



ATO QUAT

(DIN#02243658)

Quaternary ammonium based disinfectant
VIRULICIDAL – BACTERICIDAL – FUNGICIDAL – ALGICIDAL

DESCRIPTION

ATO QUAT is a wide spectrum disinfectant and is efficient against, virus, bacteria, yeast, mold and algae. **ATO QUAT** is approved by **Health Canada** and **Agriculture Canada** as a wide spectrum disinfectant. **ATO QUAT** belongs to a family of Quaternary compounds that are environmentally friendly.

DILUTION

ATO QUAT is used in different Canadian establishments at a concentration varying from 0.2% to 1%. However, for a complete control of microorganisms, use **ATO QUAT** at a concentration of 1%. 10 ml **ATO QUAT** is diluted in 1 L water in order to yield 1% concentration. This dilution provides 1000 ppm active quaternary compounds that control 99.99% of tested pathogenic microorganisms in 10 minutes. The phenol coefficient experiments were determined with the 10-minute killing studies; however, **ATO QUAT** is efficient in less than 15 seconds.

TEMPERATURE

The variation of temperature does not affect the efficiency of **ATO QUAT**.

ADVANTAGES

ATO QUAT is a neutral disinfectant that prevents corrosion and damage to equipment and surfaces. **ATO QUAT** is not irritant to skin. **ATO QUAT** is even approved as **no-rinse** food contact disinfectant if used at a concentration of 0.2% or below.

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P.O. Box 338 Balmoral, Manitoba R0H-0H0

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Although **ATO QUAT** controls 99.99% of microorganisms, below is a list of selected microorganisms controlled by the disinfectant.

Bacteria

Aerobacter aerogenes
Bacillus aerus, var. *mycoides* (gram +)
Bacillus subtilis (gram +)
Brevibacterium ammoniagenes
Brucella abortus
Citrobacter freundii
Clostridium difficile (gram +)
Escherichia coli (gram -)
Enterobacter aerogenes
Klebsiella pneumoniae
Lactobacillus casei
Listeria monocytogenes (gram +)
Monilia albicans
Mycobacterium amegmatis
Neisseria calarrbalis (gram -)
Pasteurella multocida (gram -)
Penicillium luteum
Penicillium notatum
Pityrosporum ovale
Proteus vulgaris (gram -)
Pseudomonas aeruginosa PRD-10 (gram -)
Salmonella gallinarum (gram -)
Salmonella pullorum (gram -)
Salmonella typhimurium (gram -)
Salmonella schottumelleri (gram -)
Salmonella typhosa (gram -)
Salmonella choleraesuis (gram -)
Shigella sonnei (gram -)
Staphylococcus aureus (gram +)
Methicillin Resistant Staphylococcus Aureus (MRSA) (gram +)

Bacteria (continue)

Streptococcus pyogenes C-203 (gram +)
Streptococcus fecalis (gram +)
Streptococcus faecalis (VRE) (Vancomycin resistant enterococci) (gram +)
Streptococcus viridans (gram +)

Yeast and Mold

Saccharomyces cerevisiae
Candida albicans
Oidium lactis
Aspergillus niger
Pityrosporum ovale
Penicillium funiculosum
Trichophyton mentagrophytes
Trichophyton interdigitale
Epidermophyton floccosum
Microsporum canis
Microsporum gypseum
Cladosporium herbarum
Aureobasidium pullulans

Algae

Chlamydomonas
Chlorella vulgaris
Scenedesmus

Kirchneriella
Nostoc

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Quaternary ammonium based disinfectant

BIOLOGICAL PROPERTIES

Phenol Coefficients of **ALL PRO** were determined by the official A.O.A.C procedure

10- Minute Killing Dilution

Organism Bacteria	Dilution of ATO Quat in water to get the 10 minute killing	Concentration of ATO Quat (ml/L) to kill in 10 minutes	ppm of ATO Quat to kill the microbe in 10 minutes	Phenol Coefficient
<i>Brucella abortus</i>	1/5088	0.20 ml/L	20 ppm	370
<i>Escherichia coli</i>	1/3375	0.30 ml/L	30 ppm	390
<i>Klebsiella pneumoniae</i>	1/3125	0.32 ml/L	32 ppm	278
<i>Lactobacillus casei</i>	1/13125	0.08 ml/L	8 ppm	1050
<i>Listeria monocytogenes</i>	1/9000	0.11 ml/L	11 ppm	720
<i>Mycobacterium amegmatis</i>	1/2625	0.38 ml/L	38 ppm	309
<i>Neisseria caiarbalis</i>	1/2163	0.46 ml/L	46 ppm	221
<i>Pasteurella multocida</i>	1/6763	0.14 ml/L	14 ppm	492
<i>Proteus vulgaris</i>	1/1500	0.66 ml/L	66 ppm	171
<i>Pseudomonas aeruginosa PRD-10</i>	1/1750	0.57 ml/L	57 ppm	200
<i>Salmonella gallinarum</i>	1/3500	0.28 ml/L	28 ppm	300
<i>Salmonella pullorum</i>	1/3125	0.32 ml/L	32 ppm	278
<i>Salmonella typhimurium</i>	1/2500	0.40 ml/L	40 ppm	250
<i>Salmonella schottumelleri</i>	1/7500	0.13 ml/L	13 ppm	630
<i>Salmonella typhosa</i>	1/5625	0.18 ml/L	18 ppm	500
<i>Shigella sonnei</i>	1/3125	0.32 ml/L	32 ppm	313
<i>Staphylococcus aureus</i>	1/5625	0.18 ml/L	18 ppm	750
<i>Streptococcus fecalis</i>	1/18750	0.05 ml/L	5 ppm	2150
<i>Streptococcus pyogenes C-203</i>	1/3125	0.32 ml/L	32 ppm	313

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<i>Streptococcus viridans</i>	1/8750	0.11 ml/L	11 ppm	778
FUNGI				
<i>Saccharomyces cerevisiae</i>	1/6250	0.16 ml/L	16 ppm	500
<i>Pityrosporum ovale</i>	1/4375	0.22 ml/L	22 ppm	350

Study of the efficiency of ATO QUAT 1.5% on different bacterial species

Microorganisms tested	Exposure Time	Starting Population (CFU/ml)	Bacterial population after exposure to ATO QUAT 1.5%		Logarithmic reduction		Percentage of reduction
			Count # 1	Count # 2	Count # 1	Count # 2	
Staphylococcus aureus ATCC 1678	15 seconds	2.9 × 10 ⁷	< 2	< 2	7.16	7.16	> 99.9999%
	30 seconds		< 2	< 2			
	45 seconds		< 2	< 2			
	60 seconds		< 2	< 2			

Microorganisms tested	Exposure Time	Starting Population (CFU/ml)	Bacterial population after exposure to ATO QUAT 1.5%		Logarithmic reduction		Percentage of reduction
Clostridium sporogenes	15 seconds	10 ⁷	47	66	5.32	5.18	99.99%
Enterococcus faecalis ATCC 51299	15 seconds	1.7 × 10 ⁷	< 2	< 2	6.92	6.92	> 99.9999%
Escherichia coli ATCC 11775	15 seconds	3 × 10 ⁷	2	2	7.17	7.17	> 99.9999%
Escherichia coli O157 :H7 ATCC 35155	15 seconds	1.3 × 10 ⁷	< 2	3	6.81	6.63	> 99.9999%
Klebsiella pneumoniae ATCC 13883	15 seconds	1.8 × 10 ⁷	6	4	6.47	6.65	> 99.9999%
Pseudomonas aeruginosa ATCC 10145	15 seconds	10 ⁷	3	2	6.52	6.69	> 99.9999%
Salmonella enteritidis	15 seconds	2 × 10 ⁷	3	2	6.82	7	> 99.9999%
Serratia marcescens	15 seconds	3 × 10 ⁷	< 2	< 2	7.17	7.17	> 99.9999%

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Streptococcus agalactiae clinique	15 seconds	1.5×10^7	< 2	2	6.87	6.87	> 99.9999%
Streptococcus pyogenes ATCC 19615	15 seconds	2×10^6	2	3	5.99	5.82	> 99.999%

Study of the efficiency of ATO QUAT 1% on different bacterial species

Microorganisms tested	Exposure Time	Starting Population (CFU/ml)	Bacterial population after exposure to to ATO QUAT 1.0%		Logarithmic reduction		Percentage of reduction
			Count # 1	Count # 2	Count # 1	Count # 1	
Staphylococcus aureus ATCC 1678	15 secondes	2.9×10^7	< 2	< 2	7.16	7.16	> 99.9999%
	30 secondes		< 2	< 2			
	45 secondes		< 2	< 2			
	60 secondes		< 2	< 2			

Microorganisms tested	Exposure Time	Starting Population (CFU/ml)	Bacterial population after exposure to to ATO QUAT 1.0%		Logarithmic reduction		Percentage of reduction
Clostridium sporogenes	15 seconds	10^7	120	160	4.92	4.79	99.99%
Enterococcus faecalis ATCC 51299	15 seconds	1.7×10^7	2	3	6.92	6.75	> 99.9999%
Escherichia coli ATCC 11775	15 seconds	3×10^7	< 2	< 2	7.17	7.17	> 99.9999%
Escherichia coli O157 :H7 ATCC 35155	15 seconds	1.3×10^7	5	< 2	6.41	6.81	> 99.9999%
Klebsiella pneumoniae ATCC 13883	15 secondes	1.8×10^7	8	10	6.35	6.25	> 99.999%
Pseudomonas aeruginosa ATCC 10145	15 secondes	10^7	6	4	6.22	6.39	> 99.999%
Salmonella enteritidis	15 secondes	2×10^7	8	4	6.39	6.69	> 99.9999%

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Serratia marcescens	15 secondes	3×10^7	4	3	6.87	6.99	> 99.9999%
Streptococcus agalactiae clinique	15 secondes	1.5×10^7	5	3	6.47	6.69	> 99.9999%
Streptococcus pyogenes ATCC 19615	15 secondes	2×10^6	6	2	5.52	6	> 99.999%

ATO QUAT is approved both from Health Canada and the Canadian Food Inspection Agency as a no-rinse sanitizer at 200 ppm.

The formulation, efficiency and toxicity of **ATO QUAT** were studied by different departments before releasing the certification as a no-rinse sanitizer when used at 200 ppm.

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