EFFICACY DATA for ES64H
BTC® 885 Neutral Disinfectant Cleaner-64
(EPA Reg. No. 1839-169)

DISINFECTION DATA:

Test Method: AOAC Use Dilution

Test Conditions: 10 minute contact time, 5% organic soil load, stainless steel carrier substrates, 400 ppm hard water, 20°C exposure temperature, 2 oz/gal dilution [with the exception of *Xanthomonas axonopodis* pathovar *citri*, dilution ratio is indicated by organism]

Results:

Test Organism	Sample	No. of Carriers Exposed	No. of Carriers Positive
Staphylococcus aureus (ATCC 6538)	A	60	1
	B	60	1
	C	60	1
Salmonella (*choleraesuis*) *enteric* (ATCC 10708)	A	60	0
	B	60	0
	C	60	1
Pseudomonas aeruginosa PRD-10 (ATCC 15442)	A	60	0
	B	60	0
	C	60	1
Ampicillin resistant *Acinetobacter baumannii* (Fairfax Hospital CI 02001)	A	10	0
	B	10	0
Bactrim resistant *Acinetobacter baumannii* (Fairfax Hospital CI 02001)	A	10	0
	B	10	0
Bordetella bronchiseptica (ATCC 31437)	A	10	0
	B	10	0
Cefazolin resistant *Acinetobacter baumannii* (Fairfax Hospital CI 02001)	A	10	0
	B	10	0
Ceftazdime resistant *Acinetobacter baumannii* (Fairfax Hospital CI 02001)	A	10	0
	B	10	0
Ceftriaxone resistant *Acinetobacter baumannii* (Fairfax Hospital CI 02001)	A	10	0
	B	10	0
Ciprofloxacin resistant *Acinetobacter baumannii* (Fairfax Hospital CI 02001)	A	10	0
	B	10	0
Community Associated Methicillin Resistant *Staphylococcus aureus* (CA-MRSA) (NRS 123, Genotype USA400)	A	10	0
	B	10	0
	C	10	0
Community Associated Methicillin Resistant *Staphylococcus aureus* (CA-MRSA) (NRS 384, Genotype USA300)	A	10	0
	B	10	0
	C	10	0
Corynebacterium ammoniagenes (ATCC 6871)	A	10	0
	B	10	0
Enterobacter aerogenes (ATCC 13048)	A	10	0
	B	10	0
Enterobacter cloacae (ATCC 23355)	A	10	0
	B	10	0
Enterobacter cloacae (clinical isolate)	A	10	0
	B	10	0

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DISINFECTION DATA (continued)

Test Organism	Sample	No. of Carriers Exposed	No. of Carriers Positive
Enterococcus faecalis	A	10	0
(ATCC 19433)	B	10	0
Enterococcus faecalis	A	10	0
(clinical isolate)	B	10	0
Escherichia coli	A	10	0
(ATCC 11229)	B	10	0
Escherichia coli	A	10	0
(clinical isolate)	B	10	0
Escherichia coli O111:H8	A	10	0
(ATCC BAA-184)	B	10	0
Fusobacterium necrophorum	A	10	0
(ATCC 27852)	B	10	0
Gentamicin resistant *Acinetobacter baumannii*	A	10	0
(Fairfax Hospital CI 02001)	B	10	0
Klebsiella pneumoniae subsp. *Pneumonia*	A	10	0
(ATCC 13883)	B	10	0
Lactobacillus casei subsp. *Rhamnosus*	A	10	0
(ATCC 7469)	B	10	0
Levofloxacin resistant *Acinetobacter baumannii*	A	10	0
(Fairfax Hospital CI 02001)	B	10	0
Listeria monocytogenes	A	10	0
(ATCC 35152)	B	10	0
Methicillin Resistant *Staphylococcus aureus*	A	10	0
(MRSA) (ATCC 33592)	B	10	0
Pasteurella multocida	A	10	0
(ATCC 7707)	B	10	0
Proteus mirabilis	A	10	0
(ATCC 9921)	B	10	0
Proteus mirabilis	A	10	0
(ATCC 25933)	B	10	0
Proteus vulgaris	A	10	0
(ATCC 13315)	B	10	0
Salmonella (*paratyphi B*) *enterica*	A	10	0
(ATCC 8759)	B	10	0
Salmonella (*pullorum*) *enterica*	A	10	0
(ATCC 9120)	B	10	0
Salmonella (*typhi*) *enterica*	A	10	0
(ATCC 6539)	B	10	0
Salmonella (*typhimurium*) *enterica*	A	10	0
(ATCC 14028)	B	10	0
Salmonella (*enteritidis*) *enterica*	A	10	0
(ATCC 13076)	B	10	0
Serratia marcescens	A	10	0
(ATCC 8100)	B	10	0
Shigella dysenteriae	A	10	0
(ATCC 12180)	B	10	0
Shigella flexneri Type 2b	A	10	0
(ATCC 12022)	B	10	0

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DISINFECTION DATA (continued)

Test Organism	Sample	No. of Carriers Exposed	No. of Carriers Positive
Shigella sonnei	A	10	0
(ATCC 25931)	B	10	0
Staphylococcus aureus subsp. *aureus*	A	10	0
(ATCC 33592)	B	10	0
Staphylococcus aureus	A	10	0
(clinical isolate)	B	10	0
Staphylococcus epidermidis	A	10	0
(ATCC 29641)	B	10	0
Staphylococcus epidermidis	A	10	0
(clinical isolate)	B	10	0
Streptococcus pyogenes Group A	A	10	0
(ATCC 19615)	B	10	0
Streptococcus pyogenes	A	10	0
(clinical-flesh eating strain, BIRD M3)	B	10	0
Tobramycin resistant *Acinetobacter baumannii*	A	10	0
(Fairfax Hospital CI 02001)	B	10	0
Vancomycin Resistant *Enterococcus faecalis*	A	10	0
(VRE) (ATCC 51575)	B	10	0
Vancomycin Intermediate Resistant *Staphylococcus aureus* (VISA)	A	10	0
(HIP 5863)	B	10	0
Xanthamonas maltophilia	A	10	0
(clinical isolate)	B	10	0
Xanthomonas axonopodis pathovar *citri* at a dilution ratio of 1:27	A	10	0
(2000 ppm active quat)	B	10	0

Conclusion: Under the conditions of these investigations, BTC® 885 Neutral Disinfectant Cleaner-64 demonstrated **disinfectant** activity against *Staphylococcus aureus, Salmonella* (*choleraesuis*) *enterica*, *Pseudomonas aeruginosa,* Ampicillin resistant *Acinetobacter baumannii*, Bactrim resistant *Acinetobacter baumannii*, *Bordetella bronchiseptica,* Cefazolin resistant *Acinetobacter baumanni*, Ceftazdime resistant *Acinetobacter baumannii*, Ceftriaxone resistant *Acinetobacter baumannii,* Ciprofloxacin resistant *Acinetobacter baumannii,* Community Associated Methicillin Resistant *Staphylococcus aureus* (CA-MRSA) (NRS 123, Genotype USA400), Community Associated Methicillin Resistant *Staphylococcus aureus* (CA-MRSA) (NRS 384, Genotype USA300), *Corynebacterium ammoniagenes, Enterobacter aerogenes, Enterobacter cloacae, Enterococcus faecalis, Escherichia coli, Escherichia coli* O111:H8, *Fusobacterium necrophorum,* Gentamicin resistant *Acinetobacter baumannii, Klebsiella pneumoniae* subsp. *pneumoniae, Lactobacillus casei* subsp. *rhamnosus,* Levofloxacin resistant *Acinetobacter baumannii, Listeria monocytogenes,* Methicillin Resistant *Staphylococcus aureus* (MRSA), *Pasteurella multocida, Proteus mirabilis* (ATCC 9921), *Proteus mirabilis* (ATCC 25933), *Proteus vulgaris, Salmonella* (*paratyphi B*) *enterica, Salmonella* (*pullorum*) *enterica, Salmonella* (*typhi*) *enterica, Salmonella* (*typhimurium*) *enterica, Salmonella* (*enteritidis*) *enterica, Serratia marcescens, Shigella dysenteriae, Shigella flexneri* Type 2b, *Shigella sonnei, Staphylococcus aureus* subsp. *aureus, Staphylococcus epidermidis, Streptococcus pyogenes* Group A, *Streptococcus pyogenes* (clinical-flesh eating strain, BIRD M3), Tobramycin resistant *Acinetobacter baumannii,* Vancomycin Resistant *Enterococcus faecalis* (VRE), and Vancomycin Intermediate Resistant *Staphylococcus aureus* (VISA), according to criteria established by the U.S. Environmental Protection Agency for registration and labeling of a disinfectant product as a bactericide.

BTC® 885 Neutral Disinfectant Cleaner-64 also demonstrated **disinfectant** activity against the following antibiotic resistant clinical isolates: *Enterobacter cloacae, Enterococcus faecalis, Escherichia coli, Staphylococcus aureus, Staphylococcus epidermidis,* and *Xanthamonas maltophilia*.

At a dilution ratio of 1:27 (2000 ppm active quat), BTC® 885 Neutral Disinfectant Cleaner-64 demonstrated **disinfectant** activity against *Xanthomonas axonopodis* pathovar *citri* (Citrus Canker Disease).

VIRUCIDAL DATA:

Test Method:

- ***** U.S. E.P.A. Pesticide Assessment Guidelines, Subdivision G: Product Performance, Section 91-2 (f), and Section 91-30, (d), (e), November 1982.
- † Protocols for Testing the Efficacy of Disinfectants against Hepatitis B Virus (HBV) (EPA, Federal Register, Vol. 65, No. 166, 8/25/2000, p. 51828).
- ‡ Protocol for Testing Disinfectants against Hepatitis C Virus using Bovine Viral Diarrhea Virus as approved by the U.S. EPA on August 15, 2002.

Test Conditions: 2 oz/gal dilution, 5% organic soil load, 10 minute contact time, 400 ppm hard water, 21-24°C exposure temperature, sterile glass petri dishes,

Results:

Test Organism	Sample		Titer Reduction	
*Avian Influenza A Virus (H3N2) (Avian Reassortant) (ATCC VR-2072)	A	B	$\geq 4.25 \log_{10}$	$\geq 4.25 \log_{10}$
*Avian Influenza Virus, Type A (Turkey/WIS/66) (H9N2)	A	B	$\geq 4.0 \log_{10}$	$\geq 4.0 \log_{10}$
*Bovine Rhinotracheitis, strain LA (ATCC VR-188)	A	B	$\geq 5.0 \log_{10}$	$\geq 5.0 \log_{10}$
‡Bovine Viral Diarrhea Virus (BVDV)	A	B	$5.9 \log_{10}$	$5.9 \log_{10}$
*Canine Distemper Virus, strain Lederle (ATCC VR-128)	A	B	$\geq 6.25 \log_{10}$	$\geq 6.25 \log_{10}$
*Feline Picornavirus, strain FRV (ATCC VR-649)	A	B	$\geq 4.25 \log_{10}$	$\geq 4.25 \log_{10}$
†Hepatitis B Virus (HBV) (Duck Hepatitis B Virus-DHBV)	A	B	$4.5 \log_{10}$	$4.7 \log_{10}$
‡Hepatitis C Virus (HCV) (Bovine Viral Diarrhea Virus-BVDV)	A	B	$5.9 \log_{10}$	$5.9 \log_{10}$
*Herpes Simplex Type 1 (ATCC VR-260)	A	B	$\geq 5.0 \log_{10}$	$\geq 5.0 \log_{10}$
*Herpes Simplex Type 2 (ATCC VR-734)	A	B	$\geq 6.0 \log_{10}$	$\geq 6.0 \log_{10}$
*Human Coronavirus (ATCC VR-740, strain 229E)	A	B	$\geq 3.0 \log_{10}$	$\geq 3.0 \log_{10}$
*Human Immunodeficiency Virus, $HTLV\text{-}III_{RF}$, strain of HIV-1 (associated with AIDS)	A	B	$\geq 3.5 \log_{10}$	$\geq 3.5 \log_{10}$
*Human Immunodeficiency Virus type 2 (HIV-2), strain CBL-20	A	B	$\geq 3.25 \log_{10}$	$\geq 3.25 \log_{10}$
*Influenza A_2, strain Hong Kong (ATCC VR-544)	A	B	$\geq 4.25 \log_{10}$	$\geq 4.25 \log_{10}$
*Pandemic 2009 H1N1 Influenza A Virus	(Refer to NOTE below.)			
*Paramyxovirus (Mumps) (ATCC VR-1438)	A	B	$\geq 3.0 \log_{10}$	$\geq 3.0 \log_{10}$
*Porcine Respiratory & Reproductive Syndrome Virus (PRRSV), strain NVSL	A	B	$\geq 5.0 \log_{10}$	$\geq 5. 0 \log_{10}$
*Pseudorabies, strain Aujeszky (ATCC VR-135)	A	B	$\geq 5.25 \log_{10}$	$\geq 5.25 \log_{10}$
*Rabies Virus (attenuated CDC ERA strain)	A	B	$3.0 \log_{10}$	$3.0 \log_{10}$
*Rotavirus, strain SA-11 (ATCC VR-899)	A	B	$4.5 \log_{10}$	$4.5 \log_{10}$
*SARS Associated Coronavirus (ZeptoMetrix)	A	B	$3.03 \log_{10}$	$3.03 \log_{10}$
*Vaccinia, strain WR (ATCC VR-119)	A	B	$\geq 5.5 \log_{10}$	$\geq 5.5 \log_{10}$

Conclusion: Under the conditions of this investigation, BTC® 885 Neutral Disinfectant Cleaner-64 demonstrated **virucidal** activity against Avian Influenza A Virus (H3N2), Avian Influenza Virus Type A (H9N2), Bovine Rhinotracheitis, Bovine Viral Diarrhea Virus (BVDV), Canine Distemper Virus, Feline Picornavirus, Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), Herpes Simplex Type 1, Herpes Simplex Type 2, Human Coronavirus, Human Immunodeficiency Virus (HIV-1), Human Immunodeficiency Virus type 2 (HIV-2), Influenza A_2, Pandemic 2009 H1N1 Influenza A Virus, Paramyxovirus (Mumps), Porcine Respiratory & Reproductive Syndrome Virus (PRRSV), Pseudorabies, Rabies Virus, Rotavirus, SARS Associated Coronavirus and Vaccinia according to criteria established by the U. S. Environmental Protection Agency for registration and labeling of a disinfectant product as a virucide.

NOTE: Per the EPA guidance document dated October 21, 2009, disinfectant products that bear label claims against human, avian, or swine influenza A virus, and have submitted and received approval of efficacy data to support these label claims, may include a label claim against the Pandemic 2009 H1N1 Influenza A Virus.

FUNGICIDAL DATA:

Test Method: AOAC Fungicidal Activity of Disinfectants

Test Conditions: 2 oz/gal dilution, 5% organic soil load, 10 minute contact time, 200 ppm hard water, 20°C exposure temperature

		Exposure Time (min.) vs. Growth		
Test Organism	Sample	5	10	15
Trichophyton mentagrophytes	A	+	0	0
(ATCC 9533)	B	+	0	0
Candida albicans (ATCC 10231)	A	0	0	0
	B	0	0	0

Conclusions: Under the conditions of this investigation, BTC® 885 Neutral Disinfectant Cleaner-64 demonstrated **fungicidal** activity against *Trichophyton mentagrophytes* and *Candida albicans* according to criteria established by the U. S. Environmental Protection Agency for registration and labeling of a disinfectant product as a fungicide.

MILDEW FUNGISTATIC DATA:

Test Method: Hard Surface Mildew Fungistatic Test

Test Organism: *Aspergillus niger* (ATCC 6275)

Test Conditions: 2 oz/gal dilution, 400 ppm hard water, ceramic tile carriers

Results:

Sample	No. of Exposed Tiles	No. of Tiles Showing Growth
A	10	0
B	10	0
Control	10	10

Conclusion: Under the conditions of this investigation, BTC® 885 Neutral Disinfectant Cleaner-64 demonstrated **fungistatic** activity against *Aspergillus niger* according to criteria established by the U. S. Environmental Protection Agency for registration and labeling of a disinfectant product as a fungistat.

BACTERICIDAL STABILITY DATA OF USE-SOLUTION:

Test Method: Use Dilution

Test Conditions: 2 oz/gal dilution, 5% organic soil load, 10 minute contact time, 400 ppm hard water, 20°C exposure temperature, stainless steel carrier substrates

Storage Conditions: sealed containers at room temperature

Results:

			No. of Carriers	
Test Time	Sample	Test Organism	Exposed	Positive
Zero Time	A	*Staphylococcus aureus* (ATCC 6538)	10	0
		Salmonella (*choleraesuis*) *enterica* (ATCC 10708)	10	0
		Pseudomonas aeruginosa (ATCC 15442)	10	0
	B	*Staphylococcus aureus* (ATCC 6538)	10	0
		Salmonella (*choleraesuis*) *enterica* (ATCC 10708)	10	0
		Pseudomonas aeruginosa (ATCC 15442)	10	0
Week 1	A	*Staphylococcus aureus* (ATCC 6538)	10	0
		Salmonella (*choleraesuis*) *enterica* (ATCC 10708)	10	0
		Pseudomonas aeruginosa (ATCC 15442)	10	0
	B	*Staphylococcus aureus* (ATCC 6538)	10	0
		Salmonella (*choleraesuis*) *enterica* (ATCC 10708)	10	0
		Pseudomonas aeruginosa (ATCC 15442)	10	0
Week 2	A	*Staphylococcus aureus* (ATCC 6538)	10	0
		Salmonella (*choleraesuis*) *enterica* (ATCC 10708)	10	0
		Pseudomonas aeruginosa (ATCC 15442)	10	0
	B	*Staphylococcus aureus* (ATCC 6538)	10	0
		Salmonella (*choleraesuis*) *enterica* (ATCC 10708)	10	0
		Pseudomonas aeruginosa (ATCC 15442)	10	0
Week 3	A	*Staphylococcus aureus* (ATCC 6538)	10	0
		Salmonella (*choleraesuis*) *enterica* (ATCC 10708)	10	0
		Pseudomonas aeruginosa (ATCC 15442)	10	0
	B	*Staphylococcus aureus* (ATCC 6538)	10	0
		Salmonella (*choleraesuis*) *enterica* (ATCC 10708)	10	0
		Pseudomonas aeruginosa (ATCC 15442)	10	0
Week 4	A	*Staphylococcus aureus* (ATCC 6538)	10	0
		Salmonella (*choleraesuis*) *enterica* (ATCC 10708)	10	0
		Pseudomonas aeruginosa (ATCC 15442)	10	0
	B	*Staphylococcus aureus* (ATCC 6538)	10	0
		Salmonella (*choleraesuis*) *enterica* (ATCC 10708)	10	0
		Pseudomonas aeruginosa (ATCC 15442)	10	0

Conclusion: The results of this investigation show that a 2 oz/gal use dilution of BTC® 885 Neutral Disinfectant Cleaner-64 will demonstrate disinfectant efficacy against *Staphylococcus aureus*, *Salmonella* (*choleraesuis*) *enterica*, and *Pseudomonas aeruginosa* for up to 4 weeks in accordance with criteria established by the U.S. Environmental Protection Agency for registration and labeling of a disinfectant product as a bactericide.