



Maintenance Solutions

SUMMARY OF ANTIMICROBIAL ACTIVITY

SPECTRUM HBV

Hospital Disinfectant

Description

Spectrum HBV Disinfectant & Detergent is a broad spectrum, hard surface disinfectant. When used as directed, this product will deliver effective biocidal action against bacteria, fungi, and viruses. This formulation is a blend of a premium active ingredients and inerts: surfactants, chelates, and water. Biocidal performance is attained when this product is properly diluted at 2 oz. per gallon or 1:64. **Spectrum HBV** can be used to disinfect a wide variety of hard surfaces such as floors, walls, and countertops in hospitals, households, and institutions.

Regulatory Summary

EPA Registration No.	10324-59-8325
USDA Authorization	None
California Status	
Canadian PCP#	None
Canadian Din #	None

Physical Properties

pH of Concentrate	11.5 ±0.2
Specific Gravity @ 25°C	1.043
Pounds per gallon @ 25°C	8.7

Flash Point (PMCC)	>200°F
% Quat (mol. wt.360.5)	4.275-4.725
% Volatile	93.5-94.5

Summary of Antimicrobial Test Results

Spectrum HBV Neutral Disinfectant & Detergent is a "One-Step" Hospital Disinfectant, Virucide, Fungicide, Mildewstat, and Cleaner. Listed below, and in the following pages, is a summary of the Antimicrobial Claims and a review of the Antimicrobial Test Results.

Claim: Disinfectant		Contact Time: 10 minutes	Organic Soil: 5%	Water Conditions: 400 ppm as CaCO ₃	
Test Method: Official Method of the AOAC, 14 Edition Use Dilution Method					
Organism	ATCC#	Use-Dilution Concentration	Hard Water Condition	Contact Time	Results
Acinetobacter Baumannii	19606	703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/60, 0/60, 0/60
Bordetella bronchiseptica		703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/60, 0/60, 0/60
Campylobacter jejuni		703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/60, 0/60, 0/60
Corynebacterium ammoniagenes		703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/60, 0/60, 0/60
Enterobacter aerogenes	13048	703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Enterococcus faecalis		703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Escherichia coli	11229	703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Escherichia coli 0111:H8	BAA-184	703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Escherichia coli 0157:H7	35150	703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Klebsiella pneumoniae	13883	703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Listeria monocytogenes	15313	703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Pseudomonas aeruginosa	Clinical Isolate	703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Salmonella enterica		703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Salmonella Typhi	6539	703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Salmonella schottmuelleri		703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Shigella dysenteriae		703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Staphylococcus aureus (MRSA)	33592	703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Community associated Methicillin resistant Staphylococcus aureus (CA MRSA)		703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Staphylococcus aureus	Clinical Isolate	703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10
Streptococcus salivarius		703 ppm (2.0 oz/gal)	400 ppm	10 minutes	0/10, 0/10

Conclusion: All lots of **Spectrum HBV** effectively killed the above listed bacteria as specified in the test performance standards. **Spectrum HBV** meets EPA requirements for hard surface disinfectant claims in hospital and medical environments when diluted to 703 ppm active concentration in 400 ppm synthetic hard water, and in the presence of 5% organic soil.

Summary of Antimicrobial Test Results - (Continued)

Claim: Mildewstat	Contact Time: 10 minutes	Organic Soil: 5%	Water Conditions: 400 ppm as CaCO ₃
Test Method: Mildewstat (Mold and Mildew Control) - EPA - TSD 6-201 Mildewstat on Hard Surfaces			

Organism	ATCC#	Use-Dilution Concentration	Hard Water Condition	Replicates	Results
Aspergillus niger	6275	703 ppm (2.0 oz/gal)	400 ppm	10, 10	0/10, 0/10

Conclusion: All lots of **Spectrum HBV** were effective against *Aspergillus niger* under the test conditions outlined in the EPA test performance standards described above. **Spectrum HBV** is an effective mildewstat for non-porous inanimate hard surfaces when diluted to 703 ppm active concentration in 400 ppm synthetic hard water and in the presence of 5% organic soil.

Claim: Fungicide	Contact Time: 10 minutes	Organic Soil: 5%	Water Conditions: 400 ppm as CaCO ₃
Test Method: Official Method of Analysis of the AOAC Fungicidal Test.			

Organism	ATCC#	Dilution	Replicates	Results		
				5 Min	10 Min	15 Min
Trichophyton mentagrophytes	9533	703 ppm (2.0 oz/gal)	4	0/4 +	0	0

Conclusion: All lots of **Spectrum HBV** effectively killed *Trichophyton mentagrophytes* as specified in the test performance standards. **Spectrum HBV** is an effective fungicide for non-porous inanimate hard surfaces when diluted to 703 ppm active concentration in 400 ppm synthetic hard water and in the presence of 5% organic soil.

Summary of Antimicrobial Test Results - (Continued)

Claim: Virucide		Contact Time: Varies		Organic Soil: 5%		Water Conditions: 400 ppm as CaCO ₃	
Test Method:		EPA Guidelines					
Organism	Source of Virus or ATCC#	Host System; Cytopathic Effect	Use-Dilution Concentration	Contact Time			
Herpes Simplex Type 1	HSV-1; ATCC VR-733	VERO cells; lytic cytopathic effect	703 ppm (2.0 oz./gal)	10 Min.			
Herpes Simplex Type 2	HSV-2; MS Strain	VERO cells; lytic cytopathic effect	703 ppm (2.0 oz./gal)	10 Min.			
HIV-1 (AIDS Virus)	HTLV-III _{RF} ; NCI	MT2 cells; lytic cytopathic effect	703 ppm (2.0 oz./gal)	4 Min.			
Influenza A/ Hong Kong	ATCC 68-H3N2	MDCK cells; lytic cytopathic effect	703 ppm (2.0 oz./gal)	10 Min.			
Hepatitis B	Hepadnavirus Testing, Inc. (DHBV)	Primary Duck Hepaocytes No Cytopathic Effects	703 ppm (2.0 oz./gal)	10 min.			
Hepatitis C (HCV)	Bovine Viral Diarrhea Virus	MDBK Cells	703 ppm (2.0 oz./gal)	10 min.			
Human Corona Virus	VR-740 Strain 229E	MRC-5 Host	703 ppm (2.0 oz./gal)	10 Min.			
Norovirus (Norwalk-like virus) (Feline Calicivirus)	ATCC VR-782		703 ppm (2.0 oz./gal)	10 Min.			
Influenza A (H1N1) virus	ATCC VR-1469		703 ppm (2.0 oz./gal)	10 Min.			
Influenza A2/Japan			703 ppm (2.0 oz./gal)	10 Min.			
Rubella virus	Strain M-33	RK13 cells; cytopathic effect	703 ppm (2.0 oz./gal)	10 Min.			
Rabies virus	ATCC VR-138		1055 ppm (2.5 oz./gal)	10 Min.			
Respiratory Syncytial virus	ATCC VR-26		703 ppm (2.0 oz./gal)	10 Min.			
Vaccinia	Strain IHD	VERO Cells; lytic cytopathic effect	703 ppm (2.0 oz./gal)	10 Min.			
Vancomycin Resistant Enterococcus Faecalis VRE	ATCC 51575		703 ppm (2.0 oz./gal)	10 Min.			
Vancomycin Intermediate resistant Staphylococcus aureus VISA	HIP 5836		703 ppm (2.0 oz./gal)	10 Min.			
Avian Influenza A	H5N1		703 ppm (2.0 oz./gal)	10 Min.			
Avian Influenza A	H9N2 Turkey/Wisconsin Virus		703 ppm (2.0 oz./gal)	10 Min.			
Avian Reovirus			703 ppm (2.0 oz./gal)	10 Min.			
Avian Infectious Bronchitis virus	ATCC VR-22		703 ppm (2.0 oz./gal)	10 Min.			
Bovine Viral Diarrhea virus			703 ppm (2.0 oz./gal)	10 Min.			
Canine Adenovirus			1055 ppm (2.5 oz./gal)	10 Min.			
Canine Coronavirus			703 ppm (2.0 oz./gal)	10 Min.			

Organism	Source of Virus or ATCC#	Host System; Cytopathic Effect	Use-Dilution Concentration	Contact Time
Canine Distemper virus	ATCC-VR-256		703 ppm (2.0 oz./gal)	10 Min.
Canine Parainfluenza virus			1055 ppm (2.5 oz./gal)	10 Min.
Canine Parvovirus (CPV)			2812 ppm (8.0 oz./gal)	10 Min.
Equine Arteritis virus			703 ppm (2.0 oz./gal)	10 Min.
Feline Calicivirus			1055 ppm (2.5 oz./gal)	10 Min.
Feline Infectious Peritonitis			1055 ppm (2.5 oz./gal)	10 Min.
Feline Leukemia Virus	ATCC VR-717 Strain FL-237		1055 ppm (2.5 oz./gal)	10 Min.
Feline Panleukopenia			1055 ppm (2.5 oz./gal)	10 Min.
Feline Picornavirus	ATCC VR-649		1055 ppm (2.5 oz./gal)	10 Min.
Feline Rhinotrachetis			1055 ppm (2.5 oz./gal)	10 Min.
Infectious Bovine Rhinotracheitis	ATCC VR-793		703 ppm (2.0 oz./gal)	10 Min.
Infectious Avian Laryotracheitis virus (IBR)			703 ppm (2.0 oz./gal)	10 Min.
Infectious Bronchitis virus			703 ppm (2.0 oz./gal)	10 Min.
Infectious Canine Hepatitis virus			1055 ppm (2.5 oz./gal)	10 Min.
Minute virus of Mice (Parvovirus)			2812 ppm (8.0 oz./gal)	10 Min.
Murine Parainfluenza virus type 1			1055 ppm (2.5 oz./gal)	10 Min.
Newcastle disease virus			703 ppm (2.0 oz./gal)	10 Min.
Porcine Parvovirus			2812 ppm (8.0 oz./gal)	10 Min.
Porcine Respiratory & Reporductive Virus (PRRSV)			703 ppm (2.0 oz./gal)	10 Min.
Porcine Rotavirus			703 ppm (2.0 oz./gal)	10 Min.
Pseudorabies Virus	ATCC VR-135		703 ppm (2.0 oz./gal)	10 Min.
Transmissible Gastroenteritis	ATCC VR-763		703 ppm (2.0 oz./gal)	10 Min.

Conclusion: All lots of **Spectrum HBV** effectively inactivated the above listed viruses as specified in the test performance standards. **Spectrum HBV** meets EPA requirements for hard surface virucidal claims in hospital and medical environments when diluted to 703 ppm in 400 ppm A.O.A.C. synthetic hard water and in the presence of 5% organic soil.

Summary of Antimicrobial Efficacy - Etiology¹

Pathogenic Microorganism	Description
<i>Pseudomonas aeruginosa</i>	Gram negative bacteria identified as a major cause of hospital acquired (nosocomial) infections. Causes wound infections (especially burn), meningitis, pneumonia and eye infections. Required for Hospital Disinfectants.
<i>Staphylococcus aureus</i>	Gram positive bacteria identified as a major cause of hospital acquired (nosocomial) infections. Colonizes food and secretes enterotoxins which cause food poisoning after ingestion. Causes wound infections, septicemia, endocarditis, meningitis, osteomyelitis and pneumonia. Required for Hospital Disinfectants.
<i>Aspergillus niger</i>	Black mold, found in shower and dressing rooms. Environmental contaminant may also cause "Aspergillosis."
<i>Enterobacter aerogenes</i>	Gram negative bacteria spread by anal/oral route of infection. Associated with bacteremia, respiratory, wound and urinary tract infections.
<i>Escherichia coli</i>	Gram negative bacteria spread by anal/oral route of infection, resulting in diarrhea outbreaks. Associated with urinary tract infections and bacteremia.
<i>Listeria monocytogenes</i>	Gram positive (rod shape) bacteria. Considered a potent food pathogen. Found in raw meat and poultry. Infections can result in meningitis or sepsis.
<i>Klebsiella pneumoniae</i>	Gram negative bacteria associated with severe pneumonia, bacteremia and urinary tract infections.
<i>Salmonella enterica</i>	Gram negative (rod shape) bacteria associated with acute gastroenteritis and diarrhea.
<i>Salmonella schottmuelleri</i>	Gram negative (rod shape) bacteria associated with acute gastroenteritis and diarrhea.
<i>Salmonella typhi</i>	Gram negative (rod shape) bacteria associated with acute gastroenteritis and diarrhea, the causative agent for typhoid fever.
<i>Shigella dysenteriae</i>	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.
<i>Enterococcus faecalis</i>	Gram positive (Enterococci) bacteria causing hemolysis, urinary tract infections and endocarditis.
<i>Trichophyton mentagrophytes</i>	Athlete's foot fungus. Found in shower and dressing rooms. Also the causative agent of Ring Worm, a fungi that is transmitted through non-socomal contact (e.g. activity mats, wrestling mats, etc)
Canine Distemper	Lipophilic (enveloped) RNA virus. Highly contagious among dogs causes fever, gastrointestinal and respiratory symptoms.
Feline Leukemia Virus	Non-enveloped RNA virus. One of the causative agents of lymphosarcoma in cats.
Herpes Simplex Type 1	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).
Influenza A/Japan	Lipophilic (enveloped) RNA virus. Causative agent in viral flu. Causes flu epidemics in nearly 2 of every 3 years.
Hepatitis B virus (HBV)	Lipophilic (enveloped) DNA virus of the hepadnavirus family. Causitive agent of Hepatitis B (serum hepatitis),
Hepatitis C virus (HCV)	Major cause of acute hepatitis and chronic liver disease, including cirrhosis and liver cancer. It is an enveloped RNA virus in the flaviviridae family.

Human Corona Virus	Single stranded RNA containing virus causing respiratory infection in humans. From order Nidovirales and Family Coronaviridae.
Rabies	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.
Vaccinia	Lipophilic (enveloped) DNA poxvirus; causes poxvirus infections.