VIOLET DEFENSE®

Clinical Data Overview on Violet Defense's UV Disinfection Technology

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Our Approach

Since its inception, Violet Defense has been committed to independently validating its technology to ensure that all of our UV disinfection products achieve the desired outcomes and that we can provide our customers the assurance they need that Violet Defense will protect their spaces from the pathogens they are concerned about.

Over the last 4 years, Violet Defense has engaged with 4 third-party, clinical testing labs to validate the efficacy of its products, including Microchem Laboratory, ResInnova Labs, Georgia State University, and Eurofins Australia.

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

Our Partner Labs

Microchem Laboratory is an EPA and FDA GLP-Compliant, ISO 17025 Accredited Testing Laboratory (Laboratory Accreditation Bureau Certificate Number L2450). Tests were conducted at the Microchem Laboratory, 1304 W. Industrial Blvd, Round Rock, TX 78681. For more information, visit www.microchemlab.com.

ResInnova Laboratories is an International Antimicrobial Council (IAC) certified laboratory and implements testing standards established by AATCC, ASTM, ISO and JIS. Tests were conducted at the ResInnova Laboratory, 8807 Colesville Rd, Silver Spring, Maryland. For more information, visit www.resinnovalabs.com.

Center for Microbial Pathogenesis, Institute for Biomedical Sciences at Georgia State University analyzes 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. Tests were conducted at their lab in Atlanta, Georgia. For more information, visit https://biomedical.gsu.edu/center-for-microbial-pathogenesis/

Eurofins is accredited by National Association of Testing Authorities, Australia (NATA) to conduct biological testing in accordance with ISO/IEC 17025:2017. Tests were conducted at the Eurofins Sydney lab at 8, Rachael Close, Silverwater, NSW 2128 Australia. For more information, visit https://www.eurofins.com.au/.

Pathogens Tested

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 disinfection 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 are 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 foodbourne illness. Because of its regular occurrence and pathogenicity, S. enterica is a common bacteria for measuring disinfectant 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 of time 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 disinfect 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.
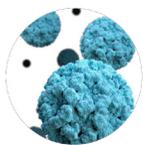
Feline calicivirus (FCV), ATCC VR-782, surrogate for human norovirus

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 are able to remain viable on environmental surfaces for extended periods of time and are resistant to a number of disinfectant actives.

Human coronavirus, Strain 229E, ATCC VR-740

This virus is an enveloped, negative-sense, single-stranged 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 similar to 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.
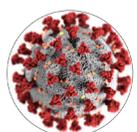
Severe Acute Respiratory Syndrome-Related Coronavirus 2 (SARS-CoV-2)

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). The 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

	Percent Reduction Achieved
E. coli	99.9%
S. enterica	99.9%
S. aureus	99.99%
K. pneumoniae	>99.99%
P. aeruginosa	99.99%
C. difficile	>99.9%
Norovirus	99.99%
Human coronavirus 229e*	99.99%
SARS-CoV-2	>99.99%
Murine hepatitis virus MHV-1+	>99.99%

The efficacy of UV disinfection 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 against dual UV light engine unless otherwise noted.

Contact Us

For more information on our clinical testing results, contact Violet Defense team at info@violetdefense.com or 407-433-1104.

*Tested against single UV Light engine
+Tested against dual light engine Gen 3.1