



EFFICACY DATA for Product Central 105: Antimicrobial (MonoFoil® 1.3% Solution)

VIRUCIDAL DATA:

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.

U.S. E.P.A. Pesticide Assessment Guidelines, Subdivision G: Product Performance, 1982, Section 91-30, pp. 72-76.

Virucide Assay (EPA, Federal Register 10, No. 123, 6/25/75, p. 26836)

10 minute contact time, glass petri dish substrates, 18.5-25°C exposure temperature, tested in the presence of serum

Results:

<u>Test Organism</u>	<u>Sample</u>		<u>Titer Reduction</u>	
†Adenovirus Type 5	A	B	≥3.0 log ₁₀	≥3.3 log ₁₀
*Avian Influenza A/Turkey/Wisconsin (ATCC VR-798)	A	B	≥5.5 log ₁₀	≥5.5 log ₁₀
‡Bovine Viral Diarrhea Virus (BVDV)	A	B	5.93 log ₁₀	5.93 log ₁₀
•Hepatitis B Virus (HBV) (Duck Hepatitis B Virus- DHBV)	A	B	4.68 log ₁₀	4.68 log ₁₀
‡Hepatitis C Virus (HCV) (Bovine Viral Diarrhea Virus-BVDV)	A	B	5.93 log ₁₀	5.93 log ₁₀
†Herpes Simplex Type 1 (Sabin)	A	B	4.0 log ₁₀	4.0 log ₁₀
*Human Coronavirus (ATCC VR-740, strain 229E)	A	B	≥4.25 log ₁₀	≥4.25 log ₁₀
*Human Immunodeficiency Virus, HIV-1, strain HTLV- III _B , (associated with AIDS)	A	B	≥3.5 log ₁₀	≥3.5 log ₁₀
†Influenza A ₂ (Japan 305/57)	A	B	7.5 log ₁₀	7.5 log ₁₀
*Norovirus	A	B	4.75 log ₁₀	≥4.75 log ₁₀
*Newcastle Disease Virus (strain H.J. Roakin, 1946)	A	B	≥5.5 log ₁₀	≥5.5 log ₁₀
*SARS associated Coronavirus (ZeptoMetrix)	A	B	4.03 log ₁₀	4.03 log ₁₀
†Vaccinia (Wyeth)	A	B	3.5 log ₁₀	3.5 log ₁₀

Conclusion: Under the conditions of this investigation, MONOFOIL® 1.3% Solution was **virucidal** for Adenovirus Type 5, Avian Influenza A/Turkey/Wisconsin, Bovine Viral Diarrhea Virus (BVDV), Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), Herpes Simplex Type 1 (Sabin), Human Coronavirus, Human Immunodeficiency Virus (HIV-1), Influenza A₂ (Japan 305/57), Laryngotracheitis, Newcastle Disease Virus, SARS associated Coronavirus and Vaccinia (Wyeth) according to criteria established by the U. S. Environmental Protection Agency for registration and labeling of a disinfectant product as a virucide.

SANITIZATION DATA:
Test Method: AOAC Germicidal and Detergent Sanitizing Action of Disinfectants

Test Conditions: synthetic hard water as **650 ppm** hardness (as CaCO₃)

Results:
**TOTAL BACTERIAL COUNTS/
% KILL vs. EXPOSURE TIME**

Organism	30 seconds			60 seconds		Initial Inoculum
	Sample	TBC*	% Kill†	TBC*	% Kill†	Control Count
<i>Staphylococcus aureus</i> (ATCC 6538)	A	970	99.999	105	99.999	7.8 x 10 ⁷
	B	1285	99.999	205	99.999	9.2 x 10 ⁷
	C	1145	99.999	130	99.999	9.3 x 10 ⁷
<i>Escherichia coli</i> (ATCC 11229)	A	1125	99.999	50	99.999	1.0 x 10 ⁸
	B	1075	99.999	95	99.999	9.3 x 10 ⁷
	C	835	99.999	75	99.999	8.1 x 10 ⁷
<i>Campylobacter jejuni</i> (ATCC 29428)	A	790	99.999	410	99.999	8.6 x 10 ⁷
	B	780	99.999	470	99.999	8.6 x 10 ⁷
<i>Escherichia coli</i> O157:H7 (ATCC 43895)	A	1220	99.999	110	99.999	9.2 x 10 ⁷
	B	1000	99.999	125	99.999	9.2 x 10 ⁷
<i>Listeria monocytogenes</i> (ATCC 35152)	A	<10	>99.999	<10	>99.999	7.8 x 10 ⁸
	B	<10	>99.999	<10	>99.999	7.8 x 10 ⁸
Methicillin resistant <i>Staphylococcus aureus</i> (ATCC 33592)	A	950	99.999	<10	>99.999	1.0 x 10 ⁸
	B	970	99.999	<10	>99.999	1.0 x 10 ⁸
<i>Salmonella typhi</i> (ATCC 6539)	A	<10	>99.999	<10	>99.999	1.4 x 10 ⁸
	B	<10	>99.999	<10	>99.999	1.4 x 10 ⁸
<i>Shigella sonnei</i> (ATCC 11060)	A	680	99.999	<10	>99.999	9.3 x 10 ⁷
	B	4500	99.999	<10	>99.999	9.3 x 10 ⁷
Vancomycin resistant <i>Enterococcus faecalis</i> (ATCC 51299)	A	<10	>99.999	<10	>99.999	1.2 x 10 ⁸
	B	<10	>99.999	<10	>99.999	1.2 x 10 ⁸
<i>Vibrio cholera</i> (ATCC 14035)	A	<10	>99.999	<10	>99.999	8.3 x 10 ⁷
	B	<10	>99.999	<10	>99.999	8.3 x 10 ⁷
<i>Yersinia enterocolitica</i> (ATCC 23715)	A	108	99.999	<10	>99.999	1.7 x 10 ⁸
	B	1300	99.999	263	99.999	5.9 x 10 ⁸

*TBC = Total Bacterial Count, organisms/ml

Kill calculation based on Initial Inoculum Control Count.

Conclusion: Under the conditions of these investigations, MONOFOIL® 1.3% Solution demonstrated **sanitizing** activity against *Staphylococcus aureus*, *Escherichia coli*, *Campylobacter jejuni*, *Escherichia coli* O157:H7, *Listeria monocytogenes*, Methicillin resistant *Staphylococcus aureus*, *Salmonella typhi*, *Shigella sonnei*, Vancomycin resistant *Enterococcus faecalis*, *Vibrio cholera* and *Yersinia enterocolitica* according to criteria established by the U. S. Environmental Protection Agency



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SANITIZATION DATA (continued):

Test Method: AOAC Germicidal and Detergent Sanitizing Action of Disinfectants

Test Conditions: synthetic hard water as **650 ppm** hardness (as CaCO₃)

Results:

Organism	30 seconds		TOTAL BACTERIAL COUNTS/ % KILL vs. EXPOSURE TIME			
	Sample	TBC*	% Kill†	60 seconds TBC*	% Kill†	Initial Inoculum Control Count
<i>Klebsiella pneumoniae</i> (ATCC 4352)	A	100	99.999	<10	>99.999	9.4 x 10 ⁸
	B	310	99.999	<10	>99.999	9.4 x 10 ⁸

*TBC = Total Bacterial Count, organisms/ml

†% Kill calculation based on Initial Inoculum Control Count.

Conclusion: Under the conditions of these investigations, MONOFOIL® 1.3% Solution demonstrated **sanitizing** activity against *Klebsiella pneumonia* at 300 ppm quaternary concentration and 650 ppm water hardness according to criteria established by the U. S. Environmental Protection Agency for registration and labeling of a disinfectant product as a sanitizer.

Test Method: AOAC Germicidal and Detergent Sanitizing Action of Disinfectants

Test Conditions: synthetic hard water as **500 ppm** hardness (as CaCO₃)

Results:

Organism	30 seconds		TOTAL BACTERIAL COUNTS/ % KILL vs. EXPOSURE TIME			
	Sample	TBC*	% Kill†	60 seconds TBC*	% Kill†	Initial Inoculum Control Count
<i>Klebsiella pneumoniae</i> (ATCC 4352)	A	340	99.999	<10	>99.999	1.1 x 10 ⁸
	B	190	99.999	<10	>99.999	1.1 x 10 ⁸

*TBC = Total Bacterial Count, organisms/ml

†% Kill calculation based on Initial Inoculum Control Count.

Conclusion: Under the conditions of these investigations, MONOFOIL® 1.3% Solution demonstrated **sanitizing** activity against *Klebsiella pneumoniae* at 200 ppm quaternary concentration and 500 ppm water hardness according to criteria established by the U. S. Environmental Protection Agency for registration and labeling of a disinfectant product as a sanitizer.



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DISINFECTION DATA:

Test Method: AOAC Use Dilution

Test Conditions: 5% organic soil load, 10 minute contact time, stainless steel carrier substrates
20°C exposure temperature

Results:

Test Organism	Dilution	Number of Carriers		Positive
		Sample	Exposed	
<i>Staphylococcus aureus</i> (ATCC 6538)	3 ounces/1 gallons	A	60	0
		B	60	0
<i>Salmonella enterica</i> (ATCC 10708)	3 ounces/1 gallons	A	60	0
		B	60	0
<i>Listeria monocytogenes</i> (ATCC 35152)	3 ounces/1 gallons	A	10	0
		B	10	0
<i>Yersinia enterocolitica</i> (ATCC 23715)	3 ounces/1 gallons	A	10	0
		B	10	0
<i>Pseudomonas aeruginosa</i> (ATCC 15442)	3.5 ounces/1 gallons	A	60	0
		B	60	0
<i>Staphylococcus aureus</i> (Vancomycin intermediate resistant) (VISA) (HIP-5836)	3.5 ounces/1 gallons	A	10	0
		B	10	0
<i>Xanthomonas axonopodis</i> (pathovar <i>citri</i>) (Citrus Canker) (USDA Permit No. 46190)	2.67 ounces/1 gallon	A	10	0
		B	10	0

Under the conditions of these investigations, MONOFOIL® 1.3% Solution demonstrated **disinfectant** activity against *Staphylococcus aureus*, *Salmonella enterica*, *Listeria monocytogenes*, *Yersinia enterocolitica*, *Pseudo-monas aeruginosa*, *Staphylococcus aureus* (Vancomycin intermediate resistant) (VISA), and *Xanthomonas axonopodis* pathovar *citri* (citrus canker) according to criteria established by the U. S. Environmental Protection Agency for registration and labeling of a disinfectant product as a bactericide.

The testing data is provided for informational use as to the effectiveness of the MonoFoil Antimicrobial product. The provided information does not reflect actual EPA label claims and makes no claims above and beyond the master label.