

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 CaCO₃) 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
<i>Escherichia coli</i>	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
<i>Staphylococcus aureus</i>	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

<i>Aeromonas hydrophila</i>	ATCC #23213	8.04 Log ₁₀	A	>5.53 Log ₁₀	-
			B	>6.09 Log ₁₀	-
<i>Campylobacter jejuni</i>	ATCC #29428	7.27 Log ₁₀	A	>7.27 Log ₁₀	>7.27 Log ₁₀
			B	>7.27 Log ₁₀	>7.27 Log ₁₀
<i>Enterococcus faecalis</i> Vancomycin Resistant (VRE)	ATCC #51299	8.00 Log ₁₀	A	6.10 Log ₁₀	-
			B	6.15 Log ₁₀	-
<i>Enterobacter sakazakii</i>	ATCC #29544	7.93 Log ₁₀	A	>5.37 Log ₁₀	-
			B	5.16 Log ₁₀	-
<i>Escherichia coli</i> 0111:H8	ATCC #BAA-184	7.95 Log ₁₀	A	>6.96 Log ₁₀	-
			B	>6.96 Log ₁₀	-
<i>Escherichia coli</i> 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
<i>Listeria monocytogenes</i>	ATCC #984	8.22 Log ₁₀	A	6.42 Log ₁₀	>7.30 Log ₁₀
			B	7.32 Log ₁₀	7.43 Log ₁₀
<i>Salmonella typhi</i>	ATCC #6539	8.00 Log ₁₀	A	6.70 Log ₁₀	-
			B	6.41 Log ₁₀	-
<i>Shigella dysenteriae</i>	ATCC #9361	7.87 Log ₁₀	A	>7.87 Log ₁₀	>7.87 Log ₁₀
			B	>7.87 Log ₁₀	>7.87 Log ₁₀
<i>Streptococcus pyogenes</i>	ATCC #12344	7.90 Log ₁₀	A	>6.60 Log ₁₀	-
			B	>6.90 Log ₁₀	-
<i>Yersinia enterocolitica</i>	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 Log₁₀) 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
<i>Enterobacter aerogenes</i>	ATCC 13048	5.43 Log ₁₀	A (60 Days Old)	>4.03 Log ₁₀	>99.9
			B	>3.09 Log ₁₀	>99.9
			C	>3.93 Log ₁₀	>99.9
<i>Staphylococcus aureus</i>	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 (825 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
<i>Pseudomonas aeruginosa</i>	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 ⁵ CFU/Carrier	C	60	0/60
<i>Salmonella enterica</i>	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 ³ CFU/Carrier	C	60	1/60
<i>Staphylococcus aureus</i>	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
<i>Botrytis cinerea</i>	ATCC 12481	3.0 X 10 ⁴ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Burkholderia cepacia</i>	ATCC 25416	3.5 X 10 ⁴ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Campylobacter jejuni</i>	ATCC 29428	5.0 X 10 ⁵ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Botrytis cinerea</i>	ATCC 12481	3.0 X 10 ⁴ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Corynebacterium ammoniagenes</i>	ATCC 6871	6.0 X 10 ⁴ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Escherichia coli</i> 0157:H7	ATCC 35150	1.4 X 10 ⁵ CFU/Carrier	A	20	0/20
			B	20	0/20
<i>Enterococcus faecium</i> Vancomycin Resistant (VRE)		1.0 X 10 ⁵ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Klebsiella pneumoniae</i>	ATCC 13883	1.8 X 10 ⁴ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Listeria monocytogenes</i>	ATCC 984	2.4 X 10 ⁴ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Proteus mirabilis</i> Clinical Isolate		1.1 X 10 ⁵ CFU/Carrier	A	20	0/20
			B	20	0/20
<i>Salmonella typhi</i>	ATCC 6539	4.0 X 10 ⁴ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Shigella sonnei</i>	ATCC 9290	1.3 X 10 ⁴ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Staphylococcus aureus</i> (Methicillin Resistant) (MRSA)	ATCC 33591	4.2 X 10 ⁵ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Staphylococcus aureus</i> (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
<i>Yersinia enterocolitica</i>	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
<i>Salmonella enterica</i>	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
<i>Staphylococcus aureus</i>	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 #	DRIED VIRUS CONTROL	SAMPLE	RESULT	LOG REDUCTION
<i>Campylobacter jejuni</i>	ATCC 29428	5.0 X 10 ⁵ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Escherichia coli</i> 0157:H7	ATCC 35150	1.4 X 10 ⁶ CFU/Carrier	A	20	0/20
			B	20	0/20
<i>Listeria monocytogenes</i>	ATCC 984	2.4 X 10 ⁴ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Proteus mirabilis</i> Clinical Isolate		1.1 X 10 ⁶ CFU/Carrier	A	20	0/20
			B	20	0/20
<i>Staphylococcus aureus</i> (Methicillin Resistant) (MRSA)	ATCC 33591	4.2 X 10 ⁶ CFU/Carrier	A	10	0/10
			B	10	0/10
<i>Yersinia enterocolitica</i>	ATCC 23715	4.6 X 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
<i>Aspergillus niger</i>	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%