

Test Procedure

Minimum Inhibitory Concentration and Time Kill efficacy tests were run on the formula used in Advanced Antibacterial Foam Hand Soap. The objective of the Minimum Inhibitory Concentration (MIC) test was to determine the MIC in water that will prevent visible bacterial growth. The objective of the Time Kill test was to evaluate the antimicrobial efficacy of the formulation against various organisms applicable in food handler environments.

Table 1: Time Kill Study (TK)

Organism	Log reduction versus exposure time		Percent reduction versus exposure time	
	15 s	30 s	15 s	30 s
<i>Acinetobacter baumannii</i> (ATCC 19606)	>5.40	>5.40	>99.999	>99.999
<i>Bacteroides fragilis</i> (ATCC 43859)	>5.00	>5.00	>99.999	>99.999
<i>Candida albicans</i> (ATCC 10231)	1.91	3.14	98.773	99.927
<i>Enterobacter cloacae</i> (ATCC 13047)	>5.60	>5.60	>99.999	>99.999
<i>Enterococcus faecalis</i> (ATCC 29212)	>5.43	>5.43	>99.999	>99.999
<i>Enterococcus faecalis</i> – VRE (ATCC 51299)	>5.54	>5.54	>99.999	>99.999
<i>Enterococcus faecium</i> (ATCC 51559)	>5.08	>5.08	>99.999	>99.999
<i>Escherichia coli</i> (ATCC 11229)	5.05	>5.71	>99.999	>99.999
<i>Escherichia coli</i> O157:H7 (ATCC 43895)	3.22	3.76	99.940	99.982
<i>Haemophilus influenzae</i> (ATCC 10211)	>5.65	>5.65	>99.999	>99.999
<i>Klebsiella pneumoniae</i> (ATCC 10031)	>5.57	>5.57	>99.999	>99.999
<i>Listeria monocytogenes</i> (ATCC 7644)	>5.78	>5.78	>99.999	>99.999
<i>Micrococcus yunnanensis</i> (ATCC 7468)	>4.00	>4.00	>99.990	>99.990
<i>Proteus mirabilis</i> (ATCC 7002)	4.33	>5.45	99.995	>99.999
<i>Pseudomonas aeruginosa</i> (ATCC 15442)	>5.82	>5.82	>99.999	>99.999
<i>Pseudomonas stutzeri</i> (ATCC 17588)	>5.68	>5.68	>99.999	>99.999
<i>Salmonella typhimurium</i> (ATCC 13311)	>5.84	>5.84	>99.999	>99.999
<i>Salmonella enteritidis</i> (ATCC 13076)	>5.63	>5.63	>99.999	>99.999
<i>Salmonella enterica</i> (ATCC 10708)	>5.71	>5.71	>99.999	>99.999
<i>Shigella sonnei</i> (ATCC 11060)	>5.43	>5.43	>99.999	>99.999
<i>Staphylococcus aureus</i> (ATCC 6538)	3.87	5.06	99.987	>99.999
<i>Staphylococcus aureus</i> MRSA (ATCC 33592)	2.97	4.64	99.892	99.998
<i>Staphylococcus epidermidis</i> (ATCC 12228)	2.49	3.63	99.674	99.977
<i>Staphylococcus haemolyticus</i> (ATCC 29970)	>5.18	>5.18	>99.999	>99.999
<i>Staphylococcus hominis</i> (ATCC 27844)	>4.00	>4.00	>99.990	>99.990
<i>Staphylococcus saprophyticus</i> (ATCC 43867)	>5.23	>5.23	>99.999	>99.999
<i>Streptococcus pneumoniae</i> (ATCC 6303)	>4.46	>4.46	>99.997	>99.997
<i>Streptococcus pyogenes</i> (ATCC 19615)	>4.34	>4.34	>99.995	>99.995

Table 2: Minimum Inhibitory Concentration (MIC)

Organism	MIC (dilution rate)	Temperature
<i>Acinetobacter baumannii</i> (ATCC 19606)	1:1,024	35 ± 2 °C
<i>Bacteroides fragilis</i> (ATCC 43859)	1:8,192	35 ± 2 °C (anaerobic)
<i>Candida albicans</i> (ATCC 10231)	1:2,048*	26 ± 2 °C
<i>Enterobacter cloacae</i> (ATCC 13047)	1:512	30 ± 2 °C
<i>Enterococcus faecalis</i> (ATCC 29212)	1:2,048	35 ± 2 °C
<i>Enterococcus faecalis</i> – VRE (ATCC 51299)	1:2,048	35 ± 2 °C
<i>Enterococcus faecium</i> (ATCC 51559)	1:4,096	35 ± 2 °C
<i>Escherichia coli</i> (ATCC 11229)	1:512	35 ± 2 °C
<i>Escherichia coli</i> O157:H7 (ATCC 43895)	1:256	35 ± 2 °C
<i>Haemophilus influenzae</i> (ATCC 10211)	1:2,048	35 ± 2 °C (5% CO ₂)
<i>Klebsiella pneumoniae</i> (ATCC 10031)	1:2,048	35 ± 2 °C
<i>Klebsiella pneumoniae</i> (ATCC 4352)	1:2,048	35 ± 2 °C
<i>Listeria monocytogenes</i> (ATCC 7644)	1:2,048	35 ± 2 °C
<i>Micrococcus yunnanensis</i> (ATCC 7468)	1:16,384	30 ± 2 °C
<i>Proteus mirabilis</i> (ATCC 7002)	1:128	35 ± 2 °C
<i>Pseudomonas aeruginosa</i> (ATCC 15442)	1:4	35 ± 2 °C
<i>Pseudomonas stutzeri</i> (ATCC 17588)	1:512	35 ± 2 °C
<i>Salmonella typhimurium</i> (ATCC 13311)	1:512	35 ± 2 °C
<i>Salmonella enteritidis</i> (ATCC 13076)	1:512	35 ± 2 °C
<i>Salmonella enterica</i> (ATCC 10708)	1:64	35 ± 2 °C
<i>Salmonella typhi</i> (ATCC 6539)	1:512	35 ± 2 °C
<i>Serratia marcescens</i> (ATCC 14756)	1:2	26 ± 2 °C
<i>Shigella sonnei</i> (ATCC 11060)	1:1,024	35 ± 2 °C
<i>Staphylococcus aureus</i> (ATCC 6538)	1:4,096	35 ± 2 °C
<i>Staphylococcus aureus</i> MRSA (ATCC 33592)	1:2,048	35 ± 2 °C
<i>Staphylococcus epidermidis</i> (ATCC 12228)	1:2,048	35 ± 2 °C
<i>Staphylococcus haemolyticus</i> (ATCC 29970)	1:4,096	35 ± 2 °C
<i>Staphylococcus hominis</i> (ATCC 27844)	1:4,096	35 ± 2 °C
<i>Staphylococcus saprophyticus</i> (ATCC 43867)	1:4,096	35 ± 2 °C
<i>Streptococcus pneumoniae</i> (ATCC 6303)	1:2,048	35 ± 2 °C (5% CO ₂)
<i>Streptococcus pyogenes</i> (ATCC 19615)	1:8,192	35 ± 2 °C

*MBC Dilution