STERAMINE® Efficacy Summary

SANITIZER • DISINFECTANT • DEODORIZER

Food Contact Sanitizer (No Rinse)

At 0.25 ounces per gallon (1 ounce per 4 gallons) (200 ppm) **Steramine®** is an effective food-contact surface sanitizer eliminating 99.999% of the following bacteria in 60 seconds in 500 ppm hard water (calculated as $CaCO_3$) according to the AOAC Germicidal and Detergent Sanitizing Action of Disinfectants test.

(Testing is performed per the AOAC method (AOAC Germicidal and Detergent Sanitizers) on 3 separate lots, one of which must be ≥ 60 days old, against both Escherichia coli and Staphylococcus aureus. Acceptable results must demonstrate a 99.999% reduction in the number of test microorganisms within 30 seconds.)

ORGANISM	ATCC #	CARRIER POPULATION	SAMPLE	30 SECOND KILL	60 SECOND KILL
Escherichia coli	ATCC #11229	7.47 Log_{10}	A	7.47 Log_{10}	7.47 Log_{10}
			B	7.47 Log_{10}	7.47 Log_{10}
			C	7.47 Log_{10}	7.47 Log_{10}
Staphylococcus aureus	ATCC #6538	7.0 Log_{10}	A	7.0 Log_{10}	7.0 Log_{10}
			B	7.0 Log_{10}	7.0 Log_{10}
			C	7.0 Log_{10}	7.0 Log_{10}
Aeromonas hydrophila	ATCC #23213	8.04 Log_{10}	A	>5.53 Log_{10}	-
			B	>6.09 Log_{10}	-
Campylobacter jejuni	ATCC #29428	7.27 Log_{10}	A	>7.27 Log_{10}	>7.27 Log_{10}
			B	>7.27 Log_{10}	>7.27 Log_{10}
Enterococcus faecalis Vancomycin Resistant (VRE)	ATCC #51299	8.00 Log_{10}	A	6.10 Log_{10}	-
			B	6.15 Log_{10}	-
Enterobacter sakazakii	ATCC #29544	7.93 Log_{10}	A	>5.37 Log_{10}	-
		8.15 Log_{10}	B	5.16 Log_{10}	-
Escherichia coli 0111:H8	ATCC #BAA-184	7.95 Log_{10}	A	>6.96 Log_{10}	-
			B	>6.96 Log_{10}	-
Escherichia coli 0157:H7	ATCC #43888	8.04 Log_{10}	A	5.15 Log_{10}	>5.78 Log_{10}
			B	5.07 Log_{10}	>5.65 Log_{10}
Listeria monocytogenes	ATCC #984	8.22 Log_{10}	A	6.42 Log_{10}	>7.30 Log_{10}
			B	7.32 Log_{10}	7.43 Log_{10}
Salmonella typhi	ATCC #6539	8.00 Log_{10}	A	6.70 Log_{10}	-
			B	6.41 Log_{10}	-
Shigella dysenteriae	ATCC #9361	7.87 Log_{10}	A	>7.87 Log_{10}	>7.87 Log_{10}
			B	>7.87 Log_{10}	>7.87 Log_{10}
Streptococcus pyogenes	ATCC #12344	7.90 Log_{10}	A	>6.60 Log_{10}	-
			B	>6.90 Log_{10}	-
Yersinia enterocolitica	ATCC #23715	7.88 Log_{10}	A	>7.88 Log_{10}	>7.88 Log_{10}
			B	>7.88 Log_{10}	>7.88 Log_{10}

Non-Food Contact Surface Sanitizer

Add 1/4 ounce of **Steramine®** to 1 gallon of water to sanitize hard porous and non-porous non-food contact surfaces. Treated surfaces must remain wet for 3 minutes. Then wipe with sponge, mop or cloth or allow to air dry. At this dilution food contact surfaces must be rinsed.

(Testing is performed per EPA Guidance (DIS/TSS-10). Three lots are required, one of which must be ≥ 60 days old. Testing is performed against Staphylococcus aureus and Klebsiella pneumoniae containing 5% organic load. Enterobacter aerogenes may be substituted for Klebsiella pneumoniae. The results must show a reduction of at least 99.9% (3 Log_{10}) in the number of each test microorganism over the parallel control count within 5 minutes.)

ORGANISM	ATCC #	CARRIER POPULATION	SAMPLE	60 SECOND KILL CFU / CARRIER	PERCENT KILL
Enterobacter aerogenes	ATCC 13048	5.43 Log_{10}	A (60 Days Old)	>4.03 Log_{10}	>99.9
			B	>3.09 Log_{10}	>99.9
		7.07 Log_{10}	C	>3.93 Log_{10}	>99.9
Staphylococcus aureus	ATCC #6538	6.55 Log_{10}	A (60 Days Old)	>5.03 Log_{10}	>99.9
			B	>5.15 Log_{10}	>99.9
			C	>4.90 Log_{10}	>99.9

Hospital Disinfection

Steramine® is bactericidal according to the AOAC Use Dilution Test method on hard inanimate surfaces modified in the presence of 5% organic serum at 4 ounces of this product to 5 gallons of water (625 ppm active) Treated surfaces must remain wet for 10 minutes.

(Testing is performed per the AOAC UDT/GST method (DIS/TSS-1). Sixty carriers are required on 3 separate lots, one of which must be > 60 days old against Pseudomonas aeruginosa, Salmonella choleraesuis and Staphylococcus aureus. Killing of 59 out of 60 carriers is required (total carriers = 540).)

ORGANISM	ATCC #	CARRIER POPULATION	SAMPLE	# CARRIERS	# POSITIVE
Pseudomonas aeruginosa	ATCC #15442	1.6 X 10^7 CFU/Carrier	A (60 Days Old)	60	1/60
		1.0 X 10^6 CFU/Carrier	B	60	0/60
		9.0 X 10^6 CFU/Carrier	C	60	0/60
Salmonella enterica	ATCC #10708	5.6 X 10^4 CFU/Carrier	A (60 Days Old)	60	0/60
		5.4 X 10^4 CFU/Carrier	B	60	1/60
		4.0 X 10^4 CFU/Carrier	C	60	1/60
Staphylococcus aureus	ATCC #6538	1.6 X 10^6 CFU/Carrier	A (60 Days Old)	60	1/60
		1.4 X 10^6 CFU/Carrier	B	60	0/60
		1.4 X 10^6 CFU/Carrier	C	60	1/60

Supplemental Organisms

(Testing is performed per the AOAC UDT/GST method. Ten carriers are required on 2 separate lots, against each supplemental organism. Killing of 10 out of 10 carriers is required (total carriers = 20).)

ORGANISM	ATCC #	CARRIER POPULATION	SAMPLE	# CARRIERS	# POSITIVE
Botrytis cinerea	ATCC 12481	3.0 X 10^4 CFU/Carrier	A	10	0/10
			B	10	0/10
Burkholderia cepacia	ATCC 25416	3.5 X 10^4 CFU/Carrier	A	10	0/10
			B	10	0/10
Campylobacter jejuni	ATCC 29428	5.0 X 10^5 CFU/Carrier	A	10	0/10
			B	10	0/10
Botrytis cinerea	ATCC 12481	3.0 X 10^4 CFU/Carrier	A	10	0/10
			B	10	0/10
Corynebacterium ammoniagenes	ATCC 6871	6.0 X 10^4 CFU/Carrier	A	10	0/10
			B	10	0/10
Escherichia coli 0157:H7	ATCC 35150	1.4 X 10^5 CFU/Carrier	A	20	0/20
			B	20	0/20
Enterococcus faecium Vancomycin Resistant (VRE)		1.0 X 10^5 CFU/Carrier	A	10	0/10
			B	10	0/10
Klebsiella pneumoniae	ATCC 13883	1.8 X 10^4 CFU/Carrier	A	10	0/10
			B	10	0/10
Listeria monocytogenes	ATCC 984	2.4 X 10^4 CFU/Carrier	A	10	0/10
			B	10	0/10
Proteus mirabilis Clinical Isolate		1.1 X 10^5 CFU/Carrier	A	20	0/20
			B	20	0/20
Salmonella typhi	ATCC 6539	4.0 X 10^4 CFU/Carrier	A	10	0/10
			B	10	0/10
Shigella sonnei	ATCC 9290	1.3 X 10^4 CFU/Carrier	A	10	0/10
			B	10	0/10
Staphylococcus aureus (Methicillin Resistant) (MRSA)	ATCC 33591	4.2 X 10^5 CFU/Carrier	A	10	0/10
			B	10	0/10
Staphylococcus aureus (Community Associated Methicillin Resistant) (CA-MRSA) (NRS 123) (Genotype USA400)	ATCC 33591	1.44 X 10^5 CFU/Carrier	A	10	0/10
			B	10	0/10
Yersinia enterocolitica	ATCC 23715	4.6 X 10^4 CFU/Carrier	A	20	0/20
			B	20	0/20

Virucidal against

Steramine® was evaluated at 4 ounces per 5 gallons use level (625 ppm quat active), in the presence of 5% serum with a 10 minute contact time and found to be effective against the following viruses on hard nonporous environmental surfaces.

(Testing is performed per EPA Guidance (DIS/TSS-7). Two separate lots are tested. Inactivation of virus must be demonstrated at all dilutions when no cytotoxicity is observed or at all dilutions above the cytotoxic level when it is observed. The data must demonstrate a 3-log reduction in viral titer for both lots (3 lots for Canada).)

ORGANISM	ATCC #	DRIED VIRUS CONTROL	SAMPLE	RESULT	LOG REDUCTION
Avian Influenza A H5N1 virus		4.75 Log_{10}	A	≤0.5 Log_{10}	≥4.25 Log_{10}
			B	≤0.5 Log_{10}	≥4.25 Log_{10}
Avian influenza /Turkey/Wisconsin	ATCC VR-798	7.5 Log_{10}	A	≤1.8 Log_{10}	≥5.7 Log_{10}
			B	≤1.8 Log_{10}	≥5.7 Log_{10}
Avian Reovirus	ATCC VR-2449	6.0 Log_{10}	A	≤0.5 Log_{10}	≥5.5 Log_{10}
			B	≤0.5 Log_{10}	≥5.5 Log_{10}
Bovine Viral Diarrhea	ATCC VR-534	4.5 Log_{10}	A	≤0.5 Log_{10}	≥4.0 Log_{10}
			B	≤0.5 Log_{10}	≥4.0 Log_{10}
Canine Coronavirus	ATCC VR-809	4.5 Log_{10}	A	≤0.5 Log_{10}	≥4.0 Log_{10}
			B	≤0.5 Log_{10}	≥4.0 Log_{10}
Canine Distemper	ATCC VR-128	4.8 Log_{10}	A	≤1.5 Log_{10}	≥3.3 Log_{10}
			B	≤1.5 Log_{10}	≥3.3 Log_{10}
Equine Arteritis virus	ATCC VR-796	5.75 Log_{10}	A	≤0.5 Log_{10}	≥5.25 Log_{10}
			B	≤0.5 Log_{10}	≥5.25 Log_{10}
Hepatitis B Virus		4.5 Log_{10}	A	≤1.5 Log_{10}	≥3.0 Log_{10}
		5.0 Log_{10}	B	≤1.5 Log_{10}	≥3.5 Log_{10}
		5.38 Log_{10}	Confirmatory A	≤1.5 Log_{10}	≥3.88 Log_{10}
Hepatitis C Virus	ATCC CCL-22	7.14 Log_{10}	A	≤1.08 Log_{10}	≥6.06 Log_{10}
		7.14 Log_{10}	B	≤1.35 Log_{10}	≥5.79 Log_{10}
		7.14 Log_{10}	Confirmatory B	≤1.08 Log_{10}	≥6.06 Log_{10}
Herpes Simplex Type1	ATCC VR-260	6.8 Log_{10}	A	≤1.0 Log_{10}	≥5.8 Log_{10}
			B	≤1.0 Log_{10}	≥5.8 Log_{10}
Herpes Simplex Type 2	ATCC VR-734	5.5 Log_{10}	A	≤1.5 Log_{10}	≥4.0 Log_{10}
			B	≤1.5 Log_{10}	≥4.0 Log_{10}
Human Coronavirus	ATCC VR-740	4.5 Log_{10}	A	≤0.5 Log_{10}	≥4.0 Log_{10}
			B	≥0.5 Log_{10}	≥4.0 Log_{10}
Human Immunodeficiency Virus type 1 (HIV 1) HTLV-IIIB		5.5 Log_{10}	A	≤1.5 Log_{10}	≥4.0 Log_{10}
			B	≤1.5 Log_{10}	≥4.0 Log_{10}
Infectious Laryngotracheitis Virus (LT) Strain LT-IVAX		4.5 Log_{10}	A	≤0.5 Log_{10}	≥4.0 Log_{10}
			B	≤0.5 Log_{10}	≥4.0 Log_{10}
Influenza A (H1N1) virus	ATCC VR-1469	4.5 Log_{10}	A	≤0.5 Log_{10}	≥4.0 Log_{10}
			B	≤0.5 Log_{10}	≥4.0 Log_{10}
Influenza A2/Japan	ATCC VR-100	7.5 Log_{10}	A	≤1.8 Log_{10}	≥5.7 Log_{10}
			B	≤1.8 Log_{10}	≥5.7 Log_{10}
Infectious Bovine Rhinotracheitis virus (IBR)	ATCC VR-188	5.2 Log_{10}	A	≤1.5 Log_{10}	≥3.7 Log_{10}
			B	≤1.5 Log_{10}	≥3.7 Log_{10}
Infectious Bronchitis Virus Beaudette IB42		5.25 Log_{10}	A	≤0.5 Log_{10}	≥4.75 Log_{10}
			B	≤0.5 Log_{10}	≥4.75 Log_{10}
Newcastle disease virus		6.0 Log_{10}	A	≤1.8 Log_{10}	≥4.2 Log_{10}
			B	≤1.8 Log_{10}	≥4.2 Log_{10}
Porcine Respiratory & Reproductive (PRRSV)		5.5 Log_{10}	A	≤1.5 Log_{10}	≥4.0 Log_{10}
			B	≤1.5 Log_{10}	≥4.0 Log_{10}
Porcine Rotavirus	ATCC VR-893	4.5 Log_{10}	A	≤1.5 Log_{10}	≥3.0 Log_{10}
			B	≤1.5 Log_{10}	≥3.0 Log_{10}
Pseudorabies virus	ATCC VR-135	4.5 Log_{10}	A	≤1.5 Log_{10}	≥3.0 Log_{10}
			B	≤1.5 Log_{10}	≥3.0 Log_{10}
Transmissible Gastroenteritis (TGE)	ATCC VR-742	5.7 Log_{10}	A	≤2.5 Log_{10}	≥3.2 Log_{10}
			B	≤2.5 Log_{10}	≥3.2 Log_{10}
Vaccinia virus	ATCC VR-742	6.8 Log_{10}	A	≤1.8 Log_{10}	≥5.0 Log_{10}
			B	≤1.8 Log_{10}	≥5.0 Log_{10}

General Disinfection

Steramine® is bactericidal according to the AOAC Use Dilution Test method on hard inanimate surfaces modified in the presence of 5% organic serum at 3 ounces of this product to 5 gallons of water (469 ppm active) Treated surfaces must remain wet for 10 minutes.
(Testing is performed per the AOAC UDT/GST method (DIS/TSS-1). Sixty carriers are required on 3 separate lots, one of which must be > 60 days old against Salmonella choleraesuis and Staphylococcus aureus. Killing of 59 out of 60 carriers is required (total carriers = 360).)

ORGANISM	ATCC #	DRIED VIRUS CONTROL	SAMPLE	RESULT	LOG REDUCTION
Salmonella enterica	ATCC #10708	5.6×10^4 CFU/Carrier	A (60 Days Old)	60	0/60
		5.4×10^4 CFU/Carrier	B	60	1/60
		4.0×10^4 CFU/Carrier	C	60	1/60
Staphylococcus aureus	ATCC #6538	1.6×10^6 CFU/Carrier	A (60 Days Old)	60	1/60
		1.4×10^6 CFU/Carrier	B	60	0/60
		1.4×10^6 CFU/Carrier	C	60	1/60

Supplemental Organisms

(Testing is performed per the AOAC UDT/GST method. Ten carriers are required on 2 separate lots, against each supplemental organism. Killing of 10 out of 10 carriers is required (total carriers = 20).)

ORGANISM	ATCC #	DRIED VIRUS CONTROL	SAMPLE	RESULT	LOG REDUCTION
Campylobacter jejuni	ATCC 29428	5.0×10^5 CFU/Carrier	A	10	0/10
			B	10	0/10
Escherichia coli 0157:H7	ATCC 35150	1.4×10^5 CFU/Carrier	A	20	0/20
			B	20	0/20
Listeria monocytogenes	ATCC 984	2.4×10^4 CFU/Carrier	A	10	0/10
			B	10	0/10
Proteus mirabilis Clinical Isolate		1.1×10^5 CFU/Carrier	A	20	0/20
			B	20	0/20
Staphylococcus aureus (Methicillin Resistant) (MRSA)	ATCC 33591	4.2×10^5 CFU/Carrier	A	10	0/10
			B	10	0/10
Yersinia enterocolitica	ATCC 23715	4.6×10^4 CFU/Carrier	A	20	0/20
			B	20	0/20

Mold and Mildew Control

Use **Steramine®** at 4 ounces per gallon to control the growth of mold and mildew and their odors on hard, non-porous surfaces. Thoroughly wet all treated surfaces completely. Let air-dry. Repeat application weekly or when growth or odor reappears.

ORGANISM	ATCC #	TILE NUMBER	UNTREATED AFTER 7 DAYS	SAMPLE A AFTER 7 DAYS	SAMPLE B AFTER 7 DAYS
Aspergillus niger	ATCC #6275	1	Growth 80%	No Growth 0%	No Growth 0%
		2	Growth 100%	No Growth 0%	No Growth 0%
		3	Growth 80%	No Growth 0%	No Growth 0%
		4	Growth 80%	No Growth 0%	No Growth 0%
		5	Growth 80%	No Growth 0%	No Growth 0%
		6	Growth 80%	No Growth 0%	No Growth 0%
		7	Growth 80%	No Growth 0%	No Growth 0%
		8	Growth 100%	No Growth 0%	No Growth 0%
		9	Growth 100%	No Growth 0%	No Growth 0%
		10	Growth 80%	No Growth 0%	No Growth 0%

STEARNS

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