GPS Reports on Pathogen Testing

WHITE PAPER

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Pathogen Testing

GPS has invested substantial resources for independent testing to confirm kill rates of various pathogens using needlepoint bipolar ionization technology. Tests were conducted to measure the kill rates of

1. **Mycobacterium terrae** (**Tuberculosis** surrogate) - M. terrae is commonly used as a surrogate test for Mycobacterium tuberculosis as it demonstrates similar physical characteristics and is slightly more resistant but is far less dangerous.
2. **Clostridium difficile** (C. diff) – also known as Clostridioides difficile and often referred to as C. difficile or C. diff, is a bacterium that can cause symptoms ranging from diarrhea to life-threatening inflammation of the colon.
3. **Feline calicivirus** (human **Norovirus** surrogate) – Feline calicivirus (FCV) and human noroviruses belong to the same viral family, Caliciviridae.
4. **Methicillin Resistant Staphylococcus Aureus** (**MRSA**) - Methicillin-resistant Staphylococcus aureus infection is caused by a type of staph bacteria that's become resistant to many of the antibiotics used to treat ordinary staph infections.
5. **Escherichia coli (E.coli)** - E. coli are a large and diverse group of bacteria.
6. **Legionella pneumophila** - The bacterium Legionella pneumophila is the principal etiologic agent of Legionnaires' disease.
7. **Mold** - The most common indoor molds are Cladosporium, Penicillium, and Aspergillus.

Summary Results of GPS' Needlepoint Ion Technology

Testing at several testing agencies produced following results:

Pathogen	Test Time	Kill Rate	Test Agency
Tuberculosis	60 minutes	69.09%	EMSL
Clostridium difficile	30 minutes	86.87%	EMSL
Norovirus	30 minutes	93.50%	ATS Labs
MRSA	30 minutes	96.24%	EMSL
E.coli	15 minutes	99.68%	EMSL
Legionella	30 minutes	99.71%	EMSL
Mold Spores	24 hours	99.50%	GCA

Industry Wide Testing

Tests have been conducted by numerous parties throughout the world to measure the efficacy of bipolar ionization to kill harmful pathogens. Sharp Corporation conducted a series tests and produced a detailed compilation of lab results of bipolar ionization effects on various pathogens.

Pathogen	Tests/Results	Organization	Overview	Date
H1N1 human Influenza Virus	$1m^3$ box Time: 25 minutes **99.7% reduction**	Kitasato Institute Medical Center Hospital, Japan	Influenza that infects humans	2004
H5N1 Avian Influenza Virus	$1m^3$ box Time: 10 minutes **99% reduction**	Retroscreen Virology Ltd., UK Prof. John Oxford	Influenza that infects birds	2008
Feline Coronavirus	$1m^3$ box Time: 35 minutes **99.7% reduction**	Kitasato Institute Medical Center Hospital, Japan	Feline infectious peritonitis virus	2004
Coxsackie Virus	One-pass test Time: 3.3 seconds **98.9% reduction**	Kitasato Research Center of Enviro. Sciences, Japan	Virus causing summer illness	2002
Polio Virus	One-pass test Time: 3.3 seconds **98.9% reduction**	Kitasato Research Center of Enviro. Sciences, Japan	Virus causing infant paralysis	2002
SARS Virus	One-pass test Time: 3.3 seconds **73.4% reduction**	Retroscreen Virology Ltd., UK Prof. John Oxford	Virus of SARS	2005

Source: https://global.sharp/pci/en/certified/pdf/petodor_01.pdf