	-1.0			
Dev	ice Information	2.0			
	MANUFACTURER: Medify	-2.0			
	UNIT MODEL: M40	<u>io</u>	\ <u>\</u>		
	FAN SPEED (CFM):	<b>5</b> -3.0			
	UNIT SERIAL #:	6	<b>3</b> 2		
	FITER ID #:	5			
	FILTER LOT #:	<mark>-4.0</mark>		$\overline{}$	-•- Linear
				-2053	Fit
Gen	eral Testing Conditions (Can Be User Defined)				
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16	-5.0			
	NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb				
	SAMPLING METHOD: Impinger				-3.00
	CHAMBER MIXING FAN: yes	-6.0			
	TEMP (F): 74				Ĭ
	BH (%): 70				
	OTHED INSTDI MENTS: no	-7.0 -	30	60	90
	TDIAL COMMENTS MOTES	, in the second s			50
	IRIAL COMMENTS/NOTES na			Time (min)	
BIO	EBOSOL Sample ID and Summary Data	<b>§</b> 1	\$2	\$3	\$4
5107	SAMPLE TIME (min)	0	30	60	90
	IMPINGER LISED (v / n)	v	V N	V N	
	$\mathbf{M} = \mathbf{C} \mathbf{A} \mathbf{C} \mathbf{C} \mathbf{A} \mathbf{D} \mathbf{E} \mathbf{U} \mathbf{C} \mathbf{F} \mathbf{M}$	y	y	y	y
	VIABLE CASCADE USED (97 II)	11	1 0 4 9 5 1 9 9	0.0005.01	11
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (criptile Arr)	2.604E+06	1.243E+03	6.080E+01	3.627E+00
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)		•		
	IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)	27.65%	20.77%		
	VIABLE CONSISTENCY CHECKS (% agreement)				
	IMP & VIABLE CROSS CHECK (% agreement)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	2.604E+06	1.243E+03	6.080E+01	3.627E+00
	RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	0.0477%	0.0023%	0.0001%
	RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	99.9523%	99.9977%	99.9999%
	LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-3.32	-4.63	-5.86
Imni	nger Sampling Conditions				
inp		0	30	60	90
		20.0	20.0	20.0	20.0
		20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-5	-2	0	0
	DROPLET SIZE (µl)	100	100	100	750
1#1		4	5	20	5
mge		6	4	19	12
ı Ra	ENUMERATED PLATE COUNTS (# / drop)	7	4	18	
Itior					
Dilt	PLATE AVERAGE COUNT (# / drop)	5.67	4.33	19.00	8.50
	IMPINGER CONCENTRATION (cfu or pfi/mb	5,666,667	4 333	190	11
		3 025-06	1 205+02	6 095- 01	3 625+00
	CHAMBER BIOAEROSOL CONCEIRATION (ctu or pfu/L Air)	5.U2E+U0	1.392+03	0.082+01	5.03E+00
	DILUTION RATIO (10 <sup>x</sup> )	-4	-1	-2	-2
	DROPLET SIZE (µl)	100	100	100	100
e #1		44	32		
ang	ENTIMERATED PLATE COUNTS (# / drop)	39	35		
n R		40	36		
lutio					
Di	PLATE AVERAGE COUNT (# / drop)	41.00	34.33		
	IMPINGER CONCENTRATION (cfu or pfu/ml)	4,100,000	3,433		
	IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	4,100,000 <b>2.19E+06</b>	3,433 <b>1.10E+03</b>		

## Figure 3C: MS2 Speed 1 Trial 2



Trial	Information		TRIAL LOG F	REDUCTION R	ESULTS
	TEST DATE: Thursday, July 22, 2021				
	TRIAL PERFORMED BY: SMM	0.0 🎈			
	TRIAL NUMBER: T3		、		
	TEST ORGANSIM: MS2	৾	$\lambda$		
TR	AL NAME ID (GRAPHS/TABLES): MS2 T3	-1.0			
<b>D</b>	ing hefermation				
Dev		-2.0			
	MANUFACTURER: Medity	s i			
	EAN SPEED (CEM):	ti di	$\sim$		
	LINIT CEDIAL #-	-3.0	3.39		
	EITER ID #-	<b>R</b>	n n n n n n n n n n n n n n n n n n n		MS2 T3
	FILTER LOT #:	-4.0			-•- Linear
Gen	eral Testing Conditions (Can Be User Defined)			4.77	Fit
	TEST CHAMBER VOLUME (m <sup>3</sup> ): 16	-5.0			
	NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb				-5.73
	SAMPLING METHOD: Impinger				
	CHAMBER MIXING FAN: yes	-6.0			
	TEMP (F): 74				
	RH (%): 70	-7.0			
	OTHER INSTRUMENTS: na	-7.00	30	60	90
	TRIAL COMMENTS/NOTES na				
				Time (min)	
BIOA	EROSOL Sample ID and Summary Data	<b>S1</b>	S2	<b>S</b> 3	<b>S4</b>
	SAMPLE TIME (min)	0	30	60	90
	IMPINGER USED (y / n)	У	У	У	У
	VIABLE CASCADE USED (y / n)	n	n	n	n
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air)	4.622E+06	1.872E+03	7.893E+01	8.533E+00
	CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)				
	IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)		32.86%		
	VIABLE CONSISTENCY CHECKS (% agreement)				
	IMP & VIABLE CROSS CHECK (% agreement)				
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	4.622E+06	1.872E+03	7.893E+01	8.533E+00
	RELATIVE PERCENT REMAINING FROM T=0 (%)	100.0000%	0.0405%	0.0017%	0.0002%
	RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.0000%	99.9595%	99.9983%	99.9998%
	LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.00	-3.39	-4.77	-5.73
Impi	nger Sampling Conditions				
	SAMPLE TIME (min)	0	30	60	90
	IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	3.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-5	-2	0	0
	DROPLET SIZE (µl)	100	100	100	750
1#		10	9	20	20
nge i		8	5	25	
Rai	ENUMERATED PLATE COUNTS (# / drop)	- 8	7	29	
ıtion		-	-		
Dilt	PLATE AVERAGE COUNT (# / drop)	8.67	7.00	24.67	20.00
	IMPINGER CONCENTRATION (cfu or pfu/mb)	8,666.667	7.000	247	27
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	4.62E+06	2.24E+03	7.89E+01	8.53E+00
		-4	_1	_0	0
	DILUTION RATIO (10°) DROPLET SIZE (40)	-4	-1	- <u>-</u> 100	100
<del></del>		TNTC	/8	100	
ige #		INIC	40		
Ran	ENUMERATED PLATE COUNTS (# / drop)		49		
			44		
ion					
Dilution			17.00	•	
Dilution	PLATE AVERAGE COUNT (# / drop)		47.00		
Dilution	PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml)		47.00 4,700		•

Figure 4C: MS2 Speed 1 Trial 3



Trial Information			TRIAL LOG	REDUCTION	RESULTS	
TEST DATE: Tuesday, July 27, 2021				B. subtilis I	_ow Speed	
TRIAL PERFORMED BY: Smm		0.0 📮	-0.20			
TRIAL NUMBER: Control				0.34	-0.40	
TEST ORGANSIM: B. subtilis		-05		• •		-0.52
TRIAL NAME ID (GRAPHS/TABLES): B. subtilis Low Speed		-0.5				
Device Information		-1.0				
MANUFACTURER: Medify	E					
UNIT MODEL: M50	tio I	-1.5				
FAN SPEED (CFM):	n n					
UNIT SERIAL #:	See 1	20				
TRIAL NAME ID (GRAPHS/TABLES): B. subtilits Low Speed         Device Information         MANUFACTURER: Medify         UNIT MODEL: M50         FAN SPEED (CFM):         UNIT SERIAL #:         FILTER ID #:         FILTER LOT #:         General Testing Conditions (Can Be User Defined)         NEBULIZER CONDITIONS: 16         SAMPLING METHOD: Collison 24-Jet; approx. 20 min neb         CHAMBER MIXING FAN: Impinger         yes       TEMP (F): 74         RH (%): 70         OTHER INSTRUMENTS: na         TRIAL COMMENTS/NOTES Low Speed	2	-2.0				
	<b>1</b>					
Constal Testing Conditions (Can Bo User Defined)		-2.5				
SAMPLING METHOD: Collison 24 late approve 20 min rak		-3.0				
CHAMPED MINING FANL Impires						
CHAMBER MIXING FAIN. Impinger		-3.5				
yes						
1EMP (F): 74						
RH (%): 70		-4.0	20	60		120
OTHER INSTRUMENTS: na		U	50	60	90	120
TRIAL COMMENTS/NOTES Low Speed				Time (m	in)	
BIOAFROSOL Sample ID and Summary Data	S1		\$2	\$3	<b>S</b> 4	\$5
SAMPLE TIME (min)	0		30	60	90	120
IMPINGER USED (v/n)	v		v	v	v	v
VIABLE CASCADE USED (v/n)	, n		'n	n	n	n
CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cf1 pf1/L Air)	7 253E	+05	4 587E+05	3 349E+05	2 912E+05	2 187E+05
CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)	7.2002	100	1.001 2 100	0.0102100	2.0122100	2.1072100
IMPINGER DILUTION CONSISTENCY CHECKS (% agreement)						
VIABLE CONSISTENCY CHECKS (% agreement)						
IMP & VIABLE CROSS CHECK (% agreement)						
CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or nfu/L Air)	7 2525	+05	4 587E±05	3 349E±05	2 912E±05	2 187E±05
RELATIVE PERCENT REMAINING FROM T=0 (%)	100.00	00%	63.2353%	46.1765%	40.1471%	30.1471%
RELATIVE PERCENT REMOVAL FROM T=0 (%)	0.000	0%	36.7647%	53.8235%	59.8529%	69.8529%
LOG REDUCTION FROM T=0 (log <sub>10</sub> )	0.0	)	-0.20	-0.34	-0.40	-0.52

	SAMPLE TIME (min)	0	30	60	90	120
	IMPINGER FILL VOL (ml)	20.0	20.0	20.0	20.0	20.0
	IMPINGER SAMPLING TIME (min)	5.0	5.0	5.0	5.0	5.0
	IMPINGER FLOW RATE (lpm)	12.5	12.5	12.5	12.5	12.5
	DILUTION RATIO (10 <sup>x</sup> )	-4	-4	-3	-3	-3
	DROPLET SIZE (µl)	100	100	100	100	100
ange #1	ENUMERATED PLATE COUNTS (# / drop)	20	18	104	90	70
		23	16	108	98	70
n R		25	9	102	85	65
hutio						
Di	PLATE AVERAGE COUNT (# / drop)	22.67	14.33	104.67	91.00	68.33
	IMPINGER CONCENTRATION (cfu or pfu/ml)	2,266,667	1,433,333	1,046,667	910,000	683,333
	CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)	7.25E+05	4.59E+05	3.35E+05	2.91E+05	2.19E+05

Figure 5C: B. subtilis Control



	Information		TRIAL LOG REDUCTION RESULTS						
	TEST DATE: Friday, July 30, 2021								
	TRIAL PERFORMED BY: SMM		0.0						
	TRIAL NUMBER: T1								
	TEST ORGANSIM: B. subtilis								
TR	AL NAME ID (GRAPHS/TABLES): B. subtilis								
			-1.0						
Devi	ice Information								
	MANUFACTURER: Medify					B. subtil	is		
	UNIT MODEL: M40	5	-2.0						
	FAN SPEED (CFM):	Ĕ		<b>**</b> *		– • – Linear Fi	t		
	UNIT SERIAL #:	- <mark>-</mark>							
	FITER ID #:	Re	-3.0						
	FILTER LOT #:	8			-3.52				
		-							
Gen	eral Testing Conditions (Can Be User Defined)		4.0						
Och	TEST CHAMPER VOLUME (m <sup>3</sup> ): 16	-	-4.0			-4,29			
	NERLI IZER CONDITIONS: Collicon 24 lat: approv. 20 min pab						4 20		
	CAMPLING METHOD: Implaces						-4,00		
	SAMPLING METHOD: Impinger		-5.0						
	CHAMBER MIXING FAN: yes						0		
	TEMP (F): 74								
	RH (%): 70		-6.0						
	OTHER INSTRUMENTS: na		0	30	60	90	120		
	TRIAL COMMENTS/NOTES na				Time				
					Time (min)				
BIOA	EROSOL Sample ID and Summary Data		S1	S2	<b>S</b> 3	S4	<b>S</b> 5		
	SAMPLE TI	ME (min)	0	30	60	90	120		
	IMPINGER USI	ED (y / n)	v	v	v	v	v		
	VIABLE CASCADE US	ED $(v/n)$	n	ņ	n	n	ņ		
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu	ofu/L Air)	6.044E±05	2 203E+03	1 912	2.002E+01	0.600E+00		
	CHAMPER VIABLE BIODIOAEROSOL CONCENTRATION (cfu )	ofu/L Air)	0.0442405	2.2002+00	1.0132+02	3.033E+01	3.000E+00		
	BADRICED DI LITION CONSISTENCY CHECKS (%	plu/L All)		. 12.04%	<b>a</b> 20.00%/				
	IMPINGER DILUTION CONSISTENCY CHECKS (% ag	greement)		13.04%	JU.00%				
	VIABLE CONSISTENCY CHECKS (% ag	greement)							
	IMP & VIABLE CROSS CHECK (% ag	greement)							
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p	fu/L Air)	6.044E+05	2.293E+03	1.813E+02	3.093E+01	9.600E+00		
	RELATIVE PERCENT REMAINING FROM	T=0 (%)	100.0000%	0 370/9/	0.0300%	0.0051%	0.004.00/		
	RELATIVE PERCENT REMOVAL FROM	T=0 (%)		0.37 54 /0			0.0016%		
		(/ -/	0.0000%	99.6206%	99.9700%	99.9949%	99.9984%		
	LOG REDUCTION FROM T=	=0 (log <sub>10</sub> )	0.0000% 0.00	99.6206% -2.42	99.9700% -3.52	99.9949% -4.29	99.9984% -4.80		
	LOG REDUCTION FROM T	=0 (log <sub>10</sub> )	0.0000% 0.00	99.6206% -2.42	99.9700% -3.52	99.9949% -4.29	99.9984% -4.80		
Impi	LOG REDUCTION FROM T=	=0 (log <sub>10</sub> )	0.0000%	99.6206% -2.42	99.9700% -3.52	99.9949% -4.29	99.9984% -4.80		
Impi	LOG REDUCTION FROM T= nger Sampling Conditions SAMPLE TI	<b>=0 (log<sub>10</sub>)</b> ME (min)	0.0000% 0.00 0	99.6206% -2.42 30	99.9700% -3.52 60	99.9949% -4.29 90	0.0016% 99.9984% -4.80 120		
Impi	LOG REDUCTION FROM T- nger Sampling Conditions SAMPLE TI IMPINGER FILL	= <b>0 (log<sub>10</sub>)</b> ME (min) VOL (ml)	0.0000% 0.00 0.00 20.0	99.6206% -2.42 30 20.0	99.9700% -3.52 60 20.0	99.9949% -4.29 90 20.0	99.9984% -4.80 120 20.0		
Impi	LOG REDUCTION FROM T- nger Sampling Conditions SAMPLE TI IMPINGER FILL ' IMPINGER SAMPLING TI	=0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min)	0.0000% 0.00 0 0 20.0 3.0	99.6206% -2.42 30 20.0 5.0	99.9700% -3.52 60 20.0 5.0	99.9949% -4.29 90 20.0 5.0	99.9984% -4.80 120 20.0 10.0		
Impi	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA	=0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) ATE (lpm)	0.0000% 0.00 0 0 20.0 3.0 12.5	99.6206% -2.42 30 20.0 5.0 12.5	99.9700% -3.52 60 20.0 5.0 12.5	99.9949% -4.29 90 20.0 5.0 12.5	99.9984% -4.80 120 20.0 10.0 12.5		
Impi	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILITION RAT	=0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) ATE (lpm)	0.0000% 0.00 0 20.0 3.0 12.5 -4	30 -2.42 30 20.0 5.0 12.5 -3	99.9700% -3.52 60 20.0 5.0 12.5 -2	99.9949% -4.29 90 20.0 5.0 12.5 -1	0.0016% 99.9984% -4.80 120 20.0 10.0 12.5 -1		
Impi	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET 5	=0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) ATE (lpm) TO (10 <sup>x</sup> ) SIZE (ul)	0.0000% 0.00 0 20.0 3.0 12.5 -4 100	30 -2.42 30 20.0 5.0 12.5 -3 100	99.9700% -3.52 60 20.0 5.0 12.5 -2 100	99.9949% -4.29 90 20.0 5.0 12.5 -1 100	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100		
Impi	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S	-0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) ΔΤΕ (lpm) TO (10 <sup>x</sup> ) SIZE (μl)	0.0000% 0.00 20.0 3.0 12.5 -4 100	30 -2.42 30 20.0 5.0 12.5 -3 100	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2	99.9949% -4.29 90 20.0 5.0 12.5 -1 100	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100		
ge #1	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S	-0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) TE (lpm) TO (10 <sup>x</sup> ) SIZE (μl)	0.0000% 0.00 20.0 3.0 12.5 -4 100 14	99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0	99.9949% -4.29 90 20.0 5.0 12.5 -1 100	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100		
Range #1	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS	•• (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) XTE (lpm) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop)	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8	99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 0	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0	99.9949% -4.29 90 20.0 5.0 12.5 -1 100	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100		
ion Range #1	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS	ME (min) VOL (ml) ME (min) VTE (lpm) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop)	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8	99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 1 0	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0	99.9949% -4.29 90 20.0 5.0 12.5 -1 100	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100		
vilution Range #1	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS	<pre>e0 (log<sub>10</sub>) ME (min) VOL (m) ME (min) XTE (lpm) TO (10<sup>x</sup>) SIZE (µl) (# / drop)</pre>	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8	30347 99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 0	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0	99.9949% -4.29 90 20.0 5.0 12.5 -1 100	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100		
Dilution Range #1	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT	=0 (log <sub>10</sub> ) ME (min) VOL (m) ME (min) XTE (lpm) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop) (# / drop)	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8 8	3033478 99.6206% -2.42 300 20.0 5.0 12.5 -3 100 1 1 1 0 .67	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0	99.9949% -4.29 90 20.0 5.0 12.5 -1 100	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100		
Dilution Range #1	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT / IMPINGER CONCENTRATION (cfu	<pre>e0 (log<sub>10</sub>) ME (min) VOL (ml) ME (min) XTE (lpm) TO (10<sup>x</sup>) SIZE (µl) (# / drop) (# / drop) or pfu/ml)</pre>	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8 11.33 1,133,333	30 99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 1 0 .667 6,667	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0 0 0	99.9949% -4.29 90 20.0 5.0 12.5 -1 100	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100		
Dilution Range #1	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or	••• (tog <sub>10</sub> ) ME (min) VOL (ml) ME (min) VTE (lpm) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop) (# / drop) or pfu/ml) pfu/L Air)	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8 11.33 1,133,333 6.04E+05	30 99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 0 0 6,667 6,667 2.13E+03	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0 0 0 0.67 667 2.13E+02	99.9949% -4.29 90 20.0 5.0 12.5 -1 100	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100		
Dilution Range #1	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT / IMPINGER CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or DILUTION PAT	•0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) VTE (lpm) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop) (# / drop) or pfu/ml) pfu/L Air) TO (10 <sup>x</sup> )	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8 11.33 1,133,333 6.04E+05 -3	30 99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 0 0.67 6,667 2.13E+03 -2	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0 0 0.67 667 2.13E+02 -1	99.9949% -4.29 90 20.0 5.0 12.5 -1 100	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100		
Dilution Range #1	I LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL ' IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT IMPINGER CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or DILUTION RAT DROPLET S	•0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) VTE (lpm) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop) or pfu/ml) pfu/L Air) TO (10 <sup>x</sup> ) SIZE (µl)	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8 11.33 1,133,333 6.04E+05 -3 100	30 99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 0 0.67 6,667 2.13E+03 -2 100	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0 0 0 .13E+02 -1 100	99.9949% -4.29 90 20.0 5.0 12.5 -1 100	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100		
1 Dilution Range #1 idul	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL ' IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S PLATE AVERAGE COUNT ( IMPINGER CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or DILUTION RAT DROPLET S	•0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) VTE (lpm) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop) (# / drop) or pfu/ml) pfu/L Air) SIZE (µl) SIZE (µl)	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8 11.33 1,133,333 6.04E+05 -3 100	30 99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 0 .0.67 6,667 2.13E+03 -2 100 14	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0 0 0 0 -1 100 2 0 0 0 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2	99.9949% -4.29 90 20.0 5.0 12.5 -1 100	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100		
ge #1 Dilution Range #1 idul	I LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL ' IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S PLATE AVERAGE COUNT / IMPINGER CONCENTRATION (cfu or ) DILUTION RAT DROPLET S	<ul> <li>ME (min)</li> <li>WOL (ml)</li> <li>ME (min)</li> <li>VOL (ml)</li> <li>ME (min)</li> <li>TO (10<sup>x</sup>)</li> <li>SIZE (µl)</li> <li>(# / drop)</li> <li>(# / drop)</li> <li>or pfu/ml)</li> <li>pfu/L Air)</li> <li>SIZE (µl)</li> </ul>	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8 3 1,133,333 6.04E+05 -3 100	3.0 99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 0 .0.67 6,667 2.13E+03 -2 100 11 -2	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0 0 0 2 12.5 -2 100 2 0 0 0 -2 100 -2 100 2 0 0 0 -2 100 -2 -2 100 -2 -2 100 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2	99.9949% -4.29 90 20.0 5.0 12.5 -1 100 0 100 8 8	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100 0 0 100 4 0		
tange #1 Dilution Range #1 dil	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI IMPINGER FILL ' IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS IMPINGER CONCETRATION (cfu or DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS	•0 (log <sub>10</sub> ) ME (min) VOL (m) ME (min) xTE (lpm) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop) (# / drop) fu/ Air) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop) (# / drop) (# / drop) (m) (	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8 11.33 1,133,333 6.04E+05 -3 100	3033478 99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 1 0 0 .67 6,667 2.13E+03 -2 100 11 7	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99.9949% -4.29 90 20.0 5.0 12.5 -1 100 0 100 8 12 8 12	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100 0 100 4 6		
on Range #1 Dilution Range #1 ddl	ICIG REDUCTION FROM T nger Sampling Conditions SAMPLE TI MPINGER FILL ' IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS (cfu or ) DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS (	•0 (log10)           ME (min)           VOL (m)           ME (min)           XTE (lpm)           TO (10 <sup>x</sup> )           SIZE (µI)           (# / drop)           or pfu/Min)           pfu/L Air)           SIZE (µI)           (# / drop)	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8 8 11.33 1,133,333 6.04E+05 -3 100	99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 0 0 0.67 6,667 2.13E+03 -2 100 11 7 5	99.9700% -3.52 60 20.0 5.0 12.5 12.5 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99.9949% -4.29 90 20.0 5.0 12.5 -1 100 0 100 8 12 9	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100 0 100 4 6 8		
thation Range #1 Dilution Range #1 dilution	I LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI MPINGER FILL ' IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( CHAMBER BIOAEROSOL CONCETRATION (cfu or DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS (	(i) (log <sub>10</sub> ) ME (min) VOL (mi) ME (min) xTE (lpm) TO (10 <sup>x</sup> ) SIZE (µI) (# / drop) (# / drop) fu/L Air) TO (10 <sup>x</sup> ) SIZE (µI) (# / drop) (# / drop) (# / drop)	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8 8 11.33 1,133,333 6.04E+05 -3 100	313478 99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 1 0 0 0 6,667 2.13E+03 -2 100 11 7 5	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0 0 0 0 0 0 0 0 12.5 -2 100 2 0 0 0 0 12.5 -2 100 2 0 0 0 12.5 -2 100 2 0 0 0 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 -2 100 -2 -2 100 -2 -2 100 -2 -2 -2 100 -2 -2 -2 -2 -2 -2 -2 -2 -2 -2	99.9949% -4.29 90 20.0 5.0 12.5 -1 100 0 100 8 12 9	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100 0 100 4 6 8		
Dilution Range #1 Dilution Range #1 dilution	ILIGE REDUCTION FROM TE nger Sampling Conditions SAMPLE TI MPINGER FILL ' IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS IMPINGER CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS (	<pre>0 (log<sub>10</sub>) ME (min) VOL (mi) ME (min) XTE (lpm) TO (10<sup>x</sup>) SIZE (µ1) (# / drop) (# / drop)</pre>	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8 8 11.33 1,133,333 6.04E+05 -3 100	3.134 % 99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 1 0 0 .667 6,667 2.13E+03 -2 100 11 7 5 5	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99.9949% -4.29 90 20.0 5.0 12.5 -1 100 0 100 8 12 9 9 9.67	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100 0 100 4 6 8		
Dilution Range #1 Dilution Range #1 ddl	LOG REDUCTION FROM T nger Sampling Conditions SAMPLE TI MPINGER FILL IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS IMPINGER CONCENTRATION (cfu or J DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ( PLATE AVERAGE COUNT) PLATE AVERAGE COUNT ( MPINGER CONCENTRATION (cfu or J DILUTION RAT	•0 (log <sub>10</sub> ) ME (min) VOL (m) ME (min) TO (10 <sup>x</sup> ) SIZE (µ) (# / drop) (# / drop) or pfu/m) pfu/L Air) TO (10 <sup>x</sup> ) SIZE (µ) (# / drop) (# / drop) (# / drop) or pfu/m) or pfu/m) or pfu/m) FIL (µ) (# / drop)	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8 8 11.33 1,133,333 6.04E+05 -3 100	3.134 % 99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 1 0 0 .667 6,667 2.13E+03 -2 100 11 7 5 5	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99.9949% -4.29 90 20.0 5.0 12.5 -1 100 0 100 8 12 9 9 9 9.67 97	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100 0 100 4 6 8		
Dilution Range #1 Dilution Range #1 idul	IDG REDUCTION FROM T nger Sampling Conditions SAMPLE TI MPINGER FILL IMPINGER SAMPLING TI IMPINGER SAMPLING TI IMPINGER FLOW RA DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS IMPINGER CONCENTRATION (cfu or DILUTION RAT DROPLET S ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS ENUMERATED PLATE COUNTS PLATE AVERAGE COUNT MPINGER CONCENTRATION (cfu or CHAMBER BIOAEROSOL CONCETRATION (cfu or	•0 (log <sub>10</sub> ) •0 (log <sub>10</sub> ) ME (min) VOL (ml) ME (min) XTE (lpm) TO (10 <sup>x</sup> ) SIZE (µl) (# / drop) or pfu/ml) pfu/L Air) SIZE (µl) (# / drop) (# / drop) or pfu/ml) pfu/L Air)	0.0000% 0.00 20.0 3.0 12.5 -4 100 14 12 8 3 1,133,333 6.04E+05 -3 100	99.6206% -2.42 30 20.0 5.0 12.5 -3 100 1 1 1 0 0.67 6,667 2.13E+03 -2 100 11 7 5 7.67 7,667 2.45E+03	99.9700% -3.52 60 20.0 5.0 12.5 -2 100 2 0 0 0 0 0 0 0 0 0 0 12.5 -2 100 2 0 0 0 0 0 0 12.5 -2 100 2 0 0 0 0 12.5 -2 100 2 0 0 0 12.5 -2 100 2 0 0 0 12.5 -2 100 2 0 0 0 0 12.5 -2 100 2 0 0 0 12.5 -2 100 2 0 0 0 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 100 -2 -1 100 -2 -1 -1 100 -2 -1 -1 100 -2 -1 -1 100 -1 -1 100 -2 -1 -1 100 -1 -1 100 -1 -1 -1 100 -1 -1 100 -1 -1 100 -1 -1 100 -1 -1 100 -1 -1 100 -1 -1 100 -1 -1 100 -1 -1 100 -1 -1 100 -2 -1 -1 -1 -1 -1 -1 -1 -1 -1 -1	99.9949% -4.29 90 20.0 5.0 12.5 -1 100 0 100 8 12 9 9 9.67 97 3.09E+01	0.0016% 99.9984% -4.80 20.0 10.0 12.5 -1 100 0 100 4 6 8 8		

Figure 6C: B. subtilis Speed 1 Trial 1



TEST DATE: Monday, August 2, 2021 TRIAL PERFORMED BY: SMM TRIAL NUMBER: T2 TEST ORGANSIM: B. subtillus TRIAL NAME ID (GRAPHS/TABLES): B. subtillus -1.0	TRIAL LOG REDUCTION RESULTS							
TRIAL PERFORMED BY: SMM     0.0       TRIAL NUMBER: T2     0.0       TEST ORGANSIM: B. subtillus     0.0       TRIAL NAME ID (GRAPHS/TABLES):     B. subtillus								
TRIAL NUMBER: T2 TEST ORGANSIM: B. subtillus TRIAL NAME ID (GRAPHS/TABLES): B. subtillus -1.0								
TEST ORGANSIM: B. subtillus TRIAL NAME ID (GRAPHS/TABLES): B. subtillus -1.0								
TRIAL NAME ID (GRAPHS/TABLES): B. subtillus								
-1.0								
Device Information								
MANUFACTURER: Medify	–•– B. subtillus							
UNIT MODEL: M40 5 -2.0								
FAN SPEED (CFM):	–o– Linear Fit							
UNIT SERIAL #:								
FITER ID #:								
FILTER LOT #:								
General Testing Conditions (Can Be User Defined) 4.0	L							
TEST CHAMBER VOLUME (m <sup>3</sup> ): 16								
NEBULIZER CONDITIONS: Collison 24-Jet; approx. 20 min neb	-4.87							
SAMPLING METHOD: Impinger -5.0								
CHAMBER MIXING FAN: yes								
TEMP (F): 74								
RH (%): 70								
OTHER INSTRUMENTS: na 0 30 60 90	120 150 180							
TRIAL COMMENTS/NOTES na								
Time (m	nin)							
BIOAEROSOL Sample ID and Summary Data S1 S2 S3	3 S4 S5							
SAMPLE TIME (min) 0 30 6	0 90 120							
IMPINGER USED (y / n) y y y	у у у							
VIABLE CASCADE USED (y / n) n n r	i n n							
CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu pfu/L Air) 1.582E+05 1.387E+03 4.907	E+01 9.707E+00 2.133E+00							
CHAMBER VIABLE BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air)								
IMPINGER DILUTION CONSISTENCY CHECKS (% agreement) O 38.18%	<u> </u>							
VIABLE CONSISTENCY CHECKS (% agreement)								
IMP & VIABLE CROSS CHECK (% agreement)								
CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or pfu/L Air) 1.582E+05 1.387E+03 4.907	E+01 9.707E+00 2.133E+00							
RELATIVE PERCENT REMAINING FROM T=0 (%) 100.0000% 0.8764% 0.031	0% 0.0061% 0.0013%							
RELATIVE PERCENT REMOVAL FROM T=0 (%) 0.0000% 99.1236% 99.96	90% 99.9939% 99.9987%							
LOG REDUCTION FROM T=0 (log <sub>10</sub> ) 0.00 -2.06 -3.	51 -4.21 -4.87							
Impinger Sampling Conditions								
SAMPLE TIME (min) 0 30 6	0 90 120							
	0 200 200							
IMPINGER SAMPI ING TIME (min) 3.0 5.0 5	0 50 100							
IMPINICED ELOW DATE (http:// 125 125 12	5 125 125							
	.0 12.0 12.0							
$\begin{array}{c cccc} \text{DILUTION RATIO} (10^{\circ}) & -4 & -2 & -1 \\ \text{DDON PTOUT} (10^{\circ}) & -4 & $								
DROPLET SIZE (µI) 100 100 10	10 750 750							
	18 10							
ENUMERATED PLATE COUNTS (# / drop)								
	18.00 10.00							
PLATE AVERAGE COUNT (# / drop) 3.67 4.33	24 13							
PLATE AVERAGE COUNT (# / drop)         3.67         4.33           IMPINGER CONCENTRATION (cfu or pfu/ml)         366,667         4,333								
PLATE AVERAGE COUNT (# / drop) IMPINGER CONCENTRATION (cfu or pfu/ml) CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air) 1.96E+05 1.39E+03	7.68E+00 2.13E+00							
PLATE AVERAGE COUNT (# / drop)         3.67         4.33           IMPINGER CONCENTRATION (cfu or pfu/ml)         366,667         4,333           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)         1.96E+05         1.39E+03	7.68E+00         2.13E+00           0         0							
РЕАТЕ AVERAGE COUNT (# / drop)         3.67         4.33           IMPINGER CONCENTRATION (cfu or pfu/ml)         366,667         4,333           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)         1.96E+05         1.39E+03           DILUTION RATIO (10*)         -3         -2         0           DROPLET SIZE (µ)         100         100         100	7.68E+00         2.13E+00           0         0         0           0         100         100							
PLATE AVERAGE COUNT (#/ drop)         3.67         4.33           IMPINGER CONCENTRATION (cfu or pfu/ml)         366,667         4,333           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/ml)         366,667         4,333           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/L Air)         1.96E+05         1.39E+03           Image: the state of the	7.68E+00         2.13E+00           0         0         0           0         100         100           8         4         100							
Upper         PLATE AVERAGE COUNT (# / drop)         3.67         4.33           IMPINGER CONCENTRATION (cfu or pfu/ml)         366,667         4,333           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/ml)         366,667         4,333           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/ml)         1.96E+05         1.39E+03           DILUTION RATIO (10*)         -3         -2         00           DROPLET SIZE (µ)         100         100         100           ENUMER ATED PLATE COUNTS (# / drop)         28         1	7.68E+00         2.13E+00           0         0         0           0         100         100           8         4         4							
Image: Description of the second system         PLATE AVERAGE COUNT (# / drop)         3.67         4.33         4.3	7.68E+00         2.13E+00           0         0         0           0         100         100           8         4         4           4         3         3							
Image: Plate Average Count (# / drop)         3.67         4.33           PLATE AVERAGE COUNT (# / drop)         3.67         4.33           IMPINGER CONCENTRATION (cfu or pfu/ml)         366,667         4,333           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/ml)         366,667         4,333           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/ml)         1.96E+05         1.39E+03           Image: Plate BioAerosol Concertation (cfu or pfu/L Air)         -3         -2         00           DROPLET SIZE (µ)         100         100         100         100           Image: Plate Plate Counts (# / drop)         25         14         28         14           ENUMERATED PLATE COUNTS (# / drop)         15         14         15         14	7.68E+00         2.13E+00           0         0         0           0         100         100           8         4         4           4         3							
Upper         PLATE AVERAGE COUNT (# / drop)         3.67         4.33           IMPINGER CONCENTRATION (cfu or pfu/ml)         366,667         4,333           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/ml)         366,667         4,333           CHAMBER BIOAEROSOL CONCETRATION (cfu or pfu/ml)         1.96E+05         1.39E+03           Implement         DILUTION RATIO (10*)         -3         -2         00           DROPLET SIZE (µ)         100         100         100         100           Implement         25         11         14         28         14           ENUMERATED PLATE COUNTS (# / drop)         15         15         14           PLATE AVERAGE COUNT (# / drop)         22.57         15         15	7.68E+00         2.13E+00           0         0           0         100           33         3.67							
Image: constraint of the second sec	7.68E+00         2.13E+00           0         0           0         100           8         4           4         3           33         3.67           3         37							

Figure 7C: B. subtilis Speed 1 Trial 2



Trial	Information	TRIAL LOG REDUCTION RESULTS						
	TEST DATE: Monday, August 2, 2021							
	TRIAL PERFORMED BY: SMM		0.0					
	TRIAL NUMBER: T3							
	TEST ORGANSIM: B. subtillus							
TR	IAL NAME ID (GRAPHS/TABLES): B. subtillus		?					
			-1.0					
Dev	ice Information							
	MANUFACTURER: Medify					––– B. subtillu	s	
	UNIT MODEL: M40	E	-2.0					
	FAN SPEED (CFM):	i ii		2.45		– – Linear Fit		
	UNIT SERIAL #:	Ę						
	FITER ID #	Re	-3.0					
	FILTER LOT #-	8						
	TIETEK EGT #.				-3.64			
Gon	eral Testing Conditions (Can Be User Defined)							
Gen	TEST CHAMPER VOLUME (m <sup>3</sup> ): 16		-4.0			4.31		
	NERLI IZER CONDITIONS: Collicon 24 lat: approv. 20 min pab							
	REBULIZER CONDITIONS: Comson 24-Jet; approx. 20 min neb						-5.01	
	SAMPLING METHOD: Impinger		-5.0					
	CHAMBER MIXING FAN: yes							
	TEMP (F): 74						Ĭ	
	RH (%): 70		-6.0					
	OTHER INSTRUMENTS: na		0	30	60	90	120	
	TRIAL COMMENTS/NOTES na							
					Time (min)			
BIOA	AEROSOL Sample ID and Summary Data		S1	S2	<b>S</b> 3	S4	<b>S</b> 5	
	SAMPLE TI	ME (min)	0	30	60	90	120	
	IMPINGER USI	ED (v / n)	v	v	v	v	v	
	VIABLE CASCADE US	ED(v/n)	'n	ņ	n	n	'n	
	CHAMBER IMPINGER BIOBIOAEROSOL CONCENTRATION (cfu	ofu/L Air)	1 956E±05	6 987E±02	 4.480E±01	9 /93E+00	1 920E±00	
	CHAMBER WINDER BIODIOAEROSOL CONCENTRATION (cfu )	ofu/LAir)	1.9302+03	0.907 L +02	4.4002401	9.493L+00	1.9202400	
	INDRUCED DI LITION CONSISTENCY CHECKS (%	JUL AL)	40.07%	<b>0</b> 26 25%		0 20 4 00/		
	IMPINGER DILUTION CONSISTENCY CHECKS (% ag	greement)	10.07%	<b>30.2</b> 5%		J0.10%		
	VIABLE CONSISTENCY CHECKS (% ag	greement)						
	IMP & VIABLE CROSS CHECK (% ag	greement)						
	CHAMBER BIOBIOAEROSOL CONCENTRATION (cfu or p	fu/L Air)	1.956E+05	6.987E+02	4.480E+01	9.493E+00	1.920E+00	
	RELATIVE PERCENT REMAINING FROM	T=0 (%)	100.0000%	0.3573%	0.0229%	0.0049%	0.0010%	
	RELATIVE PERCENT REMOVAL FROM	T=0 (%)	0.0000%	99.6427%	99.9771%	99.9951%	99.9990%	
	LOG REDUCTION FROM T=	=0 (log <sub>10</sub> )	0.00	-2.45	-3.64	-4.31	-5.01	
l	near Compling Conditions							
Impi	nger Sampling Conditions			20	<u>^</u>	00	400	
	SAMPLE II	ME (min)	0	30	60	90	120	
	IMPINGER FILL	vOL (ml)	20.0	20.0	20.0	20.0	20.0	
	IMPINGER SAMPLING TI	ME (min)	3.0	5.0	5.0	5.0	10.0	
	IMPINGER FLOW RA	ATE (lpm)	12.5	12.5	12.5	12.5	12.5	
	DILUTION RAT	<b>IO</b> (10 <sup>x</sup> )	-4	-2	0	0	0	
	DROPLET	SIZE (µl)	100	100	100	750	750	
I‡		4.7	8	1	10	17		
ıge ‡			1	2	19		2	
Rar	ENUMERATED PLATE COUNTS	(# / drop)	2	5	13			
ion			3	5	13			
Dilut		(11.1.1.)						
Ц	PLATE AVERAGE COUNT	(# / drop)	4.00	2.67	14.00	17.00	9.00	
	IMPINGER CONCENTRATION (cfu	or pfu/ml)	400,000	2,667	140	23	12	
	CHAMBER BIOAEROSOL CONCETRATION (cfu or	ofu/L Air)	2.13E+05	8.53E+02	4.48E+01	7.25E+00	1.92E+00	
	DILUTION RAT	TO (10 <sup>x</sup> )	-3	-1	0	0	0	
	DROPLET	SIZE (µl)	100	100	100	100	100	
Į,		4.9	33	20		3		
ge ⊭			19	17		1		
Ran	ENUMERATED PLATE COUNTS	(# / drop)	40	17		7		
ion			49	14		1		
bilut								
Ц	PLATE AVERAGE COUNT	(# / drop)	33.33	17.00		3.67		
	IMPINGER CONCENTRATION (cfu	or pfu/ml)	333,333	1,700		37		

Figure 8C: B. subtilis Speed 1 Trial 3



## **Appendix D: Calculations**

To evaluate the viable aerosol delivery efficiency and define operation parameters of the system, calculations based on (theoretical) 100% efficacy of aerosol dissemination were derived using the following steps:

- Plating and enumeration of the biological to derive the concentration of the stock suspension (*C<sub>s</sub>*) in pfu/mL or cfu/mL, or cfu/g for dry powder.
- Collison 24 jet nebulizer use rate  $(R_{neb})$  (volume of liquid generated by the nebulizer/time) at 28 psi air supply pressure = 1.0 mL/min.
- Collison 24 jet Generation time (t) = 20 or 30 minutes, test dependent.
- Chamber volume  $(V_c) = 15,993$  Liters

Assuming 100% efficiency, the quantity of aerosolized viable particles ( $V_P$ ) per liter of air in the chamber for a given nebulizer stock concentration ( $C_s$ ) is calculated as:

Nebulizer: 
$$V_P = \frac{C_s \cdot R_{neb}}{V_c} t$$

Plating and enumeration of the biological to derive the concentration of the dry powder  $(C_p)$  in cfu/g.

- Eductor use rate  $(M_p)$  (Mass of powder generated by the eductor in grams)
- Chamber volume  $(V_c) = 15,993$  Liters

Assuming 100% efficiency, the quantity of aerosolized viable particles ( $V_P$ ) per liter of air in the chamber for a given dry powder stock concentration ( $C_p$ ) is calculated as:

Eductor: 
$$V_p = \frac{C_p \cdot M_p}{V_c}$$



AGI – 30 impinger or 47mm filter collection calculation:

- Viable aerosol concentration collection ( $C_a$ ) = cfu or pfu/L of chamber air.
- Viable Impinger concentration collection  $(C_{Imp}) = cfu$  or pfu/mL from enumeration of impinger sample or filter sample.
- Impinger sample collection volume  $(I_{vol}) = 20$  mL collection fluid/impinger, or extraction fluid for filter.
- AGI-30 impinger or filter sample flow rate  $(Q_{imp}) = 12.5 \text{ L/min.}$
- AGI-30 impinger or filter sample time (t) = 5 or 10 minutes, test dependent.

For viable impinger or filter aerosol concentration collection ( $C_a$ ) = cfu or pfu/L of chamber air:

$$C_a = \frac{\mathbf{C}_{\mathrm{Imp}} \cdot \mathbf{I}_{\mathrm{vol}}}{\mathbf{Q}_{\mathrm{imp}}} \mathbf{t}$$

The aerosol system viable delivery efficiency (expressed as %) is:

Efficiency = 
$$\frac{C_a}{V_p} \cdot 100$$

The table below is based on the principle that, as the number of viable particles being impinged on a given plate increases, the probability of the next particle going into an "empty hole" decreases. This can be corrected statistically by using the conversion formula of Feller [4]:

 $Pr = N [1/N + 1/N-1 + 1/N-2 + \dots 1/N-r+1]$ 

N is the number of holes (400) in the sampling head. For easy use of this formula please refer to the table in chapter 17.2 For each colony count **r** a statistically corrected total count **Pr** can be easily seen in the table.







### 17.2 Positive hole conversion table for all MAS-100 air monitoring systems

r = number of colony forming units counted on 100 mm petri dish Pr = probable statistical total count

