

## Summary of Antimicrobial Test Results

A One-Step Disinfectant, Virucide, Fungicide, Mildewstat and Cleaner. Listed below, and in the following pages, is a summary of the Antimicrobial Claims.

<b>Claim:</b> Disinfectant	<b>Contact Time:</b> 10 minutes	<b>Organic Soil:</b> 5%	<b>Water Conditions:</b> 200 ppm as CaCO <sub>3</sub>
<b>Test Method:</b> EPA Approved Method			

Organism	ATCC#	Use-Dilution Concentration*
Acinetobacter baumannii	BAA-1709	660 ppm
Acinetobacter calcoaceticus	23055	660 ppm
Bordetella bronchiseptica	31427	660 ppm
Chlamydia psittaci	VR-854	660 ppm
Enterobacter aerogenes	13048	660 ppm
Enterobacter cloacae	13047	660 ppm
Enterobacter cloacae NDM-1	CDC 1000654	660 ppm
Enterococcus faecalis - Vancomycin Resistant [VRE]	51299	660 ppm
Escherichia coli	11229	660 ppm
Escherichia coli NDM-1	CDC 1001728	660 ppm
Fusobacterium necrophorum	27852 25286	660 ppm
Klebsiella pneumoniae	4352	660 ppm
Klebsiella pneumoniae <sup>1</sup> NDM-1	BAA-2473	660 ppm
Legionella pneumophila	33153	660 ppm
Listeria monocytogenes	15313	660 ppm
Pasteurella multocida	12947	660 ppm
Proteus mirabilis	9240	660 ppm
Proteus vulgaris	9920	660 ppm
Salmonella enterica	10708	660 ppm
Salmonella enteritidis	13076	660 ppm
Salmonella typhi	6539	660 ppm
Serratia marcescens	14756	660 ppm
Shigella flexneri	9380	660 ppm

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Shigella sonnei	25931	660 ppm
Staphylococcus aureus	6538	660 ppm
Staphylococcus aureus <sup>1</sup> (MRSA)	33592	660 ppm
Staphylococcus aureus <sup>1</sup> (MRSA) Community Associated	(NRS 384) USA300	660 ppm
Staphylococcus aureus <sup>1</sup> (MRSA) Community Associated	(NRS 123) USA400	660 ppm
Staphylococcus aureus <sup>2</sup> (VISA)	CDC No. HIP-5836	660 ppm
Staphylococcus epidermidis <sup>1</sup> (MDR) Multi-Drug Resistant	12228	660 ppm
Streptococcus pyogenes	19615	660 ppm
Pseudomonas aeruginosa Pseudomonas aeruginosa <sup>1</sup> (MBL)	15442 CDC 2012059	660 ppm 660 ppm

\* Refer to EPA Master Label for complete dilution instructions

<sup>1</sup> Antibiotic-resistant strain

<sup>2</sup> Reduced Susceptibility to Vancomycin

**Conclusion:** This product demonstrated efficacy against the above listed bacteria as specified in the test performance standards. The formulations meet EPA requirements for hard surface disinfectant claims when diluted as directed.

<b>Claim:</b> Mildewstat	<b>Contact Time:</b> 10 minutes	<b>Organic Soil:</b> 5%	<b>Water Conditions:</b> 200 ppm as CaCO <sub>3</sub>
<b>Test Method:</b> EPA Approved Method			

Organism	ATCC#	Use-Dilution Concentration*
Aspergillus niger	6275	660 ppm

\* Refer to EPA Master Label for complete dilution instructions

**Conclusion:** This product demonstrated efficacy as a mildewstat against the above organism as specified in the test performance standards.

<b>Claim:</b> Citrus Canker Disease Control	<b>Contact Time:</b> 10 minutes	<b>Organic Soil:</b> 5%	<b>Water Conditions:</b> Deionized
<b>Test Method:</b> Approved EPA Test Method			
Organism	Use-Dilution Concentration*		
Xanthomonas axonopodis (Pathovar citri) (USDA Permit No. 46190)	2000 ppm		

\* Refer to EPA Master Label for complete dilution instructions

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<b>Claim:</b> Fungicide	<b>Contact Time:</b> 10 minutes	<b>Organic Soil:</b> 5%	<b>Water Conditions:</b> 200 ppm as CaCO <sub>3</sub>
<b>Test Method:</b> EPA Approved Method			

Organism	ATCC#	Use-Dilution Concentration*
Trichophyton mentagrophytes	9533	660 ppm
Candida albicans	11651	660 ppm

\* Refer to EPA Master Label for complete dilution instructions

**Conclusion:** This product demonstrated fungicidal efficacy against the above organisms as specified in the test performance standards.

<b>Claim:</b> Virucide	<b>Contact Time:</b> <b>Varies</b>	<b>Organic Soil:</b> 5%	<b>Water Conditions:</b> 200 ppm as CaCO <sub>3</sub>
<b>Test Method:</b> EPA Approved Method			

Organism	Source of Virus or ATCC#	Use-Dilution Concentration*	Contact Time
Adenovirus Type 4	VR-4, strain RI-67	660 ppm	10 Min.
Adenovirus Type 7	VR-7	<b>2640 ppm</b>	10 Min.
Hepatitis B [HBV]	Duck Hepatitis B Virus (Hepadna Virus Testing, Inc.)	660 ppm	10 Min.
Hepatitis C [HCV]	Bovine Viral Diarrhea Virus (BVDV-CPE)	660 ppm	10 Min.
Herpes Simplex Type 1	VR-733	660 ppm	10 Min.
Herpes Simplex Type 2	MS Strain	660 ppm	10 Min.
HIV-1 [AIDS virus]	HTLV-III <sub>RF</sub> strain	660 ppm	<b>4 Min.</b>
Human coronavirus**	VR-740, strain 229E	660 ppm	1 Min.
Influenza A virus**	VR-544, strain Hong Kong	660 ppm	2 Min.
Respiratory Syncytical virus [RSV]	VR-26	660 ppm	10 Min.
Rotavirus [WA]	Strain WA	660 ppm	10 Min.
Rubella virus	Strain M-33	660 ppm	10 Min.
SARS Associated Coronavirus [SARS]	CDC Strain #200300592	660 ppm	10 Min
Vaccinia [Pox virus]	Strain IHD	660 ppm	10 Min.

\* Refer to EPA Master Label for complete dilution instructions

\*\*Not on HWS-32 label, see label for contact time.

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**Conclusion:** This product effectively inactivated the above viruses specified in the test performance standards. The formulations meet EPA requirements for hard surface disinfectant claims when diluted as directed.

<b>Claim:</b> Animal Viruses	<b>Contact Time:</b> <b>10 minutes</b>	<b>Organic Soil:</b> 5%	<b>Water Conditions:</b> 200 ppm as CaCO <sub>3</sub>
<b>Test Method:</b>	EPA Approved Method		

Organism	Source of Virus or ATCC #	Use-Dilution Concentration	Contact time:
Avian influenza (H5N1)	Strain VNH5N1-PR8/CDC-RG CDC #2006719965	660 ppm	10 Min.
Avian polyomavirus	Dr. Bruce Calnek, Cornell University	660 ppm	10 Min.
Canine distemper virus	VR-128	660 ppm	10 Min.
Feline leukemia virus	VR-717	660 ppm	10 Min.
Feline picornavirus (calicivirus)	VR-649	660 ppm	10 Min.
Infectious bovine rhinotracheitis	VR-793	660 ppm	10 Min.
Infectious bronchitis [Avian IBV]	VR-22	660 ppm	10 Min.
Newcastle Disease	VR-108, strain B1, Hitchner or Blacksburg	660 ppm	10 Min.
Pseudorabies virus [PRV]	VR-135	660 ppm	10 Min.
Rabies Virus	VR-138	660 ppm	10 Min.
Transmissible Gastroenteritis virus [TGE]	VR-763	660 ppm	10 Min.
Equine Herpes virus Type 1	VR-2248	660 ppm	10 Min.
Feline Coronavirus	VR-2004, strain DF2	660 ppm	10 Min.
Feline Panleukopenia Virus	VR-648	660 ppm	10 Min.
Porcine Parvovirus	VR-742	660 ppm	10 Min.

**Conclusion:** This product effectively inactivated the above viruses specified in the test performance standards. The formulations meet EPA requirements for hard surface disinfectant claims when diluted as directed.

**Summary of Antimicrobial Efficacy – Etiology**

\*\*Below effect descriptions are NOT on EPA label and CANNOT be used on customer sub-registered label.

<b>Pathogenic Microorganism</b>	<b>Description</b>
Acinetobacter baumannii	Gram-negative, aerobic bacillus. Opportunistic bacterial pathogen primarily associated with hospital-acquired infections.
Acinetobacter calcoaceticus	Gram negative (spherical shape) bacteria. Occurs in soil, water and sewage. A nosocomial infection can cause septicemia, meningitis and urinary tract infections.
Adenovirus Type 4	Lipophilic (enveloped) DNA virus, (one of several) causative agent for colds and other respiratory ailments.
Adenovirus Type 7	Virus associated with acute respiratory disease syndrome, pharyngoconjunctival fever (PCF), pneumonia, and central nervous system disease.
Aspergillus niger	Black mold, found in shower and dressing rooms. Environmental contaminant may also cause “Aspergillosis.”
Bordetella bronchiseptica	Gram negative (spherical shape) bacteria. Causative agent for “puppy cough” in dogs. Bordetella pertussis is the causative agent for whooping cough in children.
Candida albicans	Fungi, yeast. This organism exhibits dimorphism; exists both as fungi and yeast. Causes skin rashes. Common cause for diaper rash. Can infect both oral and vaginal cavities. Causes itching and discomfort.
Canine Distemper	Lipophilic (enveloped) RNA virus. Highly contagious among dogs, causes fever, gastrointestinal and respiratory symptoms.
Chlamydia psittaci	Once believed to be a large virus but later found to be a parasitic bacterium. Infections cause fever, malaise and hacking cough. Most infections are occupational; poultry workers and other keepers of birds.
Enterobacter aerogenes	Gram negative bacteria spread by anal/oral route of infection. Associated with bacteremia, respiratory, wound and urinary tract infections.
Enterobacter cloacae	Gram negative bacteria spread by anal/oral route of infection. Associated with bacteremia, respiratory, wound and urinary tract infections.
Equine Herpes Virus Type 1	Double-stranded DNA virus common in horse populations. Causes sporadic outbreaks of reproductive, respiratory, and neurological disease in horses.
Escherichia coli	Gram negative bacteria spread by anal/oral route of infection, resulting in diarrhea outbreaks. Associated with urinary tract infections and bacteremia.
Feline Picornavirus (calicivirus)	Single-stranded RNA virus found in domestic cats.
Feline Coronavirus	Enveloped, single-stranded RNA virus highly prevalent in domestic cat populations worldwide. Causes mild, self-limiting gastroenteritis but can occasionally be severe or chronic.
Feline Leukemia Virus	Enveloped RNA virus. One of the causative agents of lymphosarcoma in cats.
Feline Panleukopenia Virus	Also known as Feline Distemper. Viral infection that is highly contagious, causing damage to cell line in intestines, bone marrow, lymph nodes, and red and white blood cells.
Fusobacterium necrophorum	Gram negative (rod shape) bacteria. Causative agent of “hoof rot” in sheep, cattle and horses.
HBV (Hepatitis B virus)	Lipophilic (enveloped) DNA virus of the Hepadnaviridae family. Causative agent of Hepatitis B (serum hepatitis).

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HCV (Hepatitis C Virus)	Major cause of acute hepatitis and chronic liver disease, including cirrhosis and liver cancer. It is an enveloped RNA virus in the flaviridae family.
Herpes Simplex Type 1&2	Lipophilic (enveloped) DNA virus may result in oral mucocutaneous lesions. Associated with most orofacial herpes and HSV encephalitis.
HIV-1 (AIDS Virus)	Lipophilic (enveloped) RNA retrovirus. Human Immunodeficiency Virus. Known to be the etiologic agent of Acquired Immunodeficiency Syndrome (AIDS).
Human Corona Virus	Single Strand RNA containing virus causing respiratory infection in humans. From order Nidovirales and Family Coronaviridae.
Influenza A/Hong Kong	Lipophilic (enveloped) RNA virus. Causative agent in viral flu. Causes flu epidemics in nearly 2 of every 3 years.
Klebsiella pneumoniae	Gram negative bacteria associated with severe pneumonia, bacteremia and urinary tract infections.
Legionella pneumophila	Gram negative (rod shape) bacteria. Causative agent for "legionnaire disease." First documented outbreak occurred in 1976 at Philadelphia American Legion convention.
Listeria monocytogenes	Gram positive (rod shape) bacteria. Considered a potent food pathogen. Found in raw meat and poultry. Infections can result in meningitis or sepsis.
Newcastle Disease	NDV is a contagious and fatal viral disease affecting most species of birds. A death rate of almost 100 percent can occur in unvaccinated poultry flocks. NDV can infect and cause death even in vaccinated poultry.
Pasteurella multocida	Gram negative (spherical shape) bacteria. Human infections are a result of an animal bite. Indigenous flora of many animals respiratory tracts.
Porcine Parvovirus	Single-stranded DNA virus. Cause of reproductive failure in swine throughout the world (stillbirth, mummification, embryonic death, infertility)
Proteus mirabilis	Gram negative (rod shape) bacteria. Highly motile bacteria. Opportunistic pathogen causes bacteremia, urinary tract infections, especially with the chronically ill.
Proteus vulgaris	Gram negative (rod shape) bacteria. Highly motile bacteria. Opportunistic pathogen causes bacteremia, urinary tract infections, especially with the chronically ill.
Rabies Virus	A member of the Rhabdoviridae family or RNA viruses. These bullet shaped viruses are enveloped by a lipid bilayer. The causative agent for "rabies", an encephalitis that causes neuronal degeneration-- almost always fatal.
Respiratory Syncytial Virus	A paramyxovirus type virus, lipophilic (enveloped). A causative agent of pneumonia and bronchiolitis in small children and infants. Highly contagious, transmitted by person-to-person contact.
Rubella	Lipophilic (enveloped) RNA togavirus. The causative agent of German measles.
Rotavirus	Double-stranded RNA virus in the family Reoviridae. Highly contagious virus causing gastroenteritis in young children.
Salmonella enterica	Gram negative bacteria associated with acute gastroenteritis and septicemia.
Salmonella enteritidis	Gram negative (rod shape) bacteria associated with acute gastroenteritis and diarrhea.
Salmonella typhi	Gram negative (rod shape) bacteria associated with acute gastroenteritis and diarrhea, the causative agent for typhoid fever.
Salmonella typhimurium	Gram negative (rod shape) bacteria associated with acute gastroenteritis and diarrhea.

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Serratia marcescens	Gram negative bacteria associated with urinary tract infections, meningitis and septicemia .
Shigella dysenteriae	Gram negative bacteria directly spread by anal/oral route of infection; indirectly (including food, hands, flies) spread by contaminated food and inanimate objects resulting in bacillary dysentery.
Shigella flexneri	Gram negative bacteria directly spread by anal/oral route of infection; indirectly (including food, hands, flies) spread by contaminated food and inanimate objects resulting in bacillary dysentery.
Shigella sonnei	Gram negative bacteria directly spread by anal/oral route of infection; indirectly (including food, hands, flies) spread by contaminated food and inanimate objects resulting in bacillary dysentery.
Staphylococcus aureus	Gram positive bacteria identified as a major cause of hospital acquired (nosocomial) infections. Causes wound infections, septicemia, endocarditis, meningitis, osteomyelitis and pneumonia.
Enterococcus faecalis	Gram positive (Enterococci) bacteria causing hemolysis, urinary tract infections and endocarditis.
Trichophyton mentagrophytes	Athlete's foot fungus. Found in shower and dressing rooms.
Vaccinia	Lipophilic (enveloped) DNA poxvirus; causes poxvirus infections.

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