



## Clinical Data Summary – September 2021

### Our Approach

Cablex CxUV Decontamination with the support of the Original Equipment Manufacturer (OEM) Violet Defence has been committed to independently validate its products technology and efficacy to provide assurance to customers that our CxUV Decontamination units will protect their spaces from the pathogens they are concerned about.

Over the last 5 years, Violet Defense has engaged with four third-party, clinical testing labs to validate the technology and efficacy of the CxUV Decontamination units. These labs include Microchem Laboratory and ResInnova Labs, Georgia State University in the USA and Eurofins in Australia.

This report summarizes the results of tests against key pathogens of greatest concern, including drug-resistant pathogens such as MRSA to new threats *C. auris* and SARS-CoV-2 that have emerged in recent years.

### Laboratory Details

**ResInnova Laboratories** is an International Antimicrobial Council (IAC) certified lab and implements testing standards established by AATCC, ASTM, ISO and JIS in Rockville MD USA. For more information, visit <http://www.resinnovalabs.com>

**Center for Microbial Pathogenesis, Institute for Biomedical Sciences at Georgia State University** in Atlanta Georgia USA, analyses the molecular basis of life-threatening infectious diseases such as Ebola virus disease, COVID-19 and tuberculosis and works to create new therapies and treatments. For more information, visit <https://biomedical.gsu.edu/center-for-microbial-pathogenesis>

**Eurofins** in Sydney Australia is accredited by National Association of Testing Authorities, Australia (NATA) to conduct biological testing in accordance with ISO/IEC 17025:2017. For more information, visit <https://www.eurofins.com.au>

# Pathogens Tested

## *Focus Antibacterial Pathogens:*



### **Escherichia coli**

This bacteria is a Gram-negative, rod-shaped, facultative anaerobe commonly found in the gastrointestinal tract of mammals. Certain pathogenic groups of *E. coli* such as enterohemorrhagic (EHEC), verocytotoxin producing (VTEC) and Shiga-like toxin producing (STEC) can cause a multitude of illnesses. *E. coli* is relatively susceptible to decontamination when dried on a surface, yet it can be a challenging microorganism to mitigate in solution.



### **Salmonella enterica**

This bacteria is Gram-negative, rod-shaped, facultative anaerobe. Like the closely related *Escherichia* genus, *Salmonella* is common to all parts of the world and share habitats in the digestive systems of cold and warm-blooded animals. *S. enterica* is one of the most common bacteria associated with zoonotic and foodborne illness. Because of its regular occurrence and pathogenicity, *S. enterica* is a common bacteria for measuring decontamination efficacy.



### **Staphylococcus aureus (MRSA)**

This bacteria is a Gram-positive, cocci shaped, aerobe which is resistant to the penicillin-derivative antibiotic methicillin. MRSA can cause troublesome infections, and their rapid reproduction and resistance to antibiotics make them more difficult to treat. MRSA bacteria are resistant to drying and can therefore survive on surfaces and fabrics for an extended period and therefore makes this bacteria an excellent representative for antimicrobial efficacy testing on surfaces.



### **Klebsiella pneumoniae**

This bacteria is a Gram-negative, rod-shaped, facultative anaerobe. *K pneumoniae* is in the Enterobacteriaceae family which has developed resistance to carbapenem class based antibiotics. Although *K pneumoniae* is considered normal flora of the human gastrointestinal tract, this bacterium can also cause serious diseases such as pneumonia. *K pneumoniae* is relatively easy to decontaminate and usually serves as a good representation of an antimicrobial agent's efficacy against Gram-negative bacteria.



### **Pseudomonas aeruginosa**

This bacteria is a Gram-negative, rod-shaped microorganism with a single flagellum. It grows optimally under aerobic conditions; however, it can use a host of electron receptors to respire anaerobically. *P. aeruginosa* can be found almost anywhere in nature and it is an opportunistic pathogen. Like many other bacterial-related diseases, the ability to form resilient biofilms within human tissues under anaerobic conditions is thought to be the primary cause for pathogenicity.



### **Clostridioides difficile (C. diff)**

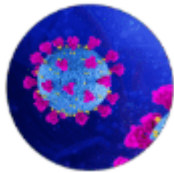
This bacteria is a gram-positive, rod shaped, endospore generating obligate anaerobe. Clostridium species are part of the normal human gut flora that produce spores which are highly resistant to chemical and environmental conditions. *C. difficile* is commonly associated with hospital acquired infections and is known to cause antibiotic assisted colitis.

## ***Focus Antibacterial Pathogens:***



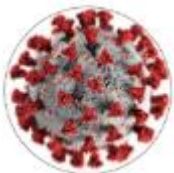
### **Feline calicivirus (FCV), ATCC VR-782, surrogate for human norovirus**

This virus is a non-enveloped, positive-stranded RNA member of the genus. As a member of the Caliciviridae viral family, FCV is closely related to human noroviruses, which cause acute gastroenteritis marked by nausea, vomiting and diarrhea. Unlike human norovirus, however, a simple cell culture assay system is available for FCV. Therefore, feline calicivirus is the US EPA-approved surrogate microorganism for human norovirus label claims. Both FCV and human norovirus can remain viable on environmental surfaces for extended periods of time and are resistant to a number of decontamination actives.



### **Human coronavirus, Strain 229E, ATCC VR-740**

This virus is an enveloped, negative-sense, single-stranded RNA virus in the Coronaviridae family. Two strains of human coronavirus, 229E and OC43, are known to cause approximately 25% of colds that exhibit symptoms like those caused by the rhinoviruses (e.g., runny nose, sneezing, and cough). However, recent zoonotic strains of coronavirus characterized by species-jumping from animals to humans have gained notoriety and become of particular concern over the past decade, including SARS-CoV-2. Human coronaviruses (i.e., ATCC 229E) is an US EPA-approved surrogate microorganism for SARS-CoV-2 claims.



### **Severe Acute Respiratory Syndrome-Related Coronavirus 2 (SARS-CoV-2)**

This virus is an enveloped, positive-sense, single-stranded RNA Virus in the coronaviridae family. This virus is responsible for the human coronavirus disease 2019 (COVID-19). This virus is thought to spread from person to person through droplets released when an infected person coughs, sneezes, or talks and causes severe respiratory diseases in humans

# Summary of Key Results

	Percentage Reduction Achieved	Distance
<i>E. coli</i>	99.9%	3 meters
<i>S. enterica</i>	99.9%	3 meters
<i>S. aureus</i>	99.99%	2 meters
<i>K. pneumoniae</i>	>99.99%	2 meters
<i>P. aeruginosa</i>	99.9%	2 meters
<i>C. difficile</i>	>99.9%	1.5 meters
Norovirus	99.99%	2 meters
Human coronavirus 229e*	99.9%	2 meters
SARS-Cov-2	>99.9%	2 meters
Murine hepatitis MHV-1**	>99.9%	3 meters

The efficacy of CxUV decontamination products are a function of time, distance, intensity, and positioning of a device within an area. Individual results may vary based on these factors, but users should reasonably expect significant reduction of tested pathogens within the air and on high touch surfaces up to the distance tested for individual products.

Results summarized above are based on testing using the dual CxUV Decontamination Unit (Vantage 2) unit unless otherwise noted. See individual study results for more specific guidance.

\* Tested using single CxUV Decontamination Unit (Vantage 1)

\*\* Tested using dual CxUV Decontamination Unit (Vantage 2)