

Anti-Microbial Test Laboratories has tested AtmosAir’s effectiveness on MS2 Bacteriophage, a surrogate for viruses, especially those that are more difficult to kill. In this test, AtmosAir reduced this by over 98% within 15 minutes and over 99.99% after 45 minutes. According to Dr. Tierno, a Professor of Microbiology and Pathology at NYU, **“Coronaviruses are enveloped viruses, they are easier to kill compared to naked viruses like Noroviruses.”**

**MS2 Bacteriophage (MS2), ATCC 15597-B1**

This virus is a non-enveloped positive-stranded RNA virus of the bacteriophage family Leviviridae. Bacterial cells are the hosts for bacteriophages, and E. coli 15597 serves this purpose for MS2 bacteriophage. **Its small size, icosahedral structure, and environmental resistance has made MS2 ideal for use as a surrogate virus** (particularly in place of picornaviruses such as poliovirus and human norovirus) in water quality and disinfectant studies.

Permissive Host Cell System for MS2: Escherichia coli ATCC 15597

Microorganism	Test Device	Initial Numbers Control (CFU/m <sup>3</sup> )	Sampling Time Point	Recovery (CFU/m <sup>3</sup> )		Percent Reduction vs. Normalized Numbers Control
				Normalized Numbers Control	Test Data	
S. saprophyticus ATCC 35552	Matterhorn	4.14E+08	15 Minutes	3.39E+07	2.31E+05	99.32%
			45 Minutes	4.48E+06	<2.27E+01	99.9995%

Note: The Limit of Detection (LOD) for this germ is 22.7 CFU/m<sup>3</sup>. Values below the LOD are represented as <2.27E+01 in the chart above and 0 in the graph.

Microorganism	Test Device	Initial Numbers Control (CFU/m <sup>3</sup> )	Sampling Time Point	Recovery (CFU/m <sup>3</sup> )		Percent Reduction vs. Normalized Numbers Control
				Normalized Numbers Control	Test Data	
E. coli K12	Matterhorn	3.42E+07	15 Minutes	1.18E+06	<7.68E+02	>99.94%
			45 Minutes	1.61E+05	<2.27E+01	>99.986%

Note: The Limit of Detection (LOD) for this germ are 768 CFU/m<sup>3</sup> and 22.7 CFU/m<sup>3</sup> for 15 and 45 minutes, respectively. Values below the LOD are represented as <7.68E+02 and <2.27E+01 in the graph below.

Microorganism	Test Device	Initial Numbers Control (CFU/m <sup>3</sup> )	Sampling Time Point	Recovery (CFU/m <sup>3</sup> )		Percent Reduction vs. Normalized Numbers Control
				Normalized Numbers Control	Test Data	
MS2 Bacteriophage ATCC 15597-B1	Matterhorn	2.50E+08	15 Minutes	8.84E+07	1.65E+06	98.13%
			45 Minutes	3.32E+07	2.27E+01	99.99993%



Microorganism	Time	Percent Reduction vs. Normalized Numbers Control
S. saprophyticus ATCC 35552	15 minutes	99.32%
	45 minutes	99.9995%
E. coli K12	15 minutes	>99.94%
	45 minutes	>99.986%
MS2 Bacteriophage ATCC 15597-B1	15 minutes	98.13%
	45 minutes	99.99993%